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Contents

FISCAL SUSTAINABILITY TO SUSTAINABLE ECONOMIC DEVELOPMENT IN THE ERA OF DIGITAL TRANSFORMATION

Emilia Mioara Câmpeanu[1]

Abstract: *Countries are thrust into a quadruple transition to revision of the economy by enhancing a more competitive, sustainable, inclusive, and resilient society. In this context, the paper aims to investigate how fiscal sustainability induces sustainable economic development while considering the impact of digital transformation and climate challenges for 27 countries in the European Union (EU). The novelty approach involving data covering multidimensional facets of the quadruple transition and panel regressions brings new perspectives and approaches for sustainable economic development of EU contributing to knowledge creation. The research findings highlighted that the less fiscal policy is sustainable, the more sustainable development is affected with a pronounced reaction due to short-term sustainability issues, while digitalisation, climate change, trade openness and some socio- and governance variables are engine for sustainable development.*

Keywords: *fiscal sustainability, sustainable development, digital transformation, climate change, governance, EU countries.*
JEL: *H39, O38, Q01.*

1. Introduction

The need to preserve the access of future generations to current resources is imperative today by designing better policies with the right trade-offs between pitfalls and priorities. Intergenerational equity is assessed by acquiring the sustainable development goals (SDGs) while encountering turbulences coming from technology, climate, and exacerbated fiscal imbalances and debt. These four pillars of the new age of turbulence induce a dilemma in applying adequate measures to tackle the quadruple transition for a more reliable and livable life for current and future generations. The widening gap between advanced economies and emerging and developing economies threatens the progress in achieving the SDGs, spotlighting the disparities among the development perspectives due to the multi-speed pattern. The effects of the desynchronised development pattern are doubled by the 'fiscal blind spot'. For example, relying on Eurostat data for 27 EU countries, the gap between emerging and developing economies and advanced economies is 1.03 for economic growth mixed with 2.75 for the public debt dynamic, compared 2023 with 2000. Therefore, growth-friendly fiscal sustainability, doubled with climate changes and digital transformation, is not only a necessity but, above all, an integral pathway to sustainable development, switching from short- to medium- and long-term goals and enhancing a more competitive, sustainable, inclusive, and resilient economy.

In this context, evaluation and recalibration of government actions and policies are required to mitigate the negative consequences of fiscal unsustainableness and of the transformation

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process of societies. The paper fills the gap in the literature regarding the incidence of fiscal sustainability, digitalisation, climate and socio-economic and governance achievements on sustainable economic growth. Previous research is concerned primarily on digitisation, economic issues and sustainable development (Vărzaru et al., 2023; Gariba, Arthur, Odei, 2024; Lei et al., 2024; Ma et al., 2024). As a consequence, this paper adds new insights into the investigation of factors of sustainable development from an economic perspective.

The paper aims to verify whether fiscal sustainability drives sustainable economic development while considering the impact of climate challenges and digital transformation for 27 EU countries. The research is based on data covering multidimensional facets of the quadruple transition revealed by environmental, fiscal sustainability, digital transformation, and sustainable development performances based on the results of the mainstream of literature and on the introduction of new variables that were not previously considered as factors to influence sustainable economic development. In terms of environmental challenges, the climate change performance index is used, while for digital transformation, e-government development is considered. Fiscal sustainability is rendered through its dimension on short- and long-term based on calculating fiscal indexes, and on overall performance referring to government revenue and expenditure and public debt. As control variables, economic, social, and governance performances are included. These multidimensions ensure a comprehensive view of the factors that could influence the achievement of the SDGs.

The investigation method relies on balanced panel regression through the inclusion of both temporal and spatial dimensions of the variables for a stable time horizon 2000-2023 constrained by the data availability. The review of literature reveals the focus more on the research on sustainable development as a demanding task that requires innovative approaches to manage realities and to provide an equilibrium between society, environment, and economy (Mensah, 2019). In terms of factors that influence sustainable development, economic variables such as trade openness, inflation rate, unemployment rate, and digital transformation are considered, neglecting other important aspects that could impact it. Social factors are represented by variables capable to highlight the outlook of the population as old age dependency ratio or population growth, on one hand, and poverty and social exclusion risk, on the other hand. It is worth mentioning especially the incidence of ageing population on development and fiscal sustainability, as is revealed by the mainstream of literature (Bodnár and Nerlich, 2022; European Commission, 2021; Bogetic et al., 2015). This research contributes to the creation of knowledge about sustainable development by including other variables to address climate, digital, and fiscal sustainability challenges through indexes based on a holistic approach. The research findings come from panel regression models with fixed effects where control variables reflect economic, social, and governance systems. As a result, the findings are based on a holistic view that takes into account categories of factors for sustainable economic development that have not been evaluated in previous research. Additionally, the research results allow the identification of measures necessary to boost sustainable economic development based on multidimensional facets sheltering the environmental, fiscal sustainability, economic, social, and governance performance.

The structure of the paper includes five sections. The Introduction indicates the context, the research purpose and niche, the core information of data used, and the knowledge contribution. The review of the relevant literature is detailed in Section 2 to encompass the relationship between fiscal sustainability and transformation emanating from climate and digitalisation and sustainable economic development under the pressures of different control variables. Section 3 presents the research methodology with data presentation and methods.

The next section is dedicated to results based on panel regressions, discussions of the findings significance, and contextualisation within the mainstream of literature. The final section presents the conclusions and contributions coupled with insights for further research.

2. Review of the literature

In the era of digital transformation and expanding fiscal sustainability weaknesses, EU countries are confronted with growth barriers and perspectives during revision of the economy connected with climate change, socio-economic and governance vulnerabilities. Therefore, achieving sustainable development is challenging and requires adequate supportive policies and actions capable of assessing intergenerational equity.

Sustainable development has been a debated topic since the 18th century, when its groundwork was settled (Carlowitz, 1713). The 1970s reactivated this subject with the model of Meadows et al. (1972) where the output is expected to be sustainable without disruption, urging a sustainable equilibrium on long-term. This brings into attention the interdependence of economy and environment because economic growth has environmental deterioration, depletion of resources, and social effects as core costs. Only in the 1980s, the concept of sustainable development was launched as 'sustainable utilization of species and ecosystems' (IUCN, 1980, p. vi).

Sustainability related to economic growth and development has different approaches in the literature with the purpose of clarifying their distinction. Growth is more connected with output or consumption, as a quantitative view of the economy, while development describes better a state, a process, or a vector for well-being with an equitable distribution of wealth, as a qualitative aspect (Coomer, 1979; Georgescu-Roegen, 1988; Barbier et al., 1990). Both economic growth and development need to be sustainable in the long term (Porritt, 1984) or even at an infinite horizon. But the mainstream of literature proves that sustainable development has multiple facets, including economic growth, poverty contraction, and efficient environmental management (United Nations, 1987), to assess a sustainable society (Coomer, 1979). The same view is embraced by Gherghina (2023), who investigated sustainable economic growth applying a broader approach to evaluate the incidence of various factors considering EU countries while demonstrating the sensitivity of the research results to the technical tools applied. The above view of sustainable economic development is expressed in this research, which relies on the global index score for sustainable development to also capture economic progress.

In 2015, sustainable development was legitimated as a global goal by the United Nations with the principal focus on combating poverty, protecting the environment, and ensuring economic prosperity until 2030 as an extension of the Millennium Development Goals. From 2000, with only eight development goals to be attained until 2015, there has been a diversification of the development facets to 17 SDGs whose fulfilment imposes strong political will, institutional capacity, sources of financing, national policies, and strategies (Câmpeanu, 2024).

The investigation of the relevant literature indicates the main two pillars of research that focus on factors that influence sustainable economic development. Firstly, fiscal sustainability as a key driver of sustainable development is approched based on its incidence on economic growth. Alshaib et al. (2023) demonstrated who fiscal sustainability, based on government revenue, expenditure, and external debt, is imperative to assess sustainable development in

Egypt relying on autoregressive distributed lag (ARDL) bounds testing and unrestricted error correction model for the period 1980-2018. Government expenditure and external debt affected sustainable economic growth in both the short and long-term, while government revenue from the previous year negatively influenced growth in the short-term. Additionally, local government debt is influencing economic sustainability in China according to Han, Guo, and Diao (2024) who used two-regional spatial lag models to demonstrate the spatial interaction of the debt of 332 subgovernments during 2015 - 2019. The effect of fiscal sustainability, indicated based on public debt, on sustainable economic growth is sensitive to corruption (Kim, Ha and Kim, 2017) because a country with less corruption, strong institutions, increasing transparency, and positive dynamic of public debt could face a boost of economic growth in the long term according to research results relying on the pooled ordinary least squares (OLS), panel regressions with fixed effects, and on the dynamic panel generalised method of moments (GMM) models for 77 countries from 1990 to 2014.

Secondly, digital technologies contribute to the assessment of long-term sustainable development through their ability to increase efficiency and competitive advantage. Alojail and Khan (2023) investigated 760 stakeholders based on a survey designed to identify the perception on how sustainable principles are integrated into the digital transformation. The findings revealed that the long-term sustainability outcomes of the investigated organisations are more empowered when digitization goals are coordinated with the SDGs. The synergistic effects of innovative digital technologies with social, environmental, and economic impact convey to sustainable adoption of innovative digital technologies which is related with Goal 9 of the SDGs that could reinforce economic growth. Furthermore, based on a Cobb-Douglas production function, with cost minimisation and new economic geography, and panel data for 30 Chinese subgovernments, from 2015-2021, Ma et al. (2024) present the strong influence of digital economy on sustainable economic development based on its capacity to mix economies of scale with economies of scope through improvements of market supply and demand and reduction of carbon dioxide emissions.

Lei et al. (2024) highlight a strong positive relationship between progress and intensification of digitalisation development and uprising of sustainable development for 36 advanced economies (OECD members) spanning from 2010 to 2020 with pooled regressions, fixed effects panel regression, and dynamic panel model. Technological innovation is influencing the scale of sustainable economic development due to its ability to shape lifestyles and production and to change from the traditional view to a greener approach. The transformative capacity of digitalization is inducing sustainable development, which indicates inertia due to previous behaviours. Furthermore, governance and innovation could influence digital transformation and cause a direct and indirect relationship between technologies and sustainable development (Mendez-Picazo, Galindo-Martin, and Perez-Pujol, 2024) for 15 EU countries based on the structural equation model for 2019-2022 with pre- and post-pandemic periods. The magnitude of the effects is affected by the manifestation of the crisis.

The influence of digital transformation on sustainability is investigated by Vărzaru et al. (2023) through their impact on government revenue in EU countries based on artificial neural network and cluster analysis. The three homogeneous EU countries are high sustainability orientated, embracing digital transformation with higher level of government revenues (Denmark, Sweden, Finland, Austria, Germany, Italy, France, Belgium, and Greece), low sustainability orientated with reduced performance for digitalisation and government revenue (Poland, Slovakia, Hungary, Bulgary, Cyprus, Czech Republic, Slovenia, Portugal, Croatia, and Romania) and no sustainability orientated with lack of government revenue and a

relatively high level of digitalisation (Netherlands, Spain, Luxembourg, Lithuania, Malta, Estonia, and Latvia). The research of Gariba, Arthur, and Odei (2024) explores the capacity of the public sector digitalisation and technological innovation in EU countries, for 2018-2023, with structural equation model, to positively reinforce economic and environmental sustainability. Similar results for EU countries were obtained by Bocean and Vărzaru (2023).

Other research focused more on aspects involving: i) impact of technological innovation on green development (Lv and Wu, 2024), government efficiency (Yang, Gu and Albitar, 2024); ii) effects of digital tax administration on government debt (Cheng, Chen and Luo, 2024) or digital economy on taxation (Anomah et al., 2024) and tax avoidance (Chen, Zhao and Jin, 2024); iii) sustainability and open innovation (Kwilinski, 2023; Robertsone and Lapina, 2023).

The literature review reinforces the importance of investigating sustainable economic development in a more broader view including variables already used in previous research while considering a new one to cover the multidimensional facets of the quadruple transition (environmental, fiscal sustainability, digital transformation, and sustainable development performances). The contributions to the body of knowledge are: i) including other factors that could impact sustainable economic development such as climate change performance for environmental challenges and e-government development as a reflection of digital transformation from the government perspectives; ii) calculating fiscal sustainability as a composite index to enfold its dimension on both short- and long-term; iii) using fiscal sustainability indexes established based on the review of relevant literature; iv) considering social and governance indicators and not only economic variables as in previous research. The methodological aspects of the paper are detailed in the next section.

3. Research methodology

This research entails the following core questions: i) What is the relationship and magnitude of the incidence of fiscal sustainability on sustainable economic development?; ii) Who digital transformation is inducing a reaction of the sustainable economic development?; iii) Is there an influence on sustainable economic development coming from the climate challenges?; iv) How sensitive are the intensity and relationship of the quadruple transition to economic, social, and governance performance? The investigation is based on a multidimensional view for a comprehensive understanding of the factors that could affect sustainable economic development of the 27 EU countries, covering the time span 2000-2023, which is restricted by data availability. The variables included in the balanced panel regression are grouped into seven categories. The first is for the dependent variable to cover the facet of sustainable economic development. The other indicators are exerting influences on the dependent variable, as are demonstrated in the relevant literature, and are highlighted in reports of international organisations (for example United Nations with Digital Economy Report or World Bank with Digital Progress and Trends Report). Details of the variables are in Table 1.

Table 1. Variables for the research

Variables	Acronym	Meaning	Source
Dependent variables			
Sustainable Development Goal Index Score	SDG	indicates the overall progress in achieving all 17 SDGs.	Online database for the Sustainable Development Report 2024 https://dashboards.sdgindex.org/explorer
Independent variables			
Climate Change Performance	CCPI	evaluates the progress of climate protection at country level	Data are collected from each annual report "The climate change performance index" https://ccpi.org/downloads/
E-Government Development	EGOV	assesses the progress of the e-government development	Data are extracted from the UN e-Government Knowledgebase https://publicadministration.un.org/egovkb/en-us/Data-Center
GDP growth rate	G	increase in the size of the country's economic activity based on the value of all goods and services	Eurostat https://ec.europa.eu/eurostat/web/main/data/database
Trade openness	TO	total exchanges of products between countries	Eurostat https://ec.europa.eu/eurostat/web/main/data/database
Inflation rate	IR	general price increase for goods and services based on a harmonised approach	Eurostat https://ec.europa.eu/eurostat/web/main/data/database
Unemployment rate	UR	unemployed population from 15 to 74 years as a percentage of the population in the labour force	Eurostat https://ec.europa.eu/eurostat/web/main/data/database
Fiscal stability index	FSTI	calculated as a composite index to reflect the fiscal sustainability on short-term	Eurostat https://ec.europa.eu/eurostat/web/main/data/database
Fiscal sustainability index	FSUI	determined as a composite index to reflect the fiscal sustainability on long-term	Eurostat https://ec.europa.eu/eurostat/web/main/data/database
Index of fiscal policy soundness	FPSI	composite index covering the multidimensional aspects of fiscal sustainability	Eurostat https://ec.europa.eu/eurostat/web/main/data/database
Old age dependency ratio	OADR	calculated as population aged 65 or older as % of people of working age	Eurostat https://ec.europa.eu/eurostat/web/main/data/database
Population growth	POPG	calculated as an annual growth rate with chain base	Eurostat https://ec.europa.eu/eurostat/web/main/data/database
Poverty and social exclusion risk	PSER	persons at risk of poverty and social exclusion as % of population	Eurostat https://ec.europa.eu/eurostat/web/main/data/database
Control of corruption	CC	perception that public power is used by governors or by public officials for the purpose of their own or private interests	World Bank https://www.worldbank.org/en/publication/worldwide-governance-indicators
Government effectiveness	GE	perceptions of the quality of public services, the quality of formulation and implementation of policies, the credibility of governments' commitment to such policies, and the independence of public services from political pressure	World Bank https://www.worldbank.org/en/publication/worldwide-governance-indicators
Political stability and absence of violence/terrorism	PS	perceptions about the potential for political instability and/or political-motivated violence, including terrorism	World Bank https://www.worldbank.org/en/publication/worldwide-governance-indicators

Rule of law	RL	perceptions of agents' confidence and compliance with society's rules	World Bank https://www.worldbank.org/en/publication/worldwide-governance-indicators

Source: own elaboration.

The selected indicators are in line with the mainstream of literature and include variables that were not considered in previous research. Therefore, the paper fills the gap on the impact of various variables on sustainable economic development to address other challenges through a holistic approach. The investigation methods included 648 observations, excluding models with lags (621 observations). Using Eviews, balanced panel regressions were applied due to their utility for the purpose of the investigation because it reveals the way some factors impact sustainable economic development for all 27 EU countries. Fixed effects due to Correlated Randon effects-Hausman test are used, allowing the explanation of the country variations and controlling the unrevealed country characteristics that could bias the results due to endogeneity issues. The findings contribute to the identification of measures to improve performance in achieving sustainable development. Therefore, using a homogeneous group of countries in terms of economic, social, governance, environment, digitisation, and fiscal sustainability, the research results could bring new insights to ameliorating the quadruple transition for a time span as comprehensive as possible relying on data from official sources.

Panel regression models are as follows:

$$SDG_{i,t}=\gamma_1+\gamma_2 CCPI_{i,t}+\gamma_3 EGOV_{i,t}+\gamma_4 G_{i,t}+\gamma_5 TO_{i,t}+\gamma_6 IR_{i,t}+\gamma_7 UR_{i,t}+\gamma_8 FS_{i,t}+\gamma_9 POP_{i,t}+$$
$$+\gamma_{10} PSER_{i,t}+\gamma_{11} GOV_{i,t}+\varepsilon_{i,t} \quad (1)$$

where: i = country; t = year; *FS* = fiscal sustainability index represented by *FSTI* and *FSUI*, on the one hand, or *FPSI*, on the other hand; *POP* = population variables expressed by *OADR* or *POPG*; *GOV* = each of the four variables to indicate governance (*CC*, *GE*, *PS*, *RL*).

The evolution of the variables considered is presented in Figure 1 (Annex 1).

In the following (Table 2), the descriptive statistics for the variables utilized in the panel regression models are presented.

Table 2. Descriptive statistics for 27 EU countries, 2000-2023

Variables	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
SDG	77.31249	77.24662	86.41798	65.99550	4.046099	-0.03105	2.729058
CCPI	48.33084	50.98000	79.61000	7.840000	13.92811	-0.52935	2.618826
EGOV	71.93860	72.26050	97.82200	30.25200	12.64547	-0.33028	2.695605
G	2.477623	2.600000	24.60000	-16	3.841143	-0.39183	7.098322
TO	119.2975	105.6500	394.2000	45.20000	58.99410	1.735228	7.351088
IR	3.044753	2.300000	45.70000	-1.7	3.736102	4.440536	38.73420
UR	8.372994	7.300000	27.50000	2.000000	4.268720	1.524847	5.688251
FSTI	0.557235	0.575310	1.000000	0.000000	0.278687	-0.2473	2.136607
FSUI	0.540740	0.566996	1.000000	0.000000	0.253452	-0.30552	2.482778
FPSI	0.572913	0.607782	1.000000	0.000000	0.259199	-0.49237	2.606213
OADR	48.47024	47.79419	77.92240	27.12984	10.95094	0.211469	2.438437
POPG	0.234545	0.178061	4.439842	-4.49846	0.908469	0.374585	6.730329
PSER	24.39070	21.60000	64.90000	10.70000	9.050578	1.648614	6.391722
CC	0.976326	0.861745	2.459118	-0.51062	0.785259	0.189932	1.856769
GE	1.072137	1.028095	2.347191	-0.36397	0.605069	-0.1288	2.293628
PS	0.771431	0.794788	1.758681	-0.4746	0.395412	-0.15282	3.019865

RL	1.068161	1.044270	2.124762	-0.26561	0.609870	-0.2153	2.042573

Source: own elaboration.

The descriptive statistics highlight the general picture of the variables for 27 EU countries. The 648 observations offer accurate estimates for the model parameters, as is revealed by mean, median, and standard deviation. Sustainable economic development has an average above the central tendency, as is the case for other explanatory variables. Significant volatility is observed for trade openness, climate challenges, and digital transformation, which could be considered normal due to high rate of adoption and diffusion of economies revisions to tackle vulnerabilities. The shape of the time series distribution is indicated by the values for Skewness (coefficient of asymmetry) and Kurtosis. An almost perfectly symmetrical distribution was obtained in the case of SDG, CCPI, EGOV, G, FSTI, FSUI, FPSI, OADR, POPG, CC, GE, PS and RL, which have values close to 0. The most asymmetric distribution is in the case of variables where we have a negative asymmetry or a longer tail to the left as smaller values predominate in the sample. The distribution of the time series is Positive Kurtosis (values above 3) for some of the variables (G, TO, IR, UR, POPG, PSER, PS).

In the panel regression, stationary variables were used, and the correlation matrix indicates a high degree of correlation (more than 0.94) between CC and GE, on the one hand, and RL, on the other hand, and between GE and RL. Table 3 presents the correlation matrix.

Table 3. Correlation matrix

	CC	CCPI	EGOV	FPSI	FSTI	FSUI	G	GE	IR	OADR	POPG	PS	PSER	RL	SDG	TO	UR
CC	1.0000	0.0913	0.5120	0.0558	-0.0822	0.2632	-0.0935	0.9404	-0.2306	0.0193	0.2000	0.5740	-0.6311	0.9470	0.4324	0.1586	-0.3531
CCPI	0.0913	1.0000	0.5395	-0.0662	-0.0656	0.0059	-0.2058	0.0814	-0.2305	0.5041	0.1091	-0.1147	-0.2014	0.1495	0.5090	0.1181	0.0290
EGOV	0.5120	0.5395	1.0000	0.0820	-0.0226	0.1332	-0.1332	0.4508	-0.1444	0.6077	0.1193	0.1194	-0.5588	0.5041	0.6682	0.1501	-0.2607
FPSI	0.0558	-0.0662	0.0820	1.0000	0.5755	0.6083	0.3740	0.0621	-0.0640	0.0462	0.0440	-0.0174	0.0281	0.0192	0.0413	0.0053	-0.0368
FSTI	-0.0822	-0.0656	-0.0226	0.5755	1.0000	-0.1348	0.4115	-0.0320	0.0442	0.0068	-0.0603	-0.0312	0.0368	-0.0866	-0.0668	0.0602	-0.1568
FSUI	0.2632	0.0059	0.1332	0.6083	-0.1348	1.0000	0.0891	0.2435	-0.0831	-0.0347	0.1748	0.1240	-0.0698	0.2284	0.1241	0.1095	-0.0041
G	-0.0935	-0.2058	-0.1332	0.3740	0.4115	0.0891	1.0000	-0.1029	0.1255	-0.2141	-0.0402	0.0922	0.1343	-0.1128	-0.1842	0.1756	-0.1325
GE	0.9404	0.0814	0.4508	0.0621	-0.0320	0.2435	-0.1029	1.0000	-0.2791	-0.0210	0.2201	0.6096	-0.6811	0.9435	0.4093	0.1818	-0.3139
IR	-0.2306	-0.2305	-0.1444	-0.0640	0.0442	-0.0831	0.1255	-0.2791	1.0000	-0.0773	-0.0156	-0.1598	0.2429	-0.2472	-0.1534	0.0007	-0.1527
OADR	0.0193	0.5041	0.6077	0.0462	0.0068	-0.0347	-0.2141	-0.0210	-0.0773	1.0000	-0.1216	-0.2953	-0.1632	0.0100	0.5808	-0.2817	-0.0381
POPG	0.2000	0.1091	0.1193	0.0440	-0.0603	0.1748	-0.0402	0.2201	-0.0156	-0.1216	1.0000	0.2635	-0.1248	0.2525	0.1524	0.3474	-0.1124
PS	0.5740	-0.1147	0.1194	-0.0174	-0.0312	0.1240	0.0922	0.6096	-0.1598	-0.2953	0.2635	1.0000	-0.4996	0.6165	0.1802	0.3898	-0.4270
PSER	-0.6311	-0.2014	-0.5588	0.0281	0.0368	-0.0698	0.1343	-0.6811	0.2429	-0.1632	-0.1248	-0.4996	1.0000	-0.6794	-0.5094	-0.2476	0.4495
RL	0.9470	0.1495	0.5041	0.0192	-0.0866	0.2284	-0.1128	0.9435	-0.2472	0.0100	0.2525	0.6165	-0.6794	1.0000	0.4365	0.2135	-0.3816
SDG	0.4324	0.5090	0.6682	0.0413	-0.0668	0.1241	-0.1842	0.4093	-0.1534	0.5808	0.1524	0.1802	-0.5094	0.4365	1.0000	-0.1599	-0.1572
TO	0.1586	0.1181	0.1501	0.0053	0.0602	0.1095	0.1756	0.1818	0.0007	-0.2817	0.3474	0.3898	-0.2476	0.2135	-0.1599	1.0000	-0.3112
UR	-0.3531	0.0290	-0.2607	-0.0368	-0.1568	-0.0041	-0.1325	-0.3139	-0.1527	-0.0381	-0.1124	-0.4270	0.4495	-0.3816	-0.1572	-0.3112	1.0000

Source: own elaboration.

The next section details the research results based on panel regressions in order to cover the research aim and questions, to bring a new perspective and approach to sustainable economic development in the EU, and to contribute to knowledge-based development.

4. Results and discussion

Digital transformation challenged with climate change, fiscal sustainability, on the one hand, and economic, social, and governance performance, on the other, could provide promising solutions to achieving sustainable economic development. This aspect is approached based on a multidimensional view to capture the interference of variables in the SDGs of the EU. In the research carried out with the aim of identifying the impact of the quadruple transition and other variables to highlight the trade-offs in pursuing sustainable development and effective policies to ensure a sustainable, inclusive and resilient society. Therefore, the panel regression models were analysed with a different mix of explanatory variables. Panel regressions are applied for the investigated variables considering that, first, fiscal sustainability is taken with short- and long-term dimensions (Tables 4 and 5) among the independent variables to reveal which is more important from the point of view of sustainable economic development. Second, the regressions are tested with the explanatory variables, while fiscal sustainability is indicated based on only one variable (Tables 6 and 7), as a composite index which reveals the country performance in terms of public debt and government revenue and expenditure.

Table 4 presents the results when one of the social performances is reflected by OADR. The findings reveal that only fiscal sustainability in the short term negatively influences sustainable economic development, while fiscal sustainability in the long term has no impact. Therefore, the less fiscal policy is sustainable, the more sustainable development is affected with a pronounced reaction due to short-term sustainability issues. Climate change, digital transformation, trade openness, old age dependency, poverty and social exclusion, and political stability could boost sustainable economic development with a contemporaneous reaction. Combating corruption does not influence on sustainable economic development because this relationship is not statistically validated in the models below.

Table 4. Results of regression models (I)

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
CCPI	0.033619*	0.034560*	0.034098*	0.035108*	0.035379*	0.037857*
EGOV	0.017276*	0.026087*	0.015817*	0.024787*	0.016929*	0.022581*
G	-0.026086*	-0.025227*	-0.028853*	-0.026897*	-0.028115*	-0.016016***
TO	0.020590*	0.019803*	0.020523*	0.019656*	0.020170*	0.019018*
IR	-0.035497*	-0.039547*	-0.036272*	-0.040771*	-0.035668*	-0.038661*
UR	-0.024315***	-0.029077**	-0.024975**	-0.031955*	-0.028030**	-0.028218* (-1)
FSTI	-0.557455*	-0.605036*	-0.514361*	-0.582157*	-0.565638*	-0.581077*
FSUI	0.045713	-	0.053824	-	0.052468	-
OADR	0.176999*	0.173633*	0.177669*	0.173575*	0.176856*	0.168790*
PSER	0.014889	0.023744** (-1)	0.014519	0.022884** (-1)	0.014043	-
CC	-0.144263	-	-	-	-	-
PS	0.484542*	0.551690*	0.582193*	0.608871*	0.550326*	0.569591*
GE	-	-	-0.415674**	-0.311338*** (-1)	-	-
RL	-	-	-	-	-0.410873***	-0.388855***
Const	63.47545*	62.72845*	63.75760*	63.14807*	63.77787*	64.09640*
R-squared	0.968122	0.968803	0.968354	0.968956	0.968285	0.968788
Observations	648	621	648	621	648	621

Source: own elaboration. Note: *, **, *** p<1%, 5%, 10%; () indicates lag.

Furthermore, the results in Table 4 highlight how the effectiveness of government produces impact only if political stability is reinforced while confidence and compliance with society's

rules have a neutral effect on sustainable economic development. The effect of the rule of law is empowered by political stability, and only together could they affect sustainable economic development in a positive way, in the case of PS, and with a negative incidence when it is mixed with RL. Also, lagged reactions with 1 year is in the case of UR, PSER and GE due to the necessary time to generate a specific reaction on the sustainable economic development.

Table 5 indicates the findings for regressions that have POPG as one of the indicators covering social aspects, while fiscal sustainability is considered as a multidimensional variable.

Table 5. Results of regression models (II)

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
CCPI	0.054564*	0.055535*	0.054383*	0.055626*	0.058271*	0.058188*
EGOV	0.090658*	0.097607*	0.090846*	0.092265*	0.091943*	0.092624*
G	-0.022605***	-0.024787**	-0.024773**	-0.022643**	-0.026928**	-0.022934***
TO	0.024453*	0.025139*	0.024638*	0.024486*	0.024061*	0.023716*
IR	-0.036327*	-0.040219*	-0.037207*	-0.036048*	-0.034300*	-0.035588*
UR	-0.069598*	-0.088692*	-0.063879*	-0.061665*	-0.069667*	-0.068844*
FSTI	-0.618693*	-0.676416*	-0.549654*	-0.572128*	-0.616981*	-0.646025*
FSUI	0.151470	-	0.143130	-	0.155883	-
POPG	-0.066526	-	-0.066184	-	-0.059165	-
PSER	-0.033289**	-	-0.033537**	-0.030849**	-0.032998**	-0.031789**
CC	-0.555752**	-0.593543**	-	-	-	-
PS	-0.330611	-	-0.301216	-	-	-
GE	-	-	-0.416272***	-0.511047**	-	-
RL	-	-	-	-	-0.745012*	-0.748610*
Const	67.87373*	66.49061*	67.66016*	67.36678*	67.64002*	0.942020*
R-squared	0.942327	0.941425	0.942083	0.941755	0.942157	67.68434
Observations	648	648	648	648	648	648

Source: own elaboration. Note: *, **, *** p<1%, 5%, 10%; () indicates lag.

The panel regression models in Table 5 demonstrate that the long-term fiscal sustainability component and population growth do not have an incidence on sustainable economic growth, while political stability is in a neutral relationship with sustainable economic development. Additionally, short-term fiscal sustainability has a significant positive impact (almost 0.15) followed by digital transformation (almost 0.09) and climate change (almost 0.05). These relationships are similar to the previous ones (Table 4) but are of higher magnitude. All three governance indicators are shown to induce a contractionary effect on sustainable economic development.

The next table (Table 6), with OADR as one of the social indicators, establishes the relationship between the variables considered when fiscal sustainability is indicated by a single indicator that could reveal the overall performance in terms of public debt and government revenue and expenditure.

Table 6. Results of regression models (III)

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
CCPI	0.033092*	0.035375*	0.033842*	0.035902*	0.032520*	0.033183*
EGOV	0.018550*	0.027186*	0.016759*	0.025257*	0.018996*	0.027349*
G	-0.030664*	-0.023274**	-0.033310*	-0.024959*	-0.028973*	-0.027150*
TO	0.019883*	0.019329*	0.019822*	0.019320*	0.019375*	0.018317*

IR	-0.035884*	-0.043383*	-0.036794*	-0.044913*	-0.040379*	-0.041805*
UR	-0.012422	-0.034443* (-1)	-0.015334	-0.037724* (-1)	-0.018651	-0.021736***
FPSI	-0.375507*	-0.381151*	-0.348555**	-0.354481**	-0.376564*	-0.404345*
OADR	0.177922*	0.174295*	0.178220*	0.174634*	0.172222*	0.168290*
PSER	0.015078	0.030303*	0.014574	0.029833*	0.010532	0.017458*** (-1)
CC	-0.065923	-	-	-	-	-
PS	0.464018*	0.571755*	0.584968*	0.676111*	-	-
GE	-	-	-0.459332**	-0.387235**	-	-
RL	-	-	-	-	-0.165420	-
Const	63.22575*	62.40511*	63.67664*	62.87176*	64.20160*	63.56665*
R-squared	0.967467	0.968340	0.967787	0.968568	0.967093	0.967463
Observations	648	621	648	621	648	621

Source: own elaboration. Note: *, **, *** p<1%, 5%, 10%; () indicates lag.

The results in Table 6 bring novelty to the body of knowledge creation due to the fact that government actions to reduce corruption and to reinforce obedience and compliance with society's rules have no impact on sustainable economic development, while the unemployment rate and poverty and social exclusion affect it with a delay of one year. Furthermore, Table 7 expresses the findings for regressions having POPG as one of the indicators that cover social aspects.

Table 7. Results of regression models (IV)

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
CCPI	0.054021*	0.054067*	0.054103*	0.055516*	0.057650*	0.057754*
EGOV	0.092832*	0.093079*	0.092379*	0.093339*	0.094127*	0.094329*
G	-0.027078**	-0.025078**	-0.028769**	-0.028798**	-0.031351**	-0.029641**
TO	0.023589*	0.023178*	0.023828*	0.023662*	0.023279*	0.022897*
IR	-0.037149*	-0.037525*	-0.038182*	-0.036097*	-0.034735*	-0.035059*
UR	-0.055345*	-0.055777*	-0.052722	-0.051770*	-0.055364*	-0.055902*
FPSI	-0.392761**	-0.397244**	-0.362223***	-0.360536***	-0.390413**	-0.394461**
POPG	-0.057572	-	-0.058292	-	-0.051519	-
PSER	-0.032974**	-0.032635**	-0.033256**	-0.031408**	-0.032364**	-0.032077**
CC	-0.461060**	-0.459574***	-	-	-	-
PS	-0.363379***	-0.368090***	-0.304853	-	-	-
GE	-	-	-0.461105***	-0.563067**	-	-
RL	-	-	-	-	-0.664748**	-0.675738**
Const	67.62616*	67.63787*	67.60030*	67.28299*	67.35996*	67.38212*
R-squared	0.941331	0.941259	0.941305	0.941053	0.941147	0.941090
Observations	648	648	648	648	648	648

Source: own elaboration. Note: *, **, *** p<1%, 5%, 10%; () indicates lag.

Table 8 illustrates the identified relationship between variables used in empirical investigations for 27 EU countries based on a time span of 2000-2023.

Table 8. Identified relationships based on regression models

Variables	SDG
CCPI	+
EGOV	+
G	-
TO	+
IR	-
UR	-
FSTI	-

FPSI	-
OADR	+
PSER	+ (with OADR) or - (without OADR)
CC	- (without OADR)
PS	+ (with OADR) or - (without OADR)
GE	-
RL	-

Source: own elaboration.

Climate change and sustainable economic development could emerge and reinforce each other (Lu et al., 2019) despite their complementarity because investment in green transition will bring positive effect on economies with upturns and downturns due to climate conditions (such as extreme weather events). These could exacerbate the disparities and inequalities between advanced economies and emerging and developing economies and threaten economic development (United Nations, 2024, p. 5) even so, the core principle is "to leave no one behind". Therefore, according to the World Economic Forum, alternative economic models that focus on sustainable resources and reduce the strong dependence of socio-economic progress on continuous economic growth is required. Until now, countries' policies have struggled to cope with the core purpose of pro-climate, pro-growth, and growth-friendly sustainable fiscal policy.

Another positive relationship between digital transformation and sustainable economic growth is confirmed, according to the literature review. Therefore, innovative technologies could enhance sustainable economic development through long-term sustainable outcomes (Alojail and Khan, 2023; Lei et al., 2024; Ma et al., 2024). Also, trade openness tends to strengthen sustainable economic development in EU countries as a result of the intensity of the commercial transactions intra and extra EU as is the case for an economic union as EU or BRICS (Monyela and Saba, 2024), while for emerging economy the relationship is indirect (Sheikh, Malik and Masood, 2020).

The ageing population, captured with the indicator of OADR, could boost sustainable economic development due to its behaviour that is more focused on recycling things and taking care of the environment despite the waste-orientated behaviour of young generations. This finding is contrary to the literature (Wang, Liang and Wang, 2024) despite a focus concentrated more on healthy ageing that could bring positive benefits in terms of standard of living (WHO, 2024).

Furthermore, research findings acknowledge the major drawbacks of sustainable economic development that need to be considered by policymakers, practitioners, and the broader citizens communities to integrate insights in designing adequate policies and actions with the purpose to assess improvements in terms of green-orientated growth with intensifying recycling activities, to safeguard fiscal policy soundness, to include population of working age in a more green labour market, and to boost the green innovation technologies for increasing efficiency, transparency, and access to personalised services based on public needs.

5. Conclusions

Countries are thrust into a quadruple transition to revision of the economy by enhancing a more competitive, sustainable, inclusive, and resilient society. In this context, challenges coming from digitalisation, climate, fiscal sustainability, socio-economic, and governance issues need to be addressed by policies and actions to mitigate risks and vulnerabilities and to empower sustainable economic growth for current and future generations. The paper brings new knowledge for the investigation of the fiscal sustainability, digitalisation, climate and socio-economic and governance achievements on sustainable economic growth based on panel regressions with fixed effects for 27 EU countries covering the time span of 2000-2023. The perspectives of the holistic approach are detailed in the research that expresses the contribution of the research in strong connection with the previous relevant literature.

The review of the literature is a synthesis of the research findings that covers the aspects followed in this paper and reveals the research novelties. To our knowledge, we have not identified research with a similar purpose that includes the multitude of factors that could enforce sustainable economic development.

Research results demonstrate that long-term fiscal sustainability, population growth, and some governance indicators taken one by one (CC, RL) are more in a neutral relationship with sustainable economic development, while the unemployment rate and poverty and social exclusion affect it with a delay of one year. Furthermore, the risk of fiscal unsustainability impacts sustainable economic development due to short-term sustainability issues. Climate change, digital transformation, trade openness, old age dependency, poverty and social exclusion, and political stability could boost sustainable economic development with a contemporaneous reaction.

Policymakers, practitioners and the broader citizens communities need to know the major drawbacks of sustainable economic development in order to improve behaviour in terms of green-orientated growth in the long term, to address the barriers for vulnerable populations, and to provide intergenerational equity.

Research limitations are concretised by data availability and some disparities among 27 EU countries, which will be addressed in future research that will analyse how the variables considered disturb sustainable economic development for groups of countries. These groups will be established based on common characteristics to verify the presence of disparities between EU countries. Furthermore, sustainable economic development will be expressed on the basis of a composite index to cover the facets of growth on a sustainable path.

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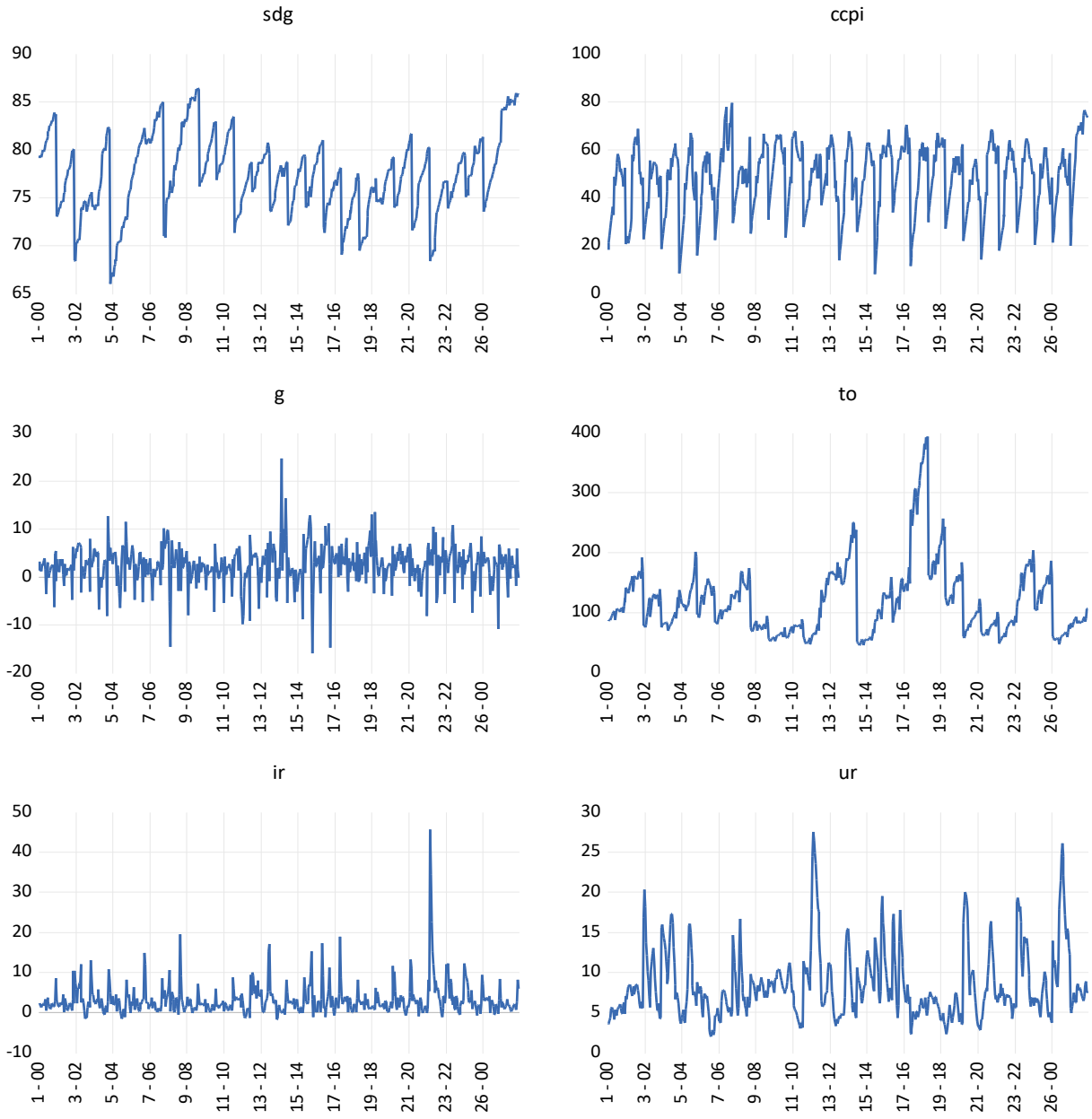
Annex 1

Figure 1. Evolution of the variables



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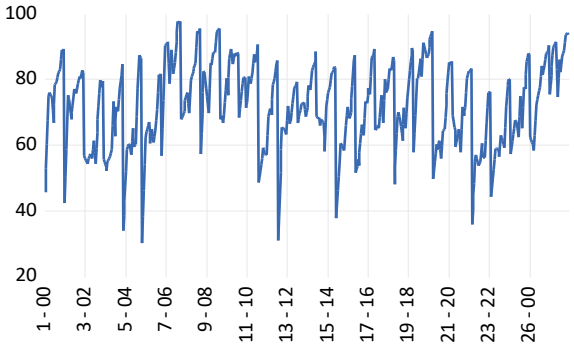

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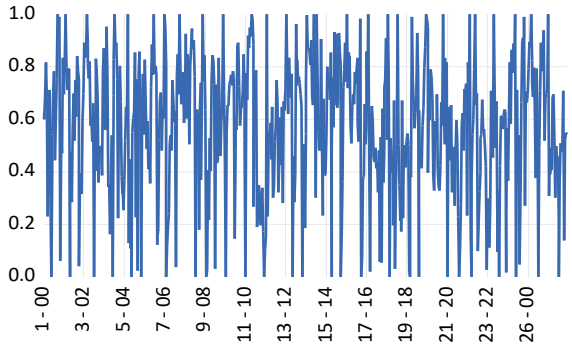

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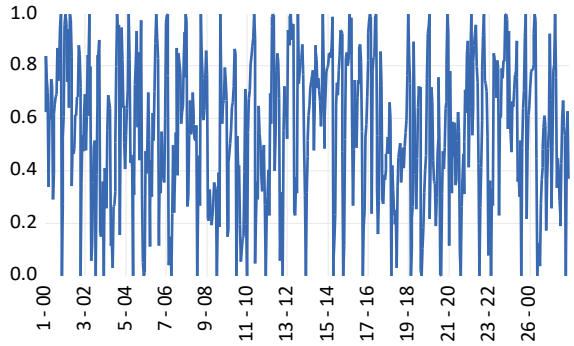

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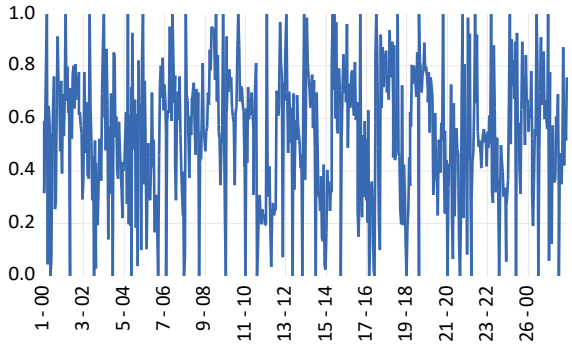

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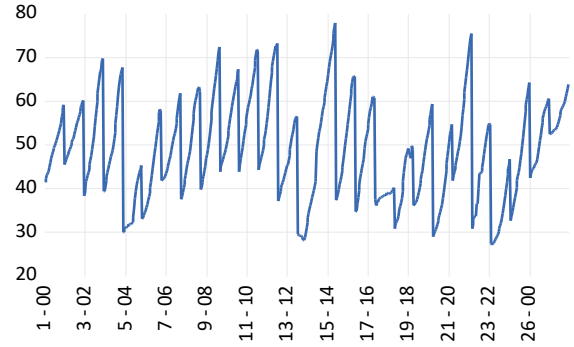

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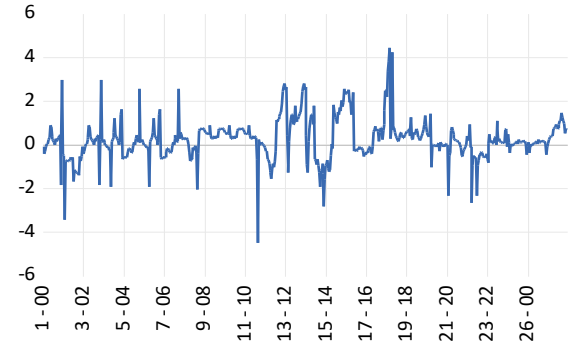

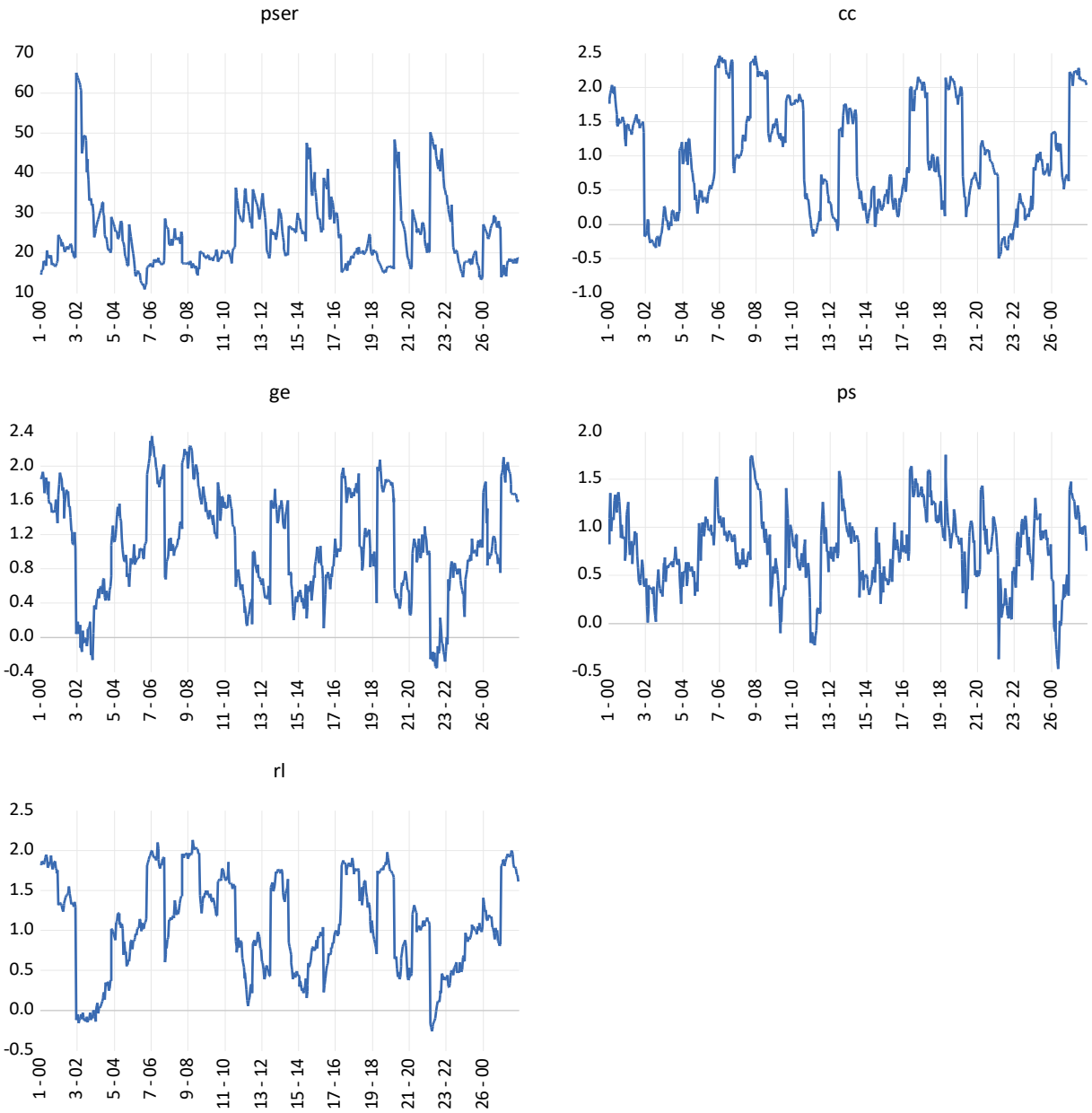

Source: own elaboration.

AN INTELLECTUAL HISTORY OF RESOURCE-BASED INTERNATIONAL CURRENCY

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Abstract: *In this paper, we outline the main point of the debates in the past, including the positions of the leading economists who have supported the idea of resource based international currency, such as S. Jevons, A. Marshall, F. Hayek, M. Friedman, JM. Keynes, H. Grubel, A. Hart, N. Kaldor, R. Cooper, several French politicians and scholars (such as L. Fizaine, J. de Larentaye, G. Ardant, P. Mendes France and S. de Brunhoff). Special attention is paid to the fathers of the idea - the two Benjamin and Frank Graham, and the Dutchman Jan Goudriaan.*

Keywords: *International currency, commodity currency, J. Goudriaan, J.de Largentaye, Pierre Mendes France*

> "The idea of commodities as monetary reserves is one that does not die easily. Should a sharp fall occur in the world prices of primary products, and especially if such a fall is accompanied by a general slump in business activity, the scheme is almost certain to be revived in one form or another" (Rosenson, 1948, 135)

> "Gold and credit, as monetary standards, must be replaced by an aggregate of stock commodities having real utility, a utility not based first and foremost on their monetary application. I am convinced that reform of this order must one day be made. However, let us have no illusion. It is not as easy as it first appears. Apart from certain practical difficulties, it is confronted by powerful interests and deep-seated prejudices. There is little chance of it being realized within our lifetime. Let us wish, however, that our children, or grandchildren, may see it carried out [...] (de Largentaye, 2022 [1965], 576).

I Introduction

The trend towards the imposition of fiat national and international money is accepted as natural and inevitable. Monetary history and the history of ideas, however, show that the counter-tendency - that of material (substance) money - has always existed. It has been supported by leading economists belonging to different and even opposing theoretical and ideological positions. Nominalism has never completely defeated substantialism.

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The idea of resource-based international money (hereafter referred to as RBIC) emerged in the 1920s, initially as an extension of national projects. since then, it has followed a certain cyclical pattern, linked to wars and crises in the global monetary economy, to the exacerbation of resource problems, and to geopolitical confrontations.

Today things are no different. The issue of resources, international resource money projects (without having been technically developed[2]), are being launched in light of the processes of de-dollarization and the formation of multipolar monetary blocs, and as a response to climate and resource (strategic resource) constraints.

In the past, criticisms of the model have been limited to three - (i) high costs (taking funds away from growth), (ii) technical and informational difficulties in calculating coverage and basket rates, and (iii) political infeasibility of the idea. Modern information technology largely solves the first two. As far as political resistance is concerned, it remains, although the idea is making its way within various groups of countries (BRICS, for example).

The task of the present text is to trace the path of the idea of the BRIC, distinguishing two periods, - from the depression years to the end of the World War II (part one), - from the World War II to today (part two). French economists have made a particular contribution to the development of the idea (their contribution is presented in the third part).

II International Resource Money Against Depression and the Collapse of the World Economy (1925-1945)

Forerunners

Within the debate between bimetallism and monometallism, the first to propose a stabilization of the purchasing power of money, including international money, based on a composite basket were Stanley Jevons (tabular standard model) and Alfred Marshall (symmetallism model). In expounding the tabular standard model, Jevons suggests converting to a particular basket of about 100 commodities (Jevons, 1875). Marshall (1887), on the other hand, proposes pegging money to a fixed combination of gold and silver. In the symmetallism model, the exchange rate between gold and silver is freely determined, i.e. it is floating, not fixed legally as in bimetallism.

The pioneers of the idea

Perhaps the first paper to appear after the Genoa conference was that of Lewis (1925). Lewis proposed the stabilization of money at the national and international level on four products - wheat, cotton, iron and silver, against which four warrants would be issued respectively. Money conversion is done on an individual basis.

The real flowering of the idea of material money occurred after the Great Depression, when the crisis of the agrarian sector (falling prices and unemployment), the destruction of international trade and international money flows, and the struggle for colonies and resources all unfolded

[2] See, for example, Nenovsky and Bondi (2024) and Nogueira (2023).

simultaneously. To these processes was added the withdrawal of Soviet Russia from world markets.

The first publication to *systematically* develop a model for stabilizing agricultural resource prices through the issuance of money was the book *How to Stop* Deflation by the Dutch economist and statistician Jan Goudriaan (1932)[3].

In the 1930s, Benjamin Graham and Frank Graham (no family relation) became the main drivers of the resource money model in the US. Together with Goudriaan, they gave the model its name (GG/ Goudriaan - Graham). And while B. Graham singles out money issuance as an element of primary resource price stabilization, F. Graham puts the stabilization of money and monetary theory in the spotlight from the very beginning. In 1937, B. Graham published "*Storage and Stability*" where he presented the concept of linking the stabilization of commodity prices through a mechanism of resource stockpile that could provide a basis for sustainable monetary issuance. Although the focus is on the national dimension of the model, its international use is also considered. In turn, F. Graham published a series of articles, and in 1942 the book *Social Costs and Economic Institutions*.

The reactions did come late. Among the first was Friedrich Hayek, who in his book *Monetary Nationalism and International Stability* (1937) gave a positive view of the commodity model as a solution to the international monetary system. In 1943, in the pages of the Keynes-led journal *The Economic Journal*, Hayek argued in detail for the commodity plan (Hayek, 1943).

Stressing again the need for an international monetary standard, Hayek shows that the advantages of a gold standard (a homogeneous monetary regime) are not related to the properties of the gold material itself, but only to their functional characteristics. These characteristics, however, can be replicated by other goods and materials. Hayek notes that the psychological factors that supported gold up to the First World War and in the early years afterwards gave way to strong biases against the yellow metal. He highlights the slow equilibration of the gold market as a result of supply and demand shocks; for example, the movement of gold volumes is much slower than the movement of its price. The latter leads to successive periods of inflation and deflation. That is, even gold poses the central problem for Hayek of the unstable side of liquidity (Hayek, 1943, 178).).

These are basically the arguments that led Hayek to support and develop the idea of a commodity basket (of raw materials) that would serve as a new anchor for money.

> "It is therefore important that we should seriously reconsider alternative systems which preserve the advantages of an automatic international standard with freedom from the special defects of gold" (Hayek, 1943, 177).

[3] J. Goudriaan (1893-1974) subsequently worked in South Africa, and in 1951/1953 was commissioned by the UN to head a committee to study the issue of stabilizing commodity prices and the issue of resource money. The commission issued a report in April 1954, but the UN Board of Directors refused to consider it (from the memoirs of de Largentaye, the administrator for France at the IMF in those years, 2022/1962, 141). In fact, Goudriaan developed the idea earlier in publications in Dutch. The influence of Goudriaan's ideas was strong, especially on Dutch-speaking economists, among them the Indonesian economist Khom Bian Tie (1953) and later Jan Tinbergen.

The new international monetary standard and the stabilisation of international prices is based on the issuance of money against warehouse receipts representing a basket of basic and demand commodities.

The weights in the basket are expressed in physical volumes, the constant convertibility of the money in this basket at a certain rate is guaranteed. Convertibility is at the basket level as a whole. According to Hayek,

> "In this respect the different commodities would be connected with money not in the way in which gold and silver were connected with it under bimetallism, so that a unit of money was obtainable either for a fixed quantity of gold or for a fixed quantity of silver; but rather as if (according to the plan suggested by Alfred Marshall under the name of "symmetallism") only the price of a certain weight of gold and a certain weight of silver together were fixed, but the price of each metal by itself allowed to fluctuate" (Hayek, 1943, 179).

Or:

> "In this respect the aim of the proposal is similar to that of the " tabular standard " or the " index currencies," which were at one time much discussed. But it differs from them in its direct and automatic operation. It is at least doubtful whether the price level of any selection of commodities could be effectively kept constant by deliberate adjustments of the quantity of money. But there can be no doubt that the aggregate price of the selected raw commodities could not vary so long as the monetary authority stood ready to sell and buy the commodity unit at a fixed price. [...] So long as it stood ready to buy commodity units at a fixed price in its national currency, any money thus issued to the producers of raw commodities would be of no use to them except for buying the products of the country to which they had sold their raw produce" (Hayek, 1943, 180-181).

Keynes immediately reacted to the publication by denying "the dictates of international money" in brief remarks in the same issue (Keynes, 1943 and later Keynes, 1944)[4] . According to him:

> "The fundamental reason for thus limiting the objectives of an international currency scheme is the impossibility, or at any rate the undesirability, of imposing stable price-levels from without. The error of the gold-standard lay in submitting national wage-policies to outside dictation. It is wiser to regard stability (or otherwise) of internal prices as a matter of internal policy and politics. Commodity standards which try to impose this from without will break down just as surely as the rigid gold-standard" (Keynes, 1943, 187).

For Keynes, Hayek's model is driven by the principle of the international monetary standard is rigidity, while according to Keynes the basic principle should be elasticity (at the national level).

[4] In the second volume of the *Treatise on Money* (the empirical monetary analysis), Keynes makes a positive case for price level stabilization through a tabular standard. See recently Telles (2023).

> "The immediate task is to discover some orderly, yet elastic method of linking national currencies to an international currency, whatever the type of international currency may be. So long as national currencies change their values out of step with one another, I doubt if this task is made easier by substituting a tabular standard for gold. Indeed, the task of getting an elastic procedure may be made more difficult, since a tabular standard might make rigidity seem more plausible. Perhaps unjustly, I was suspecting Prof. Hayek of seeking a new way to satisfy a propensity towards a rigid system" (Keynes, 1944, 429).

The commentary on Hayek's article and the reaction to Keynes was followed by one of the authors of the commodity basket project, F. Graham (1944). According to F. Graham, the clearing union model can be combined with that of the commodity basket. Keynes reacted moderately, and even positively, to F. Graham's article (Keynes, 1944).

As part of the discussions for a new monetary order held at Bretton Woods[5], B. Graham published a book specifically on the international aspects of the *World Commodities and World Currency* plan (1944)[6] .

Graham presents his RBIC project in synthesized form:

> One of the central elements in our proposal is that a commodity composite (though not the separate components) shall have the monetary status of gold, and thus function as the equivalent of an additional world currency. This mechanism is by no means indispensable to any international plan for stabilizing the price level of basic raw materials as a group. (Graham, 1944, 14)[7].

The author logically derives international resource money from the need to stabilize prices and production of structurally determining commodities, and through it to influence the global economy and employment. Resource stocks are seen not just as a technical measure, but as a philosophical principle related to the protection of the nation in war or peacetime natural disasters. The advantages of stockpiling basic commodities and essential goods are superior to the technique of stockpiling only in the form of gold.

Graham thinks 15 items are enough, but you could go up to 25-30 (in one model he selected 23 items). The weights of the individual commodity items should mostly reflect their presence in exports as well as in the production of a zone (or the world economy). The simulations the author proposes for 1937 include 62.40% agrarian products (wheat, corn, cotton, wool, rubber, coffee, tea, sugar, tobacco), and 37.60% non-agrarian (petroleum, coal, wood pulp, pig iron, copper, tin). According to his (and Goudriaan's) calculations, the required stocks represent about 1/7 of annual production (i.e. 3-4 months of annual supply). This volume is quite

[5] Her book dedicated to F. Graham "To FRANK DUNSTONE GRAHAM, Comrade-in-arms" (Graham, 1944, v).
[6] B. Graham (1894-1976) was a multifaceted personality, a pioneer in many fields, including investment analysis. Frank Graham was a professor of economics at Princeton (1990-1949).
[7] Graham puts it this way : "It proposes to accord to a composite group of basic commodities exactly the same monetary status as was formerly given to gold" (Graham, 1937, 59).

sufficient to stabilize prices. The author sees the scheme as part of a new international architecture:

> "An international agency-say, International Commodity Corporation (ICC)-will purchase, hold, and sell primary commodities on a composite or unit basis. [...] The corporation will best operate as a subsidiary of an International Monetary Bank or Fund (IMF) from which it will obtain its capital. [...] The commodities will be stored in the first instance in the country of purchase. Creditor nations of the IMF will have the right to take; over and hold physical possession of an appropriate amount of commodity units, with the provision that they defray the storage expense. [...] Nations holding deposits with the IMF, who thus have helped finance the purchase of units, should have the privilege of holding up to an equivalent amount of units in their own custody. [...] The corporation will obtain its funds by sale of its notes to the IMF. The IMF in turn will hold these notes as reserve assets against its liabilities, which will consist of deposits and capital stock held by the central banks of the participating nations. The financial transactions involved in the corporation's operations will be similar to those resulting from international trade generally. [...] Transfers may be made in the first instance by credits and debits to the central bank account on the books of the IMF. In essence, purchases by the corporation will be equivalent to exports from the vendor nations to the financing nations". (Graham, 1944, 42-47).

The model aims to stabilize the basket price through the two-way exchange rate between the basket and money. An important point is that we are talking about a composite price index, not prices of individual products. The functioning of the market mechanism continues to determine the movement of individual, relative prices within the basket (Graham, 1944, 51, 62). The stability of the overall price index of strategic commodities is automatically and rapidly transmitted to the overall price level (Graham, 1944, 78). The proposed scheme helps to increase the incomes of producers of the commodities that enter the basket (similar to the incomes of producers of gold mines in a pure gold standard regime) (Graham, 1944, 51, 63).

The emission and destruction of resource money follows closely the dynamics of the real economy, it is endogenous and sets the limits of the general price level. In this respect, B. Graham comes close to the basic ideas in Hayek's *Monetary Nationalism and International Stability* (1937). He is a liberal economist, sharing Hayek's economic philosophy.

> "We believe that this arrangement will assist greatly in stabilising both the monetary and the commodity structure of the world. Incidentally, it will make far easier the maintenance of whatever status is finally given to gold.
>
> Commodity-unit currency is physical money. It belongs in the tradition and conforms to the discipline of the classic gold standard. Professor Hayek, long a vigorous defender of the gold standard, has pointed out that new conditions in the world call for a broader standard which will produce more rapidly and helpfully the compensatory effects upon the economy which had theoretically followed from the workings of the gold mechanism. [...]

The advantage that commodity-reserve currency on an international scale will give to all raw-materials exporting nations is obvious. Broadly speaking, it endows their shipments of these products with the status of gold exports. It is not necessary that a single country have complete commodity units for sale in order to benefit from the stable demand for the units. Each land can contribute what it has to offer; the impersonal and efficient machinery of the world's markets will combine into rounded units these offerings from many quarters. Since the value of each item is subject to variation there will be changes-now unfavourable, now favourable-in the relative share of different products in the combined selling price. As long as production of the components is kept in fairly sound balance there should not be any disturbing revolutions in the economic position of one against the other. Of overshadowing importance is the fact that balanced expansion in all the items collectively can proceed unabated without the familiar and disastrous consequences of price collapse. "(Graham, 1944, 97-98).

III International Resource Money and the Reform of the World Monetary System (1945-present)

Despite the creation of new institutions within Bretton Woods, the state of Europe after the war was catastrophic. There were no mechanisms to revive trade and payments; exchange took the form of bilateral clearings and barter schemes. In 1949, the US launched the Marshall Plan, and blockade and sanctions were imposed on the USSR and the new socialist countries. But this backdrop revived discussions in Western countries about a new monetary order to overcome the hunger for dollars and for gold. In 1949 F. Graham died, and B. Graham shifted to the topics of investment strategies. At the same time critical reactions to the resource money model continued and even intensified, they became more technical[8] .

Debates in the 50s and 60s, the contributions of Jan Goudriaan and Albert Hart

In 1948, in articles by Rosensen (1948) and Calsoyas (1948), the MRP model came under moderate criticism. The authors noted two problems, -these stemmed from difficulties in choosing the basket structure, the weights of individual items, and the supply and demand elasticities of individual goods. Calsoyas gives examples of the asymmetric impact of the model on individual countries, resulting from different individual supply and demand elasticities. An asymmetric shock along the system (i.e., on only one industry, i.e., on one item in the basket) leads to complex effects both on the structure of the basket price index (through movements in individual prices and volumes) and on the transmission of the basket price to the overall national price index[9] .

Milton Friedman's (1951) position is interesting. While agreeing in principle with the model and sympathizing with it, he believed that the opportunity costs would be large. It is needed a broad market for the basket products, which locked in a long-run large stock needed for growth. In addition, Friedman thinks people will have a hard time accepting it and there will be no

[8] Bearle, Kennedy and Winn (1942).
[9] Similar criticisms related to the elasticity of agricultural commodities are found in Johnson (1956).

political support. Automaticity of equilibration would only work under conditions of full liberalization of foreign trade.

> "The commodity-reserve scheme could operate internationally and produce stable exchange rates if, and only if, the various countries were willing to permit complete free trade in the commodities and to submit their internal monetary and economic policies to its discipline. Compared with a gold standard, commodity-reserve currency has one significant technical advantage-its greater potential capacity for offsetting cyclical movements in income, production, and employment. For the rest, the two standards are technically nearly equivalent. Both rest on a relatively narrow and unrepresentative base and so could themselves be the source of fluctuations in the price level. Despite its somewhat broader base, available evidence suggests that a commodity-reserve standard would be at least as unsatisfactory in this respect as a gold standard. Both require the use of resources to provide for secular growth in the stock of money and so give an incentive for the intro- duction of fiat money. Both could be international standards with fixed exchange rates between countries" (Friedman, 1951, 231-232).

For Friedman, the most appropriate model remains that of fiat currencies, which is not only technically cheaper and more convenient, but can be constructed to mimic the pure gold standard. The author proposes that their volume should be fixed, linking them to the dynamics of the budget, and that their issue should be carried out solely by the Treasury.

Of particular interest is Jan Goudriaan's post-war study *Vers une technique monétaire rationnelle*, published in the French journal *Economie appliquée* (Goudriaan, 1966). In this extensive piece, Goudriaan takes stock of the state of the resource money debate after the Second World War, as well as of his experience as head of the UN Special Commission.

In general terms, Goudriaan positions himself as a *realist* and an empiricist (technician) in the field of money. He criticized various forms of *monetary nominalism*. For Goudriaan, money is a product of human activity; it is not "a deliberate and premeditated act [...] The time has come to shape money according to human needs, as they are more or less generally recognized ." (Goudriaan, 1966, 35). The choice of a monetary regime must be based on millennia of practice in monetary relations.

He discusses in turn the problems, first of a closed economy, and second of the existing international economy.

In a *completely closed economy*, the introduction of paper money is perfectly logical (argument for the existence of national sovereignty, etc.). In order to maintain their credibility, full monetary centralisation and policy in the hands of the state is needed (discount or open market policy, etc.). Various schemes are crucial to maintain the prices of agricultural commodities, and to compensate their producers. The agricultural sector has a direct impact on the industrial sector. The author thinks in terms of a two-sector model where the basic equilibrium has the following form

(1) $p_1 v_1 = p_2 v_2$

Where p_1 и p_2 are the price indices for agricultural and industrial products, respectively, and v_1 и v_2 are respectively the indices of transaction volumes in the two sectors. Obviously, a fall in prices p_1 will have little impact on agricultural production v_1, but it is also clear that a general fall in $p_1 v_1$ requires a decline in the industrial sector $p_2 v_2$. Given the rigidities of wages and costs in the industrial sector, - inevitably there is a reduction in the volume of industrial transactions v_2 which leads to unemployment in this sector. According to the author, the relationship (1) is basic for the monetary economy. It links the agricultural sector directly to the monetary regime:

> "We don't realize that fixing a stable price for every agricultural product means at the same time creating a new monetary standard [...] In fact, we are making monetary policy without knowing it, a bit like Mr. Jourdan was saying in prose. [...] In fact, it could be argued that an important measure to stabilise prices is the creation of a new monetary system [...] Furthermore, a monetary policy conducted against one's will and in an inconsistent manner can never lead to a rational solution. The question therefore arises of harmonizing empirical agricultural policy with the enduring requirements of rational monetary technique." (Goudriaan, 1966, 40-41).

A policy of price stabilisation divorced from output and productivity stabilisation is a major flaw of nominalist monetary theory. Linking the monetary standard to a basket of agrarian commodities makes it possible to avoid lobbying by pressure groups (formed by product), since individual commodities will have negligible weight in the basket. In fact, there need not be many commodities in the basket, it is sufficient that their prices are weakly correlated. [10]

The determination of the "long term" basket price at which it is bought should be updated periodically from 3 to 5 years, depending on stock dynamics. If stocks fall, prices should rise, and conversely, if stocks rise, prices should fall. Goudriaan looks at products such as grain, cotton, flax, sugar, coffee and cocoa. Although in earlier years (1966) he had also included iron, metals, coal and oil, he felt that these were no longer necessary for the commodity monetary aggregate. The commodity money mechanism is a guarantee against deflation in a separate isolated economy:

> "The general conclusion that is called for is this: by depriving commodities of the monetary function that logically belongs to them, these same monetary properties have a detrimental effect on their prices. The instability of commodity prices is therefore not a natural and respectable phenomenon; it is an artificial quality created by a defective monetary system. In mathematical language, this is written as follows: a rational monetary standard must be a symmetric function of commodities suitable for monetary use; any exception to this symmetry creates an essential defect. Or, to use a metaphor borrowed from mechanics, - a monetary standard with a stable value means that the center of gravity of the prices of monetized goods is at rest. It is therefore necessary to

[10] In a mathematical appendix, the author shows that an increase in the number of goods leads to a neutralization of individual price movements. Mathematical formalizations of the model are rare. Among them are also Frommer (1945), who proposes a formula for optimal basket formation, and Luke (1975), showing the stability of a general price index within the basket that overcomes inflation.

create this desired rest, by a well-chosen definition, by fixing the external base at this center of gravity. (Goudriaan, 1966, 45-46).

In other words, the unstable areas, the unstable equilibria, should be sought out and subject to monetary fixation[11]. At a concrete level, this means finding the unstable markets in an economy, and it is *the products of these unstable markets that are given monetary status*. This is done by controlling their prices.

> "On the other hand, sudden changes in volatile prices affect the purchasing value of money without the slightest change in the monetary sector itself. This simply means that there will be a problem in the monetary system until the impact of the lack of cohesion between the monetary sector and the sectors of unstable equilibria is prevented. This intolerable situation must be corrected by creating for each unstable sector new, almost automatic means of direct and immediate intervention. Self-perpetuating deviations from unstable equilibria are so harmful to the general interest that we must learn to nip them in the bud." (Goudriaan, 1966, 49)

In his study, Goudriaan does not hesitate to refer to Marx, and his formula of commodity circulation (*Commodity - Money - Commodity*), as well as to emphasize the cybernetic nature of the model (the presence of feedback).

> "Finally, in terms of economic dynamics, we can write the circulation diagram (extending Marx's and thus getting closer to reality):
>
> *Liquidity - Commodities – Claims – Biil of exchange - Liquidity*
>
> If this circulation stops and if (temporarily) unsold goods start to pile up, make a short circuit:
>
> *Commodities - Liquidity*
>
> and you will give a new boost to the weakened circulation and vice versa. This is none other than the principle of negative feedback, generally recognized as the basis of all intelligent regulation" (Goudriaan, 1966, 46).

After the analysis of the problems in a closed economy, Goudriaan turns to the international application of the model. Here, the problems of the transition from national to international liquidity as well as balance of payments crises become central.

In the beginning, Goudriaan defines the zones of instability of the international economy. According to him, they are four - (i) the collapse of export prices in monoculture developing countries (ii) the rise of export prices in competing countries when wages outstrip productivity (iii) the emergence of "wandering" short-term capital, undermining confidence in exchange rates and (iv) the shortcomings of the gold-dollar standard, which puts the two key currencies, the dollar and the pound (the 'Anglo-Saxon liquidity shortage'), at the centre of national problems. In the author's view, there has been no proper response from the international community to these four areas of instability. On the contrary, the instabilities are worsening, to

[11] Here, Goudriaan refers to the ideas of the French economist Emile James (1899 - 1992).

which the IMF's policies are contributing (in 1965, 64% of circulation was accounted for by the US and the UK).

In the global economy, national political interests also matter. Goudriaan provides an interesting explanation of the theoretical and practical positions taken by economists in different countries:

> "It is clear that the key currency gives certain advantages to the issuing country. The latter receives real goods or services and gives nothing real in return. It gains in the international sphere purchasing power well above the value of its exports. The issuing country thus also gains political power; it develops as a financial centre that makes international financing decisions in excess of its own capabilities. Aware of these economic and political advantages, it is easy to understand the tenacity with which the British and Americans defend their acquired position as world financial centres. Consequently, they judge any proposal to reform the world monetary system primarily and almost exclusively by the impact that reform will have on the prestige and international position of the pound and the dollar" (Goudriaan, 1966, 53).

Further, Goudriaan argues that every financial centre has two dimensions that are often conflated - namely (i) that of a clearing house for international payments and (ii) that of a source of international funding (here, for Goudriaan, are the main instabilities)[12] . Or :

> "Apart from the obvious flaws in the technique and the lack of vigilance shown by the relevant monetary authorities - it appears that the very existence of key currencies in the long run is incompatible with economic growth and global cooperation based on democratic principles. We cannot tolerate indefinitely that one rich nation seizes the wealth of others without compensation in real wealth, nor that there is a single centre of national power in the financial world that wants to dominate everyone else.
>
> The analysis made so far clarifies why almost all the contemporary literature on international liquidity is of Anglo-Saxon origin and why this literature is exclusively concerned with the means of increasing paper, fiat circulation. These economists are opposed to any effort to consolidate the position of gold in international circulation and categorically reject the possibility of supplementing gold with commodities" (Goudriaan, 1966, 54-55).

Goudriaan criticizes "paper currency economists/“économites de papier“, nominalists", among whom he places one of the initiators of the SDR, R. Roosa, and R. Harrod and R. Triffin:

> "We can summarize the main features of the current controversy: the protagonists of the paper money defend their own interests first. They accept international politics only insofar as their national interests are well protected and, if possible, this in a stronger and more secure way. It will always be impossible to create paper, fiat money without giving the rich countries the advantage, because paper money is mostly credit money, and credit is always on the side of the big, strong and rich. One man's gain, however, is another man's loss" (Goudriaan, 1966, 58-59).

[12] Similar to Triffin's dilemma.

For the Dutch economist, the creation of a supranational monetary authority, an international government, etc., is impossible, and attempts to do so are unnecessary. The institutional rule governing the relations between national economies should be the following:

> "Only one principle can be applied to reach an international agreement: a minimum constraint on the States involved: a minimum discretion for an international executive" (Goudriaan, 1966, 61).

In practical terms, Goudriaan proposes to form four groups for international monetization, initially subdivided into groups, and subsequently brought together in a common aggregate, the basket: (i) tropical and subtropical agricultural products (ii) temperate zone agricultural products (iii) livestock products and (iv) non-ferrous metals, i.e. excluding iron. Their weights and prices will be reviewed periodically (three to five years).

Goudriaan also provides an answer to the criticism about stocks/inventories, transaction costs, etc. According to his calculations, optimal inventories will not exceed the normal practice of commercial inventories, since price fluctuations will not be significant. The author also does not overlook the argument about the weak elasticity of demand for the goods in the basket. He notes that elasticities are high in developing countries, precisely those that will be at the centre of the model, and which are poised to gain. There, food is in high demand with a clear trend towards increasing hunger.

In the second half of the 1960s, and especially in the 1970s, the topic of resource money was first reactivated in the UNCTAD/UN report by Albert Hart, Nicholas Kaldor and Jan Tinbergen, published in January 1964 (*Hart - Kaldor - Tinbergen plan*), as well as in articles by Hart (1966, 1976) and Kaldor (1981, 1986).

Albert Hart[13] , focuses on clarifying the applied points in the model, and especially on determining the cost of maintaining inventories. He gives alternative calculations to those made by Grubel (1965)[14], a strong critic of the model. According to Grubel, the costs for 1966 (expressed in 1964 dollars) are in the range of $12-20 billion, and for the period 1968-2000 accumulate to $185 billion (with a 4% annual growth in liquidity needs). In turn, Hart arrives at numbers in the order of 4.5 billion, and a build-up of 60 billion over the period 1968 - 2000 (Hart, 1966, 239).

Ten years later, after the collapse of Bretton Woods, Hart repeated the cost-benefit calculations (Hart, 1976). The task was to specify and recalculate the gross and net costs of maintaining the system[15]. Hart calculates the total costs; they turn out to be low again. What is more interesting

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[13] Albert Hart (1909 - 1997) was a professor at Columbia University.

[14] Grubel defines the RBIC as "This plan is claimed to solve not only the shortage of world liquidity but also many of the problems of underdeveloped countries by reducing business-cycle-caused fluctuations in the demand for raw materials and by stabilizing the terms of trade between primary products and manufactured goods" (Grubel, 1965, 130). Gunter Grubel (1934) is a Canadian economist of German origin, specializing in international economics.

[15] The author shows the advantages of resource-based issuance of additional liquidity (within the IMF system) over the approach proposed in 1975 by UNCTAD to control the supply of resources by limiting their production and export quotas of producing countries (*Integrated Programme for Commodities*).

here is the detailed methodology. Costs are reduced to costs (i) of maintaining inventory stores for individual commodity items (ii) related to foregone interest benefits (which are not large, according to inflation). As well as costs: (iii) for the construction and operation of the marketing infrastructure, collection of price and stock information per item by experts, (iv) arising from maintaining the quality of stocks (spoilage/deterioration, etc.).(v) potential diversion from current consumption, and finally, (vi) costs in critical and crisis situations, when some of the goods will be withdrawn from stock and consumed by the State (with the condition that the State will restore them after the crisis has passed).

In extreme situations, when there is a shortage of a commodity and the bank has to buy the basket at that moment, the solution is a well-developed futures market. Spot and futures prices alone will regulate temporary shortages. Hart thinks it will reduce the need to maintain other forms of inventories, and that it will create employment in underdeveloped countries.

According to the author, there are risks of governments breaking the agreement with the Resource Bank to start withdrawing certain, momentarily problematic resources.

For his part, Grubel stresses the dangers of the political cycle, "time inconsistency" and especially the rule of populist governments that can compromise the functioning of resource money.

> "Within only thirty years the Commodity IMF purchases will be valued between $30 and $40 billion annually. More important, however, the commercial power of the Commodity IMF will be without precedent in world history. There exists a real dilemma in the choice of an organizational form for the Commodity IMF directorate. Very detailed, fixed operating procedure will make the institution un- wieldy and unable to adjust quickly to unforeseen contingencies. Under these circumstances, serious hardships could be inflicted upon economic units in the minority even though they had believed that their rights were protected when they agreed to the original charter. The alternative organizational form leaving more decisions to human judgement runs the danger of concentrating enormous power in the hands of a few. Only minor shifts in policy or favour can bring fortune or disaster to private business firms or even entire nations" (Grubel, 1965, 133).

And further :

> "In sum then, if the Hart-Kaldor-Tinbergen plan works properly and increases world liquidity at the required annual rate of 3-4 per cent, it will, as the computations show, very soon lead to an enormous concentration of economic power and to a substantial absorption of the world's productive resources. These costs are disadvantages of the plan which must be weighed carefully before it is put into effect." (Grubel, 1965, 134-1935).

According to Hart, the argument for the existence of the giant power is refutable because of the fact that the bank will operate under a regime of predefined rules rather than discretion. In contrast to Grubel's critical assessment, Hart argues that the model will stabilize as an institution, i.e., it will find its optimal parameters, stock, basket rate (redemption price), etc. (Hart, 1976, 30).

At the beginning of the 1990s, a new wave of revival of the idea of RBIC emerged within the IMF (in the choice of the methodology of constructing the SDR, the idea of the "Hard SDR"), as well as around the choice of a model on which the European monetary system and the common money - the ecu - would develop. In a certain sense, it was about trying to replicate the proposal of the UK and British economists to launch a hard ecu to circulate together with national money, and eventually, after a selection process, to impose itself as a common currency.

For example, IMF economist Subhash Thakur analyses the options of "rolling back" the SDR and "searching for a fixed benchmark"[16] .

> "In a world of generalized floating of major currencies, the most meaningful definition of a hard SDR would be in terms of maintaining the hard SDR's purchasing power over goods and services. At a technical level, this can be done in a number of ways. For instance, the hard SDR could be defined in terms of a basket of commodities, with an agreement on the commodity price quotations to be used in calculating its value in terms of currencies. The major difficulty with such an approach, however, (as noted in Section I) is that the markets for individual commodities are, in the short as well as the medium term, subject to several special influences, including speculation, which result in their prices deviating, often sharply, from the general price level. The price of a collection of primary commodities would tend to be more stable than that of any single commodity, but still less stable than a general comprehensive price index, such as a consumer price index or GDP deflator. " (Thakur, 1994, 479-480)

In the same vein are the publications of Richard Cooper (Cooper, 1987 [1982], 43-86[17]). Considering commodity currency in a broad historical perspective, Cooper is generally positive about the idea. He believes, however, that it carries a number of drawbacks, one of which is the unclear relationship and transmission mechanisms between the basket price index to the general price level. In his view :

> "Such proposals have found little interest beyond intellectuals. I suspect that conservatives really want gold, for reasons of history and sentiment, whereas nonconservatives prefer managed money. Also, the schemes are basically too complicated to appeal to a wider public" (Cooper, 1987, 75).

But let's go back to Jan Goudriaan, who ends his 1966 study by saying:

> "France gave the world the metric system, a pure product of reason, in the then chaotic environment of weights and measures. It sometimes seems to me that in the monetary field, France has the similar task of propagating a rational system, regardless of the interests that dominate at the time" (Goudriaan, 1966, 74).

[16] See also IMF, Coats (1989).
[17] Richard Cooper (1934 - 2020), pioneer of international political economy, part of the team of Presidents Kennedy and Carter.

This brings us to France, where an interesting discussion about the commodity money model was unfolding. In contrast to the traditional analyses, in France considerably more "heterodox" economists are involved, including those with a left and even Marxist orientation.

IV International resource money and the contributions of French economists

In fact, not only the French "inclination to rational thinking" but also the very economic and monetary conditions of France suggest a fertile ground for the spread of the idea of RBIC. France finds itself short of international liquidity, while at the same time possessing vast colonies whose material resources must be mobilized and valorised. Later in the 1960s, France initiated monetary and payment schemes to link with the new independent states (mostly in Africa).

Undoubtedly, in France, it all started with *Louis Fizaine (1888-1967)*, a textile industrialist from Nancy, in his book *Crise et Monnaie* (1933), - the result of his independent efforts to find a solution for the deflationary crisis. Fizaine was a strong influence on Jean de Largentaye[18] , who in turn helped develop the idea from Pierre Mendès France. Fizaine's idea appeared in 1931 on the pages of French newspapers and magazines, as a model of the "*monnaie octométalique*" (of eight metals, - gold, silver, nickel, tin, aluminium, copper, zinc and lead). It is supported by important personalities such as Francis Delaisi, Paul Reynaud, Henri Clerc, Joseph Dubois, Georges Guillaume and others.[19] Fizaine's model is interesting not only from a conceptual point of view, but also as algebraic and graphical examples of how the basket price is calculated and how it changes under the influence of demand movements, supply and prices of individual metals, or combinations of metals.

For the author, commodities are basically divided into two groups - commodities in general (*marchandises générales*) and monetary commodities (*marchandises monétaire*), whose value is chosen arbitrarily as a means of comparison and measurement (Fizaine, 1931, 17). As the number of monetary commodities increases, the price index of the monetary benchmark approaches the general price index (that of commodities in general). Fizaine studied the influence of money standard prices in different monetary systems (monometallism, bimetallism, simetallism, trimetallism and octometallism). Particular attention is paid to octometallism, to compensation within the index (its general stabilization), and to the impact of this regime on smoother cyclicality and the softening of crises (inflation and deflation), as well as on exchange rate and balance of payments dynamics.

Fizaine also lays out the criteria by which monetary commodities are selected (Fizaine, 1931, 101-109). The eight metals are eventually arrived at. Such important products as petroleum, mercury (difficult to transport), precious stones and crystals (not divisible), agricultural products (cannot be produced quickly, low elasticity) and strategic metals, uranium for example

[18] In the book devoted to Largentaye, correspondence with Louis Fizaine from 1933, 1966 and 1967 is published (De Largentaye, 2022, 214-218). The idea is also partly to be found in Georges Boris (1931), who proposed that the Banque de France should intervene on the commodity markets, and later the creation of a *Banque internationale de matières premières*. Fizaine argued with Boris about the paternity of the idea (Fizaine, 1933, 178-187).

[19] In 1946, Fizaine published *Dirigisme ou automatisme ?: Un système qui fonctionne sans fonctionnaires, which* collected reviews of his book, letters, and excerpts from his lectures.

(many are rare), etc. are dropped. Petroleum, despite some drawbacks, could become a monetary commodity in the future, but it has to start with metals. Storage techniques, the siting of warehouses and the protection of property rights are also specifically addressed. As well as the role of the Banque de France in intervening in the money market (*l'organisation du marché des marchandises monétaires* (Fizaine, 1931, 147-167). The system was intended for the liberal economy but had a universal character, Fizaine concludes.

> "Such a monetary law (which would preserve, by the way, its advantages in different systems of a dirigiste economy) would have an extraordinary flexibility and would by all appearances help to reduce the frequency and amplitudes of cyclical price movements, and to overcome the crisis which is claimed to be inherent in the liberal economic regime. This crisis seems to be due to the absence in our economic machinery of an economic stabilizer, gyrostatic in a sense, which, that is our present monetary system" (Fizaine, 1933, 172).

A decade later, at the Bretton Woods conference, the French delegation proposed a monetary stabilization plan (published in 1943) and prepared mainly by Hervé Alphand and André Istel. The idea of a transitional monetary system (towards the restoration of the international gold standard, with certain conditionalities) is put forward[20]. An important element is currency swaps (in national currency) between creditor and debtor countries. As a counterpart to the amounts that creditors hold in debtors' money, debtors are obliged to maintain 10 to 30% collateral within an international stabilization monetary fund[21] , and this collateral will be in the form of real resources - commodities, raw materials, etc (French Plan, 1943, 100). The aim is to create a form of additional liquidity backed by resources. The following quotation is significant, where the need for synchronous management of cash and resource flows is stressed:

> "(a) Commercial treaties should be concluded permitting a rational distribution of productive activities among nations. Such a distribution ought to take into account the natural resources, the geographic and demographic conditions, the level of education as well as various other elements of the cost of production; it ought furthermore, to take into account the creditor or debtor situation of the balance of payments.
>
> b) Certain regulatory measures of an international character should be adopted, designed to stabilize business conditions and to reduce as far as possible the swing of economic cycles. These measures ought to have a double character: they should operate on the one hand, on the volume of instruments of payment or of credit, in order to adapt them to needs; they ought to operate on the other hand, directly on the volume of goods in order to adapt them to outlets. This latter action should, itself, be of a double character: on raw materials, by some kind of regulatory action on stocks and output; on finished goods, by methods devised to accelerate or slow down the rhythm of production" (French Plan, 1943, 98).

[20] See Bordo and al. (1994).

[21] Interestingly, this fund resembles in some respects the proposal of George Boris (1932) for a *Banque Internationale de marchandises premières*. Georges Boris (1988-1960) was a highly influential economist, advisor to the PMF and Du Gaulle, in different years (Crémieux Brilhac, 2010).

Of the French economists who advocated the RBIC model at the highest political level was Pierre Mendes France (1907-1982) (PMF), prime minister (1954-1955) and minister, head of the French delegation to the Bretton Woods conference. Since the 1950s Mendès France had been developing the idea of an RBIC, and in 1974 in interviews collected in *Choisir. Une certaine idée de la gauche*, discusses the proposal at length (Mendes France, 2007 [1974], 156-283/ref MF (2007). PMF links the crisis of natural resources (in this case oil) to that of the international financial system. PMF derives a model from the need to shift to a new type of growth based mostly on production and on the basis of energy saving, and not so much on exchange and money. And further, - the value of money must be linked to the value of natural resources, it must be studied by studying the processes of energy (PM, 2000, 174-175).

The PMF addresses the constraints coming from the gold, gold-exchange and gold-dollar standards. Despite the French's sympathy and nostalgia for a gold standard (De Gaulle's and J. Rueff's attempts to return to gold), gold does not reflect economic realities. In fact, -why choose this commodity and not another?(MF, 2000, 177). PMF notes:

> "In any case, for a national currency, managed by national authorities for national purposes, and to ensure national prosperity, to be held up as an international benchmark, and its fluctuations, its oscillations, its failures reflected on the whole world, - is neither logical nor acceptable" (MF, 2000, 183).

The gold-dollar standard system leads to the emergence of short-term and to moving “wandering“ hot capital. These impact speculatively on expected exchange rates, and hence to the accumulation of foreign exchange reserves far in excess of those needed to service trade and current payments.

A new anchor for the international monetary system is needed:

> "In reality, a monetary system, but which is not always understood, - must have an anchor/pivot, a fixed point against which the other elements will define themselves. The fixed point, or what you say, the reference, is the monetary standard. That's the role that gold has played; we've already talked about. I have shown you how little gold is representative of economic life, if only because of the fact of its small world volume and its characteristics. Something less specific and which better reflects transactions, activity and production must be found, because money must serve precisely by serving them contrepartie and allowing them to pay. It is in this direction that the solution must be sought ." (MF, 2000, 189).

The anchor for money must become the commodities that money buys ("There is no monetary life other than economic life, and the rigidities are found at the level of the bonds that connect them" (MF, 2000, 198)). As for the SDRs created in 1969, they reproduce the shortcomings of paper currency and have no real basis (this is "capitulation to the problem of sound money"). SDRs represent a transfer of US liabilities to the IMF, SDRs are inflationary. PMF quotes its

French colleague, the politician Michel Debré, who says that "SDRs are an institutionalization of anarchy and of the right of the stronger" (MF, 2000, 198)[22] . What is to be undertaken?

The PMF proposes to introduce cash stocks based on basic commodities alongside gold. Among the known and well identifiable commodities (20 to 30 in number), the PMF lists lead, tin, copper, iron, textile fibres, rubber, as well as cereal and animal commodities such as wheat, maize, meat, sugar, coffee, etc. These resources form a basket whose price index (representative of the general price index and of the movement of the international trade conjuncture) is guaranteed by a specific institution (the IMF, which should be reformed). The purchasing power of the basket taken as a whole is guaranteed. Within the index, individual prices move, with the weights of products being periodically revised (depending on their weight in trade, with some products dropping, others entering the basket). The index is transparent to the population, its movement is publicly monitored. Technically, vouchers are issued against the basket and the stocks themselves are held by private, public and international organisations (MF, 2000, 200-203). Who benefits from the model?

Developing countries' terms of trade stabilize, their goods become sought after by industrial countries (every issuer wins, in principle). This boosts production and productivity in poor countries, and against increased imports they can increase their imports of machinery and technological output. That is, the developed countries also benefit from greater external demand.

The question of transnational corporations (TNC), which are owned by developed countries, and which are manipulating the production of raw materials in developing countries, remains open. The PMF does not answer the question of how the above-mentioned harmful influence will be overcome. For him the biggest obstacle to the new institution, is the psychological barrier, the "routine of thinking" (MF, 2000, 207).

Overall, PMF's positions are of utmost importance to the debate in France because of its political commitment and reputation as a visionary. Particularly active is the magazine *Tiers-Monde*, in whose pages a series of articles on the subject appear. Gabriel Ardant (1966) ,[23] puts the subject as follows :

> "A number of problems of the modern world, the problem of international trade, the currency (monetary) problem, the problem of the growth rates of the major "Western" countries, the problem of commodity price volatility and the problem of underdeveloped countries are too often seen and treated in isolation. But all these problems are closely related, and by solving some we can try to solve the others" (Ardant, 1966, 115).
>
> "Besides, at the end of the day, what do countries that are trying to export more than they import want? They want to get money, money with international value, money that allows them to buy in any market. This international money is rare. " (Ardant, 1966, 118)

[22] Michel Debré (1912-1996), Prime Minister of France (1959-1962).
[23] Gabriel Ardant (1906-1977), economist, close associate of PMF.

Commodity money puts an automatic brake on inflation, while at the same time being a powerful tool against deflation (Ardant, 1966, 123). They stabilize the exchange rate of the commodities they export to poor countries (Ardant, 1966, 131). The main problem, according to Ardant, is the formation of the prices with which the individual commodities enter the basket (these must be determined by experts):

> "The price set should be as close as possible to that which in the long term can ensure the balance of supply and demand. Determining this price is difficult, but it is still possible to rely on current data. Moreover, it would be advisable to provide for periodic review, a review which would not cause sudden fluctuations but only a bending of the long-run price curve" (Ardant, 1966, 128).

The financing of a system has two solutions, - through contributions of the parties involved, - or through a fee for the creation and destruction of the resource money, which is collected when it is bought and sold (Ardant, 1966, 132).

Unlike other authors, Ardant also envisions a mechanism for national money to be pegged to the new resource money, through an exchange rate regime appropriate to each country's circumstances. He believes that this model, can be applied to the CFA common currency area in Africa, and to the European Economic Community (Ardant, 1966, 133, 138).

Let us turn to *Jean de Largentaye* (JdL)[24] , whose texts on the subject are collected in de Largentaye (2022). Although he translates and prices Keynes, JdL believes that Keynes's theory is only valid under fiduciary money. According to the French economist are organically unstable. Keynes did not create a complete theory, but a model of the functioning of discretionary fiduciary currency. According to JdL, fiduciary money and its active management lead to the following three unacceptable alternatives - (i) inflation, (ii) deflation and unemployment, and (iii) dirigisme, i.e. authoritarian planning. The JdL is close to the postulates of the classical school and Austrian monetary analysis[25] .

The centre of the problems is the monetary regime, the monetary standard/benchmark. In his extensive report, JdL provides a comparative analysis of the effectiveness and costs of different monetary regimes, grouping them into two broad categories, ordered by degree of fiduciary (2022/1965, 577-634).

In the first group, called "intangible standards" (*de nature incorporelle*), he placed paper currency, credit currency, and currency based on labour (labour costs). In the second group, "material by nature standards" (*de nature matérielle*), are included - the mono- and bi-metallic standards (gold, silver and bronze standards), and the standard based on a commodity basket (i.e. x kg copper + y kg zinc + z kg coffee + t kg wheat, etc.). In the above series, the fiduciary is deployed from 100% in the case of paper money, to 0% in the case of the resource basket.

The resource basket standard overcomes fiduciary currency imbalances by: (i) achieving an automatic stabilization of aggregate demand (including consumption) and employment by

[24] Jean de Largentaye (1903-1970), translator of Keynes, participant at the Bretton Woods Conference, first French representative to the IMF.
[25] He was close to Jacques Rueff, corresponded with Hayek.

directly including or excluding resources from the basket, (ii) an automatic equilibrium between saving and investment that has a commodity expression, and where saving pulls investment, rather than the other way around as implied in Keynes's model for paper currency, and (iii) solving the precautionary money demand problem, hoarding (which is formed when hedging against price declines). The model allows to stabilize the prices of the money standard and through it the general price level. In the long run, prices are linked to productivity, and savings and investment to the real (natural) interest rate, which is assumed to fall as the population grows. Internationally, equilibria also occur automatically and quickly, as fluctuations in the terms of trade, and in capital movements (including speculative ones) are minimized). JdL calls its model "organized clearing" (JdL, 2022/1965, 581).

Technically, the JdL model is not original (except that it suggests resource money become quotable currencies):

> "The use of benchmark-goods implies that a monetary agency receives as a deposit the entire set of goods of which the benchmark stands. This agency will provide certificates representing these deposits, certificates which will be denominated in this benchmark and freely transferable. The holders of the certificates could at any moment exchange these currency tokens for a quantity of the commodities (constituted as a standard) equal to their value. Obviously, the stock of monetary commodities would be more voluminous than the stock of gold, but they could be dispersed at the places of their production. The commodities that make up the benchmark would be traded freely in individual markets, analogous to commodity exchanges. *Prices would be quoted not in dollars or in sterling, but in the standard monetary basket.* The individual prices of monetary commodities will obviously fluctuate with their costs under the influence of technical changes, and sometimes temporarily under the influence of changes in demand, - and only for the time until supply recovers. The rise of some prices will be offset by the fall of other prices, in such a way that the price of the aggregate remains equal to one. If this price begins to rise, the arbitrageurs will buy these commodities on the free markets to sell them to the monetary agency" (JdL, 2022/1965, 557).

Fiduciary currency redistributes resources, wealth and power, especially unacceptable internationally, where the US and partly the UK, through their banks, create money in other countries and practically conduct monetary imperialism. Due to the systematic deterioration of the terms of trade and the chaotic movement of capital, underdeveloped countries suffer, they file into one of three configurations (inflation, deflation/unemployment or dirigisme). In order to protect themselves, their governments are forced to accumulate foreign exchange reserves, create state structures to support commodities, or resort to price fixing.

> "The credit-based standard is the most unjust because it concentrates in a few hands the power to acquire all kinds of wealth for free. [...] Internationally, it is the American banks that exploit, especially today, the issuance privilege - because capital transfers outside the US are free and, for the central banks of other countries, the dollar is directly convertible into gold. Thus, these American banks enjoy the power to create not only dollars, but also yen, marks, bolivars, and other money, ceding to the issuing banks of

this money the dollars thus created for that purpose. Such a situation is incapable of developing equality of wealth among states" (JdL, 2022/1965, 606-607).

The JdL pays particular attention to the *cost of the resource money model*. He reduces them to three broad groups (i) money production costs (ii) money storage costs and (iii) inventory costs, paying particular attention to the financing models of inventory costs (JdL, 2022/1965, 623-630). He notes that while the first two costs are present in the other benchmarks (for gold these costs are visible), and there are also high social costs, the latter, - those of maintaining stocks/inventories, - are specific to the resource benchmark (they depend on the volume and frequency of replacement). Their level is lower even than those projected by B. Graham 2-3% of the stock. In any case, they are much lower than foreign exchange reserves in a fiduciary money regime (because less liquidity would be needed). Foreign exchange reserves under fiduciary money, on the other hand, actually represent the financing of advanced economies (JdL, 2022/1965, 624-626).

The cost of inventories can be seen as the price that must be paid to have a stable monetary system, i.e. to remove the costs associated with inflation, deflation (unemployment), and administrative intervention. Furthermore, giving a monetary function to the commodity stock, and linking the monetary function directly to the survival of society, will free up commodity and strategic stocks that each state accumulates in the event of war (JdL, 2002/1965, 629).

According to the JdL, the stock can be financed either through a commission fee to be collected from the cash institution that issues the stock certificates, bills. It would be even more logical, were a fee (in form of negative interest) introduced on the holders of this money, according to their volume and the period of holding[26] (JdL, 2022/1965, 627).

For JdL, the idea is irrefutable and has been worked on and recommended by "the best theorists of money and the most enlightened statesmen" (JdL, 2022/1965, 642). The main obstacle was the political and economic interests of the United States and the leading industrial countries, and the adherence of French economists to the classical gold standard. JdL recalls:

> "Ten years ago, I was able to convince my Belgian IMF colleague, who had talked about this idea with the Governor of the National Bank of Belgium, the distinguished and sympathetic financier Mr Maurice Frère, of the benefits of the benchmark. On reflection, Mr Frère confined himself to telling him : 'My young friend, if there is one piece of advice I can give you, *ne touchez pas au* grisbi'. Addressing a young banker with such advice (and the advice is undoubtedly good) makes us wonder what will ultimately happen to our countries if we take care not to *toucher pas au grisbi*" (JdL, 2022/1965a, 660).

In *Tiers-Monde* in 1971 appeared the article by the French Marxist Suzanne de Brunhoff (1929-2015) (hereafter SdB). The resource money model, according to SdB, "preserves a certain freshness", in contrast to previous models, which were limited to technical modifications or to power, political changes between countries.

[26] Resembles in some respects the Silvio Gesell's melting currency.

The first criticism of the SdB is the ambiguity of the institutional nature of the new currency, the lack of clarity of its emergence. The author adheres closely to the approach of Marx, according to whom money (more precisely the gold standard) is a spontaneous product of human activity, a centuries-old selection of gold silver from commodities, processes that cannot be reproduced artificially.

For SdB, the model also has fundamental methodological and policy flaws. First, proposals to introduce resource money at the global level (in all countries simultaneously), within the IMF framework, or some other configuration, - are unrealistic. The world economy is composed of geopolitical and geo-economic blocs that differ in their level of development, degree of homogeneity and interconnectedness. Within these blocs, the poor countries are asymmetrically located and are subordinated to different leading centres which have different mechanisms of capital accumulation (following Marx) (SdB, 1976, 528-529).

Second, the model suffers from basic unclarities about the nature, genesis and functions of money *as an institution*. Following Marx's approach, SdB argues that to become money, a commodity goes through a long process of social validation, valuation, and deriving value from economic activity. The transformation of commodity into money cannot be a discrete act (such an act can only take place in relation to the form of money). It does not easily become money, - for this it is necessary to reach a level of economic relations where money reflects the socially necessary costs of labour. (SdB, 1976, 530).

Further, - there is no clear distinction between currency, as the medium of final, ultimate payment, and credit. According to her, the voucher/certificate that is intended to be issued against the commodity, resource basket, and into which it is to be converted, is not money, but a type of *commodity credit*. Further, the rules under which vouchers can become a source of national currency supply are not clear.

> "The bills allow for the postponement of the settlement of monetary balances between countries, they are not themselves a means for this settlement. Their role is similar to that of currencies and differs from that of gold, taken as a 'universal currency', or from a claim by a possible World Central Bank. The confusion between currency (of final settlement) and bills is of the same type as the confusion between money and commodities. In both cases the forms and functions of money are poorly defined, and the concept of money is vague" (SdB, 1976, 532).

This leads to the fundamental problem of the functions of money, which are said to be reduced to a means of calculation, and a means of payment. It does not get to the leading and most basic function (within Marx's labour theory) - the measure of value/exchange value. The model misses the mechanism of value formation (SdB, 1976, 532). According to SdB, the mechanism of the *social validation* of the commodity basket as international money is missing.

V Conclusion

Historical hindsight shows us that the idea of RBIC (or international commodity money) has always been alive. Like the structural crises of international economic relations, which as a rule manifest itself as monetary, resource, and geopolitical, resource-based money projects, in

various configurations of countries, are becoming relevant today[27]. Global risks and technologies are changing, but the search for a new, substantive/material anchor (pivot) of the international monetary system remains.

Finally, the development and defence of the idea, in its struggle with the practice and theories of international fiduciary money, - have been undertaken by some of the leading and talented economists belonging to different schools and with different political preferences. This fact, in itself, gives us reason to study the theoretical and practical aspects of a possible application of RBIC in the near or foreseeable future.

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THE DIGITAL TRANSFORMATION AND THE MONETARY CHALLENGES IN THE POST-CRISIS PERIOD

Jovan Zafiroski[1]

Abstract: *Digitalization of money is one of the most important challenges for the monetary authorities which alongside inflation and geopolitical turbulences has potential for profound changes of the traditional monetary landscape. The launch of the CBDCs a as new form of public money should strengthen monetary sovereignty in times of increased digitalization of the economy. However, the process of introduction of the central bank digital money raises numerous legal questions that should be answered before its launch. Also, the economic effects will be significant especially for the financial system and the payment infrastructure. Moreover, the introduction of the CBDCs might have serious consequences for the society as a whole. In broader terms the risks are related to the possible abuse of the digital money for surveillance, more options for weaponization of money, and manipulation of programmability of money.*

Keywords: *CBDCs, digitalization, monetary sovereignty, legal tender, surveillance, weaponization, programmability*
JEL: *K39, E42, E52*

Introduction

The title of the 10th Annual MRC conference: *The digital transformation and economic recovery in the post crisis period* opens a vital question about the notion of the *crisis* that we are examining. Is it the Global Financial Crisis from 2008, Eurozone crises, Sovereign debt crisis, Covid19 crisis, Ukrainian crisis, the crisis in the Middle East etc.? One can go deeper in the history and point to the EU crisis from the beginning of this century. The Lisbon strategy from 2000 was a crucial document at that time aiming to deal with the low productivity and stagnation of the European economy. Thus, the problems, at least at the European soil, are not new but they are constantly accumulating in the last 25 years. Each of these *crises* is fit to be a title of this conference. But looking at some economic data one may ask why are we talking about crisis and challenges when the numbers are encouraging. We live in a time of ATHs of Dow Jones, Gold price, Bitcoin price, Real estate prices…However, there are also all-time highs in the public debt and the Buffett indicator. The reality is not so pinky while in the

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monetary field we are facing different events that are fundamentally changing the traditional relations and rules that existed for many decades. The creation of the new economic, political and military blocs will have important effects on the international monetary system built after the Second World War. There are multiple views on how the future international system will look like as some proposals for the Bretton Woods III (Pozsar Z. 2022) and certain ideas for creation of a monetary system with currencies based on natural resources (Nenovsky N., Bondi G.,2024). In addition, the process of digitalization is dramatically changing the realm of money while challenging the incumbent players in the payment and financial system. Different technological breakthroughs, the *blockchain* technology in particular, offered technical solutions for the monetary and payment system that were unimaginable in the past. At the first glance, the crypto mania is mostly driven by the desire for fast profits, but the story is much deeper. The idea behind them is a creation of a decentralized monetary system that would be independent and outside the powers of the state, without a third or trusted party in the system of payments and settlements. If this process continues and the use for payments of the private digital money in various forms and on different levels gains momentum, while at the same time the cash loses its role in everyday payments, the monetary sovereignty will be jeopardized while the monetary policy will become an ineffective tool of the general economic policy.

The text will present the CBDCs as a new form of money (1) in terms of its basic characteristics (1.2.) and the current research for its launch (1.1.). Also, the main legal and economic questions (2.1.) and the broader challenges concerning the entire society (2.2.) deriving from the launch of this new form of central bank money will be examined.

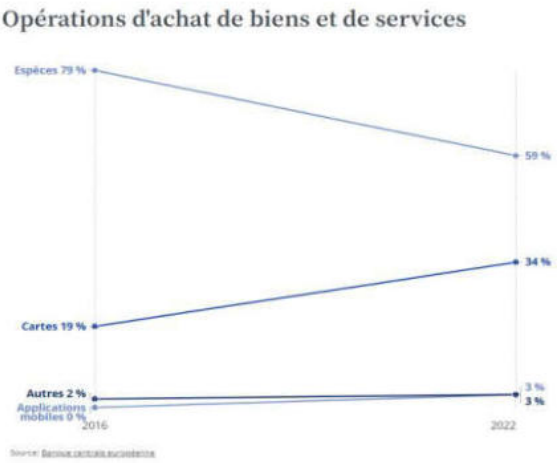
1. CBDCs as a new form of money

The idea for introduction of a central bank money in digital form seems progressive and adequate in times increased digitalization of the economy. The process of adaptation of the monetary system and the money as a payment instrument is an evolutionary process. However, some events are catalyzing and speeding up this process. When it comes to the research on the launch of the digital central bank money it seems that the start of the project of the stablecoin Libra (latter called Diem) was the decisive moment when the central banks decided to enter the game and to provide the broad public with a new digital form of central bank money as another form of public money alongside with the cash and the private bank money. The Libra was the first global private stablecoin backed by a “basket” of currencies that aimed to provide open,

fast and low-cost transfer of money. The potential of its use in the framework of Meta platform and its partners was significant therefore it was seen as a destabilizing factor for the financial system and the effectiveness of the monetary policy. For these reasons the regulators response was harsh (Zetzsche et al., 2021) which ultimately led to abandonment of Diem. However, this was a wake-up call for the central banks and other monetary authorities to start their research for a solution for a central bank money in the highly digitalized world.

1.1. Current research on CBDCs

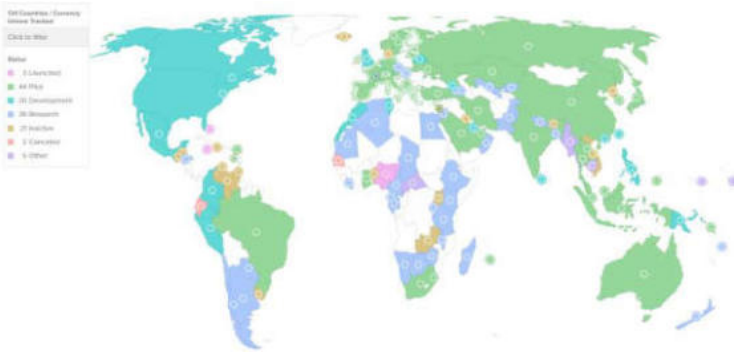
The majority of the central banks are working on the creation of digital form of public money. They are forced to be proactive and to work on introduction of the central bank digital currencies in an environment of rising e-commerce and reduced role of cash payments in the economy where private money is the dominant medium for exchange.



The reduced role of the public money in everyday transactions may pose serious risks for the monetary authorities to preserve the role of the State as major player in the realm of money. The central banks are in quest for solutions how to preserve the monetary sovereignty and to continue to use the monetary policy as an important tool of the broader economic policy. The digital form of the public money that will be accessible to the broader public in one solution. The data shows that majority of the central banks are in process of exploring or developing digital currencies. The success varies among countries and regions but the process moves forward.

According to the CBDCs Tracker of the Atlantic Council 134 countries and currency unions, representing 98% of the global GDP, are exploring a CBDC. The Bahamas, Jamaica and Nigeria are the first countries that have fully launched a CBDC. In the developed economies or

the block of G20 every country is exploring the CBDC while 10 of them are in advanced stage of exploration. Also, the BRICS member states are working of the digital central bank money with China's leading role with the largest CBDC pilot in the world. There are many cross-border wholesale CBDCs projects linking the major central banks in the world.



Source : https://www.atlanticcouncil.org/cbdctracker/

1.2. The notion of CBDC

In its document that laid the foundations on the research of the CBDCs the BIS defined this new form of money as *a digital payment instrument, denominated in the national unit of account, that is a direct liability of the central bank* (BIS, 2020, p.3). In much broader sense one may say that the CBDCs are digital representation of sovereign currencies that provides direct relationship between the households and businesses with the central bank. This new form of money offers a unique possibility for preserving the coexistence of sovereign and private money in a digital world (Panetta, F., 2022). The launch of the CBDCs has as its primary goal its use as a means of payment while all others objectives, as monetary policy for example, are secondary (BIS, 2020, p.5). Moreover, the BIS rapport (BIS, 2020, p. 10) defined the core principles that should underpin the research and the possible design of the CBDCs. The report detects three key principles that essential for any work or research on the CBDCs. Firstly, the launch of the CBDCs should not hamper the delivery of the central banks' objectives such as monetary and financial stability, that is the *do not harm* principle. Secondly, the design of the CBDCs should preserve an ecosystem that provides *coexistence* with commercial or bank money and cash as other form of central bank money. Thirdly, the launch of this new form of central bank money should promote *innovation* and improve *efficiency* in the payment system. The choice of the design of a CBDC is essential for its success and opens different legal and economic questions. Much of the effects of the introduction of the CBDCs derives from the

choice of its design. Three questions are of paramount importance. The first is who can have *access*. There are two possible solutions. A *wholesale* CBDC available to the banks and other market participants which will not dramatically change the current monetary landscape or a *retail* CBDC accessible to the households and companies that will be a game changer. The second question is related to the *access mechanism*. Depending on the requirement or on the presentation of *identity* for access to the CBDCs they might be *account-based* or *token-based*. The former requires the identity of the account holder for payment authentication which sparks concerns for data privacy and security while the latter is anonymous and like the payments in cash today does not require user's identity. The third question is the *transfer mechanism* or on the ledger structure used. The first option is a decentralized system without a central ledger, as the cryptocurrencies, while the second option is a centralized system based on deposit accounts within the central banks.

2. Challenges deriving from the launch of CBDCs

The success of this new type of money will primarily depend on its design and its key characteristics. The process opens series of legal and economic questions. The first are related to the legal aspects that include the legal basis for the introduction of the CBDCs, the status of *legal tender*, the relationship with other types of public and private money, the issue of monetary sovereignty etc. The economic questions are related primally on the risks for the financial stability and the risk for disintermediation or the outflow of deposits from banks and other financial institutions. The new possibilities for the implementation of the monetary policy should also be considered. Without any doubts one may say that lawyers and economists will find solutions for every single problem that arises from the launch of this new form of money. The EU Commission's proposal of the *Regulation on the establishment of the digital euro* proves it. It has found several good solutions for the introduction of the digital euro.

2.1. Legal and economic challenges

The introduction of the CBDCs will have numerous implications for the legal and economic system in the country (Zafiroski J, 2023). This new form of money will alter the functioning of the central bank and will upgrade the current legal framework regulating money and payments. The status of this new form of money is the most important legal issue alongside with other legal questions relating to the tax law, contract law, insolvency law, privacy and data protection

law etc. The legal questions focus on the legal framework for introduction of the CBDCs and the relations with this new form of public money with the existing private and public money. The legal tender status in crucial for the vast acceptance of the digital central bank money and their use as an alternative to the cash and other private forms of money. However, there are also some arguments against providing legal tender status on the CBDCs (Pfister C., 2024a). The convertibility *at par* which is essential for normal functioning of the monetary system and preserving the monetary unity or the *singleness* of the currency. Monetary sovereignty will also be affected form the introduction of digital central bank money. However, the challenges are different depending on the country and the scale of its economy and the strength of its financial system. On one hand, the introduction of the CBDCs will strengthen the monetary sovereignty by ensuring that the central bank remain important player in the monetary system while the public money is used for digital payments and are able to offer solutions for the needs of the digitalized economy. On the other hand, the lack of resources and capacity for introduction of a domestic digital currency will jeopardize the monetary sovereignty and will open the door for digital *dollarization* of the small economies. The region of the Western Balkans is a typical example for such a scenario. The countries are small with small economies having the EU as most important trading partner (Zafiroski J., 2022). The economic questions deriving from the launch of the CBDCs are related to the effects on the monetary policy and the financial stability. The digital central bank money offers new possibilities for implementation of the monetary policy making it more efficient. CBDCs could eliminate the zero lower bond making it possible for the central banks to implement negative interest rates in order to encourage spending and stimulate the economy (Dyson and Hodgson, 2016, p.6). However, there are concerns about the possible disintermediation of the financial system that is the most serious risk deriving from the introduction of the CBDCs. Thus, in times of financial distress or when certain financial risk appears some consumers may decide to convert bank deposits into CBDCs which is a modern or digital bank run that could seriously affect the normal functioning of the banking sector and lead to bank failures (Williamson, S. D., 2022).

2.2. Broader challenges concerning the entire society

It is a very logical step for the central banks to be proactive and to adopt to the new circumstances triggered by the digitalization of the economy and the society. The main objective of the central banks is to find a solution and to provide a risk-free central bank money in a highly digitalized and cashless economy. However, let's not forget that *the road to hell is*

paved with good intentions. Even if the process of creation of the new digital form of central bank money is presented, by policymakers, as a technical one which will not fundamentally change the monetary and payment system the truth is different. The launch of the CBDCs might have important effects going far beyond the legal and economic aspects of their introduction and are of great interest for the entire society. For this reason, the possible use of the CBDCs as a tool repression should be examined very carefully. This includes three aspects: surveillance and privacy; programmability of money; and *weaponization* of payment infrastructures (Pfister, C.,2024).

Surveillance. Monetary authorities and other policymakers have to make difficult choices when balancing the needs of two conflicting objectives: ensuring data protection and providing a high degree of privacy on the one hand, and complying with other policy objectives settled in other fields of government competences such as preventing money laundering, illicit financing, tax evasion, and ensuring sanctions. CBDCs have great potential for mass surveillance of the transactions by the public. Even the central banks, consider not plausible to achieve a full anonymity of the transactions with digital central bank money (BIS, 2020, p.6) since the digital transactions produce "digital fingerprints" that can be traced back and reveal the identities of the parties involved in the transaction. One may say that the risk for the privacy is not the same in democratic and in undemocratic countries. However, depending from which side you are looking from or who is in power the status of "democratic" country might be a volatile category. Taking into account that every digital transaction might be traced and those data might be used for different purposes the launch of the new form of central bank money might pose great threat for privacy of individuals and companies. Here, we have already some examples about how the degree of privacy of the transaction depends of the volume of the transferred amount. Or, defined as "tired privacy" the amount of information about transaction parties depends on the volume of the transaction. In China, for example, different categories of wallets could be opened, with different KYC levels which makes the protection of privacy different depending of the value of transaction (Kaur G., 2024). This question is not very clear at the European level. The Regulation on establishing the digital euro prescribes that the current PSP will be providing the digital euro which does not specify how the privacy will be assured.

Programmability. Firstly, we should distinguish two forms of programmability: payments or money. The *programmability of payments* already exists. Automatic transfers at given dates, machine-to machine payments, smart contracts, etc. The programmability of payments keeps

the functions of money unchanged, as a unit of value, a medium of exchange and as a store of value, and keeps the singleness of money. The *programmability of money* is another story. *It restricts its use, by reducing its acceptability whether in time, space or destination depending on whether the means of payment loses all value beyond a term, has value only in a given territory or must be used in a specific transaction* (Pfister, C.,2024, p. 545). In that way the money is transformed into *vouchers* and will certainly lose part of its functions, most notably the function of the store of value. Also, programmed money cannot be exchanged *at par* with other forms of money such as the cash and the bank money which breaks the principle of singleness of money. The possible benefits of the use of the CBDCs for facilitating fiscal transfers and using the programmability of money as a secondary objective was also recognized by the Group of central banks (BIS, 2020). Programmable money offers different possibilities for conditional payments mainly in the cases of payments of social benefits and other form of financial assistance provided by the State when certain individuals might be excluded from receiving payments. The monetary policy may become "targeted" and supporting the economy with "temporary money", encouraging the spending on certain goods or services or certain policies (green transition or discouraging carbon intensive activities, for example) or to promote the spending on a certain territory (during natural disasters, for instance). The programmability of money poses a great risk for the principle of singleness of money and its fungibility. However, even if the programmability is very important issue that may fundamentally change the notion of money and may have significant effects on the payment infrastructure the issue is not explored well (Dionysopoulos et al., 2024, p. 15).

Weaponization. Digital currency can be used as an instrument of repression not only against third countries but also in the state that issues it. The weaponization of money is nothing new. In the history we have many examples for use of the money as a weapon in the trade wars. But here we are talking about the payment infrastructure that can be used as an instrument of repression. It may come in different forms like the freezing or confiscation of financial assets. In recent decades the restrictions by Western countries in Europe and the US on access to the SWIFT messaging system, which is the core of the payments system between correspondent banks making cross-border payments, have considerably increased (Freis, J. H., Jr., & Waibel, M., 2024). As an answer to these policies, some countries, as China and Russia, have thus developed their own payment infrastructure which will be completely independent from the western payment infrastructure. In 2022, as part of severe sanctions against Russia, we were

witness of the freezing and confiscation of financial funds (not only private public but also private). So, the last two years and the crisis in Ukraine have shown us that private property is not a *fundamental right* but it is a *privilege* that depends on one's respect and compliance with State's policies. If one is against official policy, one's yacht, limousine, house, money, can be confiscated. We have some other examples, as it the case with the Canadian transporters who opposed the COVID19 policy and measures. Their bank accounts were blocked. With the digitalization of money, all these practices can be applied very easily with a simple push of a button.

Fortunately, in the Article 24 of the Regulation on the establishment of the digital euro it is explicitly stated that the digital euro is not a programmable currency. The digital euro would not be programmable money, and therefore one could not use it to limit one's spending on specific goods or services or to direct it towards specific goods or services: as a digital form of the single currency, it should be completely fungible.

Conclusion

The process of digitalization of money and payments has potential to alter the traditional understanding of money and payments. Many new players entered the game offering alternatives for payments such as in terms of cryptocurrencies, stablecoins and various payment instruments that are used for payments. In times of highly digitalized economy the CBDCs should provide the broader public with risk free public money issued by the central bank. The success of the CBDCs depends on the choice of its design that will certainly affect the demand for this new form of money. The companies and households will evaluate the utility and convenience of this form of central bank money in comparison to the existing alternatives such as cash, bank deposits, cryptocurrencies or other private monies. The central banks are working on this issue while many research projects are launched. China is leading the process while the digital euro is also in a very advanced phase. The process of the introduction of this new form of central bank money is linked to various legal and economic questions that should be answered before its introduction. The CBDCs should provide more alternatives for payments, should enhance financial stability and should protect the monetary sovereignty. However, the process is not without risks which are not only related to the economic issues such as the disintermediation of the financial system but also to broader questions on the possible abuse of the CBDCs and its use as a tool for repression.

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DEVELOPMENT OF HOUSING LOANS IN BULGARIA

Gergana Mihaylova-Borisova[1]

Abstract: *Proper management of the loan portfolio by commercial banks is particularly important to avoid generating credit risks that threaten the stability of banks and the financial system as a whole. In Bulgaria, after the COVID crisis of 2020, there has been a significant acceleration in the growth rate of banks' loan portfolios, which are expanding mainly in the direction of housing loans. These accelerating rates require close monitoring and even administrative measures and requirements by the central bank to limit the build-up of risks. The analyses housing loans' dynamics, which are outpacing the growth of other types of loans such as consumer loans and loans to non-financial corporations, which are presumably drawn for productive purposes. The results of the analysis show that the growth rate of hosing loans reached 25.9% in Q3 2024, a growth rate that has not been recorded in the last 15 years since the global crisis hit Bulgaria. Despite its acceleration, the share of housing loans in GDP is still at a much lower level in Bulgaria than in the euro area. Thanks to the BNB's stricter macroprudential requirements, risks in the banking system are being managed, but close analysis and monitoring of the housing loans market should continue.*

Keywords: *Banks, housing loans, Bulgaria, euro area*
JEL: *G21, E43, E51, E58*

1. Introduction

Proper management of the loan portfolio by commercial banks is particularly important to avoid generating credit risks that threaten the stability of the banking system and the financial system as a whole. To this end, commercial banks should be more responsible in the provision of credit and should adequately comply with the high standards set for lending in order to avoid reaching a point of over-indebtedness of economic agents that would discourage further regular servicing of existing loan exposures.

In Bulgaria, after the pandemic crisis of 2020, the growth rate of banks' loan portfolios has been accelerating, but this growth is set at around 13-14% on an annual basis in the first three quarters of 2024. For the first time in 2024, the growth rates that were inherent in the period before the financial crisis in 2008 manifested itself in Bulgaria are reached. By comparison, the banks' loan portfolio grew by 24.4% in Q1 2009 and by 11.1% in Q2 2009. The acceleration in the loan portfolio of banks in Bulgaria is largely driven by housing loans, which reached a growth rate of 25.9% in the third quarter of 2024 (32.8% in Q1 2009 and 19.1% in Q2 2009) and a share of 53.2% of total households' loans in Q3 2024 against a share of 43.7% in Q1 2009. The outlined trends in the growth of housing lending call for a more comprehensive analysis of the state of the housing loan market.

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The aim of the study is to analyse what is happening with housing loans in Bulgaria and whether there are any prerequisites for generating risk factors for the banking system.

The thesis defended is that, despite the accelerating growth rates of housing loans, there are still no significant risks in the quality of these loans and, consequently, no problems with their servicing, since their growth is also linked to the rapid acceleration of the population's income. The timely measures taken by the BNB maintain the stability of the banking system and contribute to the regulation of its inherent risks.

The study is structured in an introduction, three parts and a conclusion. The introduction presents the relevance, the thesis and the aim of the study. The first part is devoted to the literature review on banks performance and banks' loan portfolios. The second part analyses housing loans' dynamics given by banking system to households in Bulgaria. In the next part, a comparative analysis of the dynamics of lending to the household sector in Bulgaria and the Euro area is made. In the conclusion, the main results are presented.

2. Research on the development of the banking sector and lending

In the economics literature, there are studies that cover the analysis of the development of the banking sector and lending in Bulgaria (Saryski (2011), Vachkov et al. (2017)), as well as studies that deal with a comparative analysis of lending in a number of countries (Peshev (2014), Kiss et al. (2006), Mihaylova-Borisova (2022), Mihaylova-Borisova (2023)).

Vachkov et al. (2017) analyse the development of the Bulgarian banking system by emphasizing a set of indicators typical for the banking system, including the indicators for the asset quality. The impact of the financial crisis on the development of the banking system in Bulgaria is made by Saryisky (2011), who concludes that the country's banks remained almost unaffected by the international crisis in 2008. Among the studies that analyses the bank efficiency in Bulgaria, one can point out (Borisov (2020), Nenovsky et al. (2008)).

Economic activity is pointed out as a factor for the demand for loans in several non-euro area countries in Peshev (2014). The period of analysis is 2008-2012 and the great importance of economic development for faster credit growth is proved.

Kiss et al. (2006) also investigate growth of credits in the EU member states that joined the EU in 2004. They highlight that credits to GDP is at a very low level and conclude that there is no credit growth excess in three countries, Poland, Slovakia and the Czech Republic, while there is a generated risk associated with riskier credit growth in Estonia and Latvia.

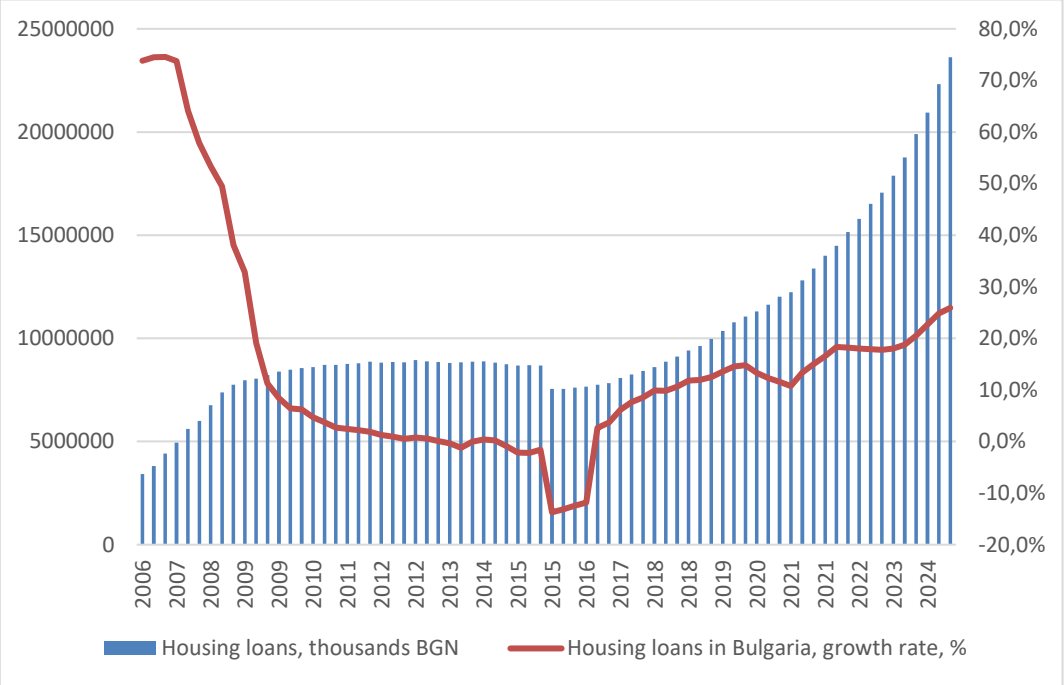
Mihaylova-Borisova (2022) analyses the loan dynamics in CEE countries. She concludes that crises over the last two decades have led to a drop in the loans to GDP indicator for the countries studied. At the same time, the non-performing loans has been falling in recent years and after the pandemic crisis, posing no additional risks to the banking system. Mihaylova-Borisova (2023) uses a balanced panel model to demonstrate the positive relationship of private sector credit dynamics as a share of GDP with economic growth, the level of NPLs and deposits attracted in countries of the CEE.

3. Analysis of the dynamics of housing loans in Bulgaria

In Bulgaria, housing loans in 2024 continue to accelerate significantly, reaching an increase of 25.9% y-o-y at the end of Q3 (Figure 1). The acceleration in growth has been substantial over

the last two years, with the growth rate becoming commensurate with that typical before the global financial crisis in Bulgaria (32.8% at end-Q1 2009).

Figure 1. Housing loans in Bulgaria

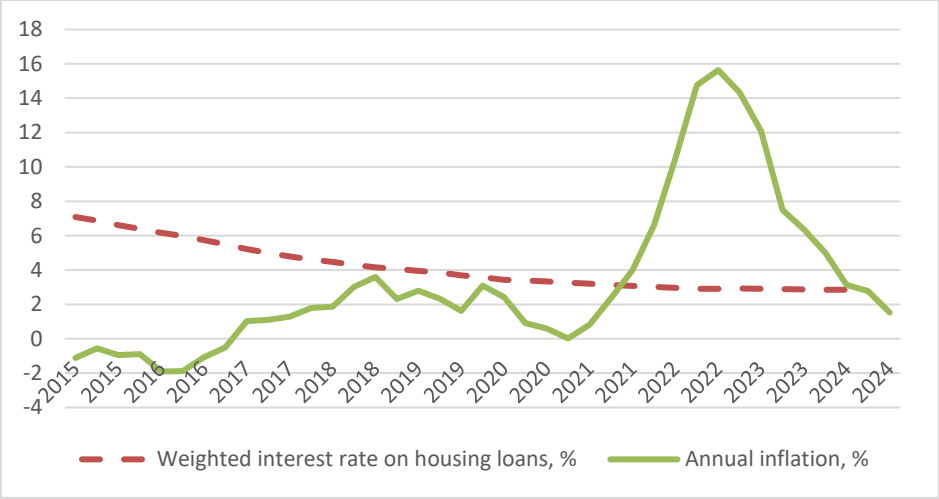


Source: BNB, own calculations

The acceleration in the growth of housing loans, especially in the last two years, is associated with a significant increase in wages in the Bulgarian economy. The average wage in Bulgaria in the third quarter of 2024 increased by 13.8% year-on-year. In the fourth quarter of 2022, gross wages grew by 16.2% y-o-y, compared with a 13% increase in the fourth quarter of 2023.

The growth in housing loans has been fuelled by a sustained downward trend in interest rates on housing loans (Figure 2). The volume-weighted interest rate on housing loans is holding at around 3% in 2022-2023, while interest rates globally are rising due to restrictive monetary policies of leading central banks, including the ECB. The ECB starts to increase key interest rates from mid-2022 and this monetary policy has no impact on interest rates on housing loans in Bulgaria. This delayed transmission of ECB monetary policy can be explained by the fact that Bulgarian banks rely on a substantial inflow of deposits from economic agents in Bulgaria and banks are over-liquid. Household deposits are also growing at high rates. Total deposits in the banking system of households, financial and non-financial corporations amounted to BGN 134 billion at the end of September 2024, growing by 9.7% year-on-year. Deposit growth in 2022 and 2023 is 14.3% and 9.5%, respectively.

Figure 2. Interest rates on mortgage loans in Bulgaria

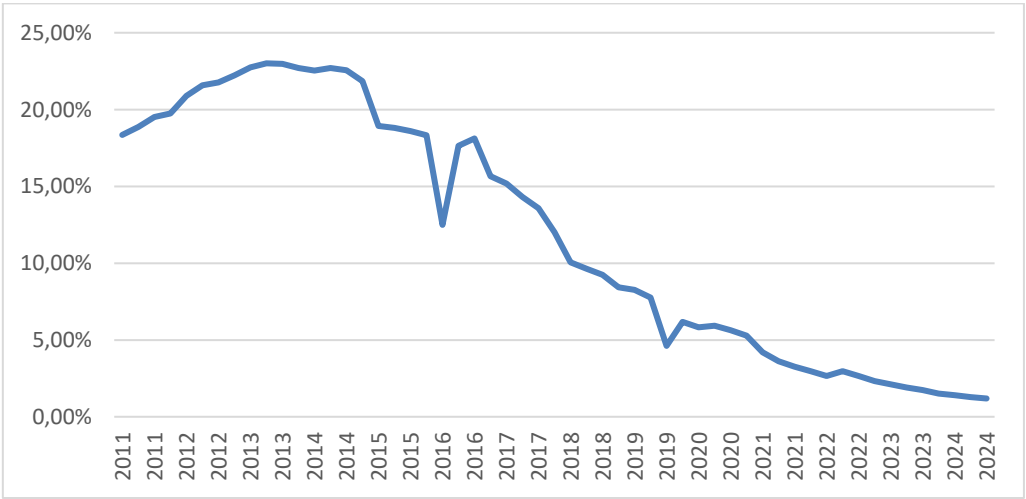


Source: BNB, own calculations

At the same time, accelerating inflation Bulgaria makes interest rates on housing loans even negative over the period 2022-2023 (Figure 2), when housing loan growth is seen accelerating. With negative lending rates, households are incentivized to borrow more resources, as they pay back less in real terms.

In analysing the dynamics of housing loans, it is important to track the level of non-performing loans and the share of regular exposures. Despite an acceleration in the growth rate of housing loans, there is a decline in the NPL ratio (Figure 3), which is favourable and does not create additional risks for households' servicing obligations.

Figure 3. Non-performing mortgage loans, % of the total mortgage loans, Bulgaria



Source: BNB, own calculations

The active role of the central bank (BNB) in monitoring and regulating the risk in the residential real estate market also contributes to the outlined trend of decreasing the share of non-

performing loans in the total amount of granted housing loans. The central bank pursues a conservative policy and takes timely action to ensure sufficient capital buffers[2]. In September 2022, the BNB took action to ensure that the Bank's policy is consistent with its policy of ensuring a prudent banking system. The BNB decided to increase the countercyclical buffer from 1.5% to 2% effective 1 October 2023 to ensure that banks have more capital in view of the continued high credit growth rates and uncertain economic environment. In addition, the BNB is introducing a number of indicators to be monitored by banks in lending to households as early as May 2024. In September 2024, the BNB further decided to apply specific indicators for credit standards to be followed in the granting of housing loans, which will come into force on 1 October 2024, such as: the ratio between the loan amount and the value of the collateral should be up to a maximum of 85%; the term of the loan granted should not exceed 30 years; the ratio between the monthly housing loan liabilities and the monthly income of the borrower should not be higher than 50%[3].

On the basis of the analysis, it can be concluded that the pace of housing lending in Bulgaria is accelerating and reaching values that were typical for the housing lending market before the global crisis, which are also worrying. This also calls for a constant and careful monitoring of the banks' exposures to the household sector and the level of indebtedness of the sector in order to avoid generating internal risks in the system that could shake the stability of the banking system.

4. Comparative Analysis of Household Credit in Bulgaria and the Euro area

When comparing the trends in the development of housing loans in Bulgaria and the Euro area, divergent trends emerge. In the euro area, housing loans are starting to slow down and even reach a negative growth of 0.2% yoy in Q1 2024 against growth rates of 5-6% in 2021-2022 (Figure 4).

[2] BNB (2024a) Press release on the application of a minimum set of indicators for monitoring credit standards in the granting and renegotiation of loans secured by residential real estate: https://www.bnb.bg/AboutUs/PressOffice/POPressReleases/POPRDate/PR_20240520_4_BG

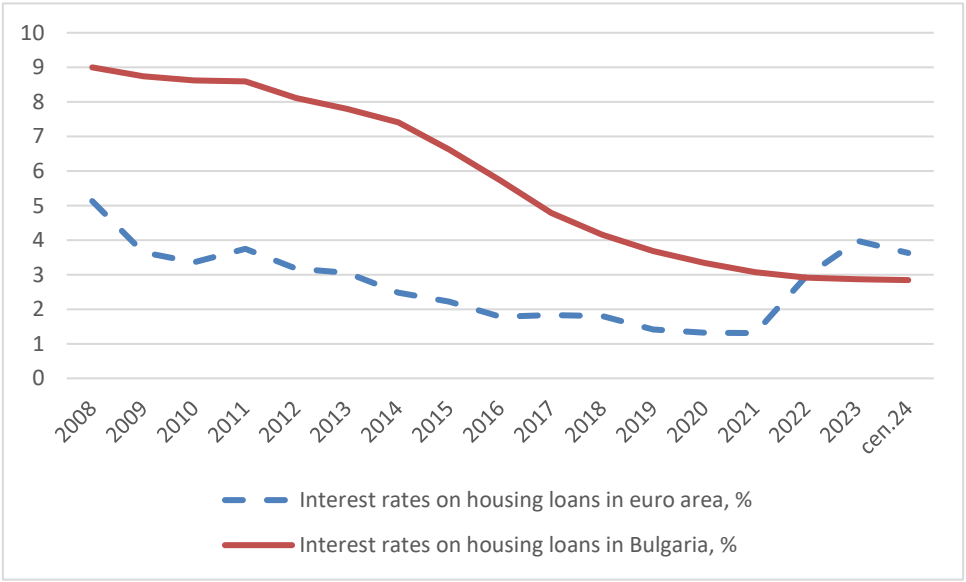
[3] BNB (2024b) BNB press release on credit standard indicators requirements for the origination and renegotiation of loans secured by residential real estate: https://www.bnb.bg/AboutUs/PressOffice/POPressReleases/POPRDate/PR_20240911_1_BG

Figure 4. Housing loans to households in Bulgaria and the Euro area, growth rate, %

Source: ECB, BNB, own calculations

This downward trend in the growth of housing loans in the Euro area is due to the restrictive monetary policy of the ECB, which is rapidly being passed on to all interest rates, including interest rates on housing loans. The interest rate on housing loans in the euro area is 4% at end-2023 and starts to decline slightly in 2024 (Figure 5) as ECB monetary policy loosens. At the same time, interest rates on housing loans remain at the same levels, unaffected by ECB policy.

Figure 5. Interest rates on housing loans to households in Bulgaria and the Euro area, %

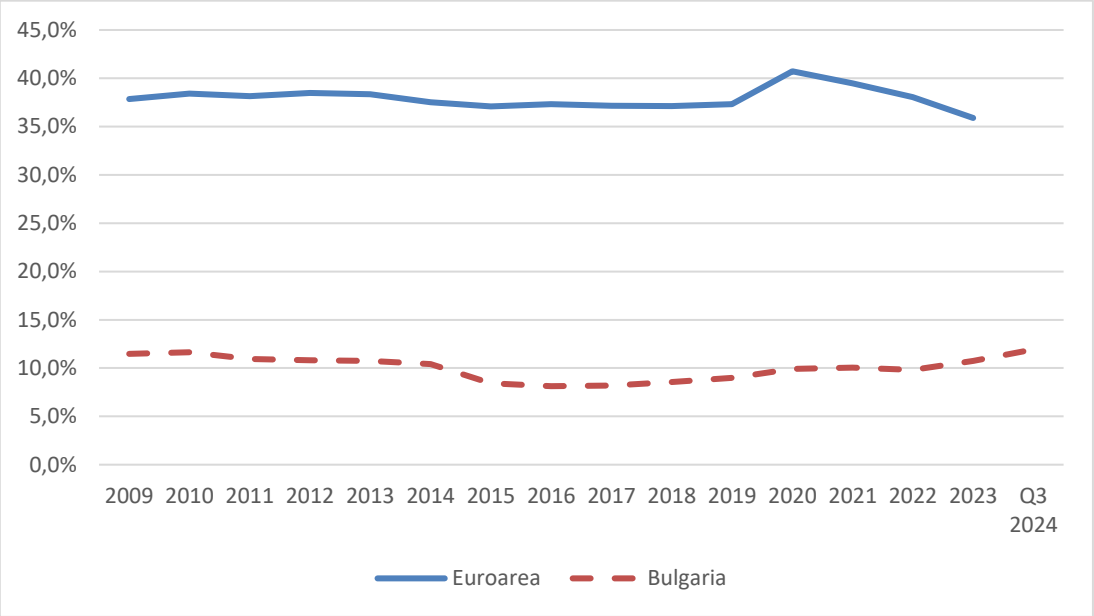


Source: ECB, BNB, own calculations

When tracking the dynamics of the growth of housing loans in Bulgaria and in the Euro area, we observe really worrying trends in the country related to the acceleration of credit growth. However, the level of housing loans as a share of GDP should also be monitored. In Bulgaria this share is only 12% at the end of Q3 2024 against 10.7% in 2023, while in the euro area it is

at a much higher level of 36% in 2023. For the 2009-2024 period analysed, it is in the range of 35-40% of GDP, indicating much higher household indebtedness in the euro area compared to Bulgaria (Figure 6).

Figure 6. Share of mortgage loans to households in GDP in Bulgaria and the euro area, %



Source: ECB, BNB, own calculations

5. Conclusion

The study analyzed the dynamics of housing loans, highlighting a trend of accelerating growth rate of housing loans due to low interest rates on these loans granted by banks, high inflation in the last two years, which turns real interest rates into negative, as well as rising incomes. At the same time, the quality of housing loans is improving, as measured by the share of non-performing loans to the total level of housing loans in the country. This accelerating trend of housing loans deepening is also due to the still low share of housing loans in GDP in Bulgaria, which is around 12% against around 37% in the Euro area. This of course creates the potential for the housing loans market to develop and grow. Of course, this growth should also be closely monitored by the central bank, which is taking timely action at this time to preserve the stability of the financial system and to eliminate the build-up of material risks. Further monitoring of housing credit trends in Bulgaria will be of interest, and the guidelines for future research will be to assess with an econometric model the relationship between housing loans dynamics and a number of factors that have been identified as driving the behaviour of economic agents with respect to housing loans.

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DIGITAL FINANCE AND INVESTOR PROTECTION

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Abstract: *This paper reviews the aspects and features of digital finance but also systemizes risks connected with the enhancing and developing field of digital finance for investors. The vast development of digital financial services and use by retail investors and also its inclusive role of giving access to digital financial means to parts of population that has not had such access before brings financial services to new levels but also introduces new risks that concern regulators as well as consumers. Responsive actions and continuing financial literacy improvements are key points for a stable and confident financial sector.*

Keywords*: capital market, digital financial risks, investor protection.*
JEL codes*: G01, E66, E43, E63.*

Introduction to digital finance

Digital finance refers to the integration of digital technologies into financial services, enabling the delivery of traditional and innovative financial products and services through digital platforms. It leverages tools like mobile apps, online platforms, blockchain, and artificial intelligence to make financial transactions and management more accessible, efficient, and cost-effective.

EU Commission defines digital finance as "*the impact of new technologies on the financial services industry, including a variety of products, applications, processes and business models that have transformed the traditional way of providing banking and financial services*." (EU Commission).

Also, there is a distinction between digital finance and digital inclusive finance. Digital inclusive finance refers to the extension of digital financial services to underserved or excluded populations tend to significantly improves individual investor performance Xiaomeng et al (2024).

However, digital inclusive finance combine all the aspects of digital finance therefor it is important to deeply understand them.

The key components of digital finance refer to digital payments, online banking, blockchain and cryptocurrencies, decentralized finance, investment platforms and others, which allow much easier access to financial services and products (see Table 1)

Table 1. Components of digital finance

Components of digital finance	**Tools and benefits**
Digital payments	○ Tools: Mobile wallets (e.g., PayPal, Apple Pay), QR codes, and peer-to-peer payment systems. ○ Benefits: Fast, secure, and convenient transactions.
Online banking	○ Tools: Internet and mobile banking apps for account management, loans, and savings. ○ Benefits: Anytime, anywhere access to banking services.
Blockchain and Cryptocurrencies	○ Tools: Decentralized technologies like Bitcoin, Ethereum, and smart contracts. ○ Benefits: Increased transparency, reduced costs, and borderless transactions.
Decentralized Finance (DeFi)	○ Tools: Platforms that remove intermediaries in lending, borrowing, and trading using blockchain. ○ Benefits: Greater access and control for users. ○ Example: Borrowing on platforms like Aave or trading on Uniswap.
Investment Platforms	○ Tools: Robo-advisors, micro-investing apps, and online trading platforms. ○ Benefits: Low-cost, automated portfolio management and market access.
InsurTech and RegTech	○ Tools: Digital solutions for insurance (InsurTech) and compliance (RegTech). ○ Benefits: Faster claims processing and enhanced regulatory compliance.

Digital finance brings financial services to underserved populations, including those in remote areas. It automates processes, reducing time and costs for both providers and users. DF allows transparency and auditable transactions and in the same time enables new products like tokenized assets and AI-driven financial advice.

The reasons for the rise of digital finance are connected with technological advancements and comsumer demand for convenience.

Technological Advancements include *the improved connectivity -t*he proliferation of high-speed internet and mobile networks allows seamless financial transactions globally. *Big Data*

and AI are the hottest technological advancements which allow advanced analytics enable real-time insights, predictive modeling, and personalized financial services. *Blockchain and cryptocurrencies* are other technologies that enhance transparency, security, and efficiency in financial transactions. Last but not lease, *cloud computing* facilitates scalable, cost-effective storage and processing for financial institutions.

Consumer Demand for Convenience like 24/7 accessibility, made financial providers to develop systems of a non-stop transaction services as customers expect to manage finances anytime, anywhere, through mobile apps and online platforms. Consumers also demand *faster transactions which means* instant payment systems and digital wallets reducing the need for cash and physical banking. Also, there is a constant demand for *personalized experiences:* digital tools offer tailored recommendations based on spending habits and financial goals.

It is important to look the connection between digital finance and financialization which is significant, as digital finance can be seen both as a product and a driver of financialization. Financialization influences digital finance through : demand for alternative investments, expansion of financial services, acceleration of capital flow, technological solutions to market saturation. The demand for alternative investments is triggered by ultra-wealthy and institutional investors who are always seeking new asset classes to diversify their portfolios.
DeFi (decentralized finance) provides high-risk, high-reward opportunities. For example, cryptocurrencies like Bitcoin began as a decentralized alternative to fiat currency but quickly evolved into speculative investment assets. Financialization drives the need to monetize every aspect of the economy, from consumer credit to digital payments. Digital finance innovations like robo-advisors, mobile payment systems, and micro-investing platforms cater to this expanding financial landscape. Financialization thrives on global capital mobility, and digital finance enables faster, more borderless transactions. Blockchain technology, for instance, facilitates instantaneous cross-border payments, aligning with financialization's focus on maximizing efficiency. Traditional financial markets are mature, and opportunities for significant growth are limited. Digital finance creates new markets (e.g., tokenized art, digital real estate) that appeal to financialized economies looking for untapped opportunities.

Risk triggered by digital finance development

The vast development of digital finance on the other side made it dependent on cyber security risks and other attempts for misuse and attempts to compromise the security of financial institutions, transactions, and sensitive customer data. Challenges in digital finance are

different types of risks that are triggered, like cybersecurity risks, regulatory gaps, exclusion risks, market volatility and others / see Table 2/.

Table 2. Key risks in digital finance

Risks	**Threats and impact**
Cybersecurity Risks	Threats: Hacking, phishing attacks, malware, ransomware, and data breaches. Impact: Loss of funds, sensitive data exposure, and identity theft
Fraud and Scams	○ Threats: Ponzi schemes, pump-and-dump schemes in crypto, fake investment platforms. ○ Impact: Investors lose their money with little recourse, especially in unregulated spaces.
Regulatory Gaps	Threats: Unregulated or poorly regulated platforms, especially cross-border services. Impact: Lack of legal protection for investors in cases of disputes or fraud
Volatility of Digital Assets ○	○ Threats: Extreme price swings in cryptocurrencies and other digital assets. ○ Impact: Significant financial losses, particularly for unsophisticated or risk-averse investors.
Lack of Transparency ○	○ Threats: Opaque algorithms, hidden fees, and lack of clear terms and conditions. ○ Impact: Investors may not fully understand the risks or costs of their investments.
Technological Failures	○ Threats: Bugs in software, smart contract exploits, or platform outages. ○ Impact: Loss of access to funds or investments. ○
Lack of Financial Literacy	○ Threats: Complexity of digital financial products, especially for novice investors. ○ Impact: Poor investment decisions or vulnerability to scams.

By addressing these risks, regulators, fintech companies, and investors can create a safer and more reliable digital financial ecosystem.

Investor Protection in the light of digital finance development and associated risks

Investors protection has been a key topic and goal in 2007-2009 post crisis financial regulation. The development of digital finance has made it even more difficult to ensure investors and their funds are secure. Investor protection regards secure use of providers of investment services, which means licensed and supervised providers on the one hand. On the other, it concerns the products and services on the market. For investors it is difficult at first to differentiate and assess which financial services providers are reliable, as usually the non-regulated providers are the ones to be most aggressive in client attraction. Thereafter it comes to ability to assess the risk of investing in the ocean of financial products which certainly needs a decent level of financial literacy. Development of digital financial services brings another obstacle to investors – to mitigate the risk that it imposes, cybersecurity risks and scams together with the other mentioned basic risks. In the same time the advertisement and popularity and the easy access to financial services by digitalization increase the number of investors and their tendency to initiate new investments.

The rise of crypto markets and its global popularity has set new requirements and need for regulations as the amount of its assets is overcoming many local and regional markets – approximately 3,4 trillion dollars as of February, 2025. That shocking amount gave no other option than put this market under the umbrella of regulations.

There are various actions at EU regulation in mitigating most of the digital finance risks. The MiCA (Market in Crypto-Assets Regulation) and the DLT Pilot foster market innovation in crypto-asset market infrastructures under the supervision of EU regulators _focused on risk Donnelly et al (2023). These two acts focus on the mitigation of traditional risks arising from new crypto operations, including monetary sovereignty and financial stability. By contrast, DORA is geared towards ensuring resilience of finance as critical infrastructure.

MiCA establishes uniform rules for issuers of **crypto-assets** that have not previously been regulated in the EU(EC, 2023). It deals with:

1. transparency and disclosure requirements for the issuance, public offering and admission of crypto-assets to a trading platform;
2. the licensing and supervision of crypto-asset service providers and issuers of asset-linked tokens and e-money;

3. the operation, organisation and management of crypto-asset issuers and service providers;
4. the protection of crypto-asset holders and clients of service providers;
5. measures to prevent insider trading, unlawful disclosure of inside information and market manipulation

On the other hand The Digital Operational Resilience Act (DORA) is an EU regulation that entered into force on 16 January 2023 and will apply as of 17 January 2025. It strengthens the IT security of financial entities andfaces the operational digital risks to which the financial sector is exposed. It harmonizes the rules relating to operational resilience for the financial sector applying to 20 different types of financial entities and ICT third-party service providers. (EIOPA, 2023) It covers: 1)Principles and requirements on ICT risk management framework; 2) ICT third-party risk management 3) digital operational resilience testing; 4) ICT-related incidents – including general requirement and Reporting of major ICT-related incidents to competent authorities; 5) Information sharing ; 6)Oversight framework for critical ICT third-party providers.

The new regulation is a challenge not only for financial services providers but also for supervisor authorities, being quite complicated to understand and apply.

Most of all it is important that investors are less exposed to risks which arise from digitalization of financial services and also to malicious attempts for fraud. Regulation and rules are important but as important is also the level of financial literacy and understanding risks on the financial market, which is a matter of much broader initiative and actions.

Conclusion

The vast development of digital finance seem to be unstoppable and irreversible. Since it improves financial transactions and increases the variety of options and raise financial transactions with different digital products and services yet it brings a lot of risks which have to be addressed by regulators, investors and society as a whole in order to protect investors' assets and the stability and credibility of the global financial system. Recognizing not only the opportunities but also the risks and the proper use of digital finance tools is a key point for achieving more effective and stable financial sector.

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THE SECRET CHESSBOARD OF THE SUPERPOWERS: FROM BRETTON WOODS TO THE 21ST CENTURY, THE CASE OF DJIBOUTI

Moustapha AMAN[1]

Abstract: *Although small in size, Djibouti occupies a crucial geostrategic position in the Horn of Africa, at the intersection of global shipping routes and international currency rivalries. Since 1949, the country has been at the centre of an international compromise in which the pegging of the Djibouti franc to the dollar has enabled France to maintain its influence in East Africa while consolidating the American presence, notably with the installation of the Camp Lemonnier military base in 2002.*

However, the growing influence of China, marked by massive investment and a strategy of debt diplomacy, is redefining the geopolitical balance. The United States and China, pursuing distinct strategic objectives, are vying for control of Djibouti's key infrastructure, while avoiding destabilisation of the region. This analysis highlights the way in which these superpowers coexist and interact in strategic areas such as Djibouti, illustrating the complexity of global competition.

JEL Code : *F33 ; F51 ; F54 ; F34*

Keywords: *Exchange Rate Regimes; International Relations and Security; Geopolitics; International Debt and Financing*

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1. Introduction :

Despite its small size and modest population, Djibouti occupies a strategic position at the entrance to the Red Sea, linking the Indian Ocean to the Mediterranean via the Suez Canal. Its exceptional geographical position makes it a key crossroads for the world's shipping routes, attracting the interest of the major powers for decades. Close to the Bab-el-Mandeb Strait, an essential passage for world maritime trade, Djibouti controls privileged access to the Red Sea and the Suez Canal, consolidating its geopolitical importance in a region marked by international tensions and rivalries.

Djibouti's strategic importance and the pegging of its currency to the dollar in 1949 have contributed to its economic stability and encouraged the installation of several foreign military bases, notably American, French and Chinese. Historically, this small state in the Horn of Africa has played a central role in international struggles for influence: first during the colonial era, when it served as a maritime control point for France, and then during the Cold War, when its position was crucial for the United States and its allies in the face of Soviet influence.

Today, the balance is once again upset by the rise of China, whose military base in Djibouti and massive investment in the Belt and Road Initiative (BRI) are evidence of increased strategic rivalry with the United States. Against this backdrop of increased militarisation and competing international interests, Djibouti continues to enjoy relative stability that is attracting new investment, particularly in its port infrastructure, underpinning significant economic growth (6.7% in 2023). Djibouti is the only country in the world to be home to two major rival powers. Like its monetary dependence on the US dollar, Djibouti's dependence on Chinese funding raises concerns about its sovereignty, given the risks associated with possible "debt diplomacy". How does China's rise fit into a monetary system shaped by the Bretton Woods agreements and dominated by the Franco-American strategic alliance?

In this analysis, we will draw on several key concepts to understand the dynamics of superpower cohabitation, particularly through the prism of economic and geopolitical relations. We begin by defining the main theoretical frameworks, such as monetary geopolitics, maritime geopolitics and debt diplomacy. We will then explore the results of this analysis, highlighting the way in which the United States and China coexist on the international stage, particularly in strategic areas such as Djibouti. This study will reveal how their interactions influence and redefine current monetary and political systems.

2. Theoretical framework - Monetary geopolitics, maritime geopolitics and diplomacy

Thanks to its proximity to the Bab-el-Mandeb Strait, Djibouti is a strategic crossroads for world trade and maritime security, linking three continents. Mastery of the seas, as Mahan theorised in 1890, is essential for the projection of power by states. Nations with powerful military fleets and the ability to control maritime trade routes dominate the world stage. Strategic chokepoints such as Bab-el-Mandeb, Hormuz and Suez are of paramount geopolitical importance. These passages are crucial for energy security (transport of oil and gas) and for world trade. The colonial powers sought to secure points of access and control on these main maritime routes linking Europe and Asia, in particular to protect their trade routes to their colonies in India, the Far East and Africa. Spykman (1942) introduced the "Rimland" theory, emphasising the strategic importance of coastal zones and strategic maritime routes in geopolitical domination and the control of international trade. As early as 1945, Djibouti, located in a strategic zone of the Rimland, saw its status reinforced by a post-war ministerial decision designating it as an "imperial base"[2] . France's departure from the Levant and the closure of the Beirut base had reshaped maritime routes, positioning Djibouti as France's closest port of call on vital trade routes to Madagascar and Indochina. This positioning made it an essential centre for military and logistical operations, aimed at controlling the strategic sea routes linking Europe to Asia via the Suez Canal and the Red Sea. The French franc had undergone several devaluations (1944, 1945, 1948), greatly affecting confidence in the franc in Djibouti. Its pegging to the US dollar in 1949 was part of a drive to counter Soviet influence in the region, particularly in the context of the Cold War, where Djibouti, as a strategic port, could become a key location for American military bases.

Paul Kennedy (1987) has shown that mastery of the seas enables naval powers to dominate the world economy and impose their currency on trade. He shows that powers such as the British Empire were able to impose the pound sterling as the world currency thanks to their naval domination. Kenneth Waltz (1979) reinforces this idea by explaining that the power of states rests on their ability to secure their interests, including control of the maritime routes that influence economic and financial stability. For Waltz, domination of the seas makes it possible to secure the trade flows essential to prosperity and thus to maintain monetary stability. The importance of US military bases near strategic routes, illustrated by Michael Beckley (2018),

[2] SAEF, B 460, R.Loiseau, note written following a visit to CFS, for M.Guindey, Director of Finex, subject: CFS, 15 September 1947.

shows that these positions support the dominance of the dollar and international trade flows. Barry Eichengreen (2011) has also explored the link between the hegemony of the dollar and the security of maritime routes. The ability of the United States to secure trade routes has played a major role in the prosperity of the dollar as the world's reserve currency.

The concept of *currency statecraft* (monetary diplomacy), according to Cohen (2019), shows that powers such as the United States, China and the European Union use their currencies to support their geopolitical and economic strategies, such as securing trade, financing international investment or projecting military power. This strategy has become an essential aspect of geopolitical ambitions, particularly in a multipolar world where the dominance of the dollar is creating tensions. The relationship between *currency statecraft* and maritime geopolitics is based on the strategic use of currency by states to strengthen their presence on the sea lanes, port infrastructures and military bases that play a key role in world trade and security. In 1949, the concept of "currency statecraft" illustrated how France used the dollar in Djibouti to secure economic and geopolitical alliances and reinforce its dominance on an international scale. By strategically aligning the Djibouti franc with the dollar, France pursued geopolitical and economic objectives such as securing trade, financing international investment and projecting American military bases during the Cold War. This choice, which demonstrates the link between currency and geopolitical influence, fostered Franco-American relations in the region while limiting British influence.

Debt diplomacy is another aspect of *currency statecraft*, where states use loan and debt mechanisms to assert their influence over smaller nations (Zarate, 2013; Dollar, 2018). Debt diplomacy is not new, but it is increasingly associated with Chinese loans to developing countries as part of the Belt and Road initiative. Djibouti, with its rapid development and maritime infrastructure, is also an exemplary case of this strategy (Al-Fadhat, 2022). China has lent massive amounts of dollars for infrastructure projects, such as the port of Doraleh and the Djibouti-Ethiopia railway, which has increased Djibouti's debt and economic dependence on China (Pairault, 2020). Some researchers, such as Hurley et al (2018), warn of the risks of debt overhang, while Brautigam (2020) acknowledges the development benefits of Chinese investment, while highlighting potential vulnerabilities. One of the most worrying aspects is the potential loss of sovereignty for borrowing countries. Dreher et al (2018) show how some African countries have become dependent on Chinese financing, which could force them to sell off strategic assets in the event of default. The case of the port of Hambantota in Sri Lanka is

often cited as an example where China acquired control of strategic infrastructure after a default.

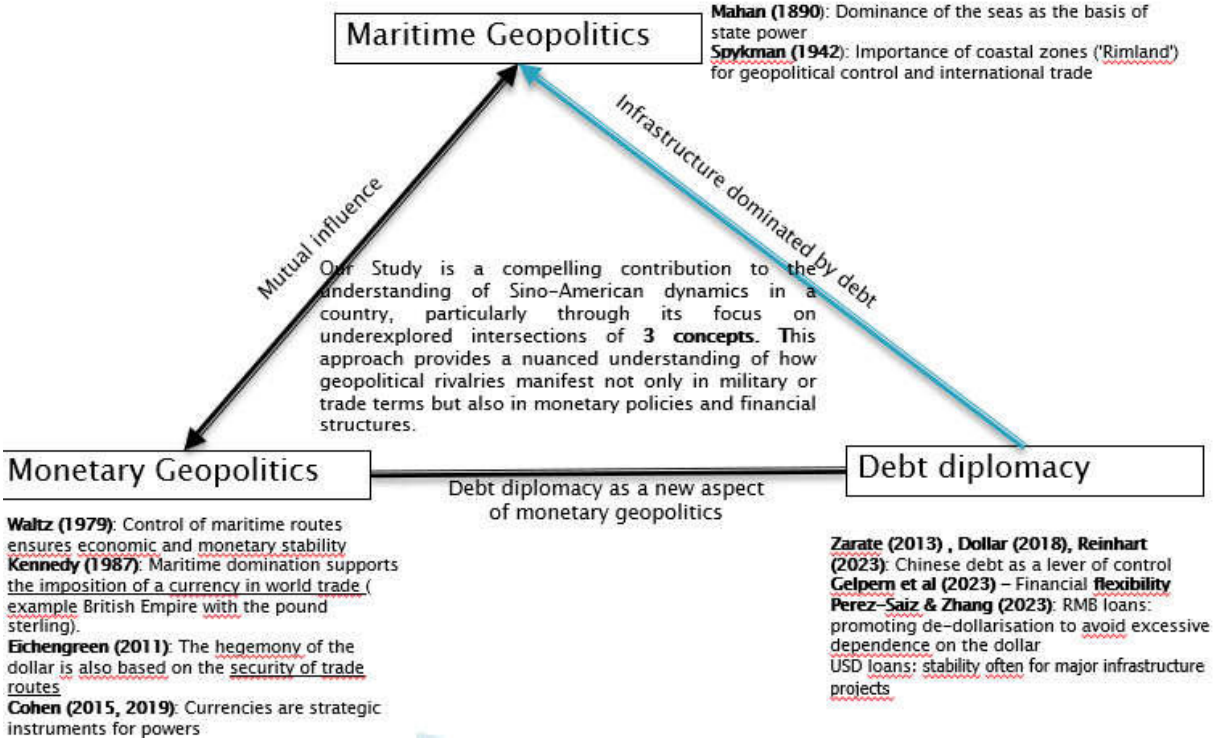
Liu & Papa (2022) argue that China aims to promote de-dollarisation and international cooperation rather than deliberate coercion. Perez-Saiz & Zhang (2023) show that the use of the RMB varies by region: it is growing in Asia, particularly in Mongolia and Laos, but remains limited elsewhere.[3][4]

China's choice of whether to lend in US dollars (USD) or renminbi (RMB) depends on a number of factors, including loan security, market conditions and strategic interests. Loans in RMB are often favoured to strengthen the influence of the Chinese currency on a global scale, while loans in USD are favoured in transactions where stability and liquidity are essential. The dollar, as the world's main reserve currency, is frequently used for large-scale, long-term financing such as infrastructure projects or investments requiring international capital. This preference underlines China's flexibility, as it adjusts its financing options to remain competitive with traditional multilateral and commercial lenders (Gelpern et al., 2023).

Figure 1: Concepts

[3] The main measures taken by the People's Bank of China to internationalise the RMB include bilateral swap lines and offshore clearing banks. Bilateral swap lines: These agreements allow foreign central banks to exchange their local currencies for RMB, thus facilitating commercial payments in the event of a shortage of RMB liquidity abroad. Offshore clearing banks: These banks, located outside China, enable payments to be processed directly in RMB, thereby reducing transaction costs and times. They play an essential role in strengthening RMB liquidity on an international scale.

[4] At 31 March 2024, China's external debt stood at around RMB 17,827 trillion (approximately USD 2,512 trillion). This debt is divided between medium- and long-term debt, which accounts for 44%, and short-term debt, which accounts for 56%. As regards the breakdown by currency, around 48% of foreign debt is denominated in domestic currency (RMB), while 52% is in foreign currencies. Of the latter, 83% is in USD, 7% in Euro, and 4% in HKD and JPY respectively. The remaining 2% includes allocations such as Special Drawing Rights (SDRs)



Source : produced by the author

3. Results of the analysis on the cohabitation of superpowers, from Bretton Woods to the 21e century.

The post-war geopolitical context was dominated by Franco-British rivalry in East Africa and the emergence of the United States as a key player. The Djibouti franc was initially pegged to the French franc, but successive devaluations of the latter weakened the local currency, threatening French influence in a region dominated by sterling. Pegging the Djibouti franc to the dollar enabled France to align itself with American interests while counterbalancing British dominance in the region. The Djibouti franc has remained pegged to the dollar for 75 years, despite two revaluations in 1971 and 1973, linked to the collapse of the International Monetary System (IMS). Today, competing powers are seeking to exert their influence without destabilising the country, each guided by their own strategic interests. These major powers, which maintain military bases in this country, have an incentive to stabilise its economy in order to guarantee the security of their military installations and preserve access to strategic maritime routes. This explains why the internationalisation of the RMB is marginal, as China has lent massively in dollars for its projects.

So, having explored the intersection between maritime and monetary geopolitical theories, which highlight the dynamics of power and influence in the region, it is essential to consider the practical implications of these concepts on Djibouti's past and present situation.

3.1 Djibouti: the dollar's gateway to East Africa under the Franco-American alliance (1949)

3.1.1 A monetary decision with geopolitical repercussions.

After the Second World War, the French franc underwent several devaluations (1944, 1945, 1948), severely affecting confidence in the Somali franc, the currency used in Djibouti. These devaluations led to a flight to more stable currencies such as the East African shilling, the Marie-Thérèse Thaler and the Ethiopian dollar, disrupting the local economy. The loss of value of the franc in Djibouti made it difficult to exchange goods, even products such as fish, as traders preferred foreign currencies. [5]

To stabilise Djibouti's economy and integrate it into international networks, it had become crucial to peg its currency to a stable one. Although sterling was considered, France opted for the dollar, influenced by the Bretton Woods Agreement and the growing presence of the United States in the region. [6]

This decision was aimed not only at avoiding British influence, but also at consolidating Djibouti as a commercial hub for Ethiopian trade, while attracting American investment. By pegging the Djibouti franc to the dollar in 1949, the United States, to which much of Ethiopia's trade was directed, was able to work with France to influence the Ethiopian government's decisions about routing traffic through the port of Djibouti. France foresaw that if the Franco-Ethiopian railway and the port of Djibouti met the needs of the growing traffic, the Americans, rather than bearing the cost of building a new line, would prefer to use them, thereby helping to strengthen French influence in the region. It was therefore crucial for France to avoid building a railway line to Assab and to do everything possible to channel the expected growth in traffic from Ethiopia to Djibouti, including seeking agreements with American interests, to safeguard the future of French influence in the Horn of Africa. This was all the more feasible as there were no longer any exchange controls in CFS territory and the Djibouti franc replaced the CFA franc, becoming the first autonomous currency in the French empire to be fully backed by dollars.

[5] SAEF, B 460, R.Loiseau, note written following a visit to CFS, for M.Guindey, Director of Finex, subject: CFS, 15 September 1947.
[6] SAEF, B 460, De Largentaye, Managing Director of the International Monetary Fund, letter to M.le Président du Conseil, Ministre des Finances et Direction des Finances extérieures, subject: monetary reform in Djibouti,30 November 1948.

American capital could circulate freely in the CFS territory, allowing any American citizen to trade with the territory as if it were American soil. Thus, the peg to the dollar in 1949 enabled the United States to strengthen its influence in East Africa, while at the same time France was able to maintain its control over Djibouti while taking advantage of American collaboration to develop trade via its strategic port.

For the French Communist Party, this "monetary operation" also had a military dimension: because of its geographical position, Djibouti offered the Americans a strategic location from which to establish bases in the event of conflict with the Soviet Union, thus weakening British positions in the region: "There is another, no less worrying aspect to the 'operation'. You only have to look at the map to see the strategic importance of Djibouti in the event of war with the Soviet Union. From now on, the Americans will have free rein to set up air and naval bases on its territory. The "monetary" operation is therefore also a military operation. And this is one of the reasons why British imperialism did not resist more strongly a measure which deals a very serious blow to its positions in this part of the world" (Henri Claude, 12 May 1949).[7]

3.1.2 Support for the IMF as a lever of American influence (1948-1949)

The Bretton Woods Agreement, signed in 1944, established a system of fixed exchange rates with the US dollar as the global benchmark. This influenced economic and monetary decisions in many countries, including France and its colonies. In two cases, the Paris free market in 1948 and the Djibouti reform in 1949, we look at the different French approaches and their geopolitical impact in a context of rivalry with Great Britain. In both cases, the involvement of the United States and the International Monetary Fund (IMF) played a decisive role, with divergent results depending on the context.

Paris Free Market in 1948: IMF support for Great Britain against France

After the Second World War, France had to deal with multiple devaluations of the franc, notably in 1944, 1945 and 1948. In January 1948, faced with a drastic fall in its foreign exchange reserves, the French government decided to create a free foreign exchange market in Paris in order to make its currency more flexible and introduce discriminatory exchange rates to support its exports (Mérigot & Coulbois, 1950).

This initiative was opposed by Great Britain, which feared a depreciation of the pound sterling against the dollar on the open market. The IMF, concerned about the stability of the Bretton

[7] SAEF, B 7483, Henri Claude, extract published in the newspaper Action, 12 May 1949.

Woods system, while recognising the need for devaluation, refused to validate this market, fearing competitive devaluations. Despite this, France pursued its reform, resulting in the loss of the franc's "par value", as well as that of the CFA franc, and in October 1948 readjusted the parity of the franc, taking into account the concerns of the IMF and Great Britain.

The creation of the free market in Paris failed to gain international support, particularly from the IMF, illustrating the tensions between France and Great Britain. This failure revealed France's inability to cope with economic pressures within the rigid framework of the Bretton Woods Agreement, but indirectly influenced monetary reform in Djibouti. Immediately after the devaluation of October 1948, which restored the exchange rate of 4.03 between sterling and the dollar, the Direction des Finances Extérieures (Finex), headed by Guillaume Guindey, recommended pegging the Djibouti franc to the dollar, recreating a situation similar to that of the quotation of the pound on the Paris free market[8]

Djibouti's monetary reform in 1949: pegging the Djibouti franc to the dollar and American support

At the same time, in Djibouti, the geopolitical rivalry was palpable, as the region was historically under British influence via the sterling zone. Djibouti, whose currency was linked to the CFA franc having lost its "par value" in 1948, occupied a key geostrategic position. The French plan to link the Djibouti franc to the dollar required the approval of the IMF, and although the monetary reform was in line with the spirit of the Bretton Woods agreements, it risked displeasing the British authorities by creating a zone pegged to the dollar in the middle of a region dominated by sterling. Indeed, the creation of a money market in Djibouti where sterling would be exchanged for dollars at rates different from the official market raised concerns that it might reflect wider geopolitical rivalries between France and Britain. However, the French authorities skilfully manoeuvred to keep the project confidential and engage in secret conversations with IMF board members to secure the IMF's discreet support, including assurances that sterling transactions in Djibouti would be restricted to the private sector, without interference from the French monetary authorities.[9] In such a case, the depreciation of sterling

[8] The attention of the brilliant External Finances - or Finex - team at the Ministry of Finance, gathered around Guillaume Guindey, between 1946 and 1950, had been drawn to both the political and economic interest attached to the project of transforming the territory into a free zone, which had long been requested by the foreign affairs departments and overseas France. The team's position was part of the group that Michel Margairaz (1991) defined as the "austero-liberals", whose movement is characterised by "the dual concern of curbing expenditure and levies internally and ensuring the free movement of goods and capital externally" (Lepage,19999).

[9] SAEF, B 460, Thierry de Clermont-Tonnerre, Direction des finances extérieures, note for the Minister of Foreign Affairs, subject: customs and monetary reform in Djibouti, 28 December 1948.

would not be the result of any action on the part of the French authorities, but of the simple interplay of supply and demand. In this way, no reproach could be levelled by the British against the official French CFS bodies.[10] In unofficial conversations, it was agreed that IMF representatives would refrain from briefing their British colleague, Mr Tansey, until the matter had been officially referred to the IMF.

On 22 March 1949, the IMF approved the reform thanks to American support, despite British opposition, thus strengthening the Franco-American axis.[11] This success enabled France to strengthen its position in Djibouti, while facilitating the entry of American interests into the region. In contrast to the Paris free market, this time the United States played a central role by supporting the pegging of the Djibouti franc to the dollar, thereby strengthening not only its influence in East Africa, but also the creation of a currency zone favourable to its strategic interests in the region. This was part of a drive to counter Soviet influence in the region, particularly during the Cold War, when Djibouti, as a strategic port, could become a key location for US military bases. As well as being a simple economic reform, this monetary operation also had a military and strategic dimension. This reform therefore had a major geopolitical impact, enabling France and the United States to position themselves advantageously in a key region for trade and military strategy.

From the outset, Djibouti's money market was hampered by British restrictions on the creation of Somali sterling accounts. After the devaluation of sterling in September 1949, Ethiopian exchange controls, put in place by the *State Bank of Ethiopia*[12] under the direction of the Americans M. Bennett and M. Blowers since 1943, accentuated these limitations, fuelling rumours of a crisis orchestrated to strengthen American influence to the detriment of the British[13]

3.1.3 American influence in the post-Bretton Woods era

With the collapse of the Bretton Woods system in 1971, many countries abandoned fixed exchange rates, but Djibouti chose to maintain its peg to the dollar. This decision strengthened

[10] SAEF, B 460, Thierry de Clermont-Tonnerre, Direction des finances extérieures, letter for M.Rivain, financial attaché for the Near East, Beirut, subject: monetary reform in Djibouti, 2 January 1949.
[11] SAEF, B 460, Director of the International Monetary Fund, De Largentaye, letter to M.ministre des Finances et Direction des Finances extérieures, subject: monetary reform in Djibouti, 22 March 1949.
[12] This institution, founded by a "proclamation" in 1942, is both the issuing institute and the official bank of the Imperial Government of Ethiopia
[13] SAEF, B 460, Blesson, Telegram for the Ministry of Foreign Affairs, Economic Affairs Directorate, 14 March 1949.

the continuity of monetary stability, but it also maintained Djibouti's dependence on fluctuations in the dollar and US monetary policy, a situation that remains today.

After its independence in 1977, Djibouti's strategic position also continued to influence its relations with the Bretton Woods institutions. Financial support from these institutions is not based solely on economic criteria, but is also motivated by geopolitical interests. Western powers with military bases in Djibouti have an incentive to stabilise its economy in order to guarantee the security of their military installations and access to strategic maritime routes. As a result, relations between Djibouti and the IMF and World Bank have strengthened, with significant financial support for debt management and the funding of development projects. In this context, the United States uses its monetary dominance to protect trade routes, control international transactions, strengthen its economic and military alliances, and apply financial sanctions when necessary. The United States exploits its military presence and the influence of the dollar to preserve its hegemony. As the main reserve currency, the dollar enables the United States to exert significant control over the international financial system and global trade routes, thereby facilitating trade and financing for countries that adopt it (Prasad, 2014; Cohen, 2015; 2019).

Djibouti, with its currency pegged to the dollar, illustrates this dynamic. This persistent link with the dollar, which remains the reference currency for trade and financial flows linked to economic aid and infrastructure contracts, facilitated the establishment of the American military base in 2002, notably at Camp Lemonnier, thus consolidating the American presence. This base reflects the increased geopolitical importance of the country in American security strategies in Africa and the Middle East, as already anticipated in 1949 by the French Communist Party. The country has been able to take advantage of its strategic position, close to areas of conflict in East Africa (Ethiopia, Somalia, Eritrea), becoming a key point for regional stability and the fight against terrorism and piracy. This makes it an international military hub, with new bases for several major powers (United States, China, Japan) reflecting the convergence of international security interests in the region.

However, this monetary stability is accompanied by a dependence on fluctuations in the dollar and US monetary policy, which continues to influence Djibouti's economic situation today. This approach shows that monetary domination is often linked to a military presence to protect economic and political interests.

However, while Western powers have historically been Djibouti's main partners, China has also become a key player in recent years. In 2017, China established its first overseas military base in Djibouti, a move that again reflects the country's growing importance in China's New Silk Roads initiative and its growing strategy in global security. At the same time, China's massive dollar loans also represent a dual strategy. When people talk about China 'getting rid' of its dollars by lending massively to developing countries like Djibouti, this is in fact a key element of debt diplomacy, which has several objectives: to use dollar reserves to obtain a better return on investment than safe, low-yielding assets such as US Treasury bills, while creating financial dependence for strategically located countries. Debt, often at high interest rates, can become unsustainable, giving China leverage to obtain economic concessions (control of strategic infrastructure) or geopolitical concessions (diplomatic alliances, military installations). So "debt diplomacy" and the idea that China is "getting rid" of its dollars by lending to countries like Djibouti are closely linked, strengthening its influence through debt.

3.2 China's debt diplomacy - competition via the dollar

Chinese-Djiboutian relations must be analysed not only in the context of China's economic interests, but also taking into account the economic and monetary stability and maritime geopolitical issues that influence Djibouti. Djibouti's geographical position controls access to vital sea lanes, including the Gulf of Aden, through which more than a billion dollars a day in trade between China and the European Union passes. This reinforces Djibouti's importance in global supply chains and underlines its role in maritime geopolitics, particularly in the context of energy security

Djibouti is also well placed close to resource-rich countries such as Ethiopia and Sudan. To stimulate regional production and trade, Djibouti has established several free trade zones, offering tax advantages including exemptions on corporate and income tax. These zones aim to strengthen Djibouti's role as a trade hub, and are part of China's New Silk Roads (NSI) initiative. This location represents a strategic asset for China, which is seeking to secure its access to the resources needed to support its economic growth. Djibouti's political and economic stability is therefore key to securing this access, and China's infrastructure investments in Djibouti, worth a total of $14.4 billion, aim to strengthen this stability (Chaziza, 2021). Since 2017, China has increased its presence in Djibouti by establishing its first overseas military base.

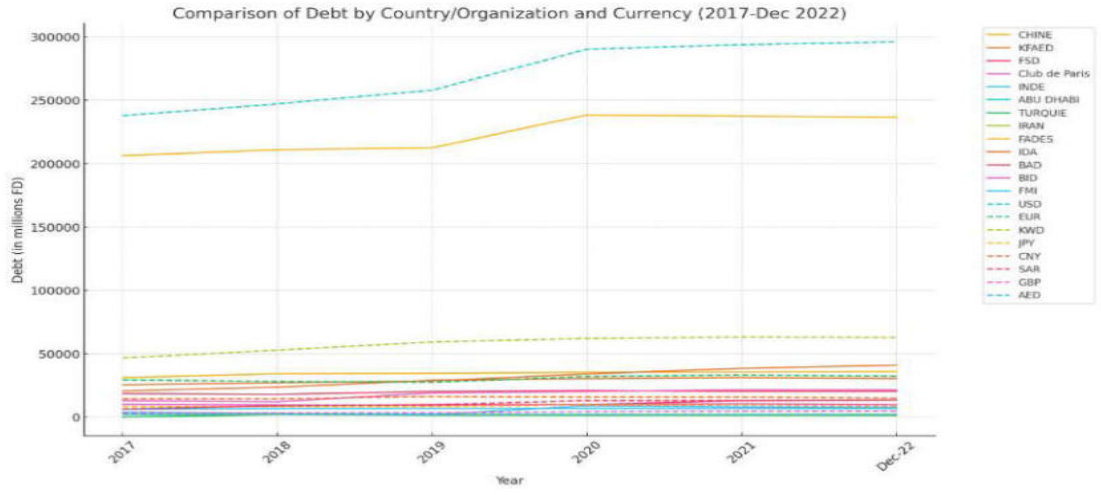
Although China is investing massively in local infrastructure, its loans remain mainly denominated in dollars, consolidating its presence without de-dollarising the local economy.

Chinese loans in USD are favoured in transactions where stability and liquidity are essential (Gelpern et al., 2023).

By using dollar loans to finance strategic investments such as the port of Doraleh and the Djibouti-Ethiopia railway, China is extending its geopolitical influence while maintaining the attractiveness of its financing. This approach allows it to integrate its own economic interests into a monetary system dominated by the United States. In this way, it is using its large currency reserves more strategically to reduce its dependence on the US dollar, diversify its investments and strengthen its economic and geopolitical influence. This approach aims not only to optimise the use of its reserves, but also to consolidate its international position on the world stage.

The most worrying aspect of China's presence in Djibouti is its debt diplomacy. Debt diplomacy is a lever of power for China. Djibouti is now one of the African countries most indebted to China, with around 70% of its external debt held by Chinese creditors. This financial dependence exposes the country to the risk of economic concessions or the sale of strategic infrastructure, such as the port of Doraleh, in the event of default (Faris Al-Fadhat, 2022). In 2020, the IMF warned Djibouti of a high risk of debt distress, fuelling fears of a 'debt trap' in which Beijing could exploit its dominant position to increase its control over Djibouti's infrastructure. China's potential control of strategic infrastructure in the event of default, combined with its military presence, could limit Djibouti's diplomatic room for manoeuvre vis-à-vis Beijing and complicate its relations with other powers such as the United States and France.

Graph 1: Breakdown of debt by country/organisation and by currency from 2017 to December 2022.



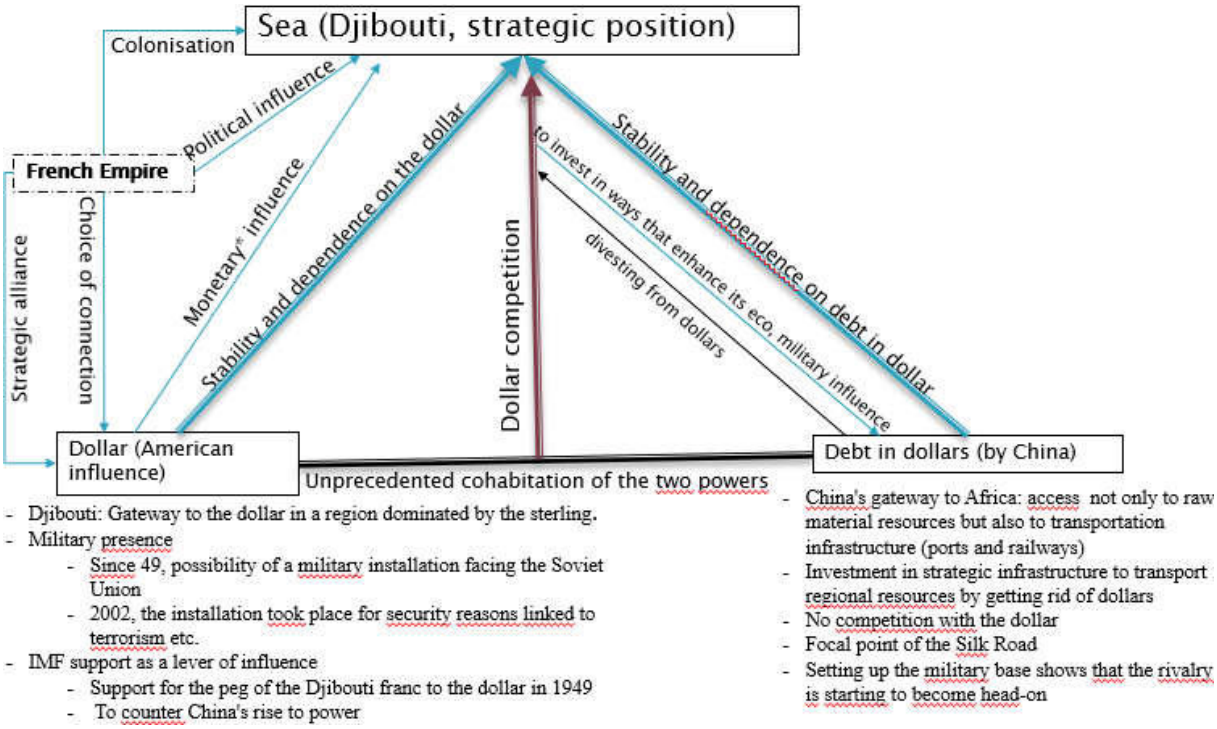
Source : produced by the author

- **Solid lines** represent debt by country or specific organisation, such as China, KFAED, IMF, etc.
- The **dotted lines** represent debt by currency, such as USD, EUR and KWD.

It can be seen that debt to China (solid orange line) and debt in US dollars (dotted blue line) are the largest, with moderate variations in other debts over the years. Djibouti thus finds itself caught up in a dual dynamic in which Chinese investment increases its economic dependence, while the use of the dollar maintains US monetary influence

In addition to this maritime and military issue, Djibouti is at the heart of another aspect of the rivalry between the great powers: control of the submarine cables, a crucial new geopolitical issue

Figure 2: diagram summarising the results of the analysis of superpower cohabitation



Source: produced by the author

Since 1949, the United States has maintained its influence in Djibouti through the pegging of the Djibouti franc to the dollar, anchored in alliances with the French colonial empire. This has meant political influence for France and monetary domination for the United States.

China's growing presence in Africa, with Djibouti as its gateway, adds a new complexity. China avoids direct monetary rivalry by using the dollar to extend its influence. However, the establishment of a Chinese military base indicates that this rivalry is beginning to take a more direct form. Over time, China could demand debt repayments in yuan, challenging the dollar's dominance and transforming the monetary system.

Conclusion

Although small in size and resources, Djibouti is a key strategic player at the crossroads of global trade routes between Asia, Africa and Europe. Its geopolitical importance stems from both its exceptional geographical position, at the crossroads of the Red Sea and the Bab-el-Mandeb Strait, and its role in securing vital maritime routes.

At the same time, its peg to the US dollar since 1949 has helped to stabilise its economy, attract foreign investment and consolidate the US military presence, notably with the Camp Lemonnier base. This strategic choice has enabled Djibouti to ensure monetary stability, which has benefited its economic development.

However, this monetary stability has been accompanied by dependence on fluctuations in the dollar and US monetary policy. With the rise of China, Djibouti finds itself juggling between two global superpowers. On the one hand, the United States is maintaining its monetary and military dominance, while on the other, China is asserting itself through its "debt diplomacy", investing massively in Djibouti's infrastructure, such as the port of Doraleh and the Addis Ababa-Djibouti railway line. These massive investments, while beneficial in the short term for infrastructure development, create economic dependence on China and risk dragging Djibouti into a "debt trap". This situation exposes Djibouti to possible economic or political concessions in the event of default, thereby compromising its sovereignty

This context highlights the complexity for Djibouti of navigating between the enduring Franco-American influence, its strategic role in maritime geopolitics, and Chinese debt diplomacy. These competing powers are seeking to exert their influence without destabilising the country, each guided by its own strategic interests.

The question remains: how can Djibouti preserve its sovereignty while maintaining a balance in its economic and geopolitical relations with these global players? The answer lies in its ability to take advantage of its unique geopolitical position to balance influences and strengthen its diplomatic alliances, to better manage its debt by strengthening its cooperation with multilateral institutions such as the IMF or the World Bank, and to avoid ceding control of its strategic infrastructure. The fact that Djibouti hosts American, French and Chinese military bases demonstrates its ability to remain a neutral and central player in international relations. This neutrality could be an asset in negotiating more favourable terms with its creditors, while maintaining a degree of strategic independence.

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CHALLENGES FOR BULGARIA AND CROATIA IN JOINING THE EURO AREA

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Ani Dimitrova[2]

Abstract: *The main objective of the report is to examine the challenges facing Bulgaria and Croatia before the adoption of the euro. Croatia is already part of the euro area and managed to overtake Bulgaria for years to achieve this goal. The subject of study is the single European currency, and the subject of adoption in Bulgaria and Croatia and the challenges that arise from it. Economic indicators will be examined in the moment before Croatia's accession and Bulgaria's expected accession.*

Keywords: *euro, eurozone, monetary policy, Bulgaria, Croatia*
JEL: *E31, E40, E50*

Introduction

1. Literature Review

There are numerous publications on the subject in the scientific literature, many of which are relevant and have been published in recent years in connection with the adoption of the euro in Croatia. Gechev, Beev & Hristozov (2020) tried to make a forecast of the euro adoption in Bulgaria. The sustainability of the nominal convergence criteria depends on a high level of real convergence and on sound macroeconomic indicators that would not generate macroeconomic imbalance (Vasiloiu, 2019). In his reasearch (Walko, 2022) reveals the the potential benefits and risks of euro adoption for Croatia and Bulgaria, and his oppinoun is that it is expedient to review their past performance in terms of convergence and compare that with the performance of current euro area (EA) countries. (Cuaresma, Fidrmuc, & Silgoner, 2008) are analyzing the link between macroeconomic fundamentals and exchange rate dynamics in two new and two potential EU member states: Bulgaria, Romania, Croatia, and Turkey. Important for the theory and practice is the research of (Alekseievska, 2020) about the financial crisis after 2020 that has forced the central banks of many countries to use new monetary policy methods. Simmilar to the topic is the research of (Dan, 2019) regarding the real and structural convergence in Romania, Bulgaria and Croatia. An interesting reading on the subject is made in the study "With or without you? Are central European countries ready for the euro? (Darvas, 2019), which deals with the cases of Bulgaria, Romania and Croatia.

2. Background

Bulgaria has been a member of the European Union since 1 January 2007 and has committed to adopt the euro when it fulfils the necessary conditions under the Maastricht Treaty. Croatia has been in the EU since 1 July 2013 and is part of Schengen and the euro area since 1 January 2023. Bulgaria has become part of full Schengen by air, sea and land

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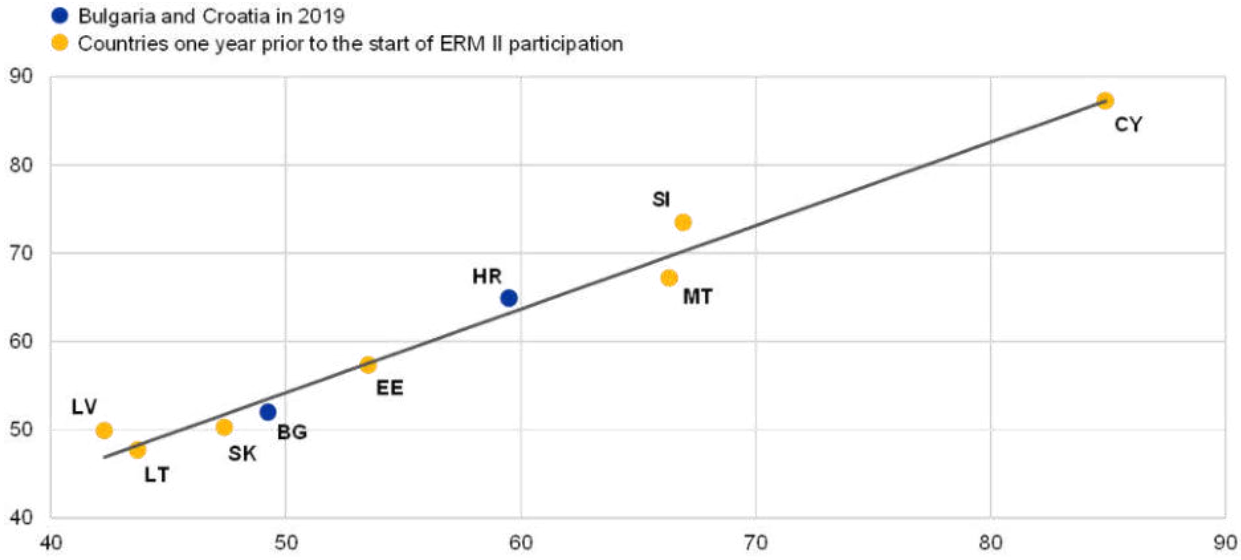
since 1 January 2025, after controls at air and sea borders have been lifted as of 31 March 2024. To fully complete its European integration, Bulgaria must also be part of the euro area. Croatia is 20 countries that have joined the euro area since 2015. Lithuania was the nineteenth member and Bulgaria is expected to be the 21st.

Bulgaria and Croatia joined together the Single Exchange Rate Mechanism ERM II and established close cooperation with the European Central Bank by becoming part of the Banking Union on 10 July 2020, although Bulgaria started this process a year before Croatia and at the beginning paved the way (ECB, 2020). On the day of Bulgaria's accession to ERM II, however, protests against political governance began and political instability has been a fact for more than 3 years.

Experience to date has shown that countries that join ERM II at comparable or even less advanced stages of convergence can subsequently introduce the euro in a successful way. In this respect, a more important prerequisite for successful participation in ERM II is price levels that are commensurate with income levels (as shown in the graph below) and, more generally, with the country's economic fundamentals.

Figure 1.



Source: European Central Bank

The difference compared to Bulgaria is, that as a result of a strong political demarche led by Prime Minister of Croatia Andrej Plenković, the process of joining the euro area has already been successfully finalised. In the years leading up to Croatia's accession to the euro area, Croatia's politicians and central bankers defined accession to the euro area as a crucial step towards the country's integration into the core of the European Union and ensuring future economic development and the accession process became official state policy because it was not only an expert but above all a political issue. Although in 2022, according to a Eurobarometer survey, 49% of Croats are worried that the euro will have a negative impact on their nation, while only 45% believe it will have a beneficial impact overall.

Bulgaria has not adopted the euro since 1 January 2023 due to the political instability in the last few years in the country and the failure to meet the criterion on price stability, the level of inflation. As of the end of November 2024, inflation in Bulgaria continues to fall, narrowing the gap between the average annual inflation in the country and that of the three best performing EU Member States. Both the regular reports of the ECB and the European Commission of summer 2024 found that Bulgaria fulfilled all the criteria, including full legal convergence, with the exception of the criterion on price stability. This criterion is also expected to be met at the end of December 2024 or at the latest in January 2025. According to Fitch, this will happen at the beginning of 2025, depending on the evolution of inflation in the EU. After the fulfilment of the last criterion, the country will send a request for the preparation of extraordinary convergence reports by the European Commission and the European Central Bank, on the basis of which the date for our country's membership in the euro area should be determined. This is a commitment by the Bulgarian executive on the basis of a decision taken by the National Assembly of the Republic of Bulgaria in the summer of 2024. Moreover, at this stage, Bulgaria is the only country that is a member of the Banking Union and participates in the Single Supervisory Mechanism within the framework of the close cooperation established with the ECB as part of the country's commitment to join both the Banking Union and the Exchange Rate Mechanism (ERM II). The framework for close cooperation with the Bulgarian National Bank entered into force on 1 October 2020, following the fulfilment of the necessary supervisory and legislative requirements.

The importance of Bulgaria's accession to the euro area is also emphasized by all rating agencies. In practice, the country has reached the highest possible level as a credit rating at this stage, and only admission to the euro area can increase it. In October 2024, the credit agency Fitch Ratings confirmed Bulgaria's 'BBB' rating with a positive outlook, with "a positive outlook reflecting the country's prospects for euro area membership, which would lead to further improvements in the country's external position indicators" (Fitch Ratings, MF, 2024). And an increase in the country's credit rating would also affect banks' and businesses' higher ratings. While not joining the euro area would have a negative effect on the country's rating. According to Fitch Ratings, there is a broad political commitment at national and European level to adopt the euro. Moreover, despite the political instability in the last 3 years, the preparations for the introduction of the euro at the level of the banking sector, central bank, business continue to this day, with investments in this direction for the preparation of the sector by commercial banks alone amounting to over BGN 500 million, excluding the funds invested by the Central Bank.

The adoption of the euro and the accession of our country to the euro area is the most successful way out of the current currency board regime for more than 27 years, during which the central bank cannot lend to the government, refinance commercial banks, but it helps to impose fiscal and financial discipline by committing to exchange local currency for a chosen reserve currency at the fixed exchange rate upon request. Moreover, the lev has been pegged to the euro since the very beginning of the existence of the euro.

Bulgaria, which, according to the regular convergence reports of summer 2024, does not meet the criterion on price stability, the challenge for Croatia on its path towards the euro area is the management of public finances, the higher level of debt than allowed under the criteria. It should be noted, however, that the general exception clause in the EU's Stability and Growth Pact was activated between 2020 and 2023. This allowed countries to take the necessary coordination measures under the Policy Pact in the context of the pandemic and Russia's invasion of Ukraine. In particular, this allowed for a departure from the budgetary

requirements that would normally have been applied. A reformed Stability and Growth Pact entered into force in April 2024, modifying the rules for opening a debt-based excessive deficit procedure.

Following the European Council's endorsement of Croatia's entry into the monetary union at its meeting at the end of June 2022, euro area finance ministers gave their formal approval on 12 July 2022. The exchange rate for the kuna to the euro was set at 7,53450 to 1 and the date of formal adoption was set for 1 January 2023. Bulgaria is expected to stand at 1.95583 to one euro, as is currently the case for the fixing of the lev to the euro.

Since its inception in 1994, Croatia's currency, the kuna, has used the German mark and then the euro as a benchmark. At the same time, most of the deposits of individuals and companies are in euros, as well as over two-thirds of the debt, as well as the prices of real estate, cars and hotel accommodation (and one-fifth of Croatia's GDP comes from tourism). Therefore, it is no coincidence that it is the tourism sector that is the biggest supporter of the adoption of the euro in Croatia. Both are small and open economies, well integrated with euro area countries with trade and financial relations. But they are direct competitors in terms of tourism. In various studies related to tourism, usually between 30 and 40% of respondents indicate that the euro saves bank charges for tourism and between 74 and 80% that the euro makes it easier to compare the prices of tourism and other services in countries because price transparency is seen as the most important effect of the common currency on tourism. Before the pandemic, tourism accounted for around 10% of GDP and 9% of employment in the European Union each year, while international tourism accounted for 6% of total EU exports. And in the case of Bulgaria, EU countries are the most important market for inbound international tourism with a relative share of about 60%, with pre-pandemic revenues of over EUR 3.7 billion per year. In Croatia, tourism revenues amounted to around 19% of GDP in 2019, and for Croatia, too, the euro area countries are the most important trading and financing partner. In addition, the introduction of the euro significantly reduces transaction costs, since it is no longer necessary to exchange the kuna for the euro and vice versa. This further boosts Croatia's trade and financial integration into the euro area and makes Croatia more attractive for investment, and it is also expected that the euro will make the economy more resilient to shocks and financial crises.

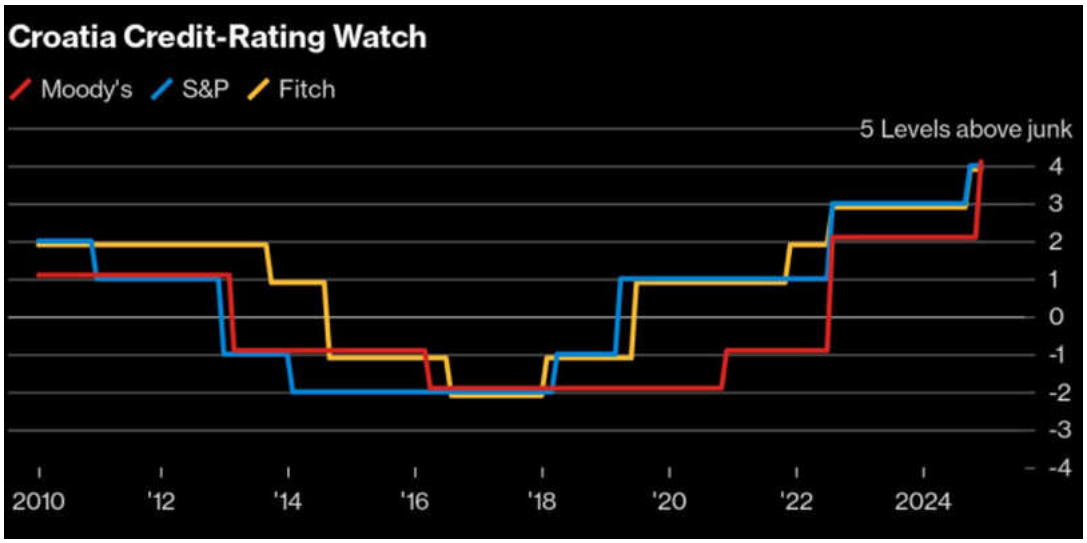
3. Croatia's connection to the euro area as a trade and financial partner

The goal set by Croatia on the path of joining the euro area is the elimination of currency risk as one of the main expected positive effects of the introduction of the euro. And this goal was fully achieved a year later after the adoption of the euro. Another challenge is the debt of different economic sectors in foreign currency. Today, the debt of all sectors in foreign currency is less than 1% of the total debt, as opposed to about 70% before the adoption of the euro. This is major progress for Croatia, which helps to reduce the country's risk premium and also limits the transfer of higher global interest rates to the domestic financial system.

Last but not least is the change in the rating of Croatia. In 2017, Croatia's rating was BB, two notches below investment grade. In the following years, credit rating agencies increased the rating and outlook for the Croatian economy. In 2019, Croatia reached the minimum investment grade rating (BBB-) and in 2022, against the background of the EU Council's decision on the adoption of the euro by Croatia, the credit rating was upgraded to BBB+ (by

two grades), approaching the Investment grade rating. Since the adoption of the euro, Croatia has received a much higher rating from all credit agencies and the outlook has changed from positive to stable. Standard & Poor's raised the country's credit rating from BBB+ with a positive outlook to A- with a positive outlook in September 2024. This is the highest credit rating in Croatia's history. Moody's Ratings raised Croatia's long-term credit rating by two levels, citing the prospects for strong economic growth and sustainable fiscal policy and shifting the sovereign rating of A3 from Baa2. Croatia has reduced its budget deficit to less than 3% of GDP and expects to bring the level of government debt below 60% of GDP by the end of 2024.

Figure 2.



Source: Bloomberg

Both employers and the government and the citizens of the country themselves, as a result of the changed credit rating, expect lower interest rates when taking out loans and better market conditions. Thanks to the increased credit rating, "Citizens, companies and companies can expect lower borrowing rates and better market conditions," Croatian Prime Minister Andrej Plenković commented on this occasion.

Even after the decision on Croatia's accession was taken and before this actually happened, two credit rating agencies raised its credit rating by two grades. Thus, the credit rating of Croatia, which before the decision was one degree lower than that of Bulgaria, months before the actual adoption of the euro is one degree higher than that of Bulgaria.

A challenge for Croatia is also the expectations for inflation growth with the introduction of the euro. According to the analysis of the Central Bank of Croatia (and that of the ECB), the impact of the euro on prices is 0.4 percentage points, while Eurostat's analysis shows that this impact is at most 0.2 percentage points. This level of impact of the euro on prices is within expectations and fully in line with the experience of other countries that introduced the euro before Croatia, despite the circumstances of historically high global inflation in which Croatia introduced the euro. In fact, inflation in Croatia at that time was lower than countries that had not adopted the euro, such as Hungary, the Czech Republic and Poland.

4. Economic Indicators

The following table presents some of the economic indicators of the two countries, compared with the euro area. The authors take a closer look at the current economic situation in Bulgaria.

Table 1.

	European Union	Euro area	Bulgaria	Croatia
People at risk of poverty or social exclusion (as percentage of the population)	**21.6%** (2022)	**21.8%** (2022)	**32.2%** (2022)	**19.9%** (2022)
Inflation rate (percentage change compared to previous year)	**6.4%** (2023)	**5.4%** (2023)	**8.6%** (2023)	**8.4%** (2023)
Unemployment rate (as percentage of the labour force aged 15 - 74 years)	**6.1%** (2023)	**6.6%** (2023)	**4.3%** (2023)	**6.1%** (2023)
GDP per capita (Euro per inhabitant)	**29 280€** (2023)	**32 150€** (2023)	**7 900€** (2023)	**15 020€** (2023)
Government gross debt (as percentage of GDP)	**80.8%** (2023)	**87.4%** (2023)	**22.9%** (2023)	**61.8%** (2023)
Government deficit / surplus (as percentage of GDP)	**-3.5%** (2023)	**-3.6%** (2023)	**-2.0%** (2023)	**-0.9%** (2023)
Renewable energy (as percentage in gross final energy consumption)	**23.1%** (2022)	**21.8%** (2022)	**19.0%** (2022)	**28.1%** (2022)
Electricity prices (Euro per MWh, incl. taxes)	**285.0€** (2023-S2)	**305.4€** (2023-S2)	**119.4€** (2023-S2)	**154.3€** (2023-S2)

Source: Eurostat

Annual HICP inflation stood at 2.8% in June 2024, with administratively priced services and goods and services contributing the most positively. In the domestic macroeconomic environment, pro-inflationary pressures continued to exert high rates of growth in unit labour costs and continued strong private consumption. Fiscal policy also continued to be a pro-inflationary factor. HICP inflation stood at 0.6% in October compared with the previous month, mainly reflecting seasonal fluctuations in the components of underlying inflation. The highest positive contribution was made by higher prices for clothing and footwear by an average of 7.9% (+0.32 percentage point), followed by those for package holidays by 16%. The annual inflation rate accelerated to 2.0% in October, from 1.5% in the previous month. This was mainly due to a higher contribution from the components of underlying inflation, which accelerated to 2.9% year-on-year. According to the BNB projections, inflation will amount to 1.9% at the end of 2024 (compared to 5.0% at the end of 2023), while average annual inflation is expected to be 2.5% (compared to 8.6% in 2023). A key factor behind the moderation in inflation was the downward dynamics in international oil prices and in some imported industrial goods. And according to the autumn macroeconomic forecast of the

Ministry of Finance, the average annual inflation is expected to reach 2.6%, and in 2025 to slow down to 2.4%.

Bulgaria's real GDP growth is expected to accelerate from 1.9% in 2023 to 2.2% in 2024, driven by higher private consumption growth, the return of goods exports to growth in 2024, as well as the formation of a low positive contribution of inventories versus a negative one in 2023. At the same time, the projected decline in fixed investment and the expected acceleration in import growth will limit the growth of economic activity this year. And Fitch forecasts average annual inflation at 3% in 2024, 3.5% in 2025 and 3.1% in 2026. At the end of the first half of 2024, the CFP budget balance is negative, with a deficit of BGN 596 million. The fiscal deposit reserve funds decreased by BGN 1,736 million compared to the end of 2023 and amounted to BGN 9,143 million (4.8% of GDP), of which BGN 8,369 million represented BNB deposit funds.

While Fitch projects the general government deficit to increase to 2.8% of GDP in 2024 from 1.9% for 2023, reflecting higher compensation and social expenditure.

Bulgaria has a GDP per capita of €24,200, which is below the EU average (€37,600), with the country's share of total EU GDP being 0.6%. Croatia has a GDP per capita of €28,700, below the EU average (€37,600) and its share of total EU GDP is 0.4%. At the same time, for the period 2003-2023, Bulgaria converged by an average of 1.5% per year and ranked third relative to the countries of Central and Eastern Europe (GDP per capita in PPS compared to the average for EU). But for Bulgaria as a small and open economy, it is of utmost importance that the exchange rate to the main trading partners is fixed, especially since after joining ERMII and the Banking Union in 2020, the best strategy is to join the euro area as soon as possible (BNB, 2024).

Conclusion

And if Croatia is already presenting itself as a success story for the introduction of the euro in the country, Bulgaria still has to complete the path of joining the euro area in order to become a success story for the euro, in order to provide cheaper and more affordable financing for the government, banks and the private sector, as well as increasing aggregate demand and production. Because even now the Bulgarian economy is highly prepared for the adoption of the euro and for successful functioning as a member of the euro area. According to the only official analysis of the effect of the introduction of the euro in Bulgaria, prepared by the widest platform of employers, trade unions and consumers, the Economic and Social Council, as a result of the introduction of the euro will be a higher potential GDP and average annual real growth rate, higher productivity and potential for accelerated development and convergence towards average levels of productivity and income in the more advanced Eastern European countries, the EU and the euro area.

An improvement of the investment environment, a significant impulse and enabling conditions for activation of domestic and foreign investment is expected, respectively to a sustainable growth of the share of gross capital formation in GDP to levels permanently exceeding 21-23%, an increase in export orientation and unlocking statistically significant positive direct and indirect effects on export-oriented sectors and on net exports of goods and services, an improvement of the fiscal base, an opportunity to reformat national strategic management, long-term budgeting and efficiency of public spending and investment programs, as well as a more efficient labour market, employment, high levels of economic

activity and labour integration and income, improved adaptive capacity and, in the longer term, to address demographic challenges, ageing of the workforce and negative net external migration.

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European Central bank

Ministry of Finance, Bulgaria

Fitch Ratings

Bulgarian National Bank

SUSTAINABLE FINANCE MARKET IN RUSSIA

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Abstract: *The present study is dedicated to an in-depth examination of the present state of the ESG-bonds and green finance market in Russia. The market is approaching a state of maturity, and it would be beneficial if investors were to demonstrate a greater propensity towards such instruments. The Moscow Exchange, the Central Bank and the Government of Russia are to contribute to the development of sustainable finance. The study hypothesises that the Russian market is developing more slowly than the global market because institutional investors have a number of questions regarding the rationale for classifying bonds as green or social, the implications of this classification for investors, the purpose of the funds and the nature of the projects to which the funds will be directed. The results of the study demonstrate an increase in investor interest and the formation of a group of such responsible investors.*

Keywords: *ESG bonds, green finance, sustainable development, Russian financial market*
JEL: *Q01, G12, G28*

1. Introduction

The subject of sustainable finance remains a pertinent issue in both global and Russian contexts, despite the challenging circumstances. Towards the end of 2023, the United Nations Climate Conference was held, representing a pivotal event on this topic at the global level. A similar event took place in Baku later. In both instances, funding constitutes a significant component of the programme, given that the commitments made and agreed to by countries collectively entail the pursuit of policies that require funding. One of the principal subjects under discussion is the redistribution of funding between developed and developing countries. This topic remains on the agenda of the G20 and BRICS, where considerable attention is devoted not only to green finance but also to adaptation finance and transition finance.

In our opinion, the development of the green agenda in Russia is useful both for the Russian economy itself and for the whole world. The country has a huge territory and large reserves of natural resources necessary for survival on this planet.

The development of the ESG (Environmental, Social, and Governance) bond market in Russia has been gaining traction in recent years, although it is still in its early stages compared to more established markets like Europe or the United States.

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1.1.Regulatory framework of green finance in Russia

The International Capital Markets Association (ICMA) and the Loan Market Association (LMA) –non-profit organisations continue to exert a significant influence on the development of key standards in sustainable finance, which are relied upon by financial institutions across the globe, including Russia.

The subject of sustainable finance is also a matter of concern for the Russian legislative assembly, with the year 2021 marking the point at which it was established. The topic is addressed in the May decrees of the President, with specific objectives related to sustainable development. Consequently, federal projects are being established in which sustainable financing is expected to be a key topic of discussion.

Since 2021, a government decree has set out the main directions of sustainable development. The Bank of Russia has also made a significant contribution to this field, offering recommendations, guidelines and speeches that demonstrate the importance of this topic for the sustainability of the financial system.

The regulation in the sphere of sustainable development projects includes (see fig.1):

1) Russian Government Resolution No. 1587 dated 21.09.2021: "On Approval of Criteria for Sustainable (including green) Development Projects in the Russian Federation and Requirements for the Verification System of Sustainable Development Financing Instruments in the Russian Federation".

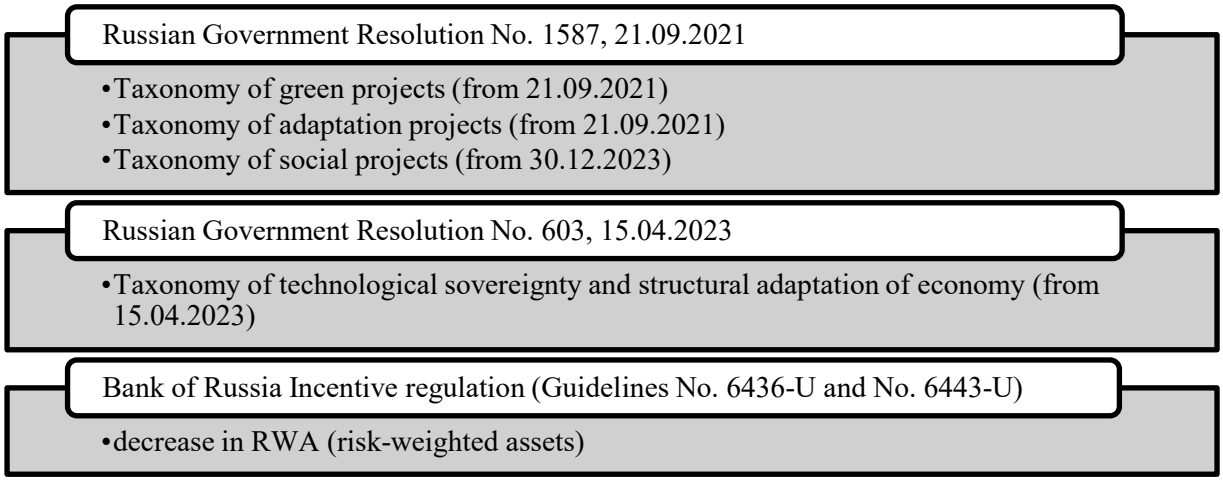
2) Russian Government Resolution No. 603 dated 15.04.2023: "On the approval of priority areas of projects of technological sovereignty and projects of structural adaptation of the economy of the Russian Federation and the Regulations on the conditions for classifying projects as projects of technological sovereignty and projects of structural adaptation of the economy of the Russian Federation, on the submission of information on projects of technological sovereignty and projects of structural adaptation of the economy of the Russian Federation and the maintenance of a register of these projects, as well as on the requirements for organisations authorised to provide opinions on the conformity of the projects with the requirements of the Regulations on the conditions for classifying projects as projects of technological sovereignty and projects of structural adaptation of the economy of the Russian Federation".

3) Bank of Russia Incentive regulation (Guidelines No. 6436-U and No. 6443-U): special measures to support lending for projects of technological sovereignty and structural adaptation of the economy. Capital relief range from 10% to 70% of the standard credit risk of a loan, depending on the category of the project (technological sovereignty or structural adjustment) and the credit quality of the loan, including as determined by national credit ratings.

In 2023, regulatory initiatives continued to refine the national sustainable development financing system. This included amendments to Russian Government Resolution No. 1587, adjustments to the listing rules of the Moscow Exchange, and the release of advisory documents by the Bank of Russia and the Ministry of Economic Development of the Russian Federation. For those considering issuing ESG bonds, a significant development was the approval of a National taxonomy of social projects at the end of 2023, when an additional section was added to the resolution No.1587. It specifies the main areas of potential social financing, eligibility criteria for social projects and verification requirements for such projects. The approval of the social taxonomy allows for the issuance of sustainable development bonds and social bonds in

accordance with national standards, whereas previously, issuers had the option to use only International Capital Markets Association (ICMA) standards.

Figure 1. Russian regulation of the national sustainable development financing system



Source: composed by the author

There is a growing recognition that sustainable finance is becoming a significant driver of growth in Russia and globally. A significant aspect of sustainable finance is the incorporation of qualitative elements alongside financial profitability. These elements encompass the achievement of environmental, social, and climate-related objectives through the use of financing.

2. Data and methods of analysis

At first, we draw differentiat of ESG bonds from conventional bonds. In the case of green, social, and sustainable development bonds, the primary distinction pertains to the targeting of funds. Specifically, the proceeds from the issuance of such bonds are directed towards specific projects, with the objective of achieving defined outcomes and impacts, for which the issuers are held accountable. However, there are additional distinctions that can be considered. The following 4 points characterize ESG bonds:

1) The targeted use of funds. The proceeds from the issuance of these bonds are to be allocated to sustainable development initiatives.

2) Revenue management. Such funds should be placed in segregated accounts or otherwise managed in a way that ensures they are not commingled with the general pool of funding.

3) Project evaluation and selection process. The process should be clearly delineated and structured. Verification is necessary.

4) Reporting. The decision to enter the bond market entails the assumption of heightened reporting obligations. In the context of ESG bonds, supplementary reporting is required with respect to the financed projects and the achieved effects.

It is essential that an independent evaluation be conducted as part of the verification process. It is evident that rating agencies occupy a significant position in this context. Additionally, it is possible for other organisations to assume the role of verifiers, thereby confirming the intended

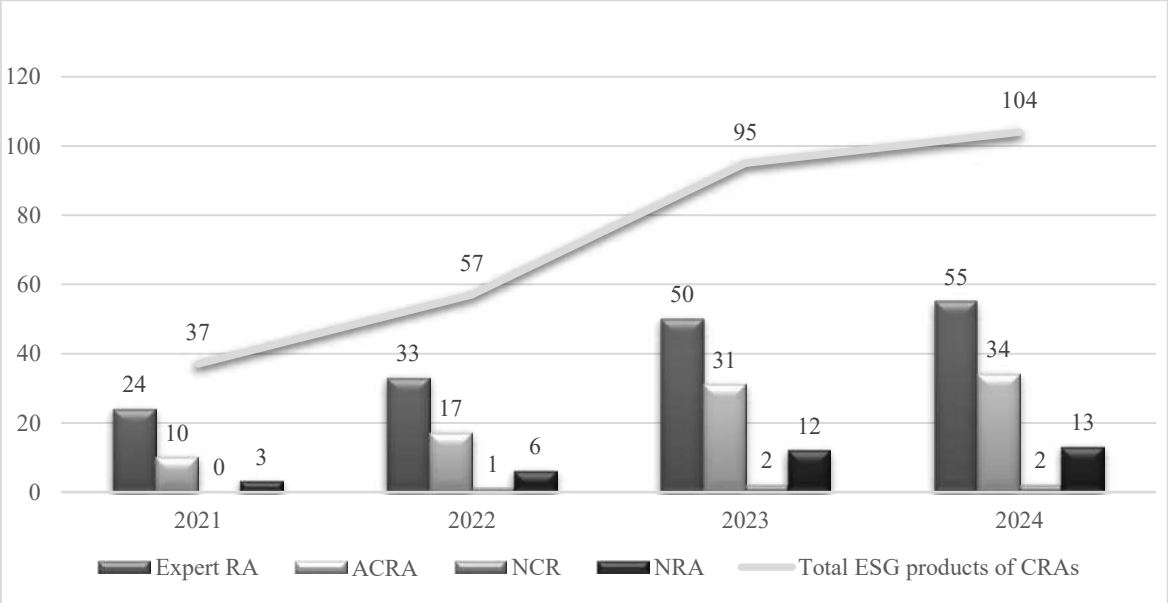
nature of the projects and forming an independent opinion as to whether the bonds in question are genuinely aligned with the principles of green, social or sustainable development, or alternatively, represent a different category of bond.

In Russia, the primary providers of market analytics are the Bank of Russia, the Moscow Exchange (which serves as the government's methodological center for green finance), and the Information and Analytical Agency Infragreen. The agency's approach to analytics is less conservative, encompassing over-the-counter instruments and a broader range of financial instruments to illustrate the diversity of responsible finance.

3. Results

The ranking of companies in order to assess the level of integration of ESG factors into their activities and subsequent formation of ESG rankings in the Russian market is predominantly carried out by credit rating agencies (see fig.2): ACRA JSC, Expert RA JSC, NRA LLC, and NCR LLC (13 ESG rankings were composed by NRA for the period 2021-2024), and also RAEX Rating Agency (8 ESG rankings were composed for 2021-2024) and AK&M Information Agency (5 ESG rankings for the period 2021-2024).

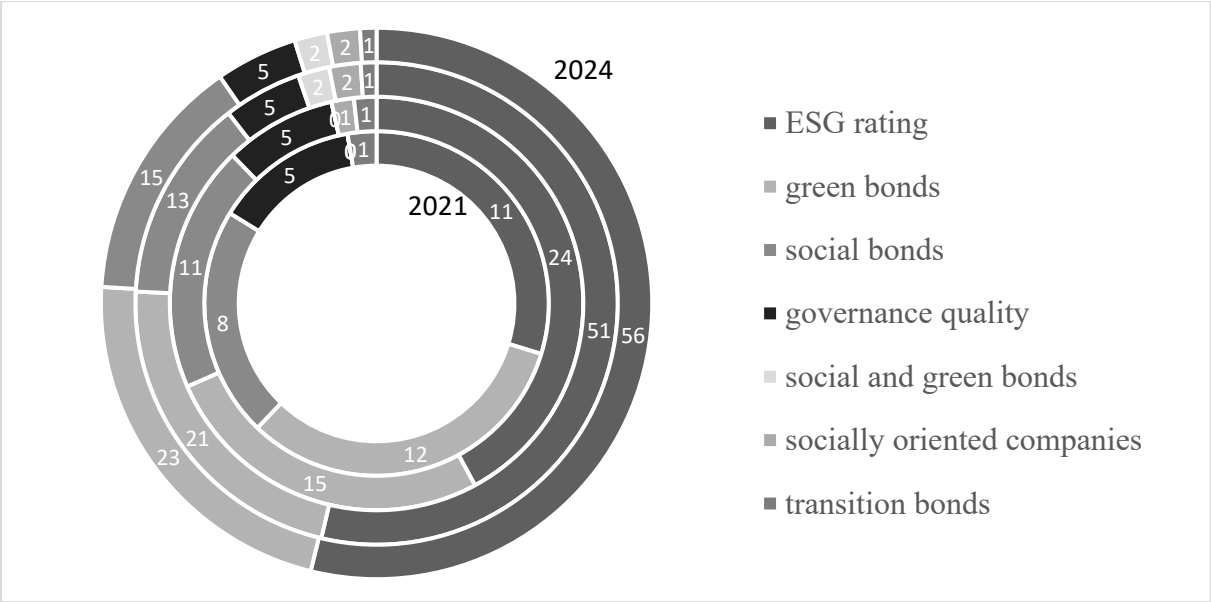
Figure 2. Market for ESG products of credit rating agencies in Russia, 2021-2024



Source: composed by the author on the basis of INFRAGREEN and CBR data https://infragreen.ru, https://cbr.ru

It can be observed that approximately 86% of the sustainability products market is represented by the largest credit rating agencies, namely Expert RA and ACRA. The market exhibited a period of exponential growth between 2021 and 2024, with the number of sustainability products increasing from 37 to 104, representing a growth rate of 181%. Concurrently, 54% of the sustainability products market is represented by ESG ratings (see Fig. 3).

Figure 3. Market for sustainable development products in Russia, 2021-2024



Source: composed by the author on the basis of INFRAGREEN and CBR data https://infragreen.ru, https://cbr.ru

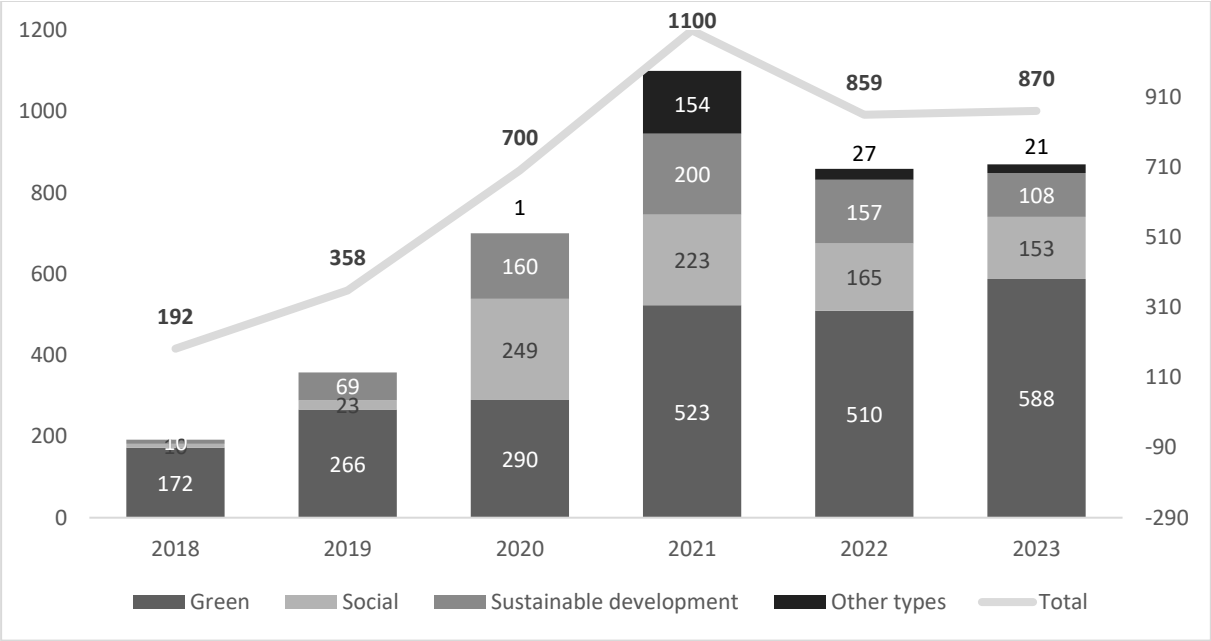
3.1.Main features of ESG bond market development in 2018-2023

European experience shows that investors are often the drivers of this market. For example, European pension funds have actively thought about taking into account the risk-return ratio in addition to the risk-return ratio, because these are investments in the future generation, and the market was formed with this in mind.

Figures 4 and 5 illustrate the evolution of ESG bond markets on a global and Russian scale. It is noteworthy that the global adoption of this financing format commenced a decade prior to its emergence in Russia. As can be observed, the market is undergoing a period of slight deceleration, which is to be expected given the circumstances. Nevertheless, it is evident that the market is developing in terms of both volume and the range of available tools.

All 5 principal categories of sustainability bonds are currently in existence worldwide, while 4 remain active in Russia. It is anticipated that climate transition bonds will eventually be utilised by companies.

Figure 4. Volume of ESG bond issues in the world, billion USD

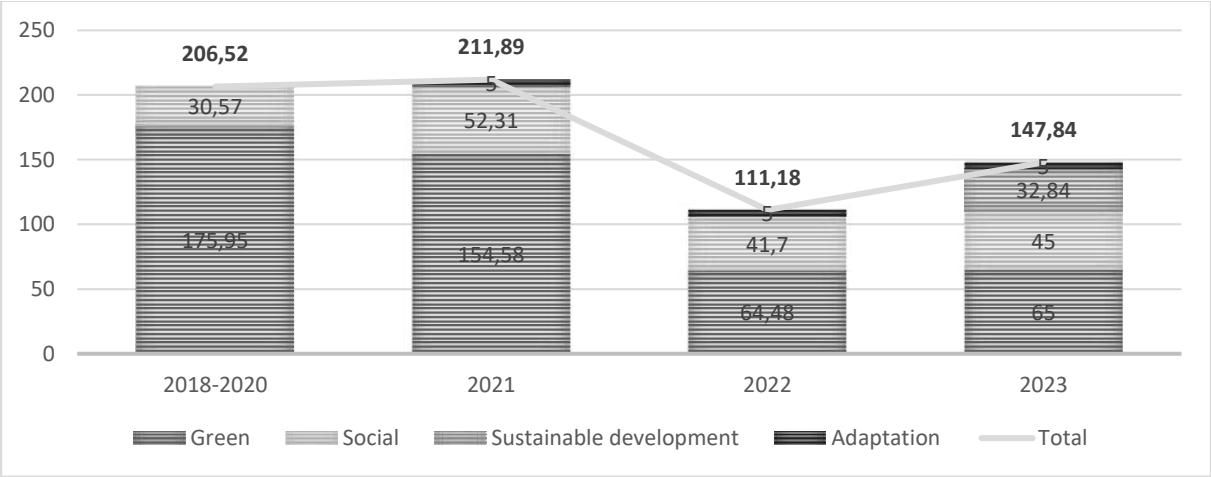


Source: composed by the author on the basis of INFRAGREEN data https://infragreen.ru

The latest figures from the Moscow Exchange show that the total value of bonds issued in Russia is approximately 667 billion rubles (equivalent to $6.7 billion), while the global figure stands at almost $4.5 trillion.

The EU is and will remain the largest market for ESG bonds, including green bonds, in the next few years. ESG-bond issuance in emerging markets, particularly in Asia, will grow at an accelerated pace. In Russia, the share of ESG bonds in the total volume of new bond placements in 2023 was about 2%, which is lower than in the rest of the world and the EU, where these financial instruments account for 5 to 10% of the total volume of bond placements.

Figure 5. Volume of ESG bond issues in Russia, billion rub



Source: composed by the author on the basis of INFRAGREEN and CBR data https://infragreen.ru, https://cbr.ru

Green bonds in Russia were first issued by a regional issuer from Khanty-Mansi Autonomous region - Yugra in December 2018. Following the local experiment of a small green bond issue for 1.1 billion rubles, which is nevertheless an important historical fact, a real giant entered the market: the green perpetual bonds of Russian Railways placed in September 2020 are still a record both in terms of the amount of funds raised and the 'green limit'. In the course of bookbuilding, bids were received from a wide range of investors, which made it possible to reduce the rate range three times and increase the placement volume to 100 billion rub. After that, no one doubted that there could be a green bond market in Russia.

Since 2018, the volume of bonds has grown annually until the peak in 2021, when the annual volume exceeded 211 billion rub. In 2022, there was an almost twofold decline, but growth resumed in 2023, with sustainable development bonds being issued for the first time in that year.

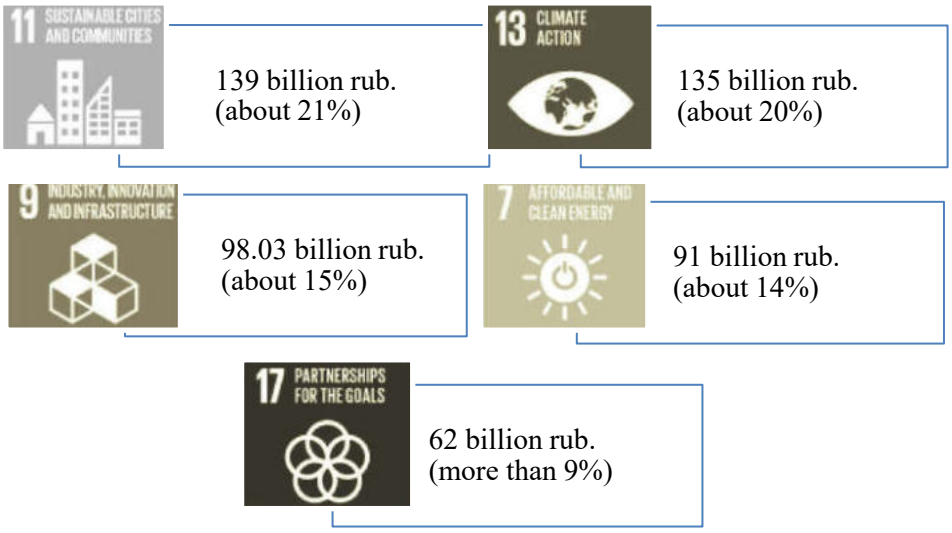
Over the entire period, 41 out of 49 issues of sustainable bonds were placed on the Moscow Exchange, 5 issues of green and social Eurobonds were placed abroad, and 3 issues were placed over-the-counter, including Moscow Exchange's Finuservices financial platform, where Moscow's green bonds for households placed in 2023.

Green bonds dominate the market structure, accounting for 69% of the total volume of sustainable development bonds. Social bonds account for 25% of the total volume, sustainable development bonds for 5% and adaptation bonds for 1%.

3.2.Compliance of bonds' objectives with the SDGs

Analysis of Russian issuers' ESG-bond targets for compliance with the UN Sustainable Development Goals showed that the top 5 most popular targets include 5 SDGs (see fig. 6), which account for more than 78% of the total bond volume (taking into account that issuer may define several SDGs as top-level targets).

Figure 6. UN SDGs and ESG bonds goals issues in Russia

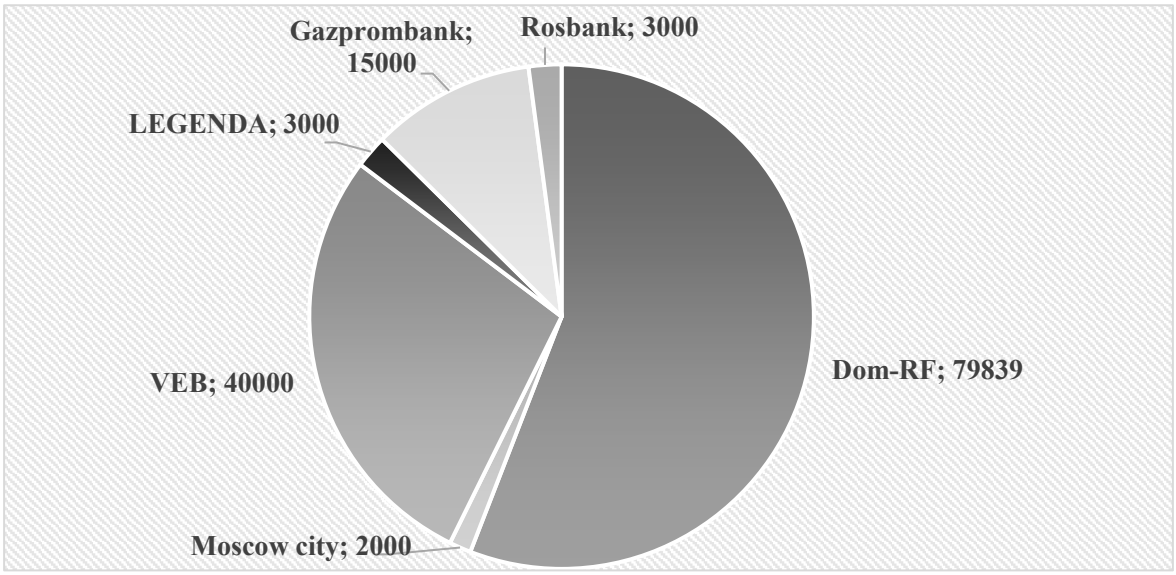


Source: composed by the author on the basis of INFRAGREEN data https://infragreen.ru

3.3. Peculiarities of Russian ESG bonds market development in 2023

The largest issue of 2023 was that of VEB.RF green bonds amounting to 40 billion rub. (see fig.7). These were used for the purpose of refinancing the construction of the initial series of an aluminum smelter with a reduced carbon footprint in the Krasnoyarsk region, as well as the construction of a nuclear power plant. All facilities have already been commissioned.

Figure 7. ESG bonds issues in Russia in 2023, mln rub.



Source: Report ESG, decarbonisation and green finance in Russia 2023/24. M: Open Communications Expert Agency, 2024, p.79 - URL: https://infragreen.ru/frontend/images/PDF/INFRAGREEN_Green_finance_ESG_Russia_2024.pdf

The largest issuer in 2023 was DOM.RF, for which four bond issues, amounting to a total of 79.84 billion rub.

DOM.RF as a development institution focuses its activity on the sustainable development issues to demonstrate how important this market is for the economy. There are green, social and sustainable development bonds, all of them are placed by a specialized project finance company, a subsidiary that is engaged in financing affordable road and transport engineering social infrastructure across Russia. Last year, the largest issue of almost 30 billion rubles was initiated by DOM.RF jointly with Gazprombank, bringing together both social and green projects.

DOM.RF as a leader among banks in ESG bond market, involves the bank's clients in this work and strives to offer both corporate clients and key clients (developers) opportunities to place bonds in sustainable development formats (see tab.1), emphasizing that this is an emphasis on their maturity, on the quality of the products they produce, it is an opportunity for dialogue with the regulator, which pays attention to these instruments and the possibility of additional verification of reporting, disclosure of information about the company.

Table 1. ESG bond issues of Dom.RF Group, 2023

Issuer	Placement date	Volume, mln rub	Rate	Type
Bank Dom.RF	21.02.2023	5 000	9,70%	green
Specialised Financial Society 'Social Development'	30.06.2020	3 216	10,21%	social
Mortgage Agent, Dom.RF	30.11.2022	5 478	r+0,47%	green
	17.11.2021	5 353	r+0,65%	social
	01.07.2022	6 704	r+0,65%	social
	29.09.2023	29 839	Pass through	sustainable development
Specialised Project Finance Company	23.09.2021	10 000	8%	social*
	23.12.2021	10 000	9,05%	social*
	18.10.2022	15 000	9,90%	social*
	21.12.2022	10 000	9,95%	social*
	26.05.2023	15 000	9,65%	social*
	31.08.2023	30 000	RUONIA+1,3%	social*
	28.02.2024	15 000	RUONIA+1,35%	social*
	28.02.2024	5 000	r+1,15%	social
Total		168 590		

*Notes: r – Key Rate, RUONIA - ruble overnight index average), * - in accordance with the standards of the International Capital Markets Association (ICMA). Included in the National and Adaptation Projects Segment of the Sustainable*

Source: DOM.RF and CBR data: https://дом.рф/analytics/ . https://cbr.ru

3.4. Territorial and sectoral allocation of sustainable finance in 2018-2023

In terms of green and adaptation projects, the majority of investment has been allocated to the transport, industry, machinery, energy and construction sectors (see fig.2).

In the context of social projects, the categories of education, healthcare and housing are of particular relevance. These and other areas are outlined in the so-called taxonomy, a document adopted by the Russian government in 2021. The taxonomy serves as a kind of classifier of those projects that can be categorized as green.

Table 2. Distribution of sustainable development bond issues by main areas, 2018-2023, bln rub

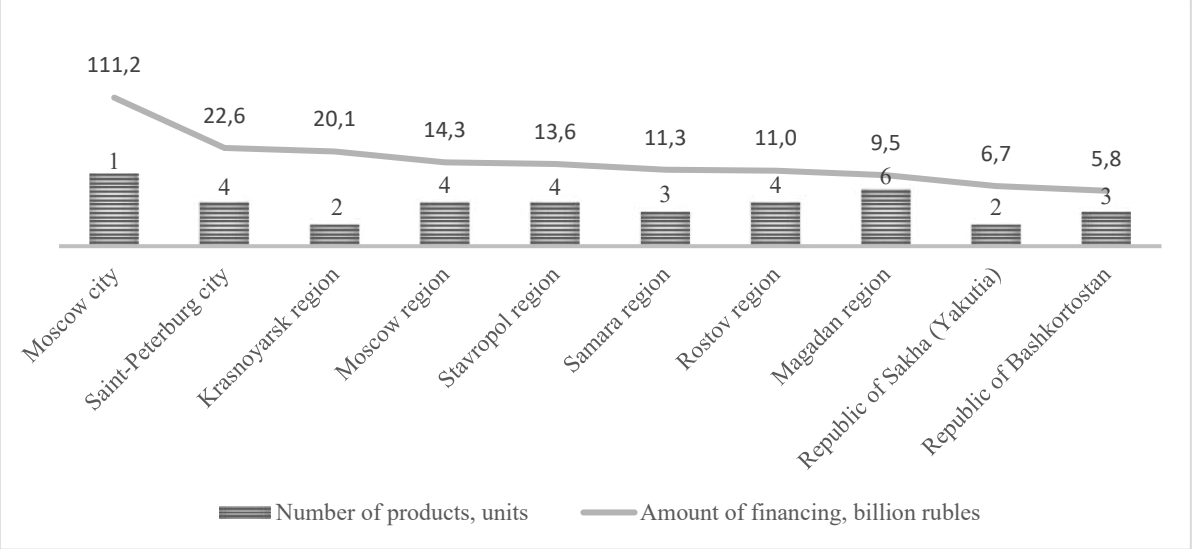
Placement volume for 2018-2023, RUB bln, total including:	**667,43**
Green and adaptation projects	
Transport and industrial machinery	338,45
Energy	69,7
Construction	45,39
Industry	25,13
Waste management	3,1
Water supply and wastewater disposal	0,15
TOTAL	**481,92**
Social projects	
Education	33,29
Health care	30,5
Housing construction	26,97
Social support and protection of citizens	22,46
Urban environment and housing and communal infrastructure	18
Transport	18
Sport	18
Communications infrastructure	14,5
Culture, art and tourism	2,79
Support of entrepreneurship, non-profit organizations	1
TOTAL	**185,51**

Source: composed by the author on the basis of INFRAGREEN data https://infragreen.ru

3.5. Geographical distribution of green funds

We can identify one more distinction between conventional and ESG bonds. The important fact, that geographical distribution of funds from bond placements can be recognized. In the case of Russian bonds, it is notable that the capital city of Moscow accounts for a significant proportion of activity in this market. However, the projects funded by the placement of such bonds are located across the entire country, providing benefits to the population at the regional level (see fig.8).

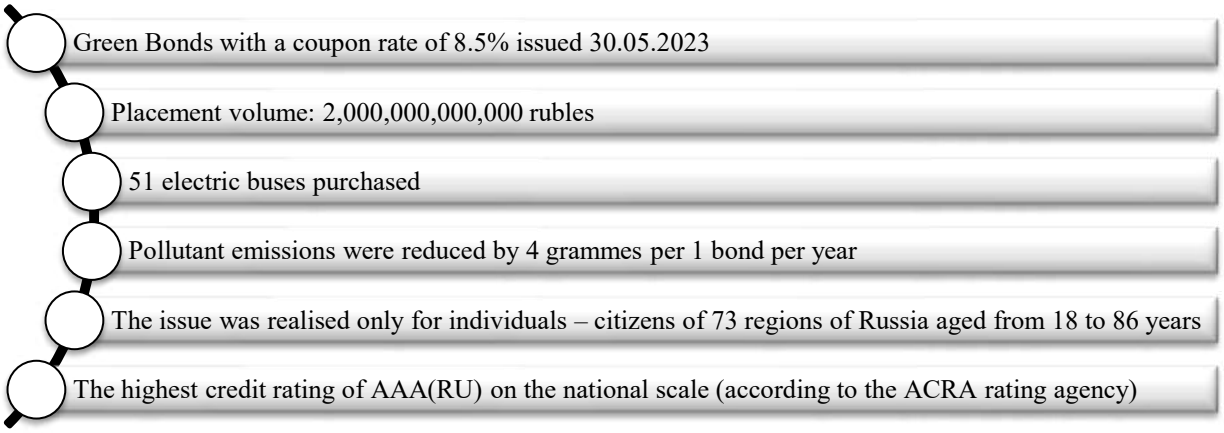
Figure 8. Top 10 Russian regions where projects financed with ESG bonds are implemented, 2018-2023



Source: composed by the author on the basis of INFRAGREEN data https://infragreen.ru

The Moscow green bonds for households indicate the growing demand from citizens for financial instruments that support sustainable development (see fig.9). In 2023, the Moscow government conducted a public offering of green bonds, with 2 billion rubles fully subscribed by citizens from 73 regions of Russia, spanning the age range of 18 to 86. The proceeds from the issuance of these bonds were allocated towards the renewal of the Moscow bus fleet and the acquisition of electric buses. It can be argued that those who purchased the bonds have already reaped the benefits of their investment. The manner in which the Moscow government disseminated information about this issue is worthy of note. This included the promotion of the issue in parks, the provision of information at bus stops and in the metro, and the presentation of information about the purpose of the funds in video clips and infographics. These resources enabled potential investors to gain insight into the intended direction of the funds.

Figure 9. Moscow city green bonds for households issue 2023



Source: composed by the author according to the info from https://greenbonds.moscow

4. Prospects of green finance development

In the context of social adaptation financing, two key concepts are the Taxonomy of Technological Sovereignty and the Structural Adaptation of the Economy. This document was adopted in 2023 in response to the challenges that emerged in 2022. The document outlines a number of projects that can be classified as both green and social. A banking regulation has been introduced which provides an incentive for investment in such projects. At the end of 2023, Russia approved a social taxonomy that defines the areas and criteria of social projects, approaches to the verification of funding instruments and stricter requirements for verifiers.

4.1. ESG loan market in Russia prospects

The bond market is a well-established and widely recognised financial instrument, making it a convenient point of reference. However, it is important to note that the ESG loan market also exists in Russia and is undergoing a gradual but steady development. The construction sector provides a useful case study, with two main types of ESG credit currently in operation: green mortgages and green project financing.

With regard to green mortgages, a working group chaired by the Bank of Russia is currently developing standards for mortgage lending, which will include a section on green mortgages. The methodological centre of the government plans to issue recommendations on green financing in construction, which will set out the criteria for green mortgages.

Two banks have already launched specialised products on the market that can be classified as green mortgages. DOM.RF has formed a programme of preferential project financing, initially operating in 39 subjects, with the goal of expanding to 61. The programme, which was formed at the expense of its own funds in the amount of 2, 26 billion rubles, offers preferential terms to qualifying developers. The programme enables developers in these regions to obtain financing with a subsidy of up to 5.5%, including up to 2% subsidy if the developers construct energy-efficient green buildings that meet quality criteria. This is one of the first instances of such support and green lending mechanisms.

In terms of lending, banks are likely to develop their own ESG product lines, taking into account risk assessment and sustainability goals.

4.2. Sustainable Digital financial assets (DFAs)

In addition to bonds, digital financial assets (DFAs) in sustainable development formats are gaining popularity. The issuance of sustainable development DFAs represents a significant step forward in the formation of innovative financial instruments in the Russian Federation. The sustainability DFA integrates refinancing not only of green building investments, but also of new property technologies. This is an ideal example of a new investment instrument that not only finances construction, but also its technological development.

LEGENDA has successfully completed Russia's inaugural sustainable development DFAs, with proceeds allocated for environmental and social initiatives. This has garnered significant interest from both large institutional investors and individuals, underscoring the growing prominence of the green agenda.

As part of the planned issuance of the CFA, all funds will be used for partial refinancing of previously incurred costs for the construction of energy-efficient residential apartment buildings with an energy efficiency class of at least A “very high”. These are six projects in St.

Petersburg and Moscow with an aggregate total area of 302,657 m2 under implementation as of the date of the CFA placement.

Furthermore, the funds will be used to refinance the costs of a set of works to build a multi-service communication network (MIS), a universal multi-purpose digital environment designed for centralised management of engineering networks and data transmission using IP technologies for apartment buildings.

The selected apartment buildings comply with the green project category and utilise heat, electricity and water saving technologies. They are equipped with an automatic system for the control and metering of resource consumption and an automated dispatching system as part of the MIS. Furthermore, the MSS elements comply with the green GOST R criteria for apartment buildings (see LEGENDA launches..).

5. Discussion: main benefits and barriers to market and ESG bond development in Russia

What benefits issuers of ESG bonds usually can accrue? We can note that there are number of them:

- Enhancement of business reputation with banks, development institutions and other counterparties, as well as ESG ratings,
- The issue will be attractive to investors, including individual investors interested in the climate agenda and other sustainable development issues, and the number of such customers is growing fast,
- The commitment to the principles of sustainable development will be confirmed by concrete projects through verified financial instruments.
- There may be state support measures for ESG projects after the regulation in Russa is upgraded.

All infrastructure for the development of sustainable financing and regulation is already in place and working. However, there are a number of limiting factors for development.

The most important is the lack of direct financial incentives. In the world, a certain discount is applied for the fact that an investor buys ESG bonds, which was formed, among other things, on the basis of investor demand and interest. Russia does not have this yet and it seems that the market expects certain support from the government or the Bank of Russia to a certain extent. Also it is necessary to expand ESG lending incentive programmes: subsidising coupons and interest payments, creation of special service conditions in the market infrastructure, tax incentives.

Other barriers to the development of green finance include:

- The lack of comprehension among companies, investors, and the general public regarding the fundamental principles and advantages of ESG financing constrains its growth. Especially it concerns Russian regions. ESG principles should be actively disseminated not only in the capital and large cities, but also in the regions.
- The prevailing economic uncertainty and sanctions have resulted in the prioritization of factors deemed more critical than sustainability.

- The discrepancy between Russia's carbon-based economy and the principles of ESG. Russia is endowed with considerable natural resources, and its economy has historically been oriented towards energy and natural resources.
- The problems of transparency and availability of information on ESG indicators. It is imperative that non-financial reporting be subjected to mandatory transparency in order to standardize data and facilitate comparisons at the national and international levels.

Nevertheless, for issuers even the absence of direct support is not always a limitation and placement of ESG-bonds is a good opportunity to show the quality of their own products, the quality of their own work. For example, for a financial institution, this is a loan portfolio, which the central bank also looks at in its recommendations on climate risks, plus a certain maturity, readiness to disclose more and more information about itself and what the organisation does in the field of environmental protection and climate issues.

Conclusion

The Russian market is developing at a rate of approximately 10 years behind that of the global market. Green bonds represent the majority of the Russian market and the global market as a whole. This is due to the detailed taxonomies of green projects in many countries, including Russia, and the ability to quantify the environmental effect.

The Russian market currently offers a range of targeted ESG bonds, but there is currently no availability of climate transition bonds, despite the fact that the securities issuance standards allow for the possibility of issuing such bonds. We believe this instrument may be of interest to large corporations that already have or are planning to adopt a climate strategy in the near future and already disclose a wide range of metrics in their non-financial reporting.

In light of global experience, it is clear that transparency is the key to the development of the ESG bond market and ESG finance in general. It is essential that issuers and their business models can be trusted. It is essential to combat greenwashing and ensure the transparent disclosure of non-financial metrics, tailored to the specificities of each business. Furthermore, the development of robust methodological approaches for assessing social and environmental impacts is vital.

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PROSPECTS AND PROBLEMS OF CENTRAL BANK DIGITAL CURRENCY IMPLEMENTATION IN BRICS COUNTRIES

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Abstract: *the peculiarities of the current economic situation in the world have given a strong impetus to the development of financial, monetary and trade associations outside the influence of the global West. The most striking example of such rapid development is the BRICS economic forum. By 2024, more than 20 countries have applied to join, which indicates the expansion of the forum and its growing economic potential. The first serious step of the BRICS countries will be the creation of a common digital currency of the cross-border digital payment system (Cross-Border CBDC). It is necessary to consider all factors and risks when developing such a large-scale project. In this article, we will look at examples of other pilot projects of similar purpose, what problems may arise during their implementation, and what threats may arise for BRICS member countries in case of careless implementation of a common digital currency.*

Keywords: *economic cooperation, integration, digital currency, Cross-Border concept*

JEL: *F15*

1. Introduction

BRICS is an informal group of states, initially consisting of Brazil, Russia, India, China and South Africa, from the English name of which the name of this organization is made up (Brazil, Russia, India, China, South African Republic). Now, in addition to the initial five, Egypt, Iran, the UAE and Ethiopia have joined the BRICS.

The goal of BRICS is mutually beneficial cooperation among all member countries and accelerating the transition of these countries from "developing" to "developed". And we can see the impact of the BRICS on the economies of these countries – since the formation of this group, the share of GDP of the participating countries in the world economy has

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increased by 10.2%, while the indicators of the G7 (Great Britain, Germany, France, Italy, Japan, the United States and Canada) have decreased by 9.2% [1]

It follows that the BRICS countries may soon reach the same level as the United States of the post war period – to exert influence on much of the global economy. With the introduction of the BRICS Pay system, the dollar may have a competitor for the title of world currency, and even if the BRICS currency does not displace the dollar, it will in any case undergo some changes to make itself more competitive.

This article will take a closer look at the concept of Cross-Border CBDC, its advantages and disadvantages, possible ways of implementation, obstacles faced by countries in its implementation, possible consequences of its implementation for both the BRICS countries and the global community, and other elements of this complex system.

2. CBDC Concept

CBDC (Central Bank Digital Currency) is digital money issued by the central bank of the state. This is the next step in the development of money – from gold to fiat cash, from fiat cash to fiat non-cash, and the final step is digital. [2]

The essence of digital money is that it is issued by a state bank, just like cash, and it is stored in virtual wallets. This allows the state to regulate monetary policy, curb inflation, reduce the cost of large capital transactions, and gain a foothold in the field of blockchain technologies.

Digital money is similar in concept to cryptocurrencies, but they have several important differences. While cryptocurrencies are volatile in most cases, due to the poorly regulated issuance, central bank digital currency is regulated by the bank that issues it. Cryptocurrencies are also anonymous as they are decentralized, while digital currency is the complete opposite, as it is stored in central bank wallets and all transactions using them take place on the state bank system.

At the time of writing, 3 states have implemented digital currency – these are the Bahamas, Nigeria, and 8 Eastern Caribbean states that are members of the Organization of Eastern Caribbean States.

The first state to introduce CBDC back in 2020 is the Commonwealth of the Bahamas, with a "sand dollar". [3] It is accessed through a mobile application, and the account is opened on the platform of the Bahamas Central Bank. The need for digital currency appeared due to the geographical location of the country - the Bahamas is an archipelago, and a fifth of the total population did not have bank accounts.

The first experience of introducing digital currency was not entirely successful. By 2022, less than 1% of all transactions were made with sand dollars, and only 24% of the country's total population had digital wallets. Also, not all sellers accept payment in digital currency, which only exacerbates its authority in the eyes of the country's population. [3]

The second country to adopt a digital currency in 2021 was Nigeria with the eNaira. The reason for the introduction was the clumsiness of paper money, which was used by about 40% of the population who did not have bank accounts. The digital currency was supposed to displace cash and become the main currency in the country.

A year after the launch of the program, 0.5% of the population had an application to access a digital wallet, which is typical of a pilot project in a country with a population of 200 million people. At the end of 2022, the Central Bank of Nigeria allowed citizens without bank accounts to open an e-wallet using a mobile phone, and cash withdrawals were limited, which led to an increase in the number of digital currency users. By 2023, about 6% of the country's population used eNaira, which is currently the largest number of users of a non-pilot digital currency project.

The eNaira project can be considered a kind of standard for the introduction of digital currency, the pros and cons of which should definitely be taken into account when developing the BRICS Pay system.

Table 1. Comparison of the key points of the e-currency projects of the central banks of the BRICS countries and Nigeria at the beginning of 2024

Country	China	Russia	UAE	India	Nigeria
Name	Electronic Yuan	Digital ruble	Digital Dirham	Digital Rupee	eNaira
Short description	The project was launched in 2014 to improve retail. The pilot was launched in 2021. In third place among retail CBDCs	Initiated on August 1, 2023. On August 15, 2023, the pilot was launched. It was attended by 13 banks, about 600 people and 30 entrepreneurs in 11 Russian cities.	The project is key in the change in the financial structure of the UAE	The Reserve Bank of India has launched a CBDC pilot, the digital rupee.	The project was launched by the central bank of Nigeria. The goals are to increase the financial inclusion of the population, stimulate transactions, ensure traceability, and increase security. In first place among retail CBDCs
CBDC Form and Technology Access	Retail-oriented using account technology for circulation	A retail CBDC that uses a distributed ledger	Wholesale CBDC Using a Distributed Ledger	Wholesale CBDC using a distributed ledger / wholesale system development	A retail CBDC that uses a distributed ledger
Simplicity	Yes	Yes	Yes	Yes	No
Transaction Limit	Absent	Absent	Absent	Absent	Yes, there are limits on daily transfers and account balance
Insurance and currency emission	Commercial banks are engaged in the emission of	Distribution with the participation of the state.	Distribution with the participation of the state.	The pilot project has not yet been launched.	The Central Bank of Nigeria will issue the eNaira and financial institutions will act as intermediaries

					between the central bank and customers.
Applications	Domestic payments Offline payments	Domestic payments, International Transactions	Domestic payments, International Transactions	Domestic payments, International Transactions	Domestic payments
Intermediaries	Commercial banks. Authorized Central Bank Operator	Commercial banks Authorized Central Bank Operator	Banks Regulated financial institutions, not Banks	Banks Regulated financial institutions, not Banks	Traders Government Agencies Financial institutions licensed by the state
Results and ways of development	Formation of models for the development of the financial system. Implementation of security and business support measures.	The pilot project of transnational payments has not yet ended.	The Central Bank of the UAE has announced the mBridge project in collaboration with the Bank for International Settlements, the Hong Kong Monetary Board, the Bank of Thailand, and the Digital Currency Institute of the People's Bank of China	Possible applications of CBDC in wholesale trade: international transactions, interbank loans, and credit services.	The CBN envisions the eNaira not as a replacement for the national currency, but as an addition that will secure and speed up transactions. A greater effect of social and monetary policy is also expected because of the introduction of digital currency.

3. Cross-Border CBDC Concept

The next logical stage in the introduction of digital money is the economic unification of states using one digital currency. This has one main advantage - the simplification of transactions between the two states. This allows two or more countries, between which there is a large trade turnover, to simplify the procedure for financial transactions and customs declaration, thereby stimulating trade between each other.

Unlike the state digital currency, the interstate digital currency is regulated by the central banks of the member countries of the economic union. This is a more costly process, as banks must coordinate their efforts to achieve the desired result. Also, the desired result may differ from state to state, which implies an even greater degree of integration of the economies of countries.

The first integrated interstate digital currency is DCash, used from March 2021 to January 2024 in the Eastern Caribbean among 8 states (Antigua and Barbuda, Grenada, Dominica, Saint Vincent and the Grenadines, Saint Kitts and Nevis, Saint Lucia, Anguilla, and Montserrat). By March 2023, fewer than 10 thousand people had taken part in the program, and this number of people does not gain even one percent of the population of the Eastern Caribbean Commonwealth. [4]

A much more successful implementation of Cross-Border CBDC is ABER, the digital currency of Saudi Arabia and the UAE. A pilot project was launched in 2019 and now this system is undergoing some changes for full implementation at the national level. [5]

The project was coordinated by the Central Bank of Saudi Arabia and the Central Bank of the UAE. Their goals were:

1. To analyze the system of distributed ledgers for effective communication between banks and persons across the border
2. Find a solution that does not use distributed ledgers in case of their incompetence
3. Experiment with the maintenance of the same currency by two banks
4. Compare ABER's experience with other digital money pilots

This project was divided into 3 phases – between central banks, between central banks and commercial banks, and finally between commercial banks. [5]

Also, a distinctive feature of the ABER project was its decentralization. This step was made to simplify communication between commercial banks - they could exchange digital currency even if there was no connection between them and the state central bank. In their report, central banks argue that a possible digital money system should be subjected to even more decentralization than was undertaken in their pilot testing.

In implementing the project at this level, central banks faced some obstacles.

1.Round-the-clock communication support between banks. Central banks have said that communication should be instant to pay interest, and more attention should be focused on this in the future.

2. Legal uncertainty. Commercial banks were concerned about the possibility of electronic transactions of money and their "completeness". In other words, which party was responsible for the transaction and what guarantors of the non-repayment of money could be presented by the state.

3. The project used real money, but falsified clients and transactions. This is permissible for trial projects, but the conditions created may be too "hothouse", and do not reflect the real pace of transactions between individuals and legal entities both within the country and between states.

4. Setting the boundaries of the currency and the size of transactions. The maximum and minimum values of transactions, as well as the value of the currency, were fixed. This made it possible to prevent a possible overload of the system, the collapse of the experiment along with the collapse of the digital currency and prevent risks.

As a result, ABER is a pioneer in the integration of digital currency on the territory of several states on a large scale. The report of the Central Banks of the UAE and Saudi Arabia ends with possible ways to develop the Cross-Border CBDC concept for other countries, such as multiple currencies, more accurate interest calculation paths, improved DvP, further decentralization, and more. [5]

4. BRICS PAY. Advantages for the participants.

BRICS PAY is a program designed to facilitate transactions between BRICS countries and for other countries wishing to participate in this program. [7] In fact, BRICS PAY is a CBDC created for operations in several countries. Also, the BRICS PAY system is open, which allows countries that are not part of the BRICS economic bloc to take part in it.

According to the plans, BRICS PAY is intended for 5 BRICS member countries. These countries are developing a common digital currency due to the high degree of economic integration. [8] For Russia, the BRICS countries account for more than 50% of exports and 47% of imports, for Brazil – about a third, for India – 37% of exports and 19% of imports, South Africa is engaged in capital-intensive production of services, and China is the largest economy in the world, importing many raw materials, including from the BRICS countries. Considering Russia alone, the volume of exports in 2022 is more than 408 billion US dollars. The introduction of a system to speed up and standardize financial transactions will play into the hands of all BRICS members. [9] [10]

Also, another incentive for the development of a common financial transaction system is economic security. The countries of the post-Soviet space, including Russia, still suffer from the shadow economy, as does Latin America. To prevent undeclared fraud between the BRICS countries, a common financial platform is being developed. Any transactions that are not made through the BRICS PAY system can be considered suspicious, which will greatly simplify the search and suppression of the shadow sector of the economy. Of course, BRICS PAY will not be a prerequisite for international transactions, but this system will be much simpler than the old method, which will attract all respectable participants in foreign economic activity and simplify the capture of international criminals. [11] [12]

Digital currency has not yet been implemented on such a scale. The BRICS have a population of 3 billion people, their GDP is 66 trillion US dollars, and the BRICS countries occupy a leading position in the world market. Also, the BRICS countries trade with other countries, not all of which are ready to accept the BRICS PAY system. [1]

5. Problems of introducing Cross-Border CBDC

The implementation of any digital currency system comes with several challenges. Edward Snowden in his article calls digital currency another step towards "crypto-fascism" and total state surveillance of its citizens. He argues that China's ban on bitcoin, a currency very similar in concept to digital currency, leaves the Chinese with no alternative but to trade through the state, as the state issues banknotes and digital currency. [13]

Snowden also notes that the introduction of CBDC will not affect the life of an ordinary person in any way, since the only thing that will change in his life is the ability to pay for goods and services by bank transfer, which is already in the hands of the people thanks to credit cards. A very small part of citizens will make transactions in the international market if we consider interstate digital money. CBDCs can also be directed against citizens of the state, for example,

the belated reaction of the suspicious transaction recognition system, which was supposed to stop, for example, the transfer of money into the hands of an illegal organization, recognized the money as suspicious only a month later, when it passed into the hands of a single mother. Or a sudden power outage in the place where the servers are located, where all the digital money of the state is stored. And while such events may not happen often, the more users the system has, the more attention you need to pay to seemingly unfortunate circumstances. Small flaws in the system, affecting, say, 1 person in a million, on a scale of 3 billion people, will be very noticeable. [13]

Implementing a CBDC system at the cross-national level also faces several challenges. Let's say we have an economic union N, which has managed to introduce a digital currency and actively uses it when trading with each other. The fact that Union N is not all-encompassing, which is a given of the modern world, companies within it will specialize in trading with the member countries of Union N, and the rest of the international community. This problem can only be solved by expanding this union, which is impossible in the current political and economic climate.

Table 2. Risks and benefits of implementing BRICS Pay for Member States

BRICS member-country	Advantages	Risks
Russia Federussia	Monitoring financial transactions, including the size and timing of loans and the financing of the security and social sectors, will minimize corruption and abuse by commercial banks	The introduction of a large-scale digital payment system under centralized control by the state greatly increases the risks of increasing monopolization of the financial system
Brazil	The introduction of an international digital currency will help to significantly facilitate and accelerate the flow of foreign trade operations, which will reduce the vulnerability of the Brazilian commodity market to external global fluctuations in this industry	With the implementation of a cross-border CBDC system, high levels of corruption and corruption scandals (such as the Lava Jato scandal) in Brazil will create problems for attracting foreign investment through this system
India	The cross-border CBDC system will significantly increase the efficiency of existing payment systems and the level of transaction control, which will solve the problem of private issuers ignoring social costs	A significant share of India's economy is shadow (up to 38% of the country's GDP), which threatens to send the share of transfers using the BRICS Pay system into the shadows
China	In the context of slowing economic growth due to trade wars and significant labor and financial losses after the COVID-19 pandemic, expanding financial inclusion and lowering transaction costs will rehabilitate and strengthen the economy	China has extremely tense trade relations with the EU countries and especially with the United States, and China's involvement in the development of BRICS Pay may be perceived as a political step, which could lead to a new round of trade wars with China
South Africa	CBDC will increase the efficiency and security of the payment system without going through a clearing house, which will reduce the risk of failure or attack on the centralized system of any bank, and this will stabilize and strengthen the financial system	The energy crisis in South Africa threatens the very existence of the BRICS Pay system in the country
Egypt	With dependence on food imports and vulnerability to fluctuations in world prices, lower transaction costs, and the absence of the vulnerability of a third intermediary country will stabilize the economic sector and speed up trade procedures	Egypt's integration into the BRICS is one of the country's top priorities due to the acute shortage of foreign investment, but due to its aspirations, Egypt does not pay enough attention to the structural problems of the economy, which contributes to the deterioration of the investment climate

Ethiopia	The international digital currency system will make it possible to control and provide short-term liquidity assistance to those in need, which will make it possible to solve the problem of the ever-growing debt burden and irrational distribution of the state budget	Ethiopia regularly faces budget deficits generated by high levels of public debt (the country's debt-to-GDP ratio is around 45%), which may simply prevent Ethiopia from consistently cooperating and trading with other BRICS countries through the forum's CBDC
Iran	The international digital currency system will make it possible to circumvent the record number of sanctions applied against it and create stable trade ties with new partners in order to successfully withstand the pressure of the geopolitical crisis in the region	The unstable political situation in the region and the deterioration of Iran's diplomatic relations with many countries will scare away foreign investors and prevent them from using the full potential of BRICS Pay
UAE	The international digital currency system will diversify exports and reduce the economy's dependence on the energy industry, which will stabilize the country's position in the global market	Due to the favorable investment climate in the UAE, there is very fierce competition in the market due to the number of entrepreneurs. The introduction of the BRICS Pay system will make it easier for foreign businessmen to enter the market, but at the same time it will further complicate the conditions for young and small companies to exist in the market
Saudi Arabia	The international digital currency system will allow it to occupy a stable niche in the global market and withstand growing competition between the countries of the region	Saudi Arabia's economy is heavily dependent on oil prices, as the country specializes in the production and export of oil. World oil prices are very volatile: the slightest fluctuations in exchange rates can seriously shake the economy of Saudi Arabia. BRICS aims to create not only a digital payment system, but also a common currency for BRICS member countries; Illiterate implementation of projects in the world market can cause significant harm to the Arab economy
Common for all member countries	Overall potential benefits	General potential risks
	The creation of the BRICS Pay system and the strengthening of trade ties between the member countries of the forum will allow sanctioned countries (Russia, China, Iran) to circumvent the imposed sanctions. BRICS Pay will also attract foreign capital and investment and diversify the economies of the member states.	There is a high probability that the forum will be politicized. Any types of interstate economic associations, integrations and organizations always carry the risk of losing the economic independence of the participating countries.

We sincerely believe that such an approach is incorrect, because for real development it is necessary to consider absolutely all factors and possible consequences, both negative and positive.

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FISCAL POLICIES AND POST-CRISIS RECOVERY IN CENTRAL AND EASTERN EUROPEAN COUNTREIS OF THE EUROPEAN UNION

Dimitar Chobanov[1]

Abstract:: *Fiscal policy is one of the most significant instruments to impact economies, address income inequality and stimulate economic activity during recessions or downturns. Using an indicator approach the fiscal policies of CEE countries which are EU members in 2003-2023 are studied. There are thresholds beyond which higher budget expenditures to GDP ratios lead to higher deficits and higher public debts to GDP which could affect negatively economic performance. Therefore, fiscal discipline is crucial for sustainable public finances and important factor for economic growth.*

Keywords: *Fiscal policy, prudent fiscal policy, budget deficit, public debt, CEE countries.*
JEL: *H62, H63, O52, O57*

1. Introduction

The role of fiscal policy in shaping economic outcomes has long been a subject of intense debate and research among economists and policymakers. Fiscal policy, which encompasses government spending, taxation, and public debt management, can have significant implications for economic growth, employment, inflation, and overall macroeconomic stability. Understanding the complex relationship between fiscal policy instruments and economic performance is crucial for the formulation of effective economic policies.

This paper aims to contribute to the ongoing discourse on the relationship between fiscal policy and economic performance by inserting specific objectives and research questions. The analysis will insert methodological approach to insert key focus areas, e.g., examine the non-linear effects of public debt on growth, investigate the role of fiscal rules and institutions, or analyze the differential impacts of domestic and external debt. The findings of this study will provide valuable insights for policymakers in insert relevant context, e.g., developing countries, transition economies, or a specific region as they navigate the complex landscape of fiscal policy and its implications for sustainable economic development.

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2. Literature Review

The optimal size of government is a subject of extensive debate among economists and policymakers, with various models and empirical studies attempting to identify the balance between government expenditure and economic growth. The concept often refers to the level of government spending that maximizes economic growth without leading to inefficiencies or excessive taxation.

Several papers exploring the relationship between government expenditure and economic growth suggest an optimal size of government around 30% of GDP. One of the foundational theories in this area is the Armey Curve, which posits that there is a non-linear relationship between government size and economic growth. According to this hypothesis[2], government spending can stimulate economic growth up to a certain point, after which additional spending may lead to diminishing returns or even negative effects on growth. This result has also been suggested in the analyses of Barro and Sala-i-Martin (1992), Glomm and Ravikumar (1994), Lau (1995), and Devarajan et al. (1996) among others.

Empirical studies have sought to quantify the optimal size of government in various contexts. Afonso and Schuknecht (2019) argue for a pragmatic approach to determining government size by analyzing efficient public expenditure across several advanced countries, emphasizing that the optimal size should be linked to the specific economic context of each country. They find that government expenditure in a range of 30-35% of GDP is still an optimal size for advanced countries.

Mittnik & Neumann (2003) highlight that an optimal, growth-maximizing government size exists, suggesting that public spending increases growth when below this optimum but decreases it when above. This nonlinearity is critical for understanding how government size impacts economic performance. Jain and Sinha Jain & Sinha (2022) estimate the optimal government size for India to be approximately 11.89% of GDP.

One notable example is the work by Chekouri et al. (2022) applying the threshold analysis for Algeria. It suggests that the optimal government size that maximizes economic growth is around 30.4% of GDP. Similarly, Adepoh (2019) identifies an optimal threshold for public expenditure at approximately 34.5% of GDP in Côte d'Ivoire. While above the 30% mark, this finding supports the notion that there exists a specific range of government expenditure that can positively influence economic growth before diminishing returns set in (Adepoh, 2019).

In the context of developing countries, Asogwa et al. (2019) explores the relationship between government size and economic growth in Nigeria and Ghana. Although they do not specify an exact percentage, their analysis contributes to the understanding of how government size impacts economic performance. The research by Alam et al. (2022) discusses the implications of reallocating government spending to optimize economic growth in Saudi Arabia. While it does not provide a specific percentage, it emphasizes the importance of maintaining government expenditure within a range that fosters growth, which aligns with the broader findings of optimal government size around 30% of GDP (Alam et al., 2022).

Asimakopoulos & Karavias (2016) employ a threshold analysis to examine the relationship between government size and economic growth, identifying that the optimal level of

[2] Also known as the nonlinearity hypothesis.

government size varies significantly across different countries and economic conditions. Their findings suggest that while a larger government can facilitate growth in some contexts, it may hinder it in others, reinforcing the idea that there is no one-size-fits-all solution to determining optimal government size.

The debate is further complicated by considerations of fiscal competition and the efficiency of public service delivery. Hoang (2022) discusses how fiscal competition among states can influence government size, suggesting that the optimal size may also depend on the ability of governments to attract residents and businesses through efficient service delivery and competitive taxation. The optimum size might be affected by population but also by a state's main industry, zoning policies, and financial resources that the government can draw on to support its provision of public goods and other amenities (Hoang, 2022).

In addition to economic growth, the composition of government spending plays a crucial role in determining its optimal size. Martins and Veiga Martins & Veiga (2014) emphasize that the relationship between government size and economic development is nuanced, as different types of public expenditure (e.g., on education, infrastructure, or welfare) can have varying impacts on growth. This highlights the importance of not only the size of government but also the effectiveness and efficiency of its spending.

Furthermore, the optimal size of government can be influenced by external factors such as demographic changes, technological advancements, and global economic conditions. Ullah et al. Ullah et al. (2021) examine how regional integration and socioeconomic determinants affect government size in the context of the Belt and Road Initiative, suggesting that optimal government size may need to adapt to changing global dynamics.

Various theoretical frameworks and empirical studies have explored how government expenditure impacts budgetary outcomes, including deficits and surpluses. This relationship is often influenced by factors such as fiscal rules, economic conditions, and political dynamics.

The concept of balanced budget requirements (BBRs) mandates that governments do not spend more than their revenues. Smith and Hou (2013) highlights that BBRs are a defining feature of state and local government budgeting, emphasizing that government budgets ought to be balanced. Their study indicates that BBRs can constrain government spending, thereby influencing the overall budget balance. When governments are required to balance their budgets, they may be less inclined to engage in deficit spending, which can lead to more prudent fiscal policies.

Ghosh and Mourmouras (2004) discusses the implications of different budgetary regimes on government spending and economic growth. They argue that when access to debt markets is available allowing public borrowing, governments may be more inclined to increase spending, potentially leading to budget deficits. Hence, the structure of fiscal rules plays a crucial role in determining the relationship between government spending and budget balance. When fiscal discipline is enforced, it can lead to a more stable budgetary environment, whereas lax rules may encourage excessive spending and deficits.

The role of political institutions in shaping budgetary outcomes is also significant. Haan et al. (2012) examines how budgetary institutions affect government budget deficits in EU member states. Their findings indicate that stronger budgetary institutions can mitigate the common pool problem, where multiple stakeholders have access to a shared budget, leading to overspending.

This highlights the importance of institutional frameworks in managing the relationship between government spending and budget balance.

Fiscal discipline is also crucial in understanding how government spending impacts budgetary outcomes. Neyaptı and Ozgur (2007) proposes criteria to measure fiscal discipline and demonstrate a significant empirical linkage between fiscal discipline and budgetary outcomes in OECD economies. Their research suggests that maintaining fiscal discipline can help governments achieve better budgetary balance, as it encourages responsible spending practices.

Furthermore, the political dynamics surrounding budgetary decisions can influence spending patterns and budget balance. For example, Jimenez (2018) discusses how excessive spending and debt can lead to budgetary imbalances, particularly when there is no corresponding increase in revenues. This relationship underscores the need for governments to carefully consider their spending decisions in the context of their revenue-generating capabilities.

The relationship between budget deficits and public debt addresses how government borrowing to cover deficits can lead to increased levels of public debt. This relationship is often characterized by a cyclical pattern where persistent budget deficits contribute to rising public debt, which in turn can affect future fiscal sustainability and economic growth.

One of the key findings in the literature is that an increase in the budget deficit typically leads to a corresponding increase in public debt. In Halebić & Moćević (2020) this relationship is confirmed, stating that an increase in the total deficit has a positive effect on total public debt. Their analysis of subnational government levels in Bosnia and Herzegovina illustrates how deficits necessitate borrowing, thereby increasing the overall debt burden.

Similarly, Van et al. (2020) discusses how budget deficits can limit economic productivity and create a crowding-out effect, where government borrowing competes with private sector investment. According to the study persistent budget deficits threaten future economic stability by increasing public and external debt and debt servicing costs, which can further exacerbate the fiscal situation. This highlights the interconnectedness between budget deficits and public debt, where deficits lead to higher debt levels, which in turn can constrain future fiscal policy options.

In the context of developing countries, Nauman (2024) emphasizes the adverse connection between debt servicing and budget deficits. This study indicates that rising inflation can increase budget deficits, which in turn necessitates further borrowing, leading to a cycle of increasing public debt. This relationship is critical for understanding the fiscal dynamics in countries with limited economic resilience.

Khan et al. (2021) provides additional evidence that budget deficits, measured as a percentage of GDP, have a significant positive impact on public debt in the long run. Their analysis of South Asian countries underscores the importance of monitoring budgetary practices to ensure that deficits do not lead to unsustainable levels of debt.

The relationship between the public debt-to-GDP ratio and economic growth provides insights into how different levels of public debt can influence growth trajectories. The consensus in the literature suggests that while moderate levels of public debt can support economic growth, excessive debt can have detrimental effects.

One of the key findings is that there exists a threshold level of public debt beyond which economic growth begins to decline. Alshammary et al. (2020) conducted a panel threshold

analysis for 20 MENA countries and found that there is a specific debt-to-GDP threshold that significantly impacts economic growth and when public debt exceeds this threshold, the negative effects on growth become pronounced, highlighting the importance of maintaining debt levels within sustainable limits.

Munir et al. (2016) identifies a threshold value of approximately 52.66% of GDP in Malaysia, suggesting that public debt levels above this point could hinder economic growth. This finding aligns with the broader literature that suggests a range of 60-90% of GDP as a common threshold where public debt starts to adversely affect economic performance (Asteriou et al., 2020).

The relationship between public debt and economic growth is influenced by various factors, including the structure of the debt, the economic context, and how the borrowed funds are utilized. One of the primary mechanisms through which public debt adversely affects economic growth is the crowding-out effect. As public debt increases, the government may need to raise funds through taxation or borrowing, which can lead to higher interest rates. Higher interest rates can discourage private investment as businesses face increased costs of borrowing. This phenomenon is particularly evident in developing economies, where limited access to capital can exacerbate the negative impact of public debt on growth Musa et al. (2023).

The cost of servicing public debt can divert resources away from productive investments. When a significant portion of government revenue is allocated to interest payments, there is less available for essential services such as education, healthcare, and infrastructure development, which are critical for long-term economic growth. Kadia (2020) emphasizes that while public debt can have a negative effect on economic growth, this impact is contingent upon the cost of the debt and how it is utilized. If debt is used for productive investments, it may not jeopardize the economy; however, if it leads to increased taxes or reduced public spending, the adverse effects become more pronounced.

The empirical evidence also supports the notion that high levels of public debt can lead to lower economic growth rates. For example, Fseifes and Warrad (2020) found that external debt has a negative impact on economic growth in Jordan, while domestic debt can have a positive effect. This suggests that the composition of public debt matters; excessive reliance on external debt can create vulnerabilities that hinder economic performance. Similarly, the work of Alshammary et al. (2020) indicates that chronic fiscal deficits, which contribute to rising public debt, can significantly affect growth prospects in the MENA region.

Additionally, the relationship between public debt and economic growth can exhibit nonlinear characteristics. Research has shown that there is often a threshold level of public debt beyond which growth begins to decline. For instance, studies have indicated that when the debt-to-GDP ratio exceeds 90%, the negative effects on growth become more pronounced (Ogawa et al., 2016; Thakur, 2022). This threshold effect highlights the importance of maintaining public debt at sustainable levels to avoid adverse economic consequences.

Furthermore, the impact of public debt on economic growth can vary across different countries and contexts. For instance, while some studies find that public debt has a negative effect on growth in advanced economies, others suggest that developing countries may experience different dynamics due to their unique economic structures and challenges (Veiga et al., 2015; Sigue & Coulibaly, 2020). The findings of Jiménez-Rodríguez and Rodríguez-López Jiménez-Rodríguez & Rodríguez-López (2015) support this notion, as they found that higher levels of debt-to-GDP ratios negatively impact growth across various European countries.

In contrast, some studies have reported a positive relationship between public debt and economic growth, particularly in developing countries. For example, Priyadarshana (2019) finds that public debt could stimulate growth through investments in infrastructure and social programs, suggesting that the impact of debt on growth can be context-dependent. Fseifes and Warrad (2020) points that, the structure of public debt—whether domestic or external—can also influence growth.

Moreover, the work of Jiménez-Rodríguez and Rodríguez-López (2015) highlights the complexity of the relationship, noting that while high levels of debt (around 90-100% of GDP) are generally associated with lower growth, there are instances where debt can be beneficial if it is directed towards productive investments. This suggests that the impact of public debt on growth is not solely determined by the debt-to-GDP ratio but also by how the borrowed funds are utilized.

The findings of Mensah et al. (2019) further illustrate this complexity, as they report that advanced countries with debt-to-GDP ratios above 90% tend to experience negative growth effects, while developing countries may exhibit different trends. This indicates that the relationship between public debt and economic growth is influenced by a variety of factors, including the economic context, the purpose of the debt, and the overall fiscal environment.

3. Data and methodology

The selected approach in the study consists in tracking the dynamics of selected indicators characterizing fiscal policy and public finances - these are budget balance as a share of gross domestic product (GDP), government debt as a share of GDP, budget expenditures as a share of GDP, budget revenues as a share of GDP. On this basis, average values are calculated for the periods when most of the selected economies are not in recession or financial crisis, as well as for the whole period considered.

Another set of indicators characterise economic development - real GDP growth, real growth in individual household consumption, convergence in terms of purchasing power parity of per capita income relative to the EU average, convergence of per capita household consumption expenditure by purchasing power standard relative to the EU average.

The study covers the European Union (EU) member countries and are located in Central and Eastern Europe. They are Bulgaria, the Czech Republic, Estonia, Greece, Croatia, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland, Romania, Slovenia and Slovakia. The period of the study is from 2003 to 2023. These years are chosen because 2003 is the last year before the majority of the selected countries join the EU, while 2023 is the last year for which statistics data are currently available. The source of the data used is Eurostat and for some indicators additional calculations have been made by the author.

On the basis of the review of theoretical and empirical literature on the topic, numerical criteria are defined for the selected indicators, which allows grouping them in order to assess the fiscal policies implemented during the period and their impact on economic growth and convergence of some indicators.

For some indicators, annual averages have been prepared to allow comparison of individual periods of different lengths. The focus is on post-crisis periods, as stabilisation policies are generally associated with higher expenditure, budget deficits and government debts.

Classification according to the budget balance to GDP indicator is as follows: positive balance, balanced budget, low deficit - up to 1% of GDP, medium deficit is between 1% and 3% of GDP, high deficit is between 3% and 6% of GDP and very high deficit is above 6% of GDP.

Classification according to the budget expenditure-to-GDP indicator is as follows: a low share of expenditure is up to 35% of GDP and according to the literature review, beyond this threshold, any increase contributes to inefficiencies and adversely affects economic growth. A medium expenditure share is between 35% and 40% of GDP, a high expenditure share is between 40% and 45% of GDP and a very high expenditure share is above 45% of GDP.

Suggested classification of government debt to GDP is as follows - low share is up to 40% of GDP, medium share is between 40% and 60% of GDP, high share is between 60% and 90% of GDP, very high share is above 90% of GDP. The 60% of GDP threshold is officially established by the European framework, while the 90% of GDP is based on the results of the literature review. The approach is similar for indicators of changes in the public debt-to-GDP ratio.

Classification according to the indicator of real annual economic growth is as follows: negative growth, low growth rate is between 0% and 1% per annum, moderate growth rate is between 1% and 2.5% per annum, medium growth rate is between 2.5% and 3.5% per annum, high growth rate is between 3.5% and 4.5% per annum and very high is above 4.5% per annum. Similar is the classification according to the real growth rate of individual consumption.

Economies are classified according to speed of convergence indicators in terms of purchasing power of income per capita relative to the EU average and in terms of purchasing power of individual household consumption expenditure per capita relative to the EU average. In this way, it is possible to correlate the assessment of fiscal policy with economic performance.

4. Results

4.1. Period between 2003 and 2008

The first period in the study is 2004-2008. It is characterised by high real growth of GDP, which for the EU averages 2.3% per year. In 2004, the Czech Republic, Estonia, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland, Slovenia and Slovakia became members of the European Union and were later followed by Bulgaria and Romania in 2007, while Greece had already been a member of both the EU and the euro area. Slovenia has been a member of the euro area since 2007 and Cyprus and Malta since 2008.

During this period there were record flows of direct, portfolio and other investment from the EU to CEE countries. These countries also had access to pre-accession instruments and EU funds. All this, together with trade integration in the EU and improved legislative frameworks, gave a strong impetus to increased economic activity in these countries.

The best performers were Bulgaria, the Czech Republic, Estonia, Latvia, Lithuania, Poland, Romania, Slovenia and Slovakia, where the average annual rate was above 5%. Latvia even recorded double-digit growth in 3 consecutive years. However, the global financial crisis affected Estonia and Latvia more rapidly and this lowered their average growth rate. Greece, Hungary and Malta had the lowest but still close to 3% economic growth rates.

According to the selected indicator of convergence, Romania, Estonia, Slovakia, Latvia and Lithuania performed best compared to the EU average, catching up more than 10 percentage

points (p.p.) of their lag according to purchasing power parity. While the worst performers were Malta and Greece, where there was a divergence, and Hungary, which catched up only 1.1 p.p. over the period. Cyprus[3] , Romania, Lithuania, Slovakia, Estonia narrowed their gap by more than 15 p.p. according to the purchasing power of consumption expenditure per household per person, while Hungary and Malta fell further behind and Slovenia narrowed the gap by only 0.7 p.p.

These successes were based on different approaches to fiscal policy. According to one of my hypotheses in the literature review, budget expenditure is a key factor that determines the size of the budget balance. Bulgaria, Estonia, Latvia, Lithuania, Romania and Slovakia had the lowest expenditure-to-GDP ratios. In all other countries these ratios exceeded 40% of GDP, with the highest ratios in Greece, Croatia, Hungary and Slovenia.

The best performers in terms of budget balance indicator were Bulgaria and Estonia, where it was positive in 2004-2008. In Estonia, there was a shift from surplus to deficit in 2008, both because of the impact of the crisis and because of the fiscal policy response, as there was a currency board in place during this period which did not allow for a significant monetary policy response. Only Cyprus had a deficit below 1% of GDP, while it was between 1% and 3% in the Czech Republic, Latvia, Lithuania, Romania, Slovenia and Slovakia. Greece and Hungary had very high deficits in this period of high economic growth, while Poland and Malta had high deficits.

The consequences of implemented fiscal policies in the long run are visible especially in the government debt-to-GDP ratio. Decreases of more than 15 p.p. were observed in Bulgaria, Cyprus and Slovakia, while smaller decreases were observed in Lithuania, Malta, Romania and Slovenia. Increases in the ratio were realized in Greece, Latvia and Hungary.

Overall, Bulgaria, Estonia, Latvia, Lithuania, Romania and Slovakia performed best during this period in terms of economic growth and fiscal discipline indicators. The worst performers were Greece, Hungary and to some extent Malta.

4.2. Central and Eastern European countries in 2009-1010

As early as 2007, signs of impending turmoil began to emerge in the financial markets, but they actually manifested themselves in the fall of 2008, when the Merrill-Lynch bankruptcy occurred. The subprime crisis broke out first in the United States, but quickly spread to Europe due to mutual credit exposures. In addition to financial problems, there had been an overheating of many economies due to fiscal and, above all, monetary expansion over an extended period of time. One of the consequences of this crisis has been a sharp fall in capital flows, which have not recovered since.

The crisis of 2009 has had very different effects on different economies. Poland was undoubtedly doing the best, not only as there was not economic decline, but even real GDP growth was 2.6%. This development allowed the convergence in terms of purchasing power of income vis-à-vis the EU to reach 3.5 p.p. and 2.3% in terms of purchasing power of consumer spending vis-à-vis the EU average. Smaller declines were present in Malta, Cyprus, while in

[3] Actually, with Cyprus it is a question of divergence from the EU average, because this country has previously overtaken the EU on this indicator.

Slovakia the contraction was more severe, but together with the former they managed to recover and even in 2010 they already exceeded the 2008 level of real GDP.

The strongest negative impact was observed in Estonia, Latvia and Lithuania[4], which recorded double-digit declines, and this was probably a sign of unsustainable growth in the previous period. The largest lags in purchasing power parity of incomes relative to the EU average were occurring in Greece, Slovenia, Cyprus, Latvia and Estonia.

The lowest deficits in 2009-2010 were realized in Estonia, but they were clearly not enough to provide a budgetary impulse to the economy and support it by offsetting the decline in private investment. Malta was an example of a good handling of this crisis, as it managed with a relatively small fiscal stimulus during this period to contain the shock and narrow the deficit to below 3% of GDP already in 2010.

The highest deficits were in Greece, where policy was based on very high deficits even before the crisis and the necessary fiscal measures contributed to further policy loosening, which has been unsuccessful in terms of economic performance. Other negative examples were Latvia and Romania, which despite easing failed to prevent a downturn or to adjust more quickly. The measures taken by Poland were also large-scale, but had the desired effect.

Poland also ranked among the best-performing countries in terms of increase in government debt-to-GDP ratio, along with Bulgaria, Malta, the Czech Republic and Hungary. Due to its more cautious budget deficit policy, Estonia was also among the countries with the smallest increase in this ratio, but this proved an unsuccessful policy in this case.

4.3. The period 2011-2018 - economic growth slowdown

The global financial crisis and the Great Recession were the trigger that later launched the eurozone debt crisis. The two countries most affected, which are the subject of this study, were Greece and Cyprus. Of course, there were repercussions in almost all the countries on the list.

Problems in the banking systems have contributed to a significant slowdown in lending, compounded by a decline in financial flows. Previously realized surpluses on the financial accounts shrank considerably along with direct investment. Economic activity slowed, which translated into lower real GDP growth and a slower rate of inflation.

The best performer in terms of average annual real GDP growth over the period was Malta, which stand out sharply from all other countries in the aggregate. One of the reasons for this is the significantly smaller size of the economy and also to some extent its geographical remoteness. Lithuania, Poland, Romania, Estonia and Latvia also performed relatively well.

Only in Greece there was a decline in real GDP in 2019 compared to 2011. The lowest but still positive growth rate was recorded in Cyprus and Croatia. The latter joined the EU in 2013 and had the opportunity to benefit from various instruments, but this did not help it much. It should also benefit from the harmonization of its legislation with that of the EU, which gives certainty to potential investors.

The greatest convergence of purchasing power of per capita income was in Lithuania, Malta, Romania, Latvia and Estonia. A serious lag was observed in Greece, while a slight lag was

[4] Which are small and very open economies.

observed in Slovakia. The reasons for the latter can be found in the conversion rate of the Slovak koruna against the euro, as it took place in a period of appreciation of almost all currencies in the region against the euro, but in the case of the koruna the adjustment was not been able to take place because of euro area participation.

A balanced budget was in place in Estonia during the period, continuing the fiscal discipline that characterized the previous growth period. Bulgaria, the Czech Republic and Malta had low budget deficits. Latvia, Lithuania, Hungary, Poland, Romania and Slovakia had medium deficits. High deficits characterized the remaining countries, with the highest deficit in Greece.

In fact, a number of reforms aimed at fiscal consolidation had been undertaken in Greece since the debt crisis. As a result, even positive budget balances were invariably achieved in the period 2016-2019 until the crisis. However, the social cost of these reforms was too high. Problems were also characteristic of public finances in Romania, where it was even the case that public sector wage payments were delayed in certain months because their growth was too high.

The policy implications for the deficit were reflected in the change in government debt-to-GDP ratios. The fiscal discipline, which were implemented then, together with high economic growth, allowed Malta to achieve the largest debt-to-GDP contraction. This was also the case in Hungary, the Czech Republic, Latvia and Poland. The largest increases in debt were recorded in Cyprus because of the local crisis and in Slovenia, probably because of weak growth and persistent deficits, and these policies have been influenced by euro area membership. The increase in the ratio in Greece was not as large, but in 2018 it reached the then EU and euro area record of 189% of GDP. At the same time, Greece was assisted by the voluntary waiver of part of the payments by some investors on the nominal amount of some bonds as a means of resolving the crisis that the public finances of that country were caught in.

4.4. COVID-19 crisis 2020-2021

In late 2019 and early 2020, the first cases of COVID-19 virus were reported in Europe. EU countries took coordinated countermeasures by restricting cross-border trade and travelling, obligations to wear masks, and mandatory testing, closing certain businesses such as restaurants, etc. This therefore resulted in a severe supply shock as international production and supply chains for raw materials and finished products were disrupted. There was also an effect on demand, which focused on specific products at the expense of consumer durables.

One of the anti-crisis measures that was adopted at EU level was subsidizing employers to maintain the number of employees, which supported inflexible labour markets in most of the countries considered. This measure was generally successful despite insufficient controls, which meant that non-compliant enterprises also received funds.

The highest average economic growth during this crisis period was realized in Malta, Cyprus and Lithuania. Only the economies of the Czech Republic and Greece failed to recover to pre-crisis levels of GDP in 2021, while the others experienced positive average annual growth over the period under review. Only Lithuania's economy did not shrink in real terms in 2020, and Greece was the most hardly hit by the shock due to its dependence on transport and tourism, which were almost entirely blocked.

The biggest catch-up in terms of purchasing power parity of income to the EU average was in Poland, Malta, Lithuania and Bulgaria. Only in Greece the difference was further behind.

During this period, no country was too strict on the budget deficit and there was a derogation from the EU rule. Bulgaria, Estonia, Cyprus and Lithuania had the lowest deficits. The highest deficits were in Greece, Romania, Malta and Hungary. This crisis allowed Greece to return to loose fiscal policies after 4 consecutive years of discipline. In the case of Romania, an excessive deficit procedure has been initiated for non-compliance with fiscal rules, but it has been temporarily suspended due to the general derogation.

The most disciplined in terms of the change in government debt to GDP were Bulgaria and Cyprus, where it rose by only about 4 p.p. The Czech Republic, Greece, Hungary, Malta, Romania and Slovakia tried the largest increases over the 2-year period, with double-digit changes.

The overall performance during the crisis was best in Bulgaria, Estonia, Cyprus, Lithuania and Poland, while in the Czech Republic, Greece, Hungary and Romania the economic growth achieved was not in line with the too large fiscal stimulus through deficits and debts. However, the crisis and the response to it resulted in a significant increase in the ratio of government expenditure to GDP. However, the continuation of this policy after the crisis has been overcome contributed to serious problems.

4.5. The period 2021-2023

This period saw the highest inflation since the euro area had been created. It is a consequence of too much fiscal and monetary stimuli because of the previous crisis. In addition, since the beginning of its mandate, the EU Commission, led by von der Leyen, took measures to accelerate the green transition and to a policy of zero net emissions by 2050. It therefore became necessary to apply subsidies to energy-intensive industries and to invest urgently in infrastructure for liquefied natural gas, which should replace that received through pipelines.

The post-crisis performance was partly affected by the incomplete recovery of some economies, which led to higher-than-average real GDP growth rates in some of them. Croatia, Cyprus, Malta and Greece had the best performance. However, the crisis in Estonia continued and only in this country there was a decline in the level of GDP compared to the base year. Growth was relatively low in the Czech Republic, Latvia, Lithuania, Hungary and Slovakia.

Croatia was a more interesting example because it is the country that was the last to join the euro area and this happened in 2023. However, the preparations for this process boosted economic activity and had an impact on increase of inflation rate, which became the highest in the euro area and among the highest in the EU as a whole.

The narrowing of the gap in the purchasing power of income vis-à-vis the EU was most significant in Poland, Malta, Lithuania and Bulgaria. Greece continued to move away from the EU average over this period. Convergence was slowest in the Czech Republic, Slovenia, Hungary and Latvia.

This period was characterized by a higher redistribution of GDP through the state budget, as expressed by budget expenditure in the EU and the EA as a whole. Croatia, Cyprus, Hungary, Malta and Slovenia registered lower ratios than the average for the period 2003-2023, while all others showed an increasing ratio, with the highest ratios in Bulgaria, Estonia, Latvia, Romania and Slovakia. That is, even countries that in previous periods pursued a policy of austerity succumbed to the desire for fiscal loosening after the latest crisis.

This resulted in budget deficits in all countries in the set. Estonia and Bulgaria had low deficits, while the Czech Republic, Cyprus, Latvia, Lithuania and Malta had medium deficits, but closer to the 3% of GDP limit, In all the others there were high deficits and in Greece it was very high.

High inflation in 2022 and 2023 had a downward impact on the government debt-to-GDP ratio in the EU and the euro area as a whole, as well as in most countries in this study. The largest reduction was realized in Greece due to its high base, and also in Cyprus and Croatia. Estonia, the Czech Republic and Romania failed to benefit because of economic problems in the former two and because of too loose policies in the latter.

The overall performance over the period was best in Cyprus and Croatia, where fiscal stimuli had the expected effect on their economies. In most of the other economies, such as Hungary, Romania, Slovakia and Latvia, the performance did not match the stimulus. In Estonia, the direct impact of the war in Ukraine prevented better results.

Overall, over the period 2003-2023, Bulgaria, Estonia and Malta performed best in terms of the trade-off between fiscal discipline and economic growth. Logically, Greece performed worst, followed by Hungary and Croatia. In terms of longer-term indicators, such as convergence according to purchasing power parity of per capita income and the change in government debt-to-GDP ratios, good performance was observed in Bulgaria, Malta, Lithuania, Poland and Romania, while Greece and Slovenia, which started from the highest base and have been euro area members for the longest time, performed relatively worse.

5. Conclusion

The optimal size of government is a complex and multifaceted issue that cannot be easily defined. It is influenced by a variety of factors, including economic conditions, the nature of public spending, and external pressures. The prevailing consensus among researchers is that there exists an optimal range of government size that can promote economic growth, but this range varies significantly across different contexts and requires careful consideration of local conditions and needs.

Furthermore, the relationship between government spending and budget balance is complex and influenced by various factors, including fiscal rules, political institutions, and economic conditions. Studies indicate that maintaining fiscal discipline and adhering to balanced budget requirements can help governments achieve better budgetary outcomes. Conversely, lax fiscal rules and excessive spending can lead to budget deficits and imbalances, highlighting the importance of prudent fiscal management.

The relationship between budget deficits and public debt is characterized by a cyclical dynamic where increasing deficits lead to higher levels of public debt. This relationship is influenced by various factors, including inflation, economic productivity, and external borrowing costs. The literature consistently highlights the importance of maintaining fiscal discipline to prevent unsustainable debt accumulation, which can have long-term implications for economic stability and growth.

On the other hand, the relationship between public debt and economic growth is complex and multifaceted. While public debt can play a role in financing growth-enhancing investments, excessive levels of debt generally lead to adverse economic outcomes. The crowding-out effect, the diversion of resources to debt servicing, and the existence of threshold levels all contribute

to the negative impact of public debt on economic growth. Policymakers must carefully consider these dynamics to ensure that public debt remains at sustainable levels that support, rather than hinder, economic development.

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DETERMINING THE COST OF EQUITY IN THE DEVELOPING STOCK MARKET OF BULGARIA: UP-TO-DATE APPROACHES AND METHODS

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Abstract

This research is focused on one of the most problematic and debatable aspects of financial management – the estimation of the cost of equity capital on the developing stock market of Bulgaria. Each of the available methods has its own serious disadvantages and limitations, which casts doubt on the reliability and validity of the determined cost of equity. At this stage, no method has yet been proven to derive a cost of equity with sufficient certainty to achieve consensus among analysts, managers, investors and academics. This paper explores briefly the disadvantages and limitations of each of the methods, especially in the context of their use at emerging capital markets. The possibilities for finding a solution are sought mainly in improving the application of the Capital Asset Pricing Model (CAPM), as the most widely used in practice. The open issues, related to each of the input variables of the model are analyzed, with focus on the equity risk premium (ERM), mainly from the perspective of emerging and developing stock markets. At the end, a combined approach for determining the cost of equity at the Bulgarian stock market is discussed and proposed.

Keywords: *cost of equity, risk-free rate, market risk premium, capital asset pricing model (CAPM).*

JEL: G12, G15, G31

1. Introduction

This article builds upon earlier studies of the authors on the estimation of the cost of equity in developed and emerging stock markets. An essential part of one previous research involves the comparative analysis of the existing methods for determining the cost of equity, with the

hope of highlighting the most durable of them and its eventual application to the emerging Bulgarian capital market (Nenkov, Miteva-Boncheva, 2018). The current study focuses on the opportunities to use the existing instruments for estimating in practice the cost of equity on the Bulgarian developing stock market.

The cost of equity is, may be, the most debated issue in the field of financial management of companies, as well as in the field of the stock markets around the world. *One of the reasons* for this is that it is of extreme importance for the decision making process in the management of company finance. The cost of equity (cost of common-stock financing) is essentially the minimum *required rate of return (RRR$_E$)* by common stockholders, based on their judgment about the degree of risk, associated with their investments. This RRR$_E$ itself sets the *discount rate* applied to future cash flows from investments in common stock or other assets with a comparable level of risk. In other words, if we learn to determine the required rate of return on common stocks, we will be able to determine the RRR and the discount rate for any investment, regardless of whether it is in financial or real assets. *The other reason* for the debates on the cost of equity is that history does not know about any consensus related to the true cost of equity. The continuing discussions refer to both the methods applied in estimating the cost of equity and the specific determined values in the different cases. It can be concluded that determining the cost of equity is a task of increased difficulty.

Among the methods for determining the cost of equity capital (R$_E$ or RRR$_E$), those that follow *the risk-adjusted rate of return approach* prevail. This is explained by the fact that in this case we are looking for a required rate of return on risky investments. Modern theory and practice of financial management offer different methods for determining RRR$_E$, so that it reflects the degree of risk of investments. There are different classifications of the approaches and methods (Brigham, Gapenski, 1994; Zukin, 1990). According to James Zukin, four main methods are applied to determine the required rate of return (Zukin, 1990):

1. Buildup method (approach);
2. Yield-plus-growth method;
3. Capital Asset Pricing Model (CAPM);
4. Arbitrage Pricing Theory (APT).

A logical question is why there are more methods. Is one method not enough? Isn't there one single method more reasonable for analysts, managers and investors to navigate? The truth is that none of the above methods is reliable enough to derive and justify the true cost of equity. Each has significant disadvantages that put in doubt the required rate of return on common

stock they determine. This is one of the most important reasons for the difficulties in determining the cost of equity, mentioned above.

The current study briefly introduces into the main features of each of the methods and focuses on their weaknesses and open issues, related to their application in practice. Special attention is given to the validity of the input variables of those methods and models that are perceived and recommended as more robust. New, derivative models and variants of some of the above four methods are also presented in brief.

2. Problems with the practical use of the existing methods for determining the cost of equity

The detailed presentation of the various methods is made in numerous publications on the subject, including publications by the authors of the present study. Here we pay attention mainly to the open issues and disadvantages, related to their application in practice.

Build-up method (approach)

The first method is **"bond yield plus risk premium"**, known in other sources as **the "build-up method"**. In this method, some risk premium is added to the rate of a low-risk security to obtain the required rate for the corresponding risky security (Zukin, 1990).

The main *disadvantages* of the method are that:

- It requires *subjective judgment* as to the amount of the firm's added risk premium;
- The premiums used based on the published data are *historical* and are used as indicators for the future;
- It excludes the influence of other factors that, according to arbitrage pricing theory, for example, are important and should be taken into account.

Ultimately, *the build-up method* is unable to offer a well-founded risk premium. As a rule, it is subjectively determined, and therefore is not recommended for use in the analysis and evaluation of serious investments.

Yield plus growth method

The yield plus growth method is also known as the ***discounted cash flow (DCF)*** *method*. The assumption is that at the equilibrium price of the common stock P_0, in the long-term, the actual rate of return (R_E) as an average value, should be equal to the required rate of return from stocks (RRR_E). Thus, knowing the price per share (P_0), and having the reason to accept it as equilibrium price, we can calculate RRR_E based on a model, derived from the *discounted dividend model (DDM)*, where R_E (i.e. RRR_E) is the unknown variable. The DDM itself is a

variant of the DCF model. When expecting a constant annual growth rate of dividends - **g**, the DDM model takes the form:

$$P_0 = \frac{DIV_1}{R_E - g}$$

Where:

P_0 = current market price per share of stock,

DIV_1 = expected dividend at the end of year 1,

R_E = expected rate of return on the stock,

g = expected long-term average growth rate of dividends.

Provided an equilibrium price (P_0) on the market, the derivative formula of the *yield plus growth method* is as follows:

$$R_E = \frac{DIV_1}{P_0} + g$$

Simply put, according to this method, *the total rate of return on a common stock is the sum of the current dividend yield (DIV_1/P_0) and the expected future growth of dividends (g)*.

One of *the advantages* of the *yield plus growth method* is that, unlike the other three, it is applicable to the cash flows of all types of assets, not just common stocks. We actually use this exact approach in pricing debt and equity financing, but in a variant adapted to these types of securities. Another *advantage of it* is that it is a very simple method to apply. A third *advantage* is that the analyst is not required to derive a risk premium subjectively or through complex procedures.

However, Zukin (1990) defines this method as the weakest in terms of its theoretical foundation. One of the main difficulties in applying this method is the correct determination of the future growth rate. The main problem with the model is regarding its applicability in any conditions. It is effectively *unavailable* for determining the cost of equity capital for companies that do not pay dividends and for non-public companies, whose shares are not traded on the stock exchange. It is unreliable even for public companies paying regular dividends when their shares trade in a small, nascent market, with limited trading volume. Such a market is the Bulgarian one, which is why the adequacy of the formed "market" prices of the shares is seriously questioned.

Thus, the method seems attractive and easy to use, but this only applies to large public companies whose shares are traded intensively in well-developed capital markets and which pay dividends regularly.

Capital Asset Pricing Model (CAPM)

CAPM model can be seen as an expanded, more developed variant of *the build-up method*. In this model, the required rate of return is a function of the risk-free rate of return and the risk premium. In other words, the model is also based on the logic of the build-up method, but offers a detailed and justified mechanism for objectively determining risk premiums in each specific case. Thus, according to the CAPM, the required rate of common stock is:

$RRR_E\ (R_E) = Risk\ Free\ Rate + Beta \times (Market\ Risk\ Premium)$

Put another way, the rate of return on common stock should be equal to the return on the risk-free security plus the company's systemic risk (beta), multiplied by the market price of risk (the market risk premium).

The CAPM has been continuously criticized over the years. The major criticisms of the model are as follows:

- Some critics of the CAPM express doubts about the realism of the very basic assumptions on which the model is based (Brigham, Gapenski, 1994).
- The main criticisms are how robust is the measure of systemic risk - beta? In particular, the extent to which past betas can be used as a proxy for future betas;
- According to some authors (Grabowski, 2009), the situation after the beginning of the financial crisis of 2008 adds new challenges to the application of the model;
- The most important question regarding the CAPM remains how useful it is in explaining the returns on risky assets, i.e. for the linear relationship between the systematic risk and the rates of return of these assets;
- The results of empirical analyzes in this regard are quite contradictory;
- One of the most frequently cited studies – by Eugene Fama and Ken French of the University of Chicago, concluded that the tests did not support a positive relationship between the average rate of return and market beta coefficients (Fama, French, 1992).

Arbitrage pricing theory

The Arbitrage Pricing Theory (APT) was developed by Stephen Ross in the mid-1970s. Stephen Ross is one of the critics of the Capital Asset Pricing Model (CAPM). He is also one of the authors who published empirical evidence on the unreliability of the CAPM model. APT incorporates certain risk factors into the assessment of the cost of equity capital, thereby seeking to eliminate some of the weaknesses of the CAPM by providing a link to systemic investment risk. According to Roll, Richard and Ross (Roll, et al., 1980), APT provides a solid theoretical

framework, which states that the factors involved in the return formation process, if they exist, are associated with the risk premium. The theory makes the traditional neoclassical assumptions about markets functioning in perfect competition and the absence of restrictions and transaction costs. Just as the CAPM model is derived from the assumption that random asset returns follow a multivariate normal distribution, so APT makes assumptions about the return generation process.

APT specifies several risk factors in order to provide a comprehensive definition of systemic (market) investment risk. In this sense, APT is defined as *the multi-factor analogue of the Capital Asset Pricing Model (CAPM)*.

Common risk factors can include *inflation, gross domestic product growth, political turmoil, changes in interest rates, unemployment rates, exchange rates, etc.* The coefficients *b* before the various factors determine how each asset reacts to the *j*-th common risk factor. The main challenge in using APT to value risky assets is the identification of risk factors. Among the most widely applied factors are *5 macroeconomic factors*, selected on the basis of empirical research (Roll, Richard and Ross, 1980):

- *Industrial manufacturing index*, an indicator of how well the economy is functioning in terms of the physical volume of production;
- *Short term real interest rate*, measured by the difference between the rate of return on short-term bills and the consumer price index;
- *Short term inflation*, measured through unexpected changes in the consumer price index;
- *Long term inflation*, measured as the difference between the rates of return to maturity of long-term and short-term government bonds;
- *Risk from insolvency*, measured through the difference between the norms on returns to maturity on the long term corporate bonds from rating classes Aaa and Baa.

Arbitrage Pricing Theory (APT) is pointed to as the leading alternative to the CAPM. Although APT is significantly newer than the CAPM, it has already undergone a number of empirical studies. Most research generally supports the pricing theory.

However, *a major problem* in the application of the APT model in practice remains that the theory does not offer a well-grounded and developed approach to identifying the essential common risk factors. The latter must be established in the process of formulating the specific model. The same applies to the specific coefficients (b_{ij}) in front of each factor, for each individual asset. Put another way, before the model can be used in practice, investors must fill

in a huge amount of missing information about the fundamental relationship between risk and expected return.

A major drawback of this multifactor model is that it was developed with insufficient theoretical guidelines and recommendations regarding the true nature of the "risk-return" relationship. It can be said that all these features of the APT model at this stage make it difficult for the wide range of investors. It is still mainly applied by a limited circle of specialized analyst companies and investment banks, which develop their own specific versions of multifactor models for different situations.

In conclusion, the following main disadvantages and difficulties in the application of APT can be outlined:

- Although APT has been applied in many empirical studies, it can be said to be an "open" theory and this is one of the main problems, namely that the risk factors are not defined, nor their number - chosen for each specific case. This greatly complicates the application of the “theory” in practice, and besides requiring very specific knowledge, skills and information, which limits the circle of those who can try to apply it, APT also takes considerable time;
- Coefficients of the risk factors are also unknown and must be determined on a case-by-case basis, which further complicates the application of the theory;
- Unlike the CAPM, APT requires the establishment of not one, but several beta coefficients and, in general, more unknowns, which significantly complicates the models;
- The method is ultimately difficult to access for the wide range of investors and analysts.

3. Why is the CAPM still the most widely used method?

The serious deficiencies highlighted in each of the four methods reasonably cast doubt on their ability to accurately and soundly determine the cost of equity. Possible solutions are generally sought in two directions:

- Search and development of new methods and models;
- Improving the use of some of the existing methods.

As a result of the search for a more reliable way to derive the cost of equity, new and modifications of existing methods and models are emerging. Thus, at the current stage, an

extended, updated *classification of methods for determining the cost of equity* could be proposed. It should look like this:

1) Buildup method (approach);
2) Yield-plus-growth method;
3) Arbitrage Pricing Theory;
4) Capital Asset Pricing Model (CAPM);
5) Three-factor model of Fama and French;
6) Five-factor model of Fama and French;
7) Other CAPM modifications for developed capital markets;
8) Modifications of the CAPM for emerging capital markets;
9) Other ….

It is no coincidence that most of the modifications (in the expanded classification) for the purpose of improvement were made on the basis of the CAPM model. In practice, the models under point 7 and 8 of the classification should be included here. To a certain extent, this also applies to 5 and 6 - the three-factor and five-factor models of Fama and French. They arise precisely as a result of testing the CAPM and follow its logic, adding two new factors at the company level (subsequently two more) with which they try to explain the size of the risk premium. According to Da, Guo, Jagannathan (2010), *the Capital Asset Pricing Model* continues to be the most widely used method of determining the cost of equity.

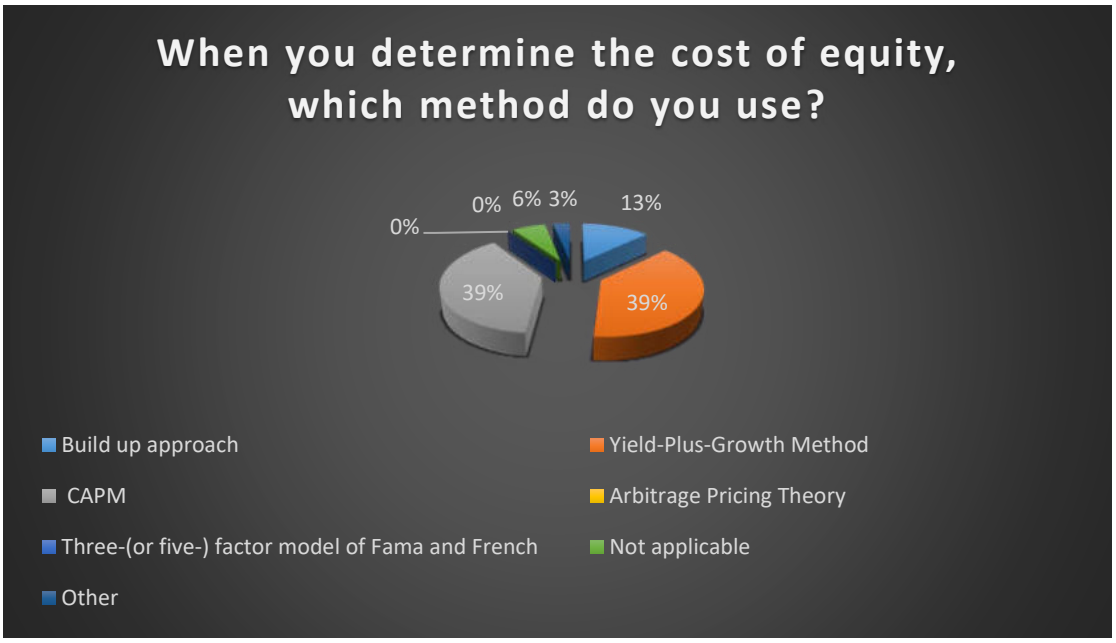
When presenting the alternative methods for determining the cost of equity (R_E), some serious shortcomings and problems related to the application of each of them were pointed out. This is one of the explanations for the great popularity of *the Capital Asset Pricing Model (CAPM)*. Research by Harrington indicates that the CAPM in the last one or two decades has been used in parallel with the three-factor model of Fama and French (Harrington, 2009). However, there is not enough information about any widespread entry of the latter into the practice of analysts.

It is obvious that the Capital Asset Pricing Model is not without weaknesses. It has been continuously subject to severe criticism from its inception to the present stage. This is also one of the reasons for developing the *Arbitrage Pricing Theory (APT)* - as an alternative to the CAPM. Due to its prominent shortcomings, however, APT cannot yet establish itself as a sufficiently widely used method for reliably determining the cost of equity capital.

Besides its weaknesses, the CAPM has also its serious merits, which could explain its wide popularity among analysts, appraisers and investors. The main advantages of CAPM could be summarized as follows:

- The prevailing opinion is that the Capital Asset Pricing Model as such is conceptually sound and consistent;
- The model is sometimes defined as extremely attractive on an intellectual level, as well as logical and rational;
- According to a number of recent studies, the CAPM is an acceptable model for determining the cost of capital (Da, Z., Guo, R., Jagannathan, R., 2010);
- The CAPM model is also based on the build-up logic, but offers a detailed and justified mechanism for the objective determination of risk premiums in each specific case;
- The theory on which the model is built is clear and sound, despite some obstructions regarding its assumptions.

Figure 1:



Source: Own research of the authors

A survey among financial managers and financial experts of companies in Bulgaria from 2017 shows that the most used methods are CAPM (39% of respondents) and Yield plus growth method (39% of respondents) (Fig. 1). Interestingly, the CAPM is preferred by representatives of the financial sector (50% of them), and the other method is preferred by representatives of the real sector (slightly more than 50%). Multifactor models are not specified, which is also not

surprising, given their limitations discussed above and the specific resources and skills required for their application.

4. Open issues with the application of the CAPM at the present stage

Possibilities in relation to improving the use of existing methods are sought above all along the lines of APT and CAPM. Considering the lack of a solid theoretical basis and the difficult accessibility of APT, CAPM seems more promising in this regard. After all, most empirical studies confirm the correlation between the rate of return of portfolios and their systemic risk (Da, Guo, Jagannathan, 2010). For example, Sharpe and Cooper (1972) found a positive correlation between rate of return and risk, although not completely linear. Grundy, and Malkiel (1996) also argue that the beta coefficient is a very useful measure of risk in down markets, i.e. just when it is important and needed.

The accumulated in-depth studies and conclusions regarding the model as a whole and regarding the calculation of its individual components (variables) are a very important prerequisite for significantly improving the way of its application. In this sense, successfully predicting the cost of equity (required rate of return) using the CAPM is primarily a function of its correct use. The improved application of the CAPM necessarily goes through the refinement of the three input variables: *the risk-free rate*, *the market risk premium* and *the systemic risk (beta)*, because they are the main reason for the weaknesses of the model and for the criticisms towards it.

Risk-free rate

Damodaran (2008) states two main criteria that risk-free assets must meet:

- Absence of default risk;
- Absence of reinvestment risk.

Regardless of the available discussions, it can be said that regarding ***the risk-free rate*** there is some consensus among specialists in the theory and practice of the leading capital markets. Thus, if we use the CAPM, based on the risk-free rate, the beta coefficient, and the market risk premium of the US developed stock market, it would be most appropriate for ***the risk-free yield to be the yield on long-term government bonds (10-Year T-Bonds)***. In the original version of the model the yield used was that of T-Bills. The use of the 10-Year T Bond yield leads to significantly better prediction of the cost of equity, more in line with what is indicated by other market analyses. It is also much more in line with long-term predictions under the model.

Beta coefficients

One of the most criticized elements of the CAPM used to be the ***beta coefficient***. There are multiple approaches to determining beta, depending on the sources used, the historical beta being practically the easiest to calculate. It is defined as the regression of the return of a given stock against the return of a given market index. These are the so-called *regression beta coefficients* (*or historical betas*).

It is this approach that is the main reason for the criticism of the beta coefficient. Numerous studies on the stability of beta have generally concluded that this measure of risk is not robust across individual stocks. They change over time as a result of changing the nature of the business, restructuring and changing the capital structure. This makes beta coefficients from past periods unreliable indicators of systemic risk in the future.

At the same time, however, the same studies found that beta coefficients by *sector (industries)* and beta coefficients of *portfolios* are stable over time. Thus, a suitable way to significantly improve the reliability of the results of applying the CAPM is by using *sectoral regression beta coefficients*. When estimating beta for an emerging market company that is not public, we may use average beta data for companies in the same sector for which information is available. In case there are prerequisites not to use local analogues, the estimated sector betas for US analogue companies can be applied, because they have more comprehensive data (Pereiro, 2002).

An alternative way of improving the model in this regard is by deriving and using the so-called *fundamental beta coefficients* of the respective companies (Damodaran, 2012).

Market risk premium

Regarding the third element (the third input variable) of the CAPM – ***the market risk premium***, it is difficult to assume that there is a consensus. **The question of what is the correct market risk premium remains one of the most controversial in the field of financial management and continues to cast doubt on the accuracy of the calculated cost of equity.**

The market risk premium can be determined using three widely advocated methods (Damodaran, 2012): *The first* is by surveying subgroups of investors, managers and academics about their expectations of the expected risk premium. *The second* method is based on historical data, assuming that the future will be like the past. *The third* method is based on anticipatory judgments, which attempt to predict the future.

Welch surveyed 226 economists in 2000, including investors, managers and academics about the level of the expected market premium (Welch, 2000). On average, economists then

predicted a risk premium of around 7% for a 10-year horizon and between 6% and 7% for a 1 to 5-year horizon. The evaluations of the individual respondents varied extremely widely - from the pessimistic 2% to the optimistic 13%, which showed that this method was highly dependent on individual attitudes.

Calculating the market risk premium based on **historical data** is one of the most preferred and used methods in practice. At the same time, the values obtained can again vary greatly. Three main reasons can be inferred for the resulting differences in historical market premium values:

- *The length of the historical period* - we would make better judgement regarding the future values, if we use longer historic period, rather than shorter, although more recent period;
- Selected *risk-free asset* - we could use short-term or long-term government securities in calculating the market risk premium. It would be best to choose risk-free assets with a maturity close to that of the investment in the calculations. In the practice of the last two or three decades, it has been accepted to use long-term government securities rather than short-term ones (as outlined above).
- *Averaging method* **-** in the calculation of the historical market premium for risk, two average values are mainly used - *the arithmetic mean* and *the geometric mean*. Copeland, Koller and Murrin (2000) consider the arithmetic mean to be more appropriate, as it determines the same probability of the fulfillment of the different development options, while the geometric mean is more accurate for past results, but not suitable for predicting the future. On the other hand, Damodaran (2002) defends the thesis that the geometric mean is more appropriate, because it reflects our desire for a risk premium that we can use for the long-term.

The arithmetic mean is always higher than the geometric mean, and the difference between them becomes larger as the variance of the rate of return increases. The longer the unit interval becomes, the smaller the arithmetic mean becomes and the closer it gets to the geometric mean. Accordingly, Copeland, Koller and Murrin (2000) recommend that the market risk premium should be determined by the calculations on a 2-year interval basis.

Koller, Goedhart, Wessels (2005) calculate a market risk premium for the period 1903-2003 for the US market between 6.2%, calculated as an arithmetic mean and 4.4%, calculated as a geometric mean. This means significant difference of about 2 percentage point. Based on another empirical research, Pratt and Grabowski (2008), in turn, conclude that the market risk premium is in the range of 4% to 6%.

An alternative to the historical market risk premium is *forward thinking,* for predicting the future. One way to do this is by calculating the market portfolio's expected rate of return - $E(R_m)$, by adding analysts' consensus forecasts for the dividend growth rate (***g***) of the S&P 500 index to the index's dividend yield - DIV/P_0. In other words, we arrive at the familiar "yield plus growth" method. We then subtract the risk-free rate from the expected market rate of return, thus calculated, and obtain the predicted *market risk premium* (***ERP***). The premium calculated in this way is actually the so-called by Aswat Damodaran ***implied risk premium*** *for common stocks* ***(implied equity risk premium - ERP)*** (Damodaran, A, 2008). To do this, he constructed a two-stage discounted dividend model for the broad index S&P 500.

The opinions presented so far reflect only a small part of the views on the correct market risk premium. One of the most extensive and impressive studies on the matter is that of Pablo Fernandez of 2006 (Fernandez, 2006). According to him, one of the reasons for the differences is that the term *risk premium for common stocks (equity risk premium – ERP)* is used to denote four different concepts:

1) Historical risk premium (historical equity premium) – HEP;
2) Expected risk premium (expected equity premium) - EEP;
3) Required risk premium (required equity premium) – REP and
4) Implied risk premium (implied equity premium) – IEP.

The Capital Asset Pricing Model assumes that EEP and REP are equal. Fernandez believes that the historical premium is easily calculated and is the same for all investors. However, the same does not apply to the other three – EEP, REP, IEP. They are different for different investors and are unobservable. A serious problem is that there is no uniform implied premium (IEP) for the market as a whole. Different investors have different IEP and use different REP.

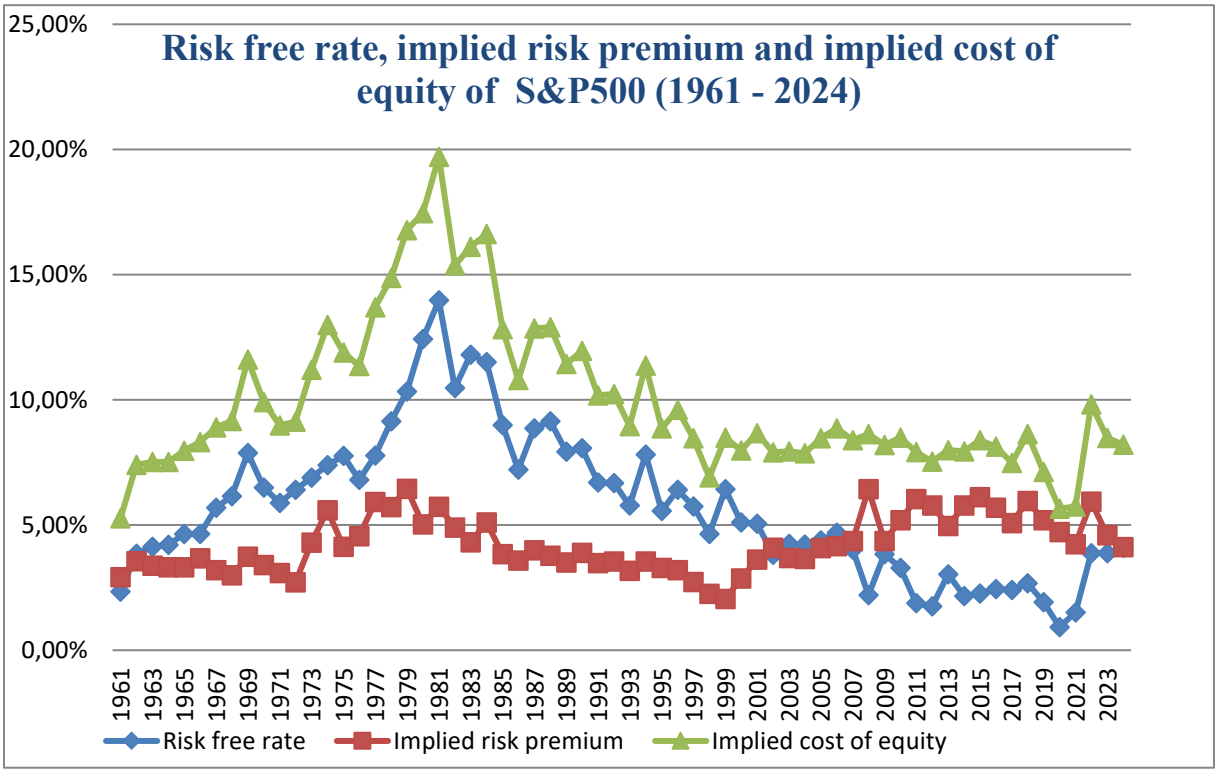
Pablo Fernandez surveys all the major authors and textbooks on finance and business valuation and finds great diversity in both the interpretation and the size of the market risk premium used. In their study from 2011, Fernandez, Aguirreamalloa, and Corres (2011) conducted a survey among three groups of participants in the process of analysis and determination of the cost of capital: 1) *professors of economics and finance,* 2) *analysts, and* 3) *companies*. Questions were sent to 19,500 email addresses, from which 5,731 responses were received. From them it is clear that the average used market risk premium for the USA in 2011 was 5.5%. The standard deviation was 1.7%. Accordingly, the average premium used by professors was 5.7%, analysts – 5.0%, companies – 5.6%.

These studies by Pablo Fernandez continue annually until present and some results of the most recent one are shown in Table 1. The studies confirm the lack of consensus among

analysts, investors and academics regarding the market risk premium. Another important feature is that professors mainly adhere to *the historical risk premium* (HEP), while practitioners more often prefer *the current implied* risk premium (IEP).

Figure 2 presents the risk-free rate, implied risk premium and implied cost of equity of the S&P 500 for the period 1961-2024. The figure shows the significant year-to-year variation of the current (implied) risk premium, the current risk-free rate, and the current cost of equity of the US S&P 500 index for the period 1961-2024. This is the reason for the problem of representativeness of current input variables when forecasting the cost of equity over a long future period.

Figure 2:

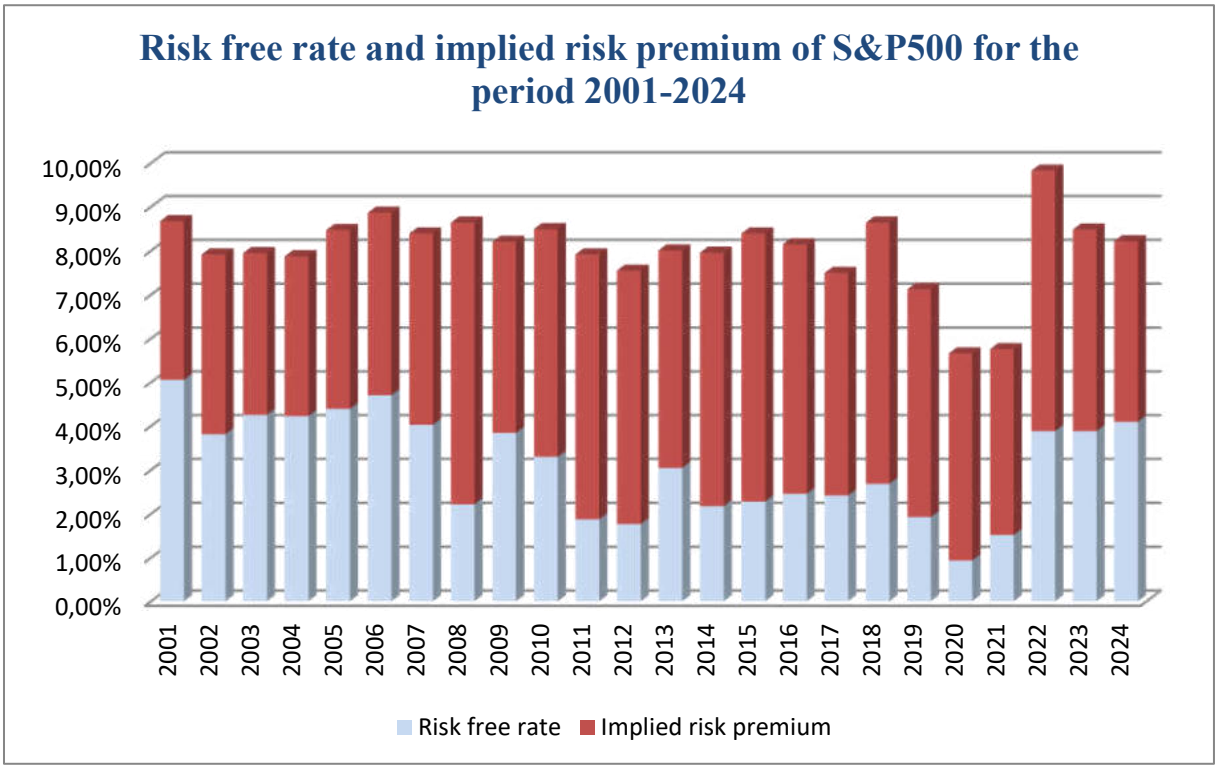


Source: Figure developed by the authors

Data: http://pages.stern.nyu.edu/~adamodar/ , (15.10.2024)

Figure 3 also presents the risk-free rate, implied risk premium and implied cost of equity of the S&P 500, but it focuses on the period from the beginning of the 21st century until August 2024. The implied cost of equity during this period ranges from 5,65% at the end of the pandemic year 2020 to 9,82% at the end of 2022. These differences are mainly due to the fluctuations of risk-free rates, and to a lower extent they are due to fluctuations of equity risk premiums. The current cost of equity, as of August 2024, is 8,21%.

Figure 3:



Source: Figure developed by the authors

Data: http://pages.stern.nyu.edu/~adamodar/ , (15.10.2024)

Table 1 provides today's summarized picture (as of 2024) of historical and current risk free rates and market risk premiums for the S&P 500. During the whole period after the Global Financial Crisis, with the exception of the last two years, the current expected return used to be significantly lower than historical average levels, due to the very low interest rates. The numbers in Table 1 indicate that historic average return is higher than current expected return. The arithmetic average historic return is the highest – 11,66%. The geometric average is 9,80% and is very close to the return derived from the latest survey of Pablo Fernandez (for 2024) of 9,60%. The average of the monthly expected returns from January 2008 to August 2024 is 7,94%, which is very close to the current expected return as of August 2024 of 8,21%.

Table 1: Risk Free Rate, Market Risk Premium and Market Return of the S&P 500

	Period	Risk Free Rate	Risk Premium	Market Return
Arithmetic Average Historical Return	1928-2023	4,86%	6,80%	**11,66%**
Geometric Average Historical Return	1928-2023	4,57%	5,23%	**9,80%**
Pablo Fernandez - Survey	2024	4,10%	5,50%	**9,60%**
Average of Monthly Expected Returns	2008-2024	2,51%	5,43%	**7,94%**

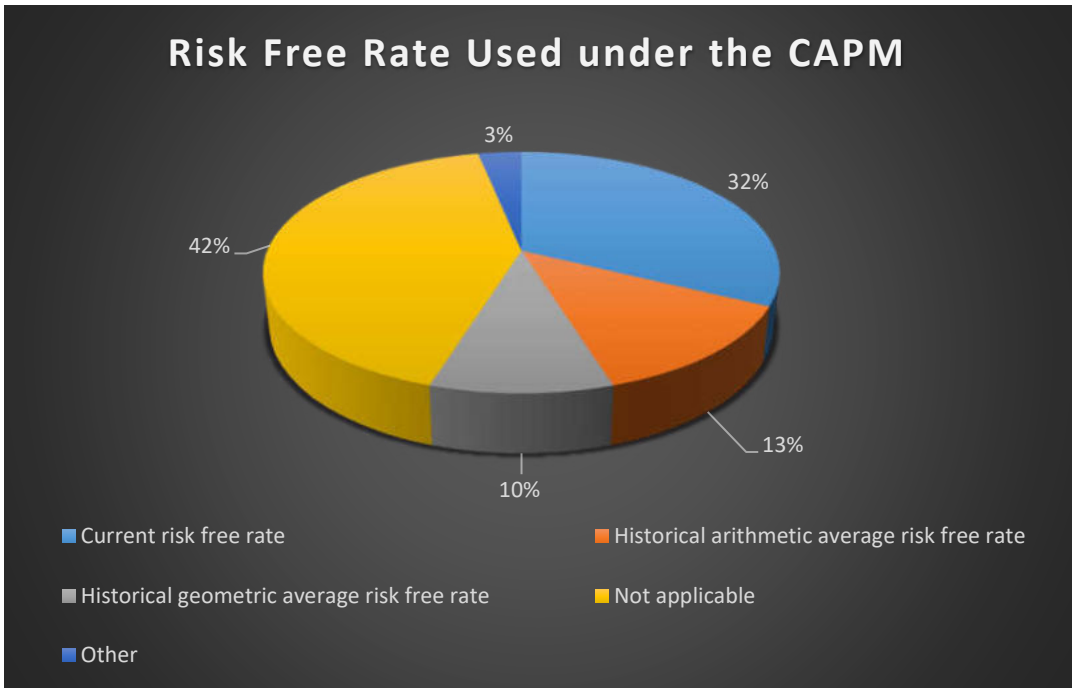
Current Expected Return	Aug 2024	4,09%	4,12%	**8,21%**

Source: Calculations of the authors

https://pages.stern.nyu.edu/~adamodar/

Fernandez, et. al., 2024

Figure 4:



Source: Own research of the authors

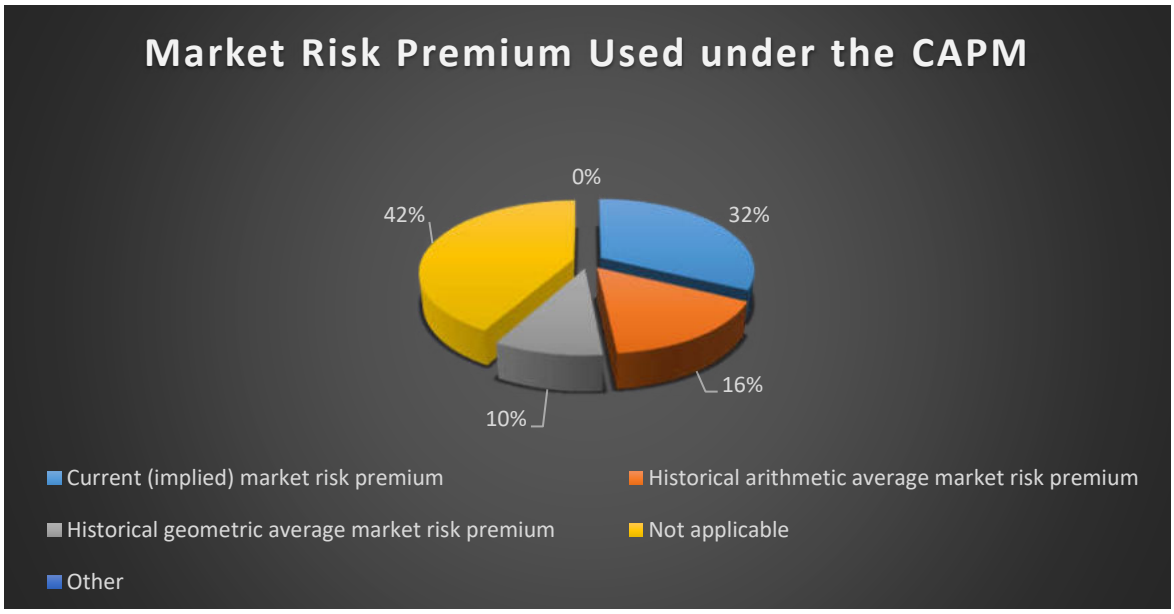
The survey among companies in Bulgaria from 2017 also confirms that there is a strong differentiation of opinions on the risk free rate, risk premium and cost of equity. In terms of choosing between historical arithmetic mean, historical geometric mean and current market premium, the preference is for the current, although not so strongly. Figure 4 shows that 32% of respondents prefer to use the current risk free rate, 13% use the historical arithmetic mean, and 10% use the historical geometric mean, 3% answered "other". The remaining respondents - 42%, are actually those who do not use the CAPM.

Figure 5, which illustrates the different preferences regarding the market risk premium, shows about the same picture: 32% of respondents trust the current market risk premium, 16% use the historical arithmetic mean, and 10% use the historical geometric mean. The remaining respondents - 42%, are again those who do not use the CAPM.

One of the features of equity valuation in the capital markets from the global financial crisis until 2022 was that the current cost of capital was strongly favored, i.e. current risk-free rate

plus current risk premium. One of the leading reasons for this was that the current implied cost of equity during this period was significantly lower due to the low interest rates. This helped a lot the justification of increasing stock prices and market ratios, and the record high stock-index levels during the period.

Figure 5:



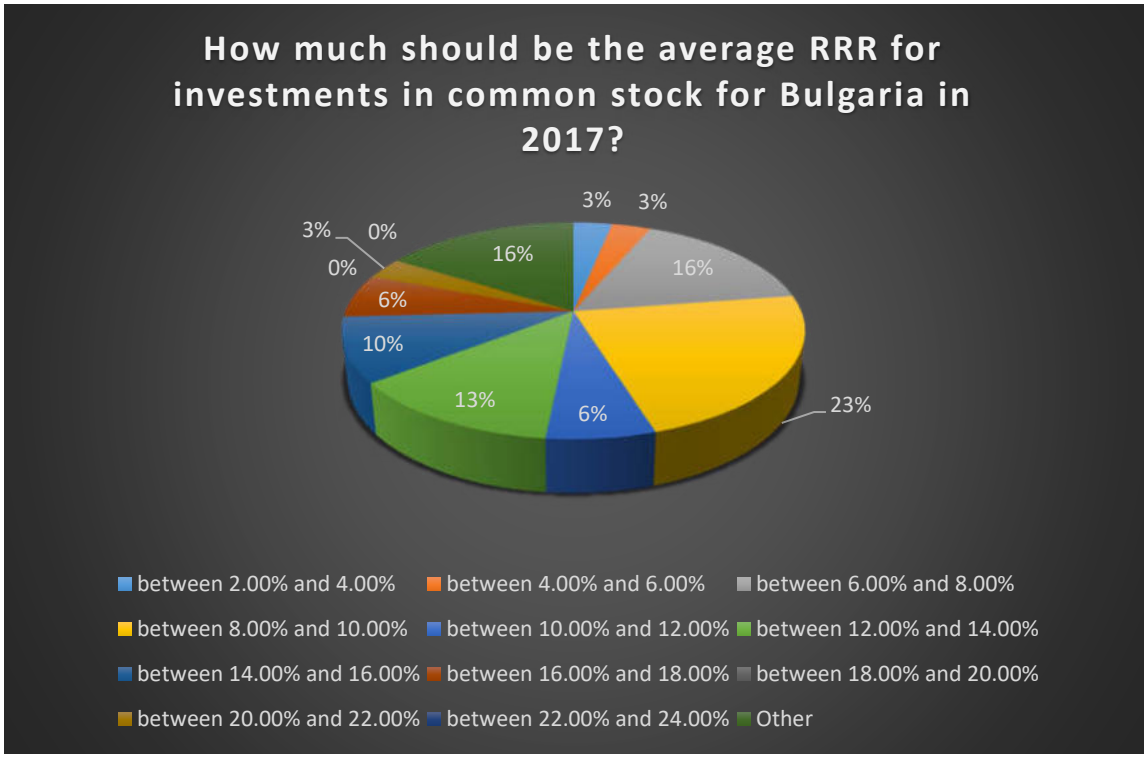
Source: Own research of the authors

5. A practical CAPM-based approach for the estimation of the cost of equity for the developing stock market of Bulgaria in 2024

It is clear that estimating the cost of equity in developed stock markets is a task of increased difficulty. This difficulty is even greater when we talk about determining the cost of equity in emerging or developing stock markets, such as Bulgaria. These markets are considered by investors to be with higher uncertainty and higher risk. The opinions regarding the true cost differ significantly and the debates are normally more intensive.

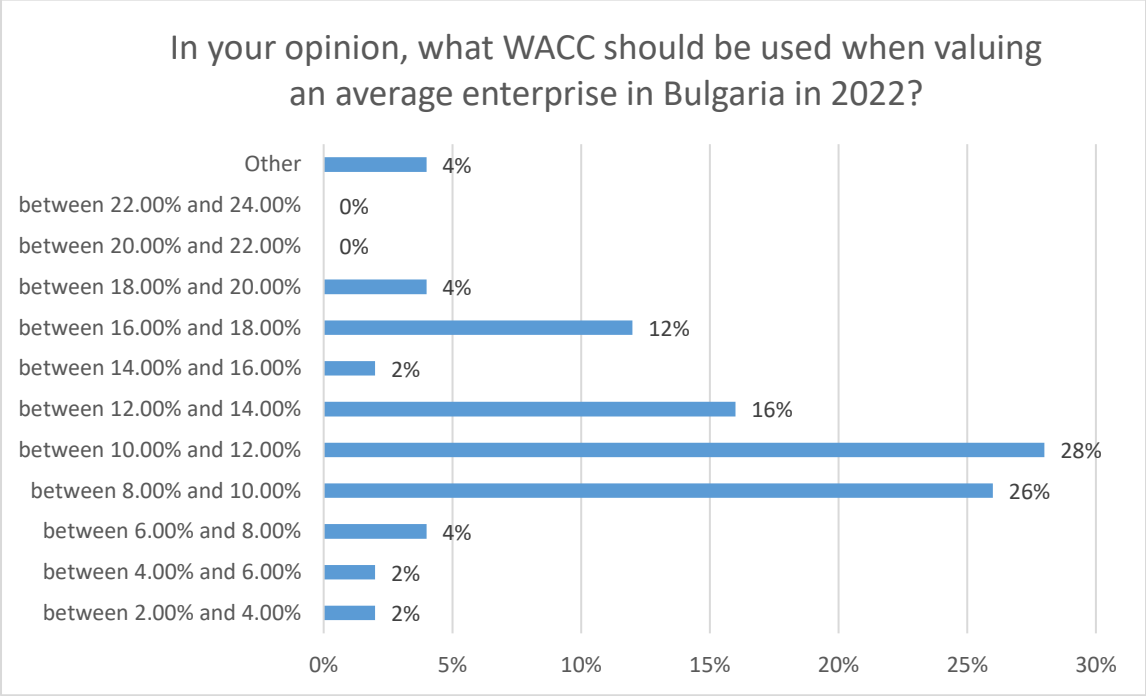
This can be seen on Figures 6 and 7. Figure 6 illustrates answers on a survey among financial experts and directors in Bulgaria in 2017. The question is: “How much should be the average RRR for investments in common stock in Bulgaria for 2017?” Figure 7 illustrates answers on a survey among appraisers of enterprises and financial assets in Bulgaria in 2022. The question is: “In your opinion, what WACC should be used when valuing and average enterprise in Bulgaria in 2022?”. The two figures show the huge diversity of opinions about the cost of equity and weighted average cost of capital (WACC) respectively. The answers are split along a broad range of values in each of the two figures, starting at 2.00% and ending at 24.00%.

Figure 6:



Source: Own research of the authors

Figure 7:



Source: Own research of the authors

Most of the emerging and developing markets have very short history. Some of them, like the Bulgarian stock market, are also very small and with low intensity of trade. The stock prices on these markets are not representative enough for the value of stocks, and the derived statistical data, needed to apply correctly the CAPM, is not quite reliable. The direct application of the CAPM on the basis of this local data is not recommended (Damodaran, 2012). A more sophisticated approach can be used, involving (Damodaran, 2012):

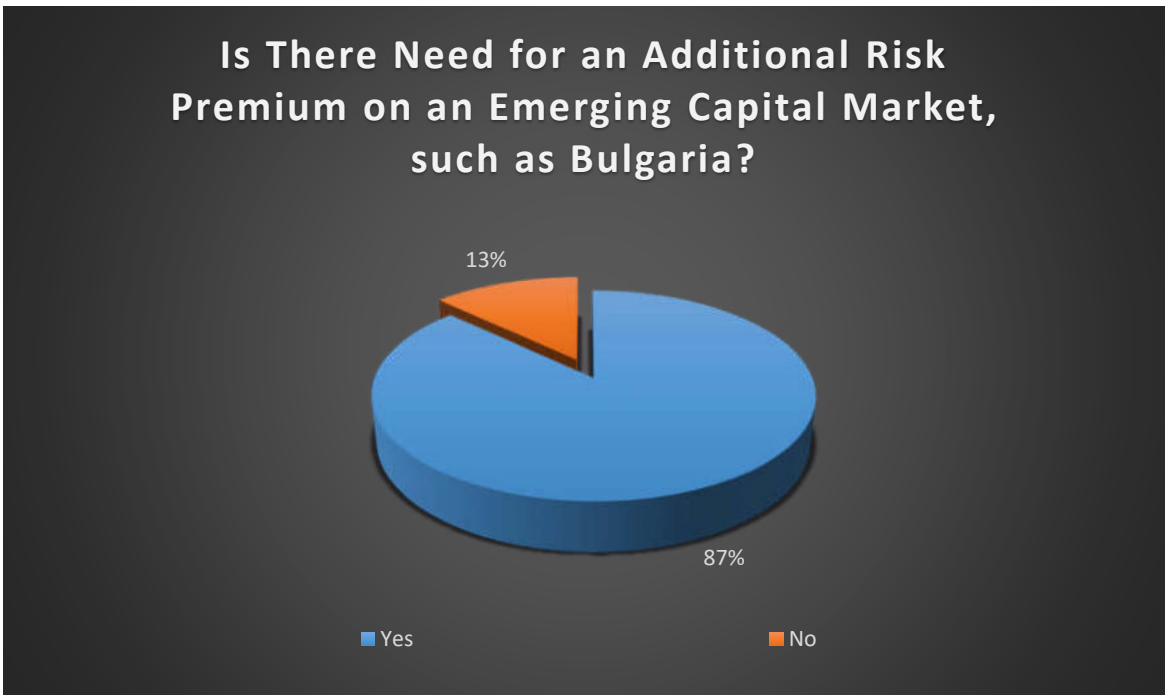
1/ Apply the CAPM on the basis of a mature stock market, such as US market or other.

2/ Estimate and add an appropriate country risk premium for the respective emerging market.

3/ Add eventually specific risk premium, such as size premium, industry premium or other if appropriate.

There are controversial opinions with regard to the need of country risk premiums or other additional premiums. The arguments in favor of such premiums seem sound enough, since the perception of international investors about emerging markets is one of higher uncertainty and risk. Within the 2017 survey, 87% of the interviewed experts confirmed the need for an additional risk premium on the emerging capital market of Bulgaria.

Figure 8:



Source: Own research of the authors

With regard of the above, one possible reliable approach to the derivation and the justification of the cost of equity for the Bulgarian stock market is demonstrated below. It takes into account the fact that the Bulgarian capital market is a developing one. The approach involves the capital asset pricing model (CAPM) to determine the cost of equity in a *mature stock market* (in this case US market). A ***country risk premium*** is added for Bulgaria, plus a *specific risk premium* for the relatively smaller size of companies in Bulgaria (*size premium*). The country risk premium itself is a function of the spread on internationally traded BG government bonds and a multiplier, equal to the ratio between the standard deviation of stocks and the standard deviation of bonds on emerging markets. Data is taken from the website of Prof. Damodaran (Damodaran, 2024) and from 2018 Ibbotson Risk Premia Over Time Report (Morning Star, 2018). In this case, long-term geometric average for the risk-free rate and for the equity risk premium are used – 4,57% and 5,23% respectively. Beta for the market is equal to 1. The spread on BG bonds at the start of 2024 is 1,74% and the multiplier is 1,34. Given the average market capitalization of the BGBX 40 companies, a corresponding size premium of 3 to 4% would be appropriate (3,5% used in this case).

Thus, the cost of equity (RE) for the average public enterprise in Bulgaria in 2024 is equal to:

RE = Risk free rate (USA)

+ Beta × Equity risk premium (mature market (USA))

+ Spread on BG government bonds × Multiplier

+ Specific premium for the smaller size of companies in Bulgaria =

= 4,57% + 1,0 × (5,23%) + 1,74% × 1,34 + 3,00% = 9,80% + 2,33% + 3,50% =

= 15,63%

The approach is illustrated in more detail in Table 2:

Table 2: Estimating the cost of equity for the market portfolio in Bulgaria in 2024

Position	Indicator	Value
1	Risk free rate - 10 Year US T-bonds yield – R_f	4,57%
2	Market risk premium (ERP) - US market - (Rm - Rf)	5,23%
3	Beta with leverage for the sector (in this case – the US market portfolio) – β_L	1,00
4	Equity risk premium (ERP) for sector (in this case the US market) - β_L × (Rm - Rf)	5,23%
5	**Cost of equity for the sector in USA (in this case the market)**	**9,80%**
6	Default spread on BG government bonds	1,74%
7	Multiplier emerging markets (st.dev of stocks/st.dev of bonds) for 2024	1,34
8	Country risk premium for Bulgaria (p.6 x p.7)	2,33%

9	Specific risk premium for the smaller size of companies in Bulgaria	3,50%
10	**Cost of equity for the market portfolio in Bulgaria**	**15,63%**

Source: Calculations of the authors

https://pages.stern.nyu.edu/~adamodar/

Conclusion

The deeper the research into equity pricing methods, the more arguments are made that no single method is good enough. CAPM emerges as the most promising. The updated classification of methods also points in this direction. This is not because the model is without serious weaknesses, but because of the practical limitations and shortcomings of alternative methods. Most of the disadvantages of the CAPM can be overcome, including through the way of derivation of beta coefficients. The main problem with the application of CAPM that still remains, is the multivariate calculation of the market risk premium - current, historical arithmetic average or historical geometric average. This leads to serious differences in the resulting cost of equity. There is still no consensus among analysts, academics and managers on this issue.

With regard to emerging markets, the direct application of the CAPM (as well as other methods) is problematic and is not recommended. The local statistical data from these markets, used for the models, is not quite representative and is often very misleading, because of short history, small size, insignificant trade volume, etc. of the market. An alternative approach is recommended, which is demonstrated on the example of the Bulgarian developing market. Within this approach, the CAPM is applied for a mature capital market (US market), a country risk premium, and a specific risk premium are then derived and added for the developing market of Bulgaria.

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CASH HOLDINGS AND INDEBTEDNESS OF PUBLICLY TRADED COMPANIES IN BULGARIA DURING COVID-19 PANDEMIC

Galya Taseva[1]

Abstract: *The aim of the study is to examine the impact of the level of indebtedness of companies in Bulgaria on their cash holdings during the crisis caused by the COVID 19 pandemic. The analysis in the article is based on data on non-financial enterprises listed on the Bulgarian Stock Exchange during the period 2019 - 2021. Multiple linear regression analysis establishes a statistically significant negative impact of leverage, measured by the ratio Total debt / Total assets, on the cash holdings of companies, measured by the ratio Cash and cash equivalents / Total assets. Companies that have more debt have lower cash holdings. Debt service costs, measured by the Interest Expenses / Interest Debt ratio, also have a negative impact on the ratio Cash and Cash Equivalents / Total Assets. High debt service costs are depleting companies' cash holdings during the pandemic.*

Keywords: *cash holdings, debt, corporate indebtedness, Covid-19 pandemic*
JEL: *G32, G30*

1. Introduction

The Covid-19 pandemic and the extraordinary economic conditions it has created have greatly increased the risks for companies, including the risk of bankruptcy. The challenges during the crisis were even more serious for heavily indebted companies. On the one hand, the reduction in cash flows of companies as a result of the contraction of economic activity and the tightening of access to credit from financial institutions due to the sharp increase in risk in the economy imply difficulties for companies in ensuring liquidity. But on the other hand, these problems strengthen the desire of companies to maintain and even increase liquidity. Existing empirical research shows contradictory results on the relationship between cash holdings and the level of leverage of firms. Cash and cash equivalents are the most liquid assets of enterprises and analyzing their relationship with the level of indebtedness is even more important in times of crisis. The purpose of the study is precisely to analyze the impact of the level of indebtedness on the cash holdings of publicly traded non-financial enterprises in Bulgaria during the pandemic.

2. Theoretical overview

The impact of corporate debt on firms' cash holdings has been the subject of numerous studies based on both cross-sectional and panel data (Vuong, Dao, Le, & Nguyen, 2022, p. 186). However, there is still insufficient research on the relationship between leverage and corporate cash holdings during the unprecedented crisis caused by the COVID-19 virus pandemic.

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Xu and Jin (2022) examine the impact of the 2019 COVID-19 pandemic on the financial performance and cash holdings of Chinese agri-food companies. They find that during the pandemic, the financial performance of state-owned companies improved, but the financial performance and cash holdings of privately owned companies deteriorated. The negative impact of the pandemic on the cash holdings of companies was stronger for those that were heavily indebted.

Nicoletti, Setzer, Tujula, and Welz (2022) find that during the coronavirus pandemic, with the increase in gross debt of non-financial corporations, there is also a strong accumulation of liquid assets, which is particularly characteristic of large corporations. Already at the beginning of the pandemic, companies formed reserves in the form of deposits, setting aside a significant part of cash receipts from newly attracted bank loans and issued debt securities, in order to secure a resource for their future needs of working capital and investments and as a preventive measure against a possible cash shortages as a result of shrinking sales and operating cash flows. (Nicoletti, Setzer, Tujula, and Welz, 2022, pp. 4 - 5).

In uncertain cash flows, holding cash reduces the risk of default, leading to improved access to short-term bank credit (Kling, 2012). But the higher the financial leverage, the smaller the effect of holding cash in reducing default risk Kling (2012, p. 11). It should also be borne in mind that during the coronavirus pandemic, the benefits of using debt financing increase as a result of the immediately induced cash flow shortfall (Halling et al., 2020; Li et al., 2020 - cited in Huang and Ye (2021, page 4760).

Jebran, Iqbal, Bhat, Khan, and Hayat (2019) examine the determinants of corporate cash holdings using panel data for 280 firms listed on the Pakistan Stock Exchange. The data they examine is for the period 2005 to 2014, which covers different economic conditions - pre-crisis (2005–2007), crisis (2008–2010), and post-crisis (2011–2014). They conclude that financial crises affect firms' cash holdings policies and also that financial crises affect the relationship between leverage and cash holdings.

A study of the impact of the mortgage crisis on private firms in the United Kingdom found that firms typically hold cash and issue equity to hedge the risk of credit defaults during an economic downturn (Akbar et al., 2013 - cited in Zeitun, Temimi, and Mimouni, 2017).

Alves and Morais (2018) examine the determinants of firms' cash holdings and the impact of the 2008 financial crisis on cash reserves using data from 54 countries for the period 1995–2014. Firms prefer to finance their investments with retained earnings, if sufficient, and to repay debt and increase their cash reserves. Otherwise, if retained earnings do not cover the need for financial resources to finance the firm's investments, firms would resort to their cash savings and, if necessary, issue debt (Alves and Morais (2018), p. 8). An indicator of the level of leverage in the study by Alves and Morais (2018) is the ratio of the amount of debt to the amount of assets. They also conclude that firms' cash holdings are negatively correlated with cash substitutes (liquidity and leverage). They argue that firms do not need high cash holdings because they can easily sell their liquid assets when they need cash. Alves and Morais (2018) find that firms tend to hold higher cash reserves when they incur high external financing costs.

Vuong, Dao, Le, and Nguyen (2022) examine the impact of debt on firms' cash holdings and the differences in this impact across ASEAN countries (Indonesia, Malaysia, the Philippines, Singapore, and Thailand), which are characterized by different macroeconomic factors and legal characteristics. Their analysis is based on panel data for the period 2009–2018. Vuong, Dao, Le, and Nguyen (2022) find that the firms studied have maintained relatively high cash holdings since the financial crisis. They show that the impact of debt on firms' cash holdings is

consistently influenced by macroeconomic and legal factors across countries. Of the firm-internal factors in Vuong, Dao, Le, and Nguyen's (2022) study, the most notable is the negative correlation between cash holdings and the level of leverage, the most indebted firms holding the least cash relative to their assets. The level of leverage can be considered as an indicator of the ability of firms to attract debt (Vuong, Dao, Le, & Nguyen, 2022). Many studies find an inverse relationship between the level of leverage and the cash holdings of firms (Vuong, Dao, Le, & Nguyen, 2022).

Arguments in support of the existence of such a negative relationship are also provided by Jensen (1986). To prevent wasting money, firms should finance themselves with more debt, the repayment of which reduces the free cash flows available to managers and reduces agency costs (Jensen, 1986).

Guney, Ozkan and Ozkan (2007) find a statistically significant nonlinear relationship between cash holdings and indebtedness based on data for companies from France, Germany, the UK, the US and Japan for the period 1996-2000. According to them, a negative relationship (substitution effect) can be expected between the degree of indebtedness of companies and their cash holdings, if indebtedness is considered as a proxy for the ability of companies to attract financing from creditors. However, as indebtedness increases, so do the fears of companies of falling into financial distress, which stimulates the desire to accumulate cash reserves for precautionary purposes. This creates expectations of a positive relationship (precautionary effect) between leverage and cash holdings of companies. Guney, Ozkan and Ozkan (2007) also find that the impact of leverage on cash holdings depends on the degree of protection of the rights of creditors and shareholders in different countries, as well as on the concentration of ownership.

Anderson (2002) examines two panel data sets, one from Belgian firms and the other from UK firms, and finds a positive correlation between firms' levels of liquid assets and their levels of leverage in the long run, which is explained by the precautionary motive for holding liquidity. The existing financial structure of firms is a major factor influencing their decisions regarding the levels of liquidity they maintain, as the degree of indebtedness determines the risk that the firm's cash flows will be insufficient to cover debt payments.

Using data on firms from seven European countries (Belgium, France, Germany, Italy, the Netherlands, Sweden and the UK) for the period 1981–2010, Quader and Abdullah (2016) conclude that financially distressed firms tend to save relatively more cash, while firms that are not financially distressed do not engage in this behavior. Sufi (2009) also shows that distressed firms that do not have access to credit lines are more likely to hold more cash for precautionary reasons.

Acharya, Davydenko, and Strebulaev (2012) also show that riskier firms accumulate larger cash reserves due to the precautionary motive for holding cash. Larger cash holdings reduce the risk of bankruptcy in the short run, but liquidity is positively related to the long-run probability of bankruptcy.

Acharya, Almeida, and Campello (2007) examine the relationship between cash and debt management using data from a large sample of constrained and unconstrained firms. They conclude that cash cannot be defined as negative debt under financial frictions.

Contrary to the results of Opler, Pinkowitz, Stulz, and Williamson (1999), who find that large, highly leveraged publicly traded firms hold less cash, Faulkender (2002, p. 6) finds that small, highly leveraged firms hold more cash as a precaution.

Faulkender (2002, p. 7) points out that the literature mostly focuses on issues that concern firms' demand for cash, but in fact firms' cash positions are not only a result of demand but also a function of firms access to cash. Ultimately, firms' cash positions are the result of the interaction between these two forces.

Faulkender (2002) highlights that smaller firms tend to hold more cash as their debt increases, while larger, highly leveraged firms tend to hold less cash. The reason for this is the difference in access to credit. Larger firms can more easily obtain cash when needed, which is why they have a lower marginal utility from holding cash and it is more profitable to use the cash to repay debt. Conversely, for small firms, access to credit is more difficult than for large firms, which is why for them the marginal benefit of holding cash is greater than the marginal benefit of paying off debt (Faulkender, 2002, p. 31).

Using data on 395 non-financial companies from Pakistan that were listed on the stock exchange for the period 2005–2011, Anjum and Malik (2013) conclude that the level of leverage is among the main determinants of firms' cash holdings. As firms' debt increases, their cash decreases.

García-Teruel, Martínez-Solano and Sánchez-Ballesta (2008) also find that firms' cash decreases when they use more bank loans and when cash substitutes are available. A negative impact of leverage on cash is also revealed by Ozkan and Ozkan (2004, p. 2103) using data on British firms.

Ferreira and Vilela (2004) examine the determinants of corporate cash holdings in the countries of the Economic and Monetary Union (EMU). Their study is based on panel data for non-financial corporations for the period 1987–2000. They define the dependent variable in their model as the ratio of cash to assets. The results of their study show a negative impact of the level of leverage on cash holdings. Ferreira and Vilela (2004, p. 298) define cash held by firms as a "safety reserve" in cases of unexpected losses or difficulties in attracting external financing. Firms' incentives to hold cash reserves as insurance against a shortage of funds are lower when they have good relationships with banks.

The outbreak of the pandemic has unprecedentedly increased the risk in the economy and led to a sharp decline in sales revenues and cash flows from operations of companies. A natural reaction of companies that are more indebted and have higher debt costs in these conditions is to seek to increase their liquid assets, including their cash holdings. From this perspective, due to the precautionary motive for seeking money, a positive impact of the level of indebtedness of companies on their cash holdings can be expected. On the other hand, the companies studied are publicly traded and have relatively easier access to credit in the event of an unexpected liquidity shortage. In conditions of crisis and more difficult generation of internal financial resources, the ability to attract debt becomes key in companies' decisions regarding the level of their cash reserves. The higher level of debt can be seen as an indicator of easier access of companies to credit. Therefore, a negative impact of leverage on companies' cash holdings should be expected. Moreover, most empirical studies on the topic reveal precisely such a negative impact.

Of importance for the relationship between debt and the level of cash holdings of companies are also the measures that were taken by the state to alleviate the negative effects of the crisis caused by the pandemic. The measures were aimed specifically at ensuring liquidity of companies and preventing mass bankruptcies. The measures also included a moratorium on loan payments.

Based on the literature review and analysis above, the following hypotheses can be formulated:

H1: The level of indebtedness of enterprises has a negative impact on their cash holdings during the crisis caused by the pandemic of the COVID 19 virus.

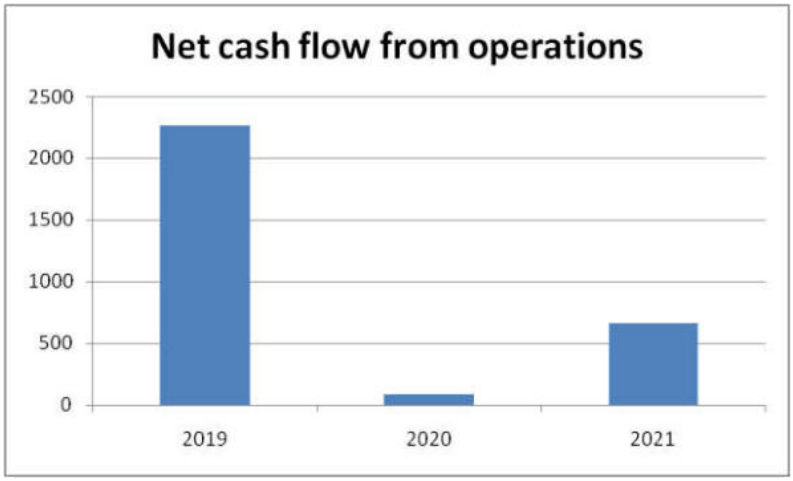
H2: Firms that incur higher debt financing costs have lower cash holdings during the pandemic.

3. Empirical analysis

The study is based on pooled data for 43 publicly traded non-financial companies in Bulgaria during the period 2019 - 2021. The sample includes companies with different main activities, including manufacturing enterprises and enterprises in the service sector. The research methods applied are literature review in the research area, analysis and synthesis, descriptive statistics, Pearson correlation analysis and multiple linear regression analysis.

The pandemic has presented companies with unprecedented challenges. The sharp contraction of economic activity as a result of measures against the spread of the coronavirus has led to a dramatic reduction in the cash flows of enterprises. The following figure presents the change in the net cash flow from operating activities of the surveyed companies. The decrease in the first year of the pandemic is 96.15%. In 2021, cash flow from operating activities increases significantly, but remains far below its level from the pre-crisis 2019.

Figure 1. Net cash flow from operations

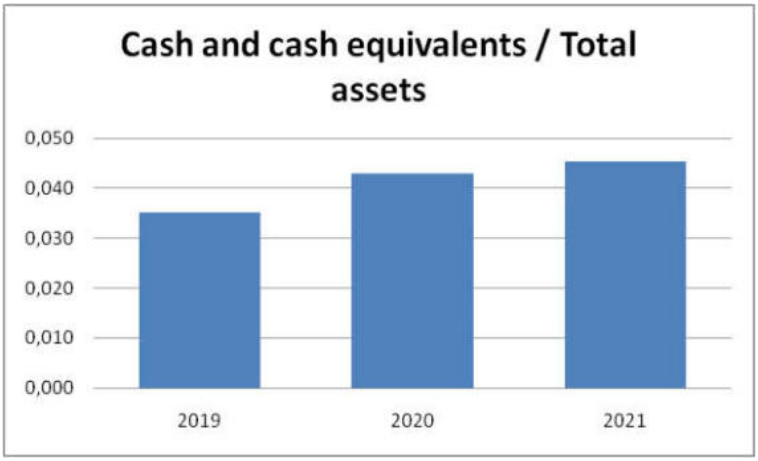


Source: Author's calculations

In the context of the Covid crisis, the ability of companies to provide liquidity to meet their current liabilities is of paramount importance. The most liquid asset of companies is cash and cash equivalents. Their importance increases even more in the face of uncertainty about the possibility of attracting financial resources from creditors.

An indicator of the level of cash reserves of companies in the article is the ratio Cash and cash equivalents / Total assets. During the pandemic, an increase in the share of cash and cash equivalents in the total assets was observed. This reflects the desire of companies to increase liquidity in extraordinary economic conditions. The increase was greater in the first year of the pandemic (22.06%), while in 2021 the ratio increased by a much smaller percentage (5.7%).

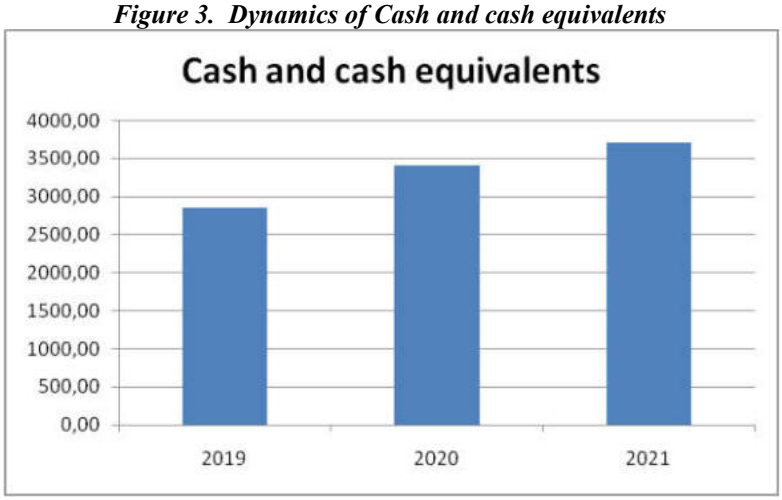
Figure 2. Dynamics of the Cash and cash equivalents / Total assets ratio



Source: Author's calculations

The increase in the ratio Cash and cash equivalents / Total assets can be explained by the greater increase in the indicator Cash and cash equivalents compared to the increase in Total assets during the period. The change in the indicator Cash and cash equivalents is presented in Figure 3. This value increased by 19.15% in the first year of the pandemic, continuing to grow significantly, albeit more slowly (by 8.71%) in 2021.

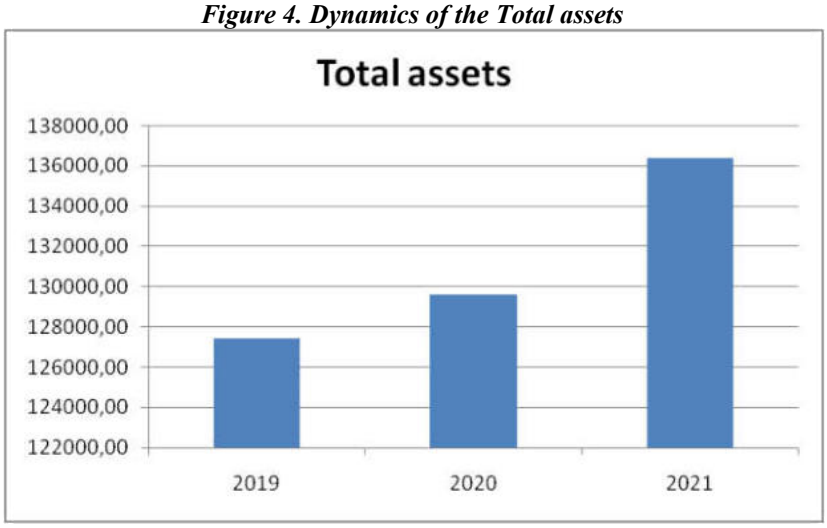
Figure 3. Dynamics of Cash and cash equivalents



Source: Author's calculations

During the period under review, there was also an increase in the amount of assets. However, the increase was greater in 2021 (5.26%) and less in the first year of the pandemic (1.7%).

Figure 4. Dynamics of the Total assets



Source: Author's calculations

The analysis with the Pearson correlation coefficient shows the presence of a medium-power statistically significant negative correlation between the degree of indebtedness of companies and the ratio Cash and cash equivalents / Total assets. The level of indebtedness of companies is measured by the indicator Total debt / Total assets. This ratio is a widely used measure of leverage in empirical research in the field. The results of the analysis with the Pearson correlation coefficient during the two most severe years of the Covid crisis (2020 - 2021) are presented in the following table.

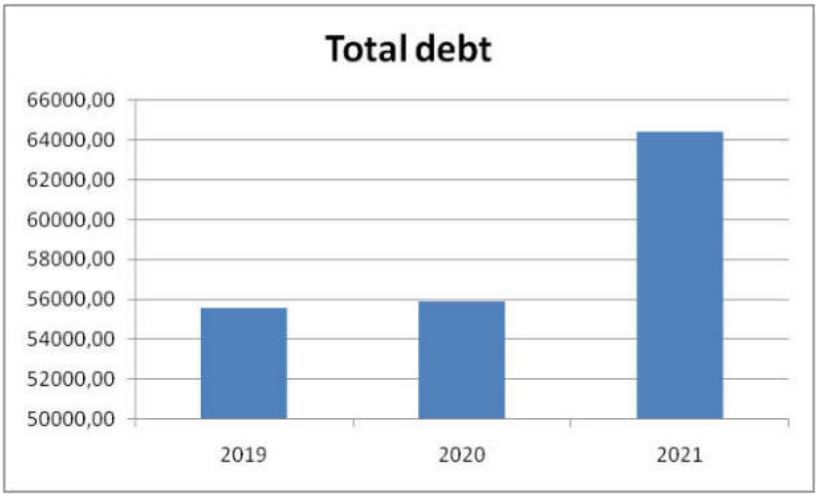
Table 1. Relationship between the ratio Cash and cash equivalents / Total assets and the ratio Total Debt / Total assets during the period 2020 – 2021

Variables	Pearson Correlation	Sig.
Ratio Cash and cash equivalents / Total assets and Ratio Amount of debt / Total assets	- 0,448	0,000

Source: Author's calculations

During the period 2019 - 2021, there was an increase in the amount of corporate debt, which was insignificant (0.66%) at the beginning of the pandemic, but extremely sharp in the second year of the crisis (15.25%).

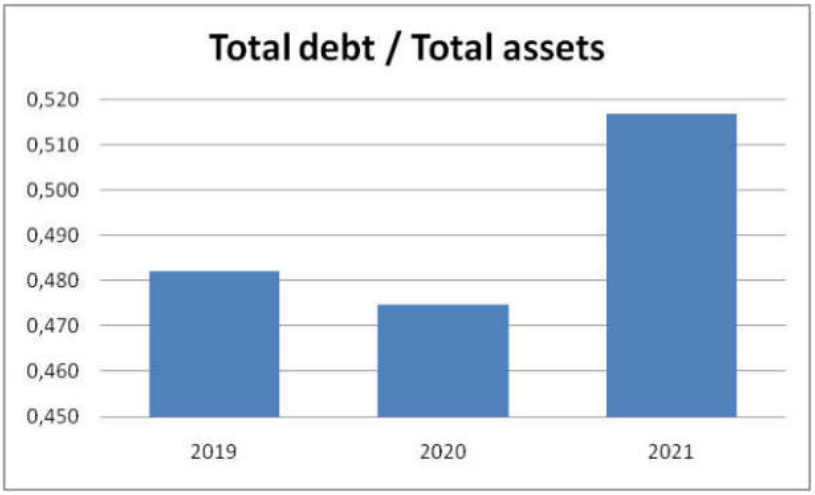
Figure 5. Dynamics of the amount of debt



Source: Author's calculations

This debt dynamics is reflected in the change in the level of leverage of companies. In the first year of the pandemic, there was a slight decrease in the ratio Total debt / Total assets, but in the second year of the crisis, there was a sharp increase in the indebtedness of companies. This is due to the strong increase in debt (15.25%), which significantly exceeds the increase in the amount of assets in 2021 (5.26%).

Figure 6. Dynamics of the Total debt / Total assets ratio



Source: Author's calculations

A medium-strong negative correlation is also found between the ratio Cash and cash equivalents / Total assets of the companies and the debt financing costs they pay. A measure of the debt financing costs of the companies is the ratio Interest expense / Interest debt. Interest debt is calculated by deducting the value of current liabilities to suppliers and customers from the amount of debt. The results of the analysis with the Pearson correlation coefficient are presented in the following table.

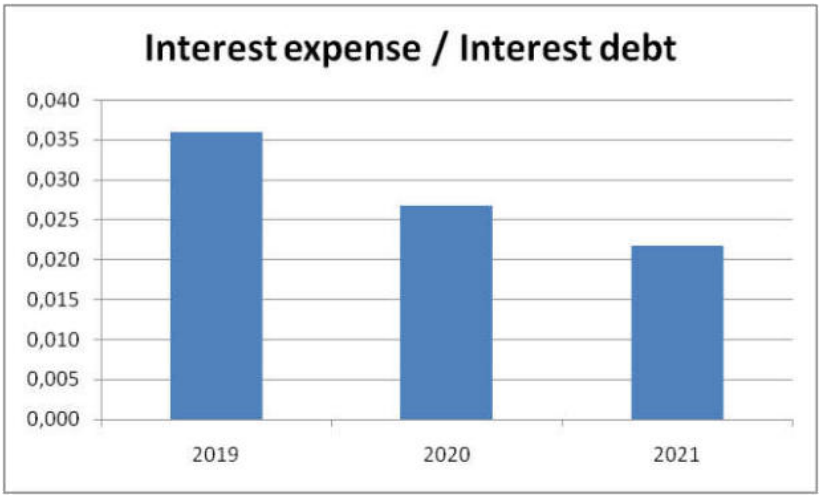
Table 2. Relationship between the ratio Cash and cash equivalents / Total assets and the ratio Interest expense / Interest debt during the period 2020 – 2021

Variables	Pearson Correlation	Sig.
Ratio Cash and cash equivalents / Total assets and Ratio Interest expense / Interest debt	- 0,428	0,000

Source: Author's calculations

The dynamics of the Interest expense / Interest debt ratio over time from 2019 to 2021 reflects the decline in interest rates during the period.

Figure 7. Dynamics of the Interest expense / Interest debt ratio



Source: Author's calculations

The multiple linear regression analysis method tests the combined influence of the ratio Total debt / Total assets and the ratio Interest expenses / Interest debt on the ratio Cash and cash equivalents / Amount of assets during the period 2020 – 2021. The following table presents descriptive statistics of the variables in the model.

Table 3. Descriptive statistics for the variables in the model during the period 2020 – 2021

	Mean	Std. Deviation
Cash and cash equivalents / Total assets	0,044	0,081
Total debt / Total assets	0,496	0,324
Interest expenses / Interest debt	0,024	0,020

Source: Author's calculations

The model is adequate, the level of significance of the F statistic sig. = 0.000. A medium-strength correlation dependence is established, the correlation coefficient (R) is equal to 0.504.

The combined influence of the factor variables included in the model explains 25% of the change in the dependent variable.

Table 4. Model features

Correlation coefficient (R)	0,504
Coefficient of determination (R^2)	0,254
Adjusted R^2	0,236
Std. Error of the Estimate	0,0705178
F statistic	14,103
Sig.	0,000

Source: Author's calculations

The two factors included in the model are statistically significant (sig. < 0.05).

Table 5. Results for the explanatory variables in the model

	B Unstandardized Coefficients	Std. Error	Beta Standardized Coefficients	t	Sig.
(Constant)	0,108	0,014		7,508	0,000
Total debt / Total assets	-0,077	0,028	-0,310	-2,799	0,006
Interest expenses / Interest debt	-1,062	0,438	-0,268	-2,423	0,018

Source: Author's calculations

The correlation matrix shows that multicollinearity is not present, i.e. the factor variables are independent of each other.

Table 6. Correlation matrix for the factors in the model

	Total debt / Total assets	Interest expenses / Interest debt
Total debt / Total assets	1	0,516
Interest expenses / Interest debt	0,516	1

Source: Author's calculations

The results of the multiple regression analysis confirm the first hypothesis of a negative impact of firms' indebtedness on their cash holdings. The explanation for this negative relationship may be the substitution effect between debt and cash. The level of leverage can be considered as an indicator of easier access of firms to credit even in the conditions of the crisis caused by COVID 19. If firms can easily secure debt financing, they do not need to maintain large cash reserves. However, another possible explanation for the negative impact of the level of leverage on the ratio of Cash and cash equivalents / Total assets is that the costs of servicing higher indebtedness deplete the cash holdings of firms in the conditions of the pandemic, when sales revenues and cash flows from operations of firms sharply decreased. In line with this explanation is the established negative impact of the ratio of Interest expenses / Interest debt. The results of the study also confirm the second hypothesis that companies that have higher debt service costs have lower cash reserves.

4. Conclusion

The results of the multiple linear regression analysis showed a negative impact of the Total Debt / Total Assets ratio on the cash holdings of publicly traded non-financial corporations in Bulgaria during the crisis caused by the coronavirus pandemic. The level of indebtedness is an indicator of the confidence of creditors in companies, i.e. for easier access to credit in the event of an unexpected liquidity shortage and, accordingly, a lower need for cash holdings. However, higher debt also means more costs for its servicing, which may also explain the lower levels of cash holdings in more indebted companies. The ratio of Interest Expenses / Interest Debt also has a negative impact on the ratio of Cash and Cash Equivalents / Total Assets. This shows that high debt servicing costs deplete the cash reserves of companies during the pandemic.

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REAL ECONOMIC CONVERGENCE OF BULGARIAN ECONOMY IN THE EURO AREA – EVIDENCE AND IMPLICATIONS

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Abstract: *Bulgaria has been applying for membership in the eurozone for years, the main logic being the achievement of a high degree of sustainable economic and monetary convergence. Fulfillment of the nominal criteria under the Maastricht Treaty became the cornerstones for carrying out the conditions set by the ECB first when the country passed through ERM II and subsequently when the country joined the Economic and Monetary Union (EMU) and the euro became its currency. Along with the nominal criteria, a series of additional indicators are also important for the ECB, which shape sustainable macroeconomic stability and contribute to the country's real convergence to the economic and financial structures of the EU. The article aims to highlight some important indicators that show the extent to which Bulgaria has achieved real convergence with the eurozone countries. Will the adoption of the euro contribute to the deepening of this process?*

Keywords: *Eurozone, European Economic and Monetary Union, Real economic convergence of Bulgaria, Sustainability and economic catching up*
JEL: *F15, F45, E42*

1. Introduction

Bulgaria's accession to the Economic and Monetary Union (EMU) is an expression of the country's ever closer attachment to European economic and political integration. In accordance with the Maastricht Treaty (1992), the number of eurozone countries increased to 20 by 2023.

Bulgaria has been applying for membership in the eurozone for years, the main logic being the achievement of a high degree of sustainable economic convergence. To this end, Bulgaria sought to meet the requirements for price dynamics, budget deficit, government debt, exchange rates, long-term interest rates. The compatibility of national legislation with the Treaties and in particular with the Statute of the European System of Central Banks (ESCB) and of the European Central Bank (ECB) is also important.

The main logic of joining the euro area is the fulfillment of the nominal criteria by the candidate country, however, the process of joining the EMU is subject to a number of additional assessments and implementation of objectives, which include achieving sustainable real economic convergence.

The article examines the importance of indicators and factors that influence the ECB's decision to join Bulgaria to the eurozone, in addition to the Maastricht nominal criteria requirements. Achieving sustainable real convergence in a given country depends directly on the economic and financial development of the EU countries, on changes in the geopolitical and geoeconomic situation, as well as on the country's ability to counteract external crisis effects

and to manage the economy aimed at catching up on economic lag based on sound state management in order to better prepare the country for membership in the eurozone.

2. Bulgaria and the euro – a long process of negotiations

The main objective of the European monetary union (EMU) is the price stability maintenance and the support of EU economic policies, in accordance with the principle of open market economy and competition. For investors and entrepreneurs, the technical benefits of the introduction of the euro are related to the reduction of transaction costs and to achieve better access to financial markets. The costs of the banking sector to maintain liquidity and buffers will be reduced and, accordingly, conditions will be created for the reduction of domestic interest rates (taking into account the phase of the monetary policy cycle regarding interest rates), possibly lowering the country's risk premium and reducing the government's funding costs.

Bulgaria's accession to the eurozone has remained one of the main prerogatives of the Bulgarian governments for years. Bulgaria has been striving to become an EMU member and thus to integrate its most closely economic structures in the EU and with the eurozone.

In 2009, the Bulgarian Government considered the country's entry into the exchange rate Mechanism II (ERM II) and subsequently into the eurozone as a top priority. In economic and financial terms, this goal was pushed to the background with the outbreak of the Greek debt crisis, which caused debts turmoil in the Southeastern eurozone countries. In 2009, the budget deficit exceeded the 3% threshold according Maastricht Treaty and the Bulgarian Government rejected the decision on ERMII entry for a future period.

In 2013, macroeconomic stability of the Bulgarian economy was underlined like a precondition for joining ERM II. Subsequently, towards the end of the Bulgarian EU presidency (2018), Bulgaria submitted an application for joining ERM II and the European Banking Union. The country undertook obligations for amendments to the Law on the BNB, the Law on Money Laundering, the Insurance Code, the Commercial Law, and the management of state-owned enterprises. As of July 2020, the ECB included the Bulgarian lev in the ERM II. Bulgarian legislation is estimated to be compatible with the Treaties and the Statute of the European System of Central Banks (ESCB) in accordance with Article 131.

Bulgaria’s entry into ERM II is the result of a political resolution with the EC and the ECB. In this sense, the most important task was to prove to the ECB that Bulgaria fully meets the described and required criteria. Bulgaria applied measures to overcome structural disparities with the EU and implement reforms and adjustment of the financial system in order to join the Eurozone.

Although when Bulgarian currency was included in ERMII, an unequal treatment and preconditions were imposed on Bulgaria and this was not in line with the fundamental principles of the Treaty on the Functioning of the EU, namely the equal treatment of Member States. The requirements for Bulgaria during ERM II include also political commitments and the acceleration of efforts to implement the action plan adopted by the Financial Action Task Force (FATF), after Bulgaria was included in the FATF “grey list” in October 2023 due to the need to reform the legal system, and it is subject to enhanced supervision. The Bulgarian lev participates in the ERM II for the two-year reference period from 20 June 2022 to 19 June 2024. During the reference period, the lev did not deviate from its central rate.

The overcoming of the debt crisis of the eurozone countries was followed by the pandemic crisis related to COVID 19, and the subsequent political turmoil related with the war on the

territory of Ukraine, which had a negative impact on the normal course of economic and social life in Europe. The pandemic crisis and the political turmoil affected the European economies, as these turmoil led to an increase in the prices of energy carriers and raw materials.

The emergence of poly-crises had an impact on the wholesale prices of electricity and natural gas increase since 2021 (nearly 15 times) and this deteriorated European economies. High energy prices are driving up costs for businesses across many channels like the increase in electricity supply. The closure of economies due to the pandemic crises has adversely affected European trade and disrupted the regular supply of goods and services along global value chains (GVCs).

Due to significant geopolitical upheavals and to the long-term deindustrialization of European industries, caused by successive waves of offshoring to destinations with lower production costs, European industrial production experienced significant difficulties to recover and upgrade the technological process which had a negative impact on the Eurozone economies.

EU economies have relatively stabilized since early 2024. Private consumption improves due to falling inflation rates, which restores purchasing power and employment. The Government deficit is expected to decline after almost all energy support measures are cut, but public debt is rising slightly, indicating the need for fiscal consolidation, while protecting investment.

The Bulgarian economy is gradually recovering, but the challenges facing the country are increasing given the unstable geopolitical environment and the associated economic shocks and uncertainty. Global uncertainty continues and – with a war still in the vicinity of Bulgaria– this leads to an increase in risks.

GDP in Bulgaria is expected to grow in the foreseeable future. Although private consumption growth is expected to slow, domestic demand is expected to remain the main driver of growth, as well as some narrowing of the budget deficit. The budget deficit is projected to reach 2.8% and 2.9% in 2024 and 2025, driven by pension and salary costs. The government debt of Bulgaria slightly increased. (Table 1)

Table 1. Structural macroeconomic indicators Bulgaria, Euro area

	2023		2024		2025	
Indicators	Bulgaria	Euro area	Bulgaria	Euro area	Bulgaria	Euro area
GDP growth (% yoy)	1.9	0.4	1.9	0.8	1,29	1.4
Inflation (%, yoy)	8.6	6.4	3.1	2.7	2.6	2.5
Unemployment (%)	4.3	6.6	4.3	6.6	4.0	6.5
General government balance (% of GDP)	-1.9	-3.6	-2.8	--3.0	-2.9	-2.8
Gross Public debt (% of GDP)	23.1		24.8		24.6	
Current account balance ($ of GDP)	-0.4		0.3		-0.3	

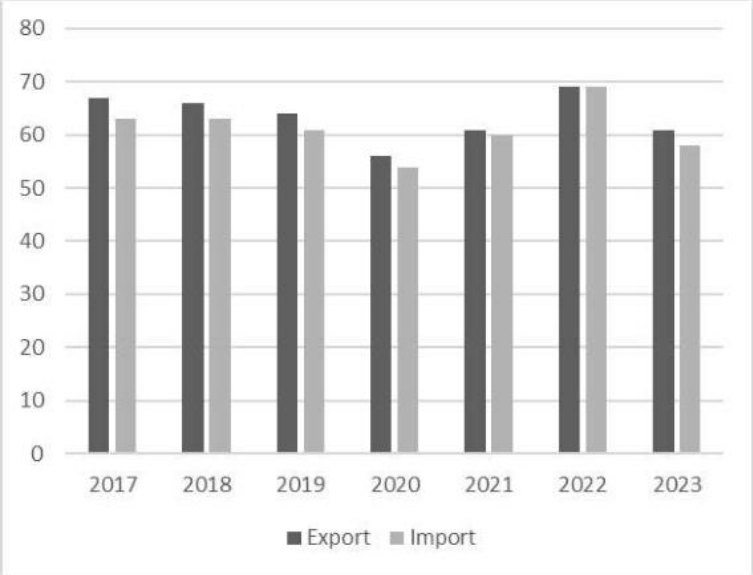
Source: Spring 2024 Economic Forecast, European Commission, 15 May 2024

After 2014, the import and export of Bulgaria remained constant, and after an increase in 2019, in 2020 there was a decrease in foreign trade activity. Bulgaria's foreign trade is shrinking

despite expectations for a recovery in external demand from the beginning of 2024, and imports to recover due to an increase in domestic demand. For the first five months of 2024, both exports and imports declined. Exports decreased by 6.2% compared to the same period in 2023. The main export destinations within the EU are Germany, Romania, Italy, Greece and France, which together represent 62.6% of the country's exports.

The stability of the trade partner countries of Bulgaria is probably due to the fact that the essential part of the Bulgarian exporters and importers are owned by companies from the partner countries. Trade with them follows their strategic interest, and is not the result of any national Bulgarian policy, as can be formally seen from the positive trade balance with developed EU economies like Germany. The 1.5% concession fee for the extraction of strategic raw materials is very low and it is not changed since years. In 2023, on an annual basis, Bulgaria is a net importer of electricity from Serbia and Turkey in euros and in MWh after decades being net exporter of electricity.

Figure 1. Bulgaria export and import as a % of GDP



Source: https://www.macrotrends.net/global-metrics/countries/BGR/bulgaria

3. The importance of the real convergence

Undoubtedly, the nominal convergence criteria are influenced by the changed geo-economic and political situation in the world and in Europe. However, the economic development of the Central and Eastern Europe (CEE) countries, and especially Bulgaria, is of essential importance for equal participation in the eurozone. The challenges facing Bulgaria should also be identified, and in this regard, the estimation of these complex factors and processes is the real convergence of the economy to EU economies.

According the theory of economic growth, real convergence is one of the foundations that maintain the smooth functioning of the monetary system in the medium term. This means that stable national economic and financial conditions are a basic prerequisite in the process

of catching up of less developed economies towards the economic developed EU countries. The achievement of economic and social convergence to the EMU requirements, is important, considering that the euro area member states are in the mode of implementing various fiscal transfer mechanisms. This stems from the fact that achieving sustainable convergence reduces differences in real incomes, maintains social and economic sustainability, and this will stabilize the EMU.

In this respect, „*real convergence is a process of convergence and eventual equalization of real income per capita in a given group of countries*." Real convergence is understood as a process in which economic growth in relatively poorer countries is faster than in richer countries. This is reflected in the differences in real incomes between countries, and these differences in incomes decrease over time, which has a beneficial effect on economic welfare and well-being. Subsequently, achieving sustainable convergence remains important for economic and monetary integration with the euro area Member States and within the EU.

In the economic growth literature, real convergence is encompassed by two complementary concepts - of beta convergence (β-convergence) and sigma convergence (σ–convergence). The first type (ß-convergence) is the catching-up of relatively less developed economies to developed economies. This means that higher incomes should be closer to those of the richer European countries. A well-known measure of ß convergence is the relative GDP per capita, calculated on the basis of purchasing power standards (PPS). The second concept (δ-convergence) is expressed by reducing the dispersion of income levels across EU countries.

This means that a less-developed economy should achieve a higher sustainable economic growth than developed economies, so that the incomes of the countries converge after a certain time within the regional bloc. EU Member States should increase GDP per capita in line with ß-convergence, while δ-convergence expresses the effects of the increase in relative GDP per capita of the less-developed economies.

The European Central Bank highlights the following main objectives for achieving a sustainable real convergence process:

- Economic policies that accelerate sustainable real convergence and overcome negative shocks;
- Macroeconomic stability and economic flexibility that can contribute to correcting pre-crisis capital misallocation;
- The achievement of higher total factor productivity growth is a precondition for sustainable convergence;
- The amelioration of labor productivity with the introduction of high level specialized workers in new industries;
- Greater economic and financial integration should also support the real convergence process.
- By reducing obstacles to trade, labor mobility and competition, and by favoring
- technological diffusion, the Single Market should support real convergence in the euro area. (Real convergence in the euro area: evidence, theory and policy implications, 2015)

After 2000, the economic progress of the CEE countries has been a rather heterogeneous process. In the years before the global and debt crisis, economic convergence has been faster in the EU CEE countries. While some countries of Central European EU countries have

achieved high economic growth and are successfully implementing the catching-up process, for others, this process has developed much more moderately and slowly.

The concept of convergence has many dimensions, and the focus is on real convergence, measured by real GDP per capita. Sustainable real convergence is the process by which the per capita GDP levels of lower-income economies catch up with those of higher income economies on a permanent basis. For convergence to be sustainable, long-term potential growth per capita must be in line with expanding demand.

GDP growth, resulting from external factors, such as a strong global demand shock or a the narrowing of interest spreads, occuring with the inclusion to the euro area, may prove unsustainable, if not coupled with higher potential for economic growth. The Structural Funds and the Cohesion Fund are EU financial instruments. Regional policy are aimed at equalizing the differences between the different EU regions. Although, the financial instruments are more limited in nature.

Here, the economic policies pursued by the member states remain important, aimed at renewing the technological base of the industry, attracting FDI, expanding public investments and modernizing the infrastructure, and creating new jobs in modern manufacturing enterprises, which will undoubtedly have a positive impact on labor productivity and the income of the population, while reducing income inequality in the country.

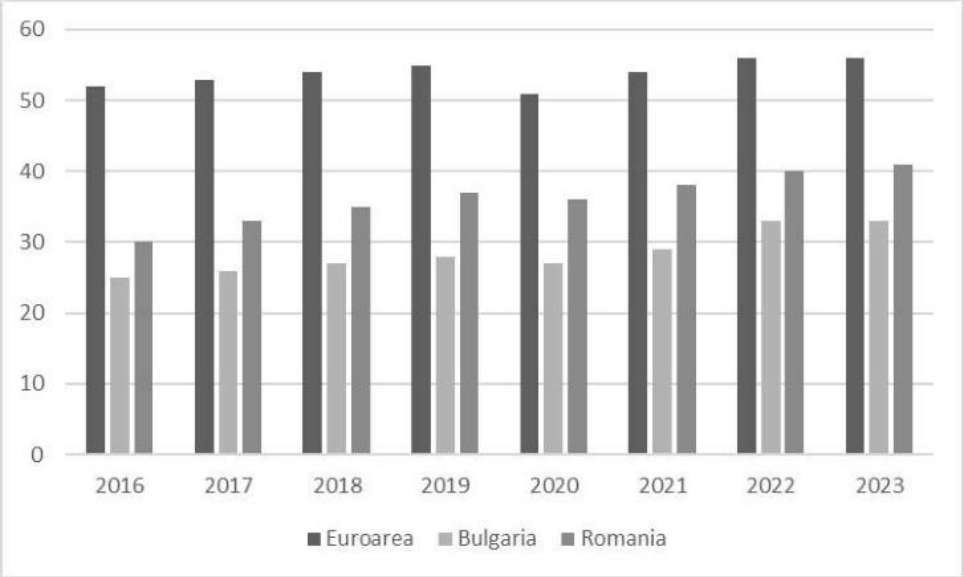
Achieving sustainable real convergence is important for economies that share a single currency. Economic, financial and social catching up is important and likely the inflation differential may increase relative to the average level in the euro area in the medium term. In the case of a monetary union, this is usually associated with a decline in real interest rates in the catching-up economies, since short-term nominal interest rates are determined by the central bank's exchange rate. Given this essential feature of monetary policy in a single currency area, great importance must be attached to fiscal and macroprudential policies that relatively smooth cyclical economic developments and are conditions for stability.

Real sustainable convergence is a process by which the GDP per capita of a lower-income country actually catches up and moves closer to these of more developed economies. Income convergence means sustainable economic growth and the ability of the less-developed economy to counteract external shocks. According ECB data, real convergence, between the twelve countries, that adopted the euro before 2002, did not occur to the extent, desired between 1999 and 2014. For the countries that adopted the euro after 2002, there are signs of beginnings of cohesion and real convergence.

The comparison between GDP per capita based on purchasing power parity (PPP) of the EU CEE Member States and Bulgaria shows that this indicator increased the most in Poland and Slovakia in 2004-2015. During this period, GDP per capita remained almost at the same level in Hungary and the Czech Republic. This indicator is also increasing in Bulgaria, but is lagging behind the other countries.

GDP per capita in Bulgaria amounted to 45.7% out of 100% in the euro area in 2016, compared to 42.7% in the period 2008-2017. In 2023, Bulgaria had the lowest level of GDP per capita in the EU, behind Greece, Latvia and Slovakia. Currently, GDP per capita in Bulgaria is 61% of the EU average.

Figure 2. GDP per capita based on PPP for the euro area countries, Comparisons between Bulgaria, Romania and the Euro area



Source:https://tradingeconomics.com/romania/gdp-per-capita-ppp

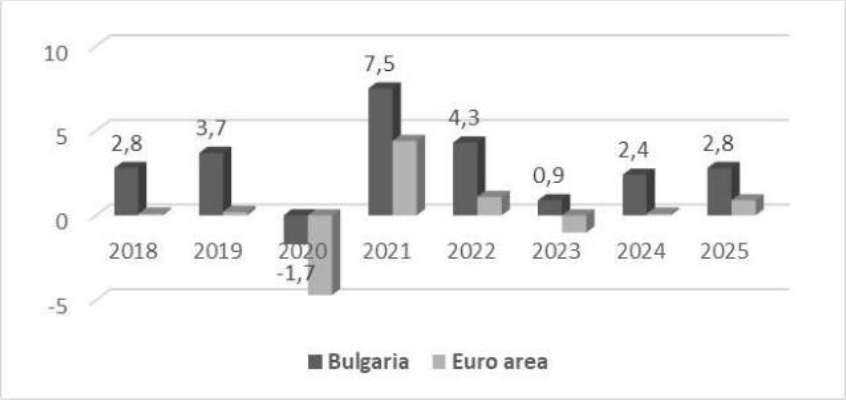
A key issue is how joining the Euro area would affect faster convergence to average level of European incomes. In the period 2014-2023, the total income of the Bulgarian household on average increased by 53.72%, wages on average by 53.18%, and pensions by 43.55%. In 2023, the minimum wage in Bulgaria is BGN 933 (about EUR 460). The average gross monthly salary in Sofia is around BGN 2.800 (about EUR 1.400), resulting in a net salary (after tax and social contributions) of about BGN 2.200 (EUR 1.000). In the rest of the country, the average gross salary is around BGN 2.000 (about EUR 1.000), but with important regional diversity. The average salary in Bulgaria has thus increased by about 50% over the last 5 years, and it increased by 20% from 780 BGN in 2023 to 933 BGN in 2024.

Increasing rates of economic growth have a positive impact on the production and consumption of goods and services. They should grow faster in a weaker economy compared to the rates of development of production in a developed economy. The objective is convergence towards the levels of production and consumption in the EU. The basis for this evidence lies in the increase in labour productivity and the added value created by a worker in one hour of work.

It seems that when compared with other EU CEE member states, the increase in wages in Bulgaria does not correspond to the level of labour productivity, which affects cost competitiveness. The real change in labour productivity demonstrates the country's capacity for economic convergence. Overall real labor productivity increased after 2012, driven by manufacturing. Nominal labor productivity per hour worked is 53.4% of the EU level in 2022 (PPS). (Eurostat) Bulgaria Labour Cost Index is at a current level of 159.40 during the second quarter of 2024, and up from 140.50 one year ago (Q2,2023). This is a change of 13.45% from 2023. (Eurostat Calculated on data of National Statistical Institute of Bulgaria)

Labour productivity is increasing in Bulgaria, but this depends on several factors, such as demographic trends, labour force qualification indicators, the level of innovation and new technologies in industry. Low labour productivity is an obstacle to the process of convergence of Bulgaria's incomes with other EU member states. *Bulgaria's membership in the EMU is clearly not a fundamental factor that will automatically lead to an improvement in labour productivity.*

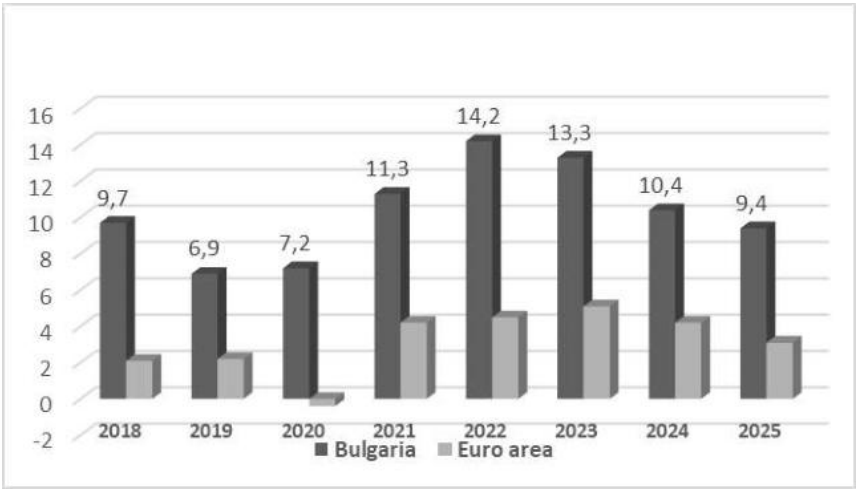
Figure 3. Labor productivity of Bulgaria and the Euro area per years 2018-2025 (p)



Source: Convergence Report European Commission, 2024, p. 48

In Bulgaria, an employee costs in average 7 euros per hour, which is 4 times less than what it costs in Luxembourg or Belgium or France. The wages per hour of work in Bulgaria do not mean that the country is acquiring good competitive positions in comparison with its counterparts in the EU, even if labour productivity is increasing. *For Bulgaria, improving labor productivity and competitiveness of production is an important challenge for its economic catch-up and full European monetary integration.*

Figure 2. Nominal compensation per employee per year 2018-2025 (p)



Source: Convergence Report European Commission, 2024, p. 48

Disruption of the synchronicity of supply of global value chains (GVC) disrupts production links, exacerbates the challenges to the production potential and competitiveness of labor shortages, especially in the service sector, but also the inflation indexation of some nominal

wages put upward pressure on wages and unit labor costs. Unit labor costs were the highest in the EU, but this was due to the long-term hold-up of wages in the real sector amid inflation. The Bulgarian economy proved relatively stable in 2022; but it recorded a decline in 2023.

Bulgaria has still not overcome the macroeconomic imbalances accumulated before and during the pandemic crisis with COVID 19, which influences export competitiveness. The increasing real effective exchange rate show that competitiveness is deteriorating, which suggests a slowdown in the process of real economic convergence in Bulgaria.

Bulgaria aims to achieve economic stability and meet the criteria for entering the euro area, but this requires continued efforts in terms of fiscal policy and controlling inflation (2024 Convergence Report). In addition, Bulgaria has a significantly below-EU average level of employment in high-tech and a moderately lower level of employment in the knowledge-intensive sector, which is an important factor for technological convergence.

Bulgaria has a lower turnover of large enterprises compared to the EU, while registering a higher share of foreign-controlled enterprises, which may have a positive impact on the development of research and development in the country. Bulgaria also has a higher share of small and medium enterprise (SME) turnover than the EU average.

Table 2. Development and structure of the Bulgarian economy compared to the average level of the EU27 and of companies in Bulgaria for 2023

	Bulgaria	**EU27**
Implementation and structure of Economy for 2023		
GDP per capita	61	100
Average annual GDP growth (%)	6.4	4.4
Employment share Manufacturing (NACE C) (%)	18.7	16.4
Of which high and medium technologies (%)	23,1	38,0
Share of employment in services (NACE G-N) (%)	41,3	41,1
of which knowledge-intensive services (%)	28,8	35,8
Share of turnover of SMEs (%)	45,9	34,1
Share of turnover of large enterprises (%)	31,4	49,6
Foreign enterprises – share of added value (%)	17,4	11,8
Business and entrepreneurship		
Birth of enterprises (10+ employees)(%)	1.6	1.0
General entrepreneurial activity	6.0	6.8
Net FDI inflows (% of GDP)	3.6	3.1
Enterprises with the largest R&D expenditures of 10 million population	0.0.	20.3

Source: European Innovation Scoreboard 2023 Country profile Bulgaria, https://research-and-innovation.ec.europa.eu/statistics/performance-indicators/european innovation scoreboard_en

The entrepreneurial dynamism of the Bulgarian economy is generally higher than that of the EU, with a higher than average rate of new business births and net FDI inflows. Data suggest some improvements in net FDI inflows, although ongoing efforts are needed to improve the regulatory system, the alignment with European laws and global standards. Education in Bulgaria is slightly below the EU average.

Research and development are needed a strong financing and special protection of the State. Bulgaria's innovation profile presents a mixed picture with areas of strength and significant challenges. Domestic product innovators with market novelties account for 10.4%, indicating a solid base for creating new market-oriented products. However, the percentage of internal product innovators without market innovations is lower at 9.1%, suggesting a limited focus on incremental product improvements. (Convergence Report, 2024)

Business process innovation is also relatively low, with 10.1% of firms engaging in this activity, indicating potential inefficiencies in internal operations. A major weakness is the high percentage of non-innovators without innovation propensity, which amounts to 49.6%. This indicates that nearly half of firms in Bulgaria are not innovation-prone, which represents a significant barrier to overall economic competitiveness. More positively, 14.2% of firms are identified as non-innovators with innovation potential, highlighting a significant opportunity for growth if appropriate support and incentives are provided. Furthermore, innovatively active non-innovators are only 1.8%, indicating minimal engagement in innovation activities among non-innovators. Overall, there is a basis for product innovation in Bulgaria, the high percentage of firms that are reluctant to innovate and the relatively low engagement in business process innovation suggest a need for targeted policies and support to foster a more vibrant innovation ecosystem.

Foreign and domestic direct investment in sectors such as machinery and equipment has been declining since 2021, partly due to political uncertainty and needs for infrastructure reconstruction or the lack of concrete measures to implement much-needed infrastructure projects. Small and medium-sized enterprises in the non-financial economy, which are considered the "backbone" of the European industrial structure, form the basis of the Bulgarian industrial sector, judging by the higher share of the SMEs' turnover. Large enterprises also dominate the Bulgarian real economic sector, and the share of foreign enterprises in Bulgaria is higher compared to the EU average. The development of entrepreneurship and business does not deviate from the average evolution of EU countries.

Public investment is insufficient and this explains the delay (or suspension) of the implementation of infrastructure projects due to the political uncertainty in the country. Public investment growth is largely driven by European funding and is higher than the EU average over the past five years (1.2% vs. 0.5% of GDP).

Combined with the significant shortage of materials and labor, the increase in prices reduces the production capacity of Bulgarian companies. Global supply chain disruptions, also due to the war in Ukraine and expectations of further price increases, have led to stockpiling of raw materials, goods and finished goods. This partially explains the increased contribution of inventories to the annual GDP growth, especially in the first half of 2022.

Investments in renewable energy sources and reduction of relatively high greenhouse gas emissions in the country are one of the main requirements of the EU. High carbon taxes are burdensome for Bulgarian industrial production. In comparison, the taxes paid by industrial

enterprises in the US and China are lower than in EU countries and this have an impact on the competitiveness of European and Bulgarian enterprises.

Political and economic unfavorable factors affect reforms and the behavior of the industrial sector. Bulgarian companies experience a number of difficulties because of the changing economic space and relations in the world, which creates an internal uncertain economic environment, combined with the shortage of labour force. According to short-term business indicators (European Commission and NSI study), the two main factors that influence the business are the shortage of qualified labour and the uncertain economic environment, which are obstacles to the growth of labour productivity and the competitiveness of production. (The availability of qualified personnel is a long-term obstacle to investment for 88% of Bulgarian companies (Investment survey of the European Investment Bank EIB.) Bulgarian SMEs from the non-financial sector face the same difficulties in hiring personnel, in improving the organization of the company.

4. Conclusions

The adoption of the euro itself as a currency is a technical process based on the observance of the Maastricht criteria and the attainment of a nominal convergence. It was expected that during the stay of the Bulgarian lev in ERM II, the economy will be in a position to apply all the necessary EU requirements to stabilize the economic and financial sector and to achieve under the supervision of the ECB the path towards a full partnership in euro area and the banking union.

There are a number of structural differences between the EU27 and Bulgaria. The unstable internal and external political environment affects the industrial sector of Bulgaria, and the situation is complicated by a series of contradictory decisions in the country's energy sector and the exacerbation of the energy crisis, which raised challenges to the production potential and competitiveness of Bulgarian companies. It is a challenge for the labor productivity of the Bulgarian industry and improve their competitiveness. Looking ahead, Bulgaria as a EU country continue to face several challenges in the real convergence process.

Real convergence and the equalisation of incomes is directly dependent on the renewal of the Bulgarian industrial sector with the implementation of new technologies and the attraction of FDI in innovative and promising sectors of the Bulgarian economy, as well as enforcing sustainability and institutional modernisation. It will have a positive factor over labour productivity and over the enforcement of Bulgarian trade integration on the EU single market .

While some of the economic reorganisations are more difficult to achieve through dedicated policies, the Government should pay attention to them in an endeavor to continue, and possibly accelerate, the process of catching up with the EU. In 2023, Bulgaria's accession to the euro area was postponed to 2026, due to the level of inflation and the efforts to stabilise the budget of Bulgaria.

The eurozone entry of Bulgaria is finally a political question resolved under the auspeces of the EU and the ECB decisions. It is also important to assess in the long term to what extent joining the eurozone will bring economic and financial benefits to Bulgaria, in addition to the eurozone as a whole. The assessment of the benefits of Bulgaria joining the eurozone should focus on the stability of the eurozone as a whole, given the complicated geo-economic

and geo-political situation, which is deteriorating the eurozone functioning and the danger to apply austerity measures is increasing, because of the deepening of the economic recession and unemployment.

Bulgaria must pursue the implementation of structural reforms for real sector technological innovations with the goal to improve the real convergence indicators.

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TAXATION OF DIGITAL COMPANIES – CURRENT STATE AND PROSPECTS

Nelly Popova[1]

Abstract: *Globalisation and the spread of new information and communication technologies has led to the creation of a strong digital sector of the economy consisted of companies specialised in the provision of remote services based on online platforms. The taxation of the profits of digital companies has proven to be a significant challenge to the public sector but nevertheless different solutions have been implemented around the world. The present paper has as its objective to outline and analyse the existing national approaches towards the taxation of the companies specialized in the provision of digital services. It is stated in the paper that unilateral fiscal measures increase tax uncertainty and add to complexity of national tax systems.*
Keywords: *Digital taxes, corporate income tax, digital economy, international tax coordination*
JEL: *H25, H32, H87*

1. Introduction

The process of digitialisation has been related to a rapid spread of new information and communication technologies throughout the world in the past three decades. On the one hand, these developments have improved the conditions for international competition and created new possibilities for economic growth and social prosperity. On the other hand, digitalisation has added new challenges at the microeconomic and macroeconomic levels. The OECD has recognised that these changes have brought with them challenges to the rules for taxing international business income, which have prevailed for more than a hundred years and created opportunities for base erosion and profit shifting (BEPS), requiring bold moves by policy makers to restore confidence in the system and ensure that profits are taxed where economic activities take place and value is created (OECD, 2024, p. 3).

2. Challenges to the taxation of the companies specialised in the provision of digital services

2.1. Characteristics and importance of digital businesses

Technological development and the spread of internet throughout the world have led to the creation of new types of business models based on online platforms. There is no single definition of the digital economy and business models. Nevertheless, a digital business can be defined as the process of applying digital technology to reinvent business models and transform a company's products and customer experiences - innovating products that create new value and connecting people with things, insights and experiences (Cognizant, 2024). According to Arthur (2011, cited in Aagard, ed., 2019, p. 1), digitalisation is creating a second

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economy that is vast, automatic and invisible, thereby bringing about the greatest societal upheaval since the Industrial Revolution.

As Requena (2017) pointed out, the adjective "digital" lends added innovation to the traditional term "economy". This novel economy is conducted by digital means, mainly charecterised by the lack of physical contact between the acting parties, and the digitalisation of the information regarding the goods and/or services subject to trade.

Becker (2021) pointed out that the digital economy includes platform-supported services such as Uber, online platforms such as Amazon, Facebook, and Google, trading electronic services such as e-books, video games, and films as well as online delivery of software and mobile-enabled technologies and applications (cited in Mpofu, 2022, p. 3).

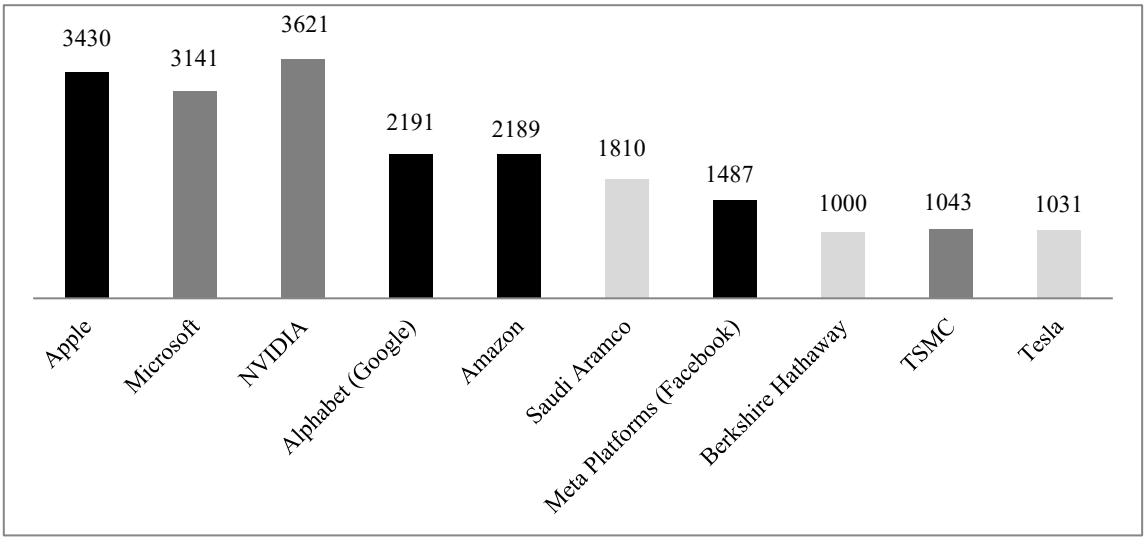
Through the use of remote technology, many digitalised businesses can effectively be heavily involved in the economic life of different jurisdictions without any, or any significant physical presence, thus achieving operational scale without mass (OECD, 2018, p. 51).

In practice, digitalisation is seen in the dramatic shift in focus toward marketing online, on social media and via mobile marketing, and a decreasing focus on traditional advertising. Stronger interactions are created and data is continuously collected from existing and potential customers through social networks (Aaagard, 2019, p. 2). These new business models contradict the prediction of a massive disintermediation caused by the strong development of digital technologies and of the Internet. Even if the Internet can reduce coordination costs, intermediaries are still needed (Brosseau and Penard, 2007, p. 82).

The Organisation for economic cooperation and development (OECD) has defined three salient features that are frequently observed in the business models of some highly digitalised firms: cross-jurisdictional scale without mass, heavy reliance on intangible assets, especially intellectual property (IP), and the importance of data, user participation and their synergies with IP. At the same time, it has been recognised that these characteristics are not exclusive to highly digitalised business models. They can also be found to varying degrees, in more traditional business models, and have gained greater prominence as a function of globalisation more generally. The third feature, data and user participation, is more evident in a subset of highly digitalised business models (OECD, 2018, p 170).

Due to the fact that information and communication technologies (ICT) have become an integral part of most economic sectors, the companies that are specialised in the provision of digital services have grown immensely over the past two decades.

Figure 1. Top 10 global companies by market capitalisation in November 2024 (in USD billions)



Source: Companies Market Cap

2.2. Projects for internationally coordinated solutions towards digital companies

The increase in digital transactions poses a remarkable challenge for tax authorities (Mpofu, 2022, p. 1). The internationally accepted rules on corporate income taxation date back to the 1920s which means that the applicable legislation towards company profits falls behind the technological developments in the digital area. The main two questions are: first, how to tax the income of the companies specialised in the provision of digital services such as Alphabet, Meta or Amazon and second, how to allocate the taxing rights between the source and the residence country. At the same time, OECD has admitted that it is impossible to "ring-fence" the digital sector from the rest of the economy.

From a fiscal point of view, the exclusion of the largest digital companies from taxation implies a loss of significant fiscal revenue for the countries where these enterprises operate. In this way, it leads to inequalities in the tax burden of traditional and digital business models (Geringer, 2021). This in turn puts digitalised business models at an unfair competitive advantage, thus distorting market conditions. In an international context, an important result of digitalisation is the double non-taxation of corporate profits of the respective companies. The double non-taxation does not necessarily arise from tax evasion or avoidance, but rather from the lack of adequate tax rules towards the income earned from the supply of digital services; therefore, this problem can be solved through modernisation of the tax regime, preferably involving the countries where large MNEs are headquartered. Furthermore, digitalisation itself opens new opportunities for tax avoidance on the part of MNEs through profit shifting to jurisdictions with low tax rates or even no direct taxes at all. Finally,

In recent years, there have been several international initiatives for the introduction of taxes towards the earnings of the MNEs specialised in the provision of digital services. A coordinated response, including the introduction of a concept of *digital permanent establishment*, has been the preferred approach by the European Union (Popova, 2020, p.). In 2018, the EU presented a draft directive on the corporate taxation of significant digital presence. The objective of the Commission's proposal was to extend the concept of permanent establishment so as to include a significant digital presence through which a business is carried on and establish rules for the attribution of profits generated through such

significant digital presence (Eur-Lex, 2018). In parallel, the EU also put forward a draft directive on the common system of a digital services tax (DST) as an interim measure until the achievement of a global consensus towards the taxation of the digital economy. According to the draft, the DST at a rate of 3% would be levied on the gross annual revenue from the provision of three types of digital services: first, the placing on a digital interface of advertising targeted at users of that interface; second, making available to users of a multi-sided digital interface which allows users to find other users and to interact with them, and which may also facilitate the provision of underlying supplies of goods or services directly between users; and third, the transmission of data collected about users and generated from users' activities on digital interfaces. The tax would apply only to companies with a total gross annual turnover exceeding 750 million euro and a gross turnover in the EU over 50 million euro (Eur-lex, 2018a). The two proposals did not obtain the necessary unanimity of the Member States, thus they were not implemented.

The Base Erosion and Profit Shifting (BEPS) Project, launched in 2013 by the OECD and G20, has been the most ambitious initiative on the global level for reforms of corporate income taxation rules in recent decades. As of 2024, over 140 countries are participating in the BEPS Project through its so-called Inclusive Framework. The main goal of the project is to modernise company taxation rules and adapt them to the context of globalisation and digitalisation, thus limiting the possibilities of multinational enterprises (MNEs) to avoid taxes through profit shifting strategies. The BEPS Project consists of fifteen actions each of which is targeted towards a particular issue.

Action One of the BEPS Project is particularly focused on the challenges arising from digitalization and the measures within its framework have been divided into two pillars. As regards Pillar One, the proposed reforms under the BEPS Project do not contain a change in the definition of “permanent establishment”; rather, they introduce a new formula-based mechanism for allocation of the taxing rights among countries with regard to the taxable profits of the companies concerned (instead on the basis of transfer prices). Its application will be limited only to a share of the residual profit, if the amount so allocated is over and above the arm’s length return that might be allocable to in-market activities such as baseline marketing and distribution (OECD, 2020, p. 9). The timing for the introduction of Pillar One is unknown and depends on its acceptance by a critical mass of jurisdictions (KPMG, 2024a). Pillar Two on its part involves measures intended to reduce the incentives of digitalised MNEs to shift their profits to low-tax jurisdictions. Its essence consists in the application towards large MNEs with revenues above EUR 750 million of a 15% effective minimum tax rate wherever they operate.

The implementation of the global minimum tax has progressed with around 55 jurisdictions already taking steps toward implementation and with the rules coming into effect in 2024. In the EU, Council Directive (EU) 2022/2523 on ensuring a global minimum level of taxation for multinational enterprise groups and large-scale domestic groups in the Union was adopted by the Member States and entered into force on December 23, 2022. The Directive requires Member States to transpose the rules into domestic law by December 31, 2023 (KPMG, 2024).

It should be noted that the global minimum tax is applicable to all MNEs with turnover above the set threshold and not only to the companies specialised in the provision of digital services. This tax can be viewed more as an attempt to curb aggressive tax planning rather than to tax

the profits of digital companies. This means that the adoption of the global minimum does not require abolishment of the national digital taxes introduced by some countries.

Cantos (2022) found fundamental reasons for not having an optimistic view on the effective solution to the problems above: unrealistic forecasts on the amount of the new estimated tax bases for Pillar One and the high administration and compliance costs. In conclusion, it is not foreseeable that the tax bases derived from the provision of digital services will suffer a territorial redistribution. We do not expect that a minimum tax rate of 15% in corporate tax will be carried out effectively or that the benefits that are transferred to tax havens will be significantly reduced.

On the basis of an empirical study, Johannesen (2022, p. 7) concluded that the welfare effect of a global minimum tax is unambiguously positive when the tax rate is high enough to end profit shifting. This author pointed to the risk of introducing a global minimum tax at a low rate where profit shifting continues and havens capture part of the global revenue gain associated with the policy.

Initially, it was envisaged that the new rules within BEPS Action One mechanism for profit allocation would be applicable only to large MNEs and under the conditions that these companies provide automated digital services and the revenue is generated from the sale of goods and services only to final consumers. However, in the latest draft of the proposed reforms the scope of covered businesses has been changed from the original intention of highly digitalised business models. However, due to difficulties in "ring-fencing" the digital sector of the economy, the scope of the proposed reforms under both Pillar One and Pillar Two has been extended to include all large multinational companies regardless of the industry in which they operate. Although extractives and regulated financial services are exempt, all other industries are generally in scope of the rules under Pillar One (KPMG, 2024a). Thus, the measures within Action One of the BEPS Project are no longer focused specifically on the companies specialized in the provision of digital services, rather they target tax avoidance by MNEs and race-to-the-bottom among countries in the area of corporate income tax.

In the near future, revising the determination of transfer prices is one of the key challenges in designing an administrable system of profit taxation with a minimum of distortive efects for digital business models (Olbert, Spengel, 2017, p. 5)

3. National approaches towards the taxation of digital companies

The difficulties for a consensus-based solution towards the taxation of the digital economy within OECD/G20 and the EU has led to the introduction of unilateral tax measures towards digital businesses by a number of countries throughout the world. Digital tax policies have targeted MNEs such as Facebook, Google, and Amazon, web-based services as well as other e-commerce marketplaces to widen the tax base by extending existing legislation to new players or directing new tax legislation specifically to new businesses and platforms that were previously not subjected to tax (Mpofu, 2022, p. 4)

On the basis of a comparative analysis of a number of countries, Strauss et al. (2023) found that although the recommended interim tax measures (where applicable) were adopted in principle by the majority of countries worldwide, the application of these measures lacks uniformity.

As of 2024, around fifty countries have adopted or announced the implementation of direct taxes on digitalised companies (KPMG, 2024). Although significant differences exist with regard to the organisation of the specific tax measures in individual countries, some commonalities can be observed. Below are presented the five main types of unilateral approaches towards the digital sector with their characteristics as well as other tax measures. Table 1 gives more detailed information regarding some of the countries that have introduced some of these tax measures towards the companies specialised in the provision of digital services.

- *Digital services tax (DST), including digital advertising taxes (DAT)*

As of 2024, taxes on the provision of digital services have been adopted by a number of countries throughout the world, including Belgium, Canada, France, India, Italy, Kenya, Turkey and others. In most countries, the tax follows the parameters set within the EU proposal from 2018, especially regarding the scope and rates of taxation. Table 1 gives information about the DSTs already implemented in selected countries. Generally, the tax rates are low (between 1% and 3%) with Turkey being an exception with a relatively higher tax rate. The digital services typically subject to taxation are targeted online advertising, the sale of user data generated in online platforms to third parties as well as online platforms for sales of goods.

Both in the literature and in practice DSTs are classified as "hybrid taxes" because they combine elements of income and consumption taxes (Geringer, 2021, p. 4). Although their goal is to help to level the playing field and function as a substitute for corporate taxation, national, DSTs are linked to the provision of digital services. Since consumption is calculated using gross revenues excluding the VAT, digital taxes are prone to be passed on to customers (Ibid, p. 4).

In several countries, such as Austria and Hungary the scope of digital taxes is limited only to the revenue from online advertising. Like national DSTs, the national DATs are based on gross revenues excluding the VAT (Geringer, 2021, p. 5).

- *Withholding tax (WHT)*

The introduction of withholding taxes is also among the prevalent approaches towards the earnings of digitalised companies. Traditionally, such taxes are used by governments as a method to collect revenue from foreign businesses. In particular, withholding taxes have been applied to cross-border interest payments, dividends, and royalties. In recent years, some countries have extended their application to payments for software and other digital services (Forbes, 2024). As can be seen in Table 1, withholding taxes have been enacted in India, Kenya, Malaysia, Mexico Slovakia and other countries. There exist some differences with regard the scope and rates among the individual countries.

- *Digital permanent establishment rule (digital PE)*

One of the possibilities to tax the profits generated in the digital sector of the economy involves an extension of the definition of permanent establishment, thus giving source countries the right to tax on their territory the profits generated through remotely provided services. A traditional permanent establishment requires a physical presence, whereas a DPE focuses on economic presence and significant digital activity Homa (2024, p. 29). As of 2024 several countries have introduced such changes in their legislations that require from foreign companies selling goods and/or providing digital services to pay taxes in the same manner as

"traditional" brick-and-mortar businesses (See Table 1). According to Homa (2024, p. 24) the concept of digital PE is the answer to the challenges posed by the digital economy, where companies can generate significant revenues in countries where they have no physical presence. However, the successful realisation of digital PE may encounter some administrative and technical obstacles. In particular, the precise rules and mechanisms for measuring the digital presence in a given jurisdiction and subsequently allocating profits must be determined (Ibid, p. 29). Furthermore, in order to be effective such update of the definition of permanent establishment should be applied on a worldwide basis (Popova, 2020, p. 4). Otherwise, the idea of a digital PE would collide with provisions in existing double tax treaties (Geringer, 2021).

- *Other tax measures*

Such measures cannot be attributed to some of the groups above either because they are targeted at a particular type of digital service or their organisation differs from that of the taxes presented above. Among these other tax measures are the streaming tax (Canada), the general income tax on digital tourist rental services income (Costa Rica and Greece), the cultural contribution levy (Denmark), the general income tax on digital income (Kenya), the equalisation levy (India) etc.

Table 1. Applicable direct tax measures towards digital businesses in selected countries as of 2024

Type of tax measure	Countries	Scope	Rate
Digital services tax (DST), incl. digital advertising tax (DAT)	Austria (DAT)	Gross receipts from advertising services rendered by service providers in Austria with global gross receipts of Euro 750M or more, and turnover in Austria from online advertising services of at least Euro 25M.	5%
	Canada (DST)	· Certain digital services that rely on engagement, data, and content contributions of Canadian users; · Certain sales or licensing of Canadian user data.	3%
	France (DST)	· Provision of digital interfaces enabling users to interact with each other; Provision of services to advertisers which aim at placing targeted advertisements on a digital interface	3%
	Hungary (DAT)	Net turnover for the financial year generated by the broadcasting or publication of advertisements in Hungary.	7.5%
	Italy (DST)	· Advertising on a digital interface; · Multilateral digital interface that allows users to buy/sell goods and services; · transmission of user data generated from using a digital interface	3%
	Kenya (DST)	Gross revenue from provision of a digital marketplace, electronic data management, provision of search engine and other digital services.	1.5%
Withholding tax (WHT)	Malaysia	Any income in relation to e-Commerce transactions is deemed to be derived from Malaysia if it is associated with any activities in Malaysia.	Variable
	Pakistan	Payments for offshore digital services, such as online advertising, designing, creating, hosting or maintenance of websites, etc., performed by nonresident persons.	5%

	Slovakia	Payments to foreign digital platforms facilitating transport and lodging services in Slovakia, acting as a marketplace for such services, not registered as a PE in Slovakia.	5%
	Taiwan	Payments to foreign providers for online advertisement and remunerations for eservices, such as online games, videos, audio broadcast, online platform services, etc..	Variable
	Uruguay	Income of non-residents from services related to businesses involved in the digital economy in Uruguay.	12%
	Vietnam	Income derived by non-residents from digital and e-commerce operations in Vietnam	Variable
Digital permanent establishment (Digital PE)	Belgium, Colombia, India, Indonesia, Israel, Nepal, Pakistan	Taxation of the revenue related to the digital PE.	n/a
OTHER TAX MEASURES			
Tax liability for tourist rental services	Costa Rica, Greece	Income from the provision of rental services via the internet.	
Streaming tax	Canada	Requires online streaming services to contribute a percentage of their Canadian revenues to support the Canadian broadcasting system.	5%
Cultural contribution levy	Denmark	Gross receipts of digital streaming services in Denmark. The proceeds will go to support both Danish public broadcasters and Danish filmmakers.	Variable
Equalisation levy	India	Gross revenue from online advertising payments to overseas platforms, provision of digital advertising space. Only applicable to business-to-business transactions.	6%

Source: KPMG (2024)

Initially, it was foreseen that unilateral digital services taxes and other similar measures were to only temporary until a consensus-based solution within the BEPS Project is reached. However, considering the slow progress of reforms at the global level and the fact that the measures already agreed under BEPS Pillar Two are not specifically targeted towards digital business, we can assume that national taxes of digital companies will remain for a long time. Probably, over the next years more countries will resort to unilateral measures in order to raise the revenue necessary for covering the growing public expenditure. As Stollsteiner (2024) has noted, the introduction of digital taxes aims to recoup some of the lost tax revenue, but it comes at the cost of unilateralism that is damaging to the international tax environment.

4. Conclusion

Finding solutions to the taxation of the profits generated in the digital sector of the economy has proven to be a difficult task because of the specifics of electronically provided services. The overview of existing unilateral fiscal instruments towards the taxation of the digital sector of the economy has confirmed the significant diversity of national approaches. On the one hand, the introduction of national digital taxes is justified on the grounds of fiscal sustainability and achieving fairness in the area of business taxation. On the other hand, the existence of various approaches towards digital taxation in individual countries pose serious

challenges to the companies with international activities. The "patchwork" of national tax approaches increases tax uncertainty and compliance costs for businesses and adds to the complexity of tax systems. Despite the difficulties in "ring-fencing" the digital sector of the economy, international coordination in this field is required in order to accomplish effective and efficient taxation of the companies specialised on the provivsion of digital services.

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SHOULD STATE-OWNED ENTERPRISES PAY DIVIDENDS?

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Abstract: *The dividend puzzle for private corporations has a long-lasting history. Six theories provide to certain extent explanations of this puzzle. However, the dividend puzzle has not yet been discussed as an economic problem for state-owned enterprises (SOEs). The article addresses this issue.*

All well-known six theoretical concepts of the dividend puzzle are presented and their strengths and weaknesses are analysed. After that, the specific features of SOEs are brought out and the dividend puzzle for them is formulated. After presenting the experience of the dividend policy of SOEs, a confrontation with the theories is made. It is proved that only the theory of dividend payment preference is relevant to SOEs.

Keywords: *Dividend puzzle, state-owned enterprises, dividend policy, Bulgaria*

JEL: *G35 G38 H32 H62*

1. Introduction

The question: Should state-owned enterprises pay dividends? initially was raised by Black (1976). In the beginning of an article entitled *The Dividend Puzzle* he asked two questions: `What should the individual investor do about dividends in his portfolio?` and `Why do investors pay attention to dividends?`. After a short analysis and discussion, Black's answers like this: 'We don't know' and we still don't know what are the economic rationales for dividend payouts (Tanushev, 2016). For that reason, the dividend policy is considered as one of the 'thorniest puzzles' (Allen, Bernardo and Welch, 2000) and an `enigma` (Al-Malkawi, Rafferty and Pillai, 2010). The `dividend controversy` ranks in the ten most important unresolved financial issues (Brealey and Myers, 2002).

The Dividend Puzzle is traditionally discussed for private corporations located in different countries around the world. Very rarely it is analyzed in the context of state-owned enterprises (SOEs). The purpose of this article is to present the results of a study on the relevance of the leading theoretical constructs that explain the dividend puzzle to the experience of SOEs in certain countries and especially in Bulgaria.

The article is conventionally divided into four parts. In the first part, a literature review of the main studies of the dividend puzzle is made and the theories that serve to explain it are presented. The second part is devoted to the peculiarities of dividend policy in SOEs. The third part presents the experience of the dividend policy in Bulgarian SOEs. In the last part, the main conclusions of the study are summed up.

2. Literature review

The wide application of SOEs since 1950s is not adequately reflected in research on their governance (Aharoni, 1982). Attempts to delineate the nature of the dividend have been the

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subject of economic research for more than a century, yet theoretical models have been unable to fully explain it (Wood, 1994). In its origin, the dividend predates the share and, in its evolution, takes different forms:

- Return on Investments. The dividend arose in the 17th century due to the need to attract capital for sea expeditions. Shipowners share the profits from trading with investors depending on the part of their investment for the commercial trips (Leeson, 2009).
- *Liquidation share*. Due to the creation of corporations for a limited time and their subsequent liquidation, the dividend is used as a liquidation share for shareholders. Practices in the Netherlands and the UK begin to limit dividend payouts to net profit and companies are given the opportunity to doing business longer.
- *Monopoly rights*. In the nineteenth century, large-scale railway infrastructure projects began in rapidly industrialising countries and monopoly rights were offered to attract investment. The first cases of unfair practices date from this period - dividends are declared before the calculation of profits and are paid out of accumulated capital or the proceeds of subsequent issues.
- *Response to tax pressure*. In the 1930s, laws were enacted in the United States to tax retained earnings. In response, many corporations increased dividends or introduced special dividends. The modern form of dividend policy emerged.
- *Reduction of information asymmetry*. To solve the principal-agent problem, managers pay high dividends to mitigate the principal's control over them. The dividend begins to perform a signaling function and provide information about the financial condition and future earnings of the company.

The 'dividend puzzle' derived from the Modigliani–Miller theorems of 1959 and 1961 (Modigliani and Miller, 1959; Miller and Modigliani, 1961). An excellent interpretation of their work and formulation of the dividend puzzle is found in La Porta et al. 2000: "...in a frictionless world, when the investment policy of a firm is held constant, its dividend payout policy has no consequences for shareholder wealth. Higher dividend payouts lead to lower retained earnings and capital gains, and vice versa, leaving total wealth of the shareholders unchanged."

However, in a real world, dividends paid by companies are not always proportional to their earnings - some companies pay out high dividends even when their earnings are low, while others pay out low dividends even when their earnings are high (Lintner, 1956). This is seen as a puzzle because it contradicts the traditional financial theory that companies should pay out dividends in proportion to their profits.

There are several possible explanations for the dividend puzzle, which are known as theories. The most prominent of them is presented in the following part.

Dividend irrelevance theory. At a certain point in economic history, capital markets are seen as perfect, investor behavior as rational, and company information as accessible to all stakeholders. According to the theorem of Fr. Modigliani and M. Miller, the dividend does not affect the value of the shares due to the assumption of a perfect capital market and a tax-free dividend (Miller and Modigliani, 1961). The theorem refers to situations in which the dividend is managed by factors of the internal environment, e.g., managers. In order to increase the market value of the company, profits are not distributed but used for investment purposes. This decision of managers is reflected in the behaviour of investors to hold or sell their shares.

Theory of clientelism. According to this theory, the rational behaviour of market participants influences the dividend decision. The change of ownership of the shares before the date of dividend declaration depends upon the tax characteristics of investors (Elton and Gruber, 1970). Changes in tax laws shape the relationship between dividend policy and investor behaviour depending on the tax liabilities of each investor group (Berk and DeMarzo, 2013). Investors with high tax liabilities may prefer companies to use share buybacks in order to avoid payment of high taxes. Other option is more radical. It refers to avoiding the payment of dividends, which would reduce the cost of capital and in the future would lead to an increase in the share prices of the company.

Agency theory. Agency theory deals with agency problems arise from the conflicts of interest between managers and shareholders because the incentives for managers are likely to differ from those of shareholders. Jensen and Meckling (1976), Easterbrook (1984) and Berezinets, Ilina and Alekseeva (2017) observe that an increase in dividends mitigates agency problems and leads to higher company value because managers have less free cash flows to invest in negative net present value projects. This forces managers to raise funds from the capital markets, which have better means of controlling managerial opportunism.

Dividend payouts can solve the vertical agency problem - between shareholders and managers, but can ignore the horizontal agency conflicts of interest between minority shareholders and controlling shareholders who can exert considerable influence on management's decision making (Shleifer and Vishny, 1997).

Last but not least, the dividend rejects the neoclassical view that managers are a homogeneous group given their opinion on dividend policy (Sarwar et al., 2019). According to this view, the ultimate owner of SOEs, the citizens, assume that an enterprise functions normally if it pays high and permanently-paid dividend (Kowerski, 2015).

Signaling theory. Market imperfections and related information asymmetry can be reduced by paying a dividend. Executive managers payout a dividend to signaling of shareholders, investors, staff and other stakeholders company's financial condition and its future plans (Bhattacharya, 1979; Miller and Rock, 1995). The fundament of this theory are managers who have complete information about the company, take into account the expectations of shareholders and balance the taxation. In adopting this theory, other profit-sharing options such as share buybacks are eliminated due to lack of information signal.

Life cycle theory. Startups have greater financing needs that require them to reinvest their profits as internal sources of finance are cheaper than external ones. In contrast, companies in a mature stage already have stable earnings and can pay dividends (Grullon et al. 2003; DeAngelo et al. 2006).

This theory is closed to the theory for signal function of dividend, the difference being in providing information about the presence or absence of growth. The maturity effect is to some extent related to the "principal-agent" theory, as the agency problem manifests itself at the maturity stage and it is at this stage that it is recommended to solve the problem through the dividend policy (Kowerski, 2015).

Theory of the dividend payment preference (A bird in the hand is better than two in the bush). This theory follows J. Williams (1938) thought that the value of a share is determined only by the money that it brings. Gordon's (1961, 1962) argues that shareholders prefer a policy of high

dividends to their investment in the future development of the company. They wish to receive a dividend today and not take risks to receive a capital gain from future investments. A number of studies demonstrate that this model fails if it is posited in a complete and perfect market with investors who behave according to notions of rational behavior (Miller and Modigliani, 1961; Bhattacharya, 1979). Nonetheless, the original reasoning of Gordon (1961) is still frequently cited.

All theories developed to explain the dividend puzzle refer to practices of private corporations. The dividend puzzle becomes even more complicated if the peculiarities of SOEs are taken into account.

By definition, a state-owned enterprise is created not only to maximize the profits of its shareholders, but also to fulfil social goals related to welfare, incl. reduction of unemployment, national security, provision of social services, development of technical and social infrastructure, uniform development of regions and others (Keremidchiev - Nedelchev 2020). Then why should SOEs pay dividends that are determined by bureaucrats and go to the state budget to finance unclear what programs, instead of remaining in SOEs and serving to support projects related to the social goals they fulfil?

In this way, two effects can be achieved. First, the influence of bureaucrats on the financial decisions of SOEs will be reduced, and secondly, the redistribution that takes place through the state budget, which simultaneously receives dividends and finances SOEs in various forms, will be reduced.

Another feature of SOEs that reflects on solving the dividend puzzle stems from the ownership of real property in SOEs. As a rule, the ultimate owner of state property is the sovereign. If so, then why are the dividends of SOEs not distributed among all citizens. In reality, however, citizens are mediated and extremely distant owners. They do not make a single important decision about the state enterprise, neither on its establishment, nor on the appointment of directors in it, nor on the distribution of its financial results, nor on its privatization or closure. All these functions have been handed over to government bureaucrats and Parliament. These institutions can, and most often do, have different priorities than the sovereign. Therefore, decisions on SOEs, incl. for the payment of dividends by them are driven by other motivations that arise from pursuing fiscal, political, populist and other objectives. In this case, the solution to the dividend puzzle for SOEs should answer the following questions: why should state enterprises pay dividends, to whom and under what conditions? Obviously, the dividend puzzle in SOEs is very different from that in private enterprises, and its solution derives from clarifying the nature of state ownership.

3. Dividend Policy in State-Owned Enterprises

In order to confront the theory with the practice, in the next two parts, the experience of the dividend policy of different countries is analyzed.

Dividend Policy in SOEs is aimed at achieving one or more of the following objectives:

- Guaranteeing adequate return on capital for the state as owner (Czech Republic and Hungary);
- Encouragement SOEs to follow higher rates of return and to invest in financially viable projects (Lithuania);

- Improving credit ratings and dividend levels that are consistent with private sector practices (Australia);
- Raising competition in the economy, increasing the transparency of liabilities of SOEs and reducing the risk of large-scale SOEs (China);
- Reducing equity and to achieve a higher rate of return on invested capital (Norway and Sweden) (World Bank, 2014).

The government, as the owner, has the ultimate right to impose the rate, terms and other conditions for the payment of dividends by SOEs. It is debatable whether the term `dividend policy` refers to this activity or rather it should be a `payment policy of dividend` (World Bank, 2009).

Under special conditions, such as economic shocks, the state may request an additional dividend. These cases became common after the global financial crisis in 2007-2008 and the turmoil connected to COVID-19. The Irish government imposes special dividends on the Electricity Supply Board and Bord Gáis Energy - both leading energy suppliers, of €585 million and €350 million respectively to implement the state policy for dealing with the effects of the crisis (Palcic and Reeves, 2017). A similar measure was taken by the Bulgarian government in connection with the need for fresh financial resources in the Covid-19 lockdown. It imposed 100 dividend payout rate of SOEs for the financial year 2021 (Table 2).

In most countries, the dividend is paid to the Ministry of Finance, regardless of which ministry acts as principal (Kuijs, Mako and Zhang, 2005). In some cases, special government funds have been set up to accumulate dividends and be used for structural reforms in the economy, to finance government agencies, projects and programmes. For example, in France a part of the dividends by SOEs is paid to a state pension fund, in the Czech Republic – to a special state-owned fund (National Property Fund of the Czech Republic – NPF), and in Austria – to the fund Österreichische Beteiligungs AG.

The privatisation proceeds are similar to dividends, as both revenues are in the portfolio of a competent authority for the budgeting process. Privatized entities pay a `*special dividend*` in the form of the sale proceeds from their assets at the request of the state-principal (World Bank, 2009).

The experiences of different countries are very diverse, but can still be represented by the policies undertaken for large non-financial state-owned enterprises (Palcic and Reeves, 2017). The main sources of information about the dividend payout are published financial statements, which are certified by an external auditor. Dividend policy has three forms of application: general guidelines defining the factors that must be taken into account when setting the dividend level; a specific percentage of net income; level of dividend required to maintain an optimal capital structure (OECD, 2018).

One of the main factor in formulating the dividend policy is the adopted ownership structure. In a decentralized ownership structure, the current needs and imbalances of state budget are partially compensated by dividend payouts. The centralized ownership structure is characterized by a high degree of predictability of financial results and risk mitigation, which makes it easier to implement dividend policy. An additional factor for the dividend policy are social and fiscal goals of SOEs.

The dividend decisions of SOEs differ in who makes the decision for them, what criteria are used to justify them and on what legal basis they are made (Table 1).

Table 1. Dividend decisions of SOEs

Country	Dividend decision is taken by		Criteria for dividend payout			Dividend payout is in accordance with		
	the board	competent authority	Fiscal needs	financial state of SOE	life cycle of SOE	legal act	the statute of SOE	consultations between competent authority and board
Bulgaria		√	√			√		
Canada	√			√				√
Czech Republic		√	√					√
Denmark	√				√			√
Estonia		√		√				√
Finland	√				√			√
Hungary		√	√					√
Ireland		√	√					√
Israel		√	√			√		
Italy		√	√	√				√
Latvia		√	√			√		
Lithuania	√			√			√	
Netherlands	√			√				√
Norway	√				√			√
Poland		√		√		√		
Slovenia		√	√			√		
Sweden	√				√	√		√
Switzerland		√		√		√		
In total	**8**	**11**	**8**	**7**	**4**	**7**	**1**	**11**

Source: adapted from Böwer, U. (2017) and Richmond et al. (2019).

In 11 of the 19 countries whose experience is summarized in Table 1 the dividend decision is taken by a competent authority that acts as the owner of the SOE. Such a practice exists in Czech Republic, Estonia, Hungary, Italy, Lavia, Poland, etc. In other countries such as Canada, Denmark, Finland, Sweden dividend decision is taken by board of SOE (Table 1).

Three criteria are most commonly used when making dividend payout decisions in SOEs:

- Fiscal needs. The state may request the payment of an *ad hoc* dividend for special purposes. This type of dividend policy has a smoothing effect on the state budget and some authors consider it to be the first form of dividend policy for SOEs (Gugler, 2003).

The fiscal needs are the main factors for taking dividend decisions, which is common in most countries, e.g., Czech Republic, Hungary, Ireland, Slovenia, France, Germany, New Zealand, South Korea (Böwer, 2017; Richmond et al., 2019; World Bank, 2005).

- Financial state of the SOE. A dividend is paid each year depending on the company's financial state and the achievement of certain financial metrics. This is the case in Canada, Lithuania, Poland, Switzerland, etc (Böwer, 2017; Richmond et al., 2019; Ter-Minassian, 2017).
- The life cycle of a SOE is a criterion that is taken into account mainly in the Nordic States - Denmark, Finland, Norway and Sweden (Böwer, 2017; Richmond et al., 2019).

In a dominant number of countries - 11 dividend payout is done after consultations between the competent authority and board. In seven countries such as Israel, Poland, Slovenia, etc. dividend payout is defined in a special legal act. Only in Lithuania dividend payout is set in the statute of SOE (Table 1).

4. Dividend Policy in Bulgarian SOES

In Eastern European countries, the role of SOEs is not well understood or consistently reported (International Monetary Fund, 2019). The amount of information generated plays a crucial role in the attitude towards SOEs, and in most cases the data from governments rarely exceed some basic indicators. For these countries, the degree of development of dividend policy in SOEs is considered as benchmark of the level of economic transition to a market economy (World Bank, 2005). These are the reasons to recommend to government of these countries to articulate explicitly the dividend policy of SOEs in order to reduce the undertaking of unjustified risks and avoid macroeconomic imbalances (World Bank, 2014).

In Bulgaria, the state owns or controls 259 enterprises in 2019. Out of them 211 enterprises are with 100% state ownership, and the remaining 48 companies have more than 50% state participation (Keremidchiev and Nedelchev, 2021). Most often the minority owner in them are the municipalities, as is the case with some hospitals and water and sewerage companies.

The legislation considers SOEs as legal entities functioning in the interest of citizens to achieve maximum value for society through the efficient allocation of resources. There are three rationales for the existence of SOEs:

- to eliminate market failures;
- to provide goods or services of strategic importance or those related to national security or development;
- to manage strategic ownership for the state.

The elaboration of dividend policy in Bulgarian SOEs are obligations of the government. The decisions of the Council of Ministers are in line with the preparation of the state budget and aims to provide conditions for the implementation of the revenue part of the state budget. Such an approach to the distribution of profits after the end of the financial year, mainly due to fiscal needs possess problems to the SOE strategic planning (Böwer, 2017). To avoid this problem one can recommend implementation of a structured dividend policy through broad guidelines or pre-defined payout (Böwer et al., 2016). It would enable investment and innovation activities in SOEs.

Traditionally, the Council of Ministers annually adopts three types of decisions related to dividend policy. The first one concerns what share of net profit to be paid as a dividend. At the beginning of the study period in 2016, dividends were defined as 60% of net profit. Thereafter, until 2021, this percentage was 50% with a few exceptions where the take of profits as dividends was 80 or even 100% (Table 2). In 2021, due to the need for fresh financial resources in the aftermath of the COVID-19 crisis, a 100% clawback of SOE profits in the form of dividends has been set, with exceptions made at a lower rate for a few specific enterprises.

Another governmental decision concerns SOEs being excluded from dividend payouts. In 2016, only state-owned hospitals were excluded from paying dividends. In the following year, water and sewerage companies joined this category. These groups of companies along with mental health centres are permanently excluded from paying dividends. The exclusion of these enterprises has a certain impact on the state budget given their profits: BGN 15 million of SOEs in the healthcare sector in 2018 and BGN 9 million for the water supply and sewerage sector in 2018. In some years, individual enterprises most often State Consolidation Company EAD, "National Industrial Zones Company" EAD, "Bulgarian Development" Bank AD are also excluded from paying dividends.

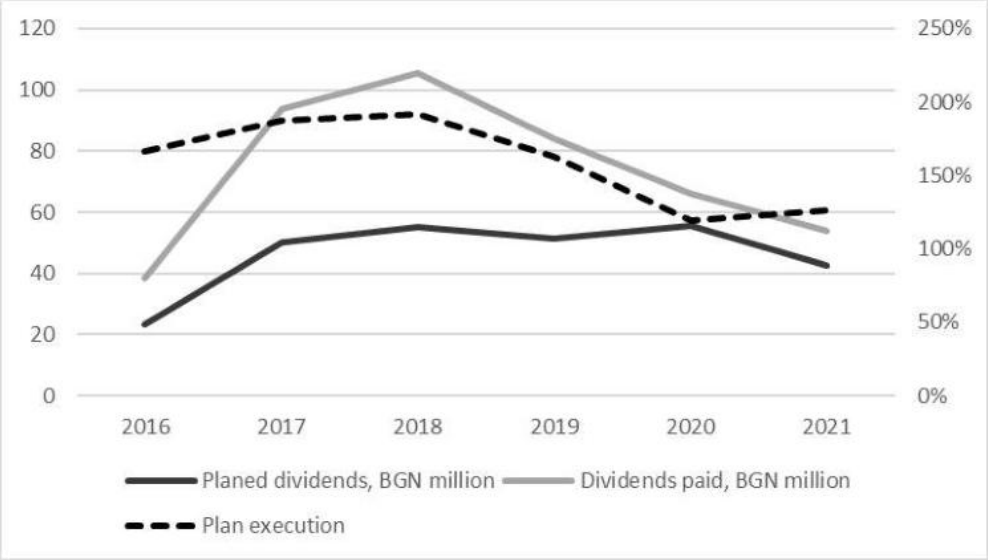
Table 2. Exemption of dividend payouts

Financial year	Exempted SOEs	Regular dividend rate	Notes
2014	Hospitals	60	
2015	Hospitals and companies in the water supply and sanitation sector	50	
2016	Hospitals and companies in the water supply and sanitation sector	50	
2017	Hospitals and companies in the water supply and sanitation sector	50	
2018	Hospitals and companies in the water supply and sanitation sector and State Consolidation Company EAD	50	Special dividend rate for "Bulgarian Development Bank" AD – 80%
2019	Hospitals and companies in the water supply and sanitation sector, State Consolidation Company EAD, "National Industrial Zones Company" EAD, "Bulgarian Development Bank" AD	50	Special dividend rate for State Enterprise "Air Traffic Control" - 100%
2020	Hospitals and companies in the water supply and sanitation sector, State Consolidation Company EAD, "National Industrial Zones Company" EAD, "Bulgarian Development Bank" AD	50	State Consolidation Company EAD, "National Industrial Zones Company" EAD, with the annulled decision as of August 2021.
2021	Hospitals, mental health centres and companies in the water supply and sanitation sector	100	Special dividend rate for: • 5 SOEs – 50% • "Information Service" AD - 70%

Source: Collected by the author from decisions of the Council of Ministers, 2015-2022.

None of the decisions of the Council of Ministers on the determination of dividends from SOEs present arguments. In the public domain, the explanation is that companies in the water supply and sanitation sector are exempted from paying dividends due to their obligation to co-finance the implementation of European Cohesion Fund projects in the water sector.

Figure 1. Dividend payouts of SOEs



Note: Planned and paid dividends are in per cent of the central government budget.

Source: Prepared by the author based on data from the state budget execution reports of Ministry of Finance.

The explanation for the exclusion of hospital care facilities is that they are extremely dependent on a limited number of funding sources and taking into account their specificity (Table 2). This rationale is flawed because it is not the number of funding sources that is important, but the volume of that funding. According to the National Statistical Institute (NSI), current expenditure on hospitals from various sources has increased by 93% - from BGN 2.106 million in 2011 to BGN 4.071 million in 2020 (NSI, 2023). With regard to the number of funding sources, after the country's accession to the EU in 2007, hospitals have the opportunity to finance special projects from European structural funds.

Dividends from SOEs are important for the central state budget as their share of non-tax revenues varies between 16 and 52% in 2016-2021. For this period, the absolute amount of dividends paid by SOEs ranges between BGN 39 million in 2020 and BGN 106 million in 2018 (Figure 1).

A specific feature of SOE dividend planning is that they are understated throughout the period. Actual amounts of dividends paid are on average nearly 60% more than planned for the period.

6. Conclusion

The dividend puzzle is an economic concept that reflects problems of private enterprises. This article confronts this concept to theories and practices of SOEs. Five of the six theories analysed are not relevant to the SOE dividend puzzle.

The dividend irrelevance theory is not relevant because the state doesn`t pay taxes over the dividends. Dividends are determined entirely by the principal and behaviour of investors to hold or sell their shares is not taken into account.

The clientelism theory is not applicable due to the fact that the state is the sole or dominant owner of SOEs and the tax characteristics of investors are not taken into account.

The agency theory is nor relevant as the dividends are determined entirely by the principal and unrestricted financial resources are lacking or very limited.

The signalling theory also does not help solving the dividend puzzle of SOEs as managers do not influence dividend decisions. Signals are received at the principal through the reporting information, controllers, auditors and other control bodies. Dividends are set entirely by the principal. Unrestricted financial resources are lacking or very limited.

The life cycle theory would be relevant to the dividend puzzle if principals set the amount of dividends according to the stage of the SOE's life cycle. This appears to be the case in roughly 20% of the countries surveyed. The common practice is for the dividend rate to be the same for all SOEs.

Only the theory of dividend payment preference is relevant and provides a partial explanation of the dividend puzzle in SOEs as dividends are determined mainly for fiscal reasons and financing of SOEs future projects is done mainly in other ways, but not through dividends.

Through the sovereign fund system, it finances the creation of a state-owned enterprise and then decides what portion of the dividend to seize from its profits, regardless of what social goals the enterprise pursues. This puts the fiscal before the social goals of the enterprise. On the other hand, the severe winterization of the residual profit limits the future investments of the enterprise and makes it dependent on new state injections. This is the vicious circle of the dividend puzzle in SOEs that has not yet been solved and deserves to be discussed in future research.

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IMPLEMENTATION OF SMART CONTRACTS SECURED BY DIGITAL RUBLE INTO THE RUSSIAN ECONOMY

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Abstract: *Over the past decade, the Russian Federation has made significant progress in the integration of digital technologies into its economy. These include the Quick Payment System (QPS), which facilitates the transfer of funds between commercial banks without the imposition of commission, and the establishment and maintenance of digital services such as "Government Services," which enables citizens to access government services and discharge government duties and fines remotely via a mobile application or online portal. However, the global landscape is constantly evolving, and these high-tech services are no longer considered innovative. One of the most contemporary technologies that all major global economies are striving to integrate into their financial systems is smart contracts. Russia is also planning to introduce smart contracts, and for this purpose, it is creating accompanying tools such as the "digital ruble," which will ensure the correct operation of this technology. This article aims to elucidate the principles of smart contracts in the Russian Federation, identify the advantages they offer over traditional contracts, examine the modalities of payment in this type of transaction, assess their impact on the Russian economy, and explore the prospects for their implementation and development in the context of current Russian realities.*

Keywords: *smart contract, digital ruble, blockchain, digital financial assets*
JEL: *O14, G28*

1. Introduction

It was observed by web users and programmers involved in researching and developing digital financial assets (DFAs) that a problem, termed "double spending", might restrict future growth in the field of DFA trading. The core issue pertains to users of the trading platform engaging in the expenditure of the same digital assets multiple times without encountering any restrictions.

To solve this problem, a person or group of people (still no confirmed information) named Satoshi Nakamoto published a project document in 2008 called "Bitcoin: A Digital Peer-to-Peer Cash System." This 8-page document contained an innovative idea: the introduction of blockchain technology to eliminate the problem of duplication of digital financial assets and to maintain confidence that no one could defraud users.

In the contemporary context, the blockchain is defined as a comprehensive and permanent record of transactions conducted by a decentralised community of users. This transaction register is updated in real time and accepted as fact by users, with copies of its database stored

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on each user's computer. This characteristic is pivotal in ensuring the seamless and transparent operation of the blockchain system, without the occurrence of "double spending" issues. In the event of such an occurrence, it would result in immediate conflict in the transaction history of each participant.

In order to comprehend the principles of blockchain, it is necessary to consider the operation of this registry, commencing from the lowest level. The lowest link in this case is defined as any transaction that occurs on the blockchain. Each transaction is considered complete and validated when it is grouped with several others and recorded in a special structure called a block (a special structure for recording a group of transactions in the blockchain system). The assembled blocks are then combined to create a blockchain.

The number of transactions in each block is limited and always equal, and each new block added to the chain contains information about the previous block. This is done so that the chain is continuous, and the transaction information contained in a block cannot be changed.

Each new block performs validation of the transactions whose information it contains and additional validation of transactions in all previous blocks in the chain. It is virtually impossible to change the information in a block that is in the chain, because then the information in all previous blocks would have to be edited, which would be noticed by other users.

As long as the transaction is not included in the block, the system considers that the number of digital financial assets on the digital wallet addresses of the buyer and seller remains unchanged. Therefore, it is technically possible for several different transactions to be executed to sell the same DFAs from one digital wallet to different buyers. Despite this, as soon as one of these transactions is included in the block, the system will ignore the other transactions with the same DFAs. In other words, the inclusion of a transaction in the block is a confirmation of its authenticity, regardless of the presence of other earlier or later transactions with the same digital financial assets.

Based on this, we can observe that blockchain has the following properties:

1) Decentralization;

2) Reliability;

3) Continuity;

4) Transparency;

5) Irreversibility.

However, even though blockchain was designed to provide a decentralized infrastructure for transactions, it can be made centralized. This possibility exists due to various blockchain algorithms such as Proof of Work, Proof of Importance, and Proof of Stake.

“Proof of Work” is the most commonly and long-used algorithm. In this algorithm, the user needs to prove that they have done the work. Whoever is the first to do the work is the first to choose a transaction status and receives a mining reward. This reward consists of all transaction fees for mining the block.

“Proof of Stake” is the simplest algorithm for confirming or rejecting transactions. In simple terms, whoever controls more money in the blockchain has more value. This algorithm is the

most criticized because it turns the blockchain into a centralized distribution registry where power is distributed among a narrow circle of the wealthiest users, contradicting its creator's idea of a decentralized system.

The “Proof of Importance” algorithm is one of the least used mechanisms at the moment. It is used by users with the highest significance to confirm or reject transactions. In this algorithm, “importance” refers to the trust users have in the miners that form the blocks.

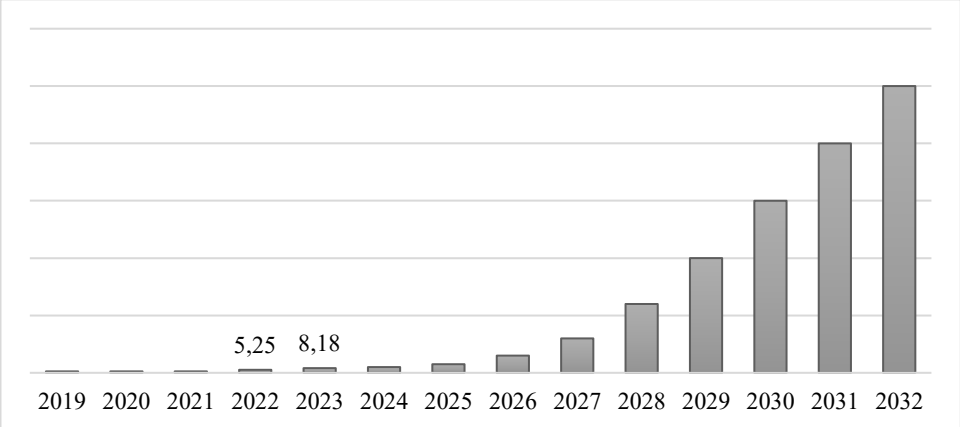
The importance factor of each user is based on the value it represents in the system. It decides which users have the right to engage in block mining, how often they can do it, and what their reward will be.

The peculiarity of this algorithm is that absolutely any user can get the right to engage in mining, regardless of how many DFAs are in their digital wallet. In this regard, this algorithm can be easily cheated by creating fake user accounts that will vote for the necessary miner. Some blockchain systems use this algorithm, but we believe it is unstable and needs improvements to make it less vulnerable to such fraud.

2. Data and Results

Today, the demand for blockchain is steadily increasing. Thus, according to Figure 1, we can see that the demand for blockchain technology is growing rapidly in North America. While today the market size of blockchain technology is approximately 10 billion USD, by 2032, the market size will increase tenfold to tens of billions of USD. In our view, one of the main reasons why the demand for blockchain is so high today, and will continue to grow in the future, is the possibility of realizing an instrument such as a “smart contract” in it.

Figure 1. Blockchain technology market size in North America, 2019-2032 (USD billion)



Source: www.fortunebusinessinsights.com

To date, there is no clearly defined definition for the concept of a ‘smart contract’ in Russian legislation. Of course, we can refer to the definition of an ordinary contract contained in paragraph 1 of Article 420 of the Civil Code of the Russian Federation, which states that “a contract is an agreement of two or more persons to establish, change or terminate civil rights and obligations.” However, this definition is too general.

In the publications of the Russian scientific community, when defining the concept of smart contract, some researchers refer to A.I. Savelyev, who understands a smart contract as "a contract existing in the form of software code implemented on the blockchain platform, which ensures the autonomy and self-execution of the terms of such a contract upon the occurrence of predetermined circumstances"[3].

Another part of the scientific community is more inclined to the definition that a smart contract is a special "digital algorithm describing a set of conditions, the fulfilment of which entails some events in the real world or digital systems."

In addition to the above definitions, there is also the definition by Nick Szabo, the person who developed the idea of a smart contract. He defines a smart contract as a computer protocol that fulfils the conditions of a contract.

Based on our understanding of the essence of the "smart contract," we have formulated a definition that we will rely on in our research: a smart contract is an electronic contract written using program code and existing in the form of a computer protocol that independently oversees the fulfilment of the terms of the contract.

The smart contract originated in 1994 when cryptographer and lawyer Nick Szabo first used the term. A smart contract is the result of the joint work of lawyers and programmers, where the former provide the terms of the contract, and the latter write the corresponding program code using ternary conditional operations.

However, unlike many other programs, a smart contract works with real assets. When a pre-programmed condition is triggered, the smart contract fulfils the corresponding contractual condition. It is important to note that Szabo's original theories on how these contracts could and should work remained unrealized in the 90s because there was no digital financial system that could support such complex programmed transactions. Only in 2008, with the advent of cryptocurrency and blockchain technology, was it possible to put the idea of smart contracts into practice. Many companies have actively taken up Szabo's idea, the most famous of which are Ethereum and Bitcoin. Today, smart contracts are used extensively in cryptocurrency exchange trading and in NFT (non-fungible token) trading.

Given the capacity of smart contracts to facilitate the exchange of a wide range of assets, it is reasonable to hypothesise that they will, in the near future, supersede some traditional written and electronic contracts with which we are familiar.

To understand how useful and effective a smart contract is, it is necessary to compare it with a conventional contract (see Table 1).

Table 1. Smart contract and traditional contract: main differences

Comparison criterion	Traditional contract	Smart contract
Control over fulfilment of transaction conditions	Rests with the parties to the contract/intermediaries	Independently monitors the fulfilment of conditions
Execution of funds transfer	Manually/ with the help of intermediaries	Automatically without intermediaries

[3] *Savelyev A.I. Contract Law 2.0: 'smart' contracts as the beginning of the end of classical contract law [Text] / A.I.Savelyev // Vestnik Civil Law - 2016 - No3 - P. 32 - 60.*

Size of commission	Commercial banks charge large commissions for transferring large amounts of money	Minimal
Double interpretation	Present due to contradiction of state laws	None
Possibility of illegal enrichment	Yes	Minimised
Possibility of changing the terms and conditions of the agreement	Yes	None

Source: compiled by the author

Let us list the advantages of a smart contract over a traditional contract:

1) No Intermediary Required: Smart contracts monitor the performance of the transaction by all parties to the contract without needing an intermediary. In a conventional contract, either a rightful intermediary or the contracting firm oversees the implementation of the terms. In the case of a smart contract, the software code oversees the execution of the terms of the transaction, saving time typically spent on compliance checks by the client firm or the authorized intermediary.

2) Efficiency of Fund Transfer: When parties enter into a conventional contract and fulfil the terms, funds are transferred either by the contracting firm to the executing firm's account or through a bank letter of credit. In the first case, the bank charges a fee, and the executing firm waits from hours to days for funds. In the second case, a tripartite agreement involves additional time and fees. Smart contracts streamline fund transfers, executing them within minutes and independently verifying the fulfilment of terms through uploaded documents.

In the first case, there is a commercial transfer of funds, for which the bank charges a fee. The executing firm then must wait from a few hours to a few days for the funds to reach its account.

In the second case, a tripartite agreement is concluded between the client firm, the executing firm and the commercial bank. Once the tripartite agreement is concluded, a special account is created at the intermediary bank, into which the client firm deposits the funds. Then, the executing firm provides the bank with documents confirming that it has fulfilled all the conditions of the agreement and only then is authorised to withdraw the money from the bank account.

In both cases, the parties to the transaction need to spend a lot of time to verify the fulfilment of the conditions and to make the payment, in addition, the client company has to pay the bank commission. A smart contract makes it much easier to supervise the transfer of funds because the funds are transferred within minutes, and to confirm that the terms of the transaction have been fulfilled, all necessary documents need to be uploaded and attached to the smart contract, which will verify them independently.

As mentioned above, when transferring funds for a transaction or opening a bank letter of credit, the commercial bank charges the ordering firm a commission of either a fixed amount or a percentage of the transaction. A smart contract secured by a digital ruble will require a much lower fee than a commercial bank. The reason for this is that the aim of a commercial bank is to make a profit, while the conclusion of smart contracts with payment in digital rubles will be made on the platform of the Bank of Russia, which is a non-profit organisation and does not pursue the goal of enrichment.

3) Unambiguous Interpretation: Smart contracts, being software code, follow a strict algorithm, eliminating the potential for double interpretation. In traditional contracts, terms can be contested after signing, leading to legal disputes. The straightforward nature of smart contract code ensures clarity and reduces the need for costly legal battles over interpretations.

The point is that when writing code, programmers follow a simple algorithm "If..., else...". This algorithm allows you to provide for all possible conditions that are necessary to draw up a contract, making it so that any scenario has a predetermined outcome. In this case, if one of the parties disagrees with the outcome of the smart contract transaction and decides to go to court to challenge the decision of the software code, the parties to the contract will not have to spend a huge amount of money and time on legal fees due to the unambiguous interpretation of the terms in the smart contract.

4) Transparency and Security: Smart contracts operate on blockchain technology, where unique blocks cannot be overwritten. This allows easy online access to transaction information and minimizes the risk of illegal enrichment by any party involved in the smart contract.

5) Flexibility: While traditional contracts are flexible and can be amended at any time, smart contracts lack this flexibility. However, if a smart contract's terms are not fulfilled, a new contract can be drawn up. Although this is not as flexible as a traditional contract, it still allows for modifications.

Having compared a smart contract with a traditional contract, we conclude that smart contracts are superior to traditional contracts in many aspects and represent the digitalization of both legal and economic spheres. As one of the leading powers actively introducing digital technologies into the economy, Russia stands to benefit significantly from creating a new payment infrastructure and the mass introduction of smart contracts, facilitated by the establishment of a digital ruble.

3. Discussion

3.1. Digital ruble

Starting in December 2021, Russia has been actively developing a "digital ruble." This innovation is being developed by the Central Bank of the Russian Federation in cooperation with commercial banks. As of today, the list of banks participating in the pilot for digital ruble transactions includes large banks such as ALFA-BANK JSC, VTB Bank (PJSC), Ingosstrakh Bank JSC, Sovcombank PJSC, Promsvyazbank PJSC, and others. Additionally, banks such as PJSC Sberbank of Russia, JSC Rosselkhozbank, JSC Russian Standard Bank, and other Russian banks plan to join the project.

According to the Central Bank of the Russian Federation, the digital ruble is the "third form of the ruble." Currently, there are only two forms of the ruble in mass use in Russia: cash (banknotes and coins) and non-cash (money in bank accounts). The digital ruble aims to introduce a new, third form of the ruble. Any individual or legal entity will be able to open only one digital wallet on the platform of the Central Bank, which will not be tied to any specific commercial bank. However, access will be provided through the commercial bank's application. This means that the commercial bank will act as an intermediary between the user and the Bank of Russia's platform, where their digital rubles will be stored.

Table 2 shows that the digital ruble shares similarities with both cash and non-cash money. However, in terms of the 'Form' parameter, the digital ruble has a clear distinction: it is a digital code recorded in the digital ruble system and operates on its platform, while also possessing the same security features inherent in its cash form. Despite the similarities and differences in the forms of Russia's national currency, digital rubles will be equivalent to cash and non-cash for users, i.e., one digital ruble equals one non-cash ruble, and one non-cash ruble equals one cash ruble, and vice versa.

Table 2. Comparison of the digital ruble with other forms of national currency

Parameter	Cash rubles	Non-cash rubles	Digital rubles
Form	Watermarked paper	Digital record in commercial bank database	Digital code secured by the CBR
Issuer	CBR	Commercial bank	CBR
Personalisation	Bearer	Personalised	Bearer Personalised
Means of payment	Offline	Online	Offline/online
Means of saving	Without interest accrual	Possible interest accrual	Without interest accrual
Possibility of crediting	Present	Present	None
Possibility of cashback	Present	Present	None

Source: compiled by the author on the basis on Ordynskaya M.E., Silina T.A., Tkharkakhova I.G. Digital ruble as a new form of money. Innovative economy: prospects of development and improvement 4(62),2022 – URL: https://cyberleninka.ru/article/n/tsifrovoy-rubl-kak-novaya-forma-deneg-1/viewer.

When discussing the management of funds stored in a digital wallet on the platform of the Central Bank of Russia, attention should be paid to the following operations:

1) Deposit and Withdrawal of Money: There are two options for replenishing the digital account: cash and non-cash. If you have non-cash funds in your bank account, you can simply top up your digital account without incurring bank charges. But if you have cash rubles, you must first deposit them into a commercial bank account and then transfer the non-cash funds to your digital account. When withdrawing funds, you will need to perform these operations in reverse order. Most of these actions can be completed through the commercial bank's application or website.

2) Transfer of Funds: To transfer digital rubles from one wallet to another, you will need to access your commercial bank's application, select the recipient by phone number, enter the amount, and confirm the transfer. Importantly, transferring digital rubles between ordinary citizens will incur no commission, while business transactions will involve minimal fees. Furthermore, the Bank of Russia states: "The digital ruble is being created to serve as another means for payments and transfers, which will not depend on the restrictions of banks in terms of commissions and limits." This suggests that the limits for transferring digital rubles will be lower than those imposed by commercial banks for non-cash rubles.

3) Payment for Purchases: Many people think that digital rubles will only be used for online purchases or the acquisition of digital assets, but this is not the case. In fact, digital rubles can be used to pay for any goods because the digital ruble is not a separate currency linked to the

ruble rate; it is simply the third form of the ruble, alongside cash and non-cash. To pay for a purchase, it will be enough to scan a QR code, select the digital ruble as the payment option, and confirm the transaction. Additionally, there are plans to introduce payment with digital rubles via NFC technology (near-field communication), allowing devices in proximity that support this technology to exchange data, including non-cash funds.

3.2. Prospects for the introduction of smart contracts secured by the digital ruble in the Russian economy

When discussing the prospects for the development and application of the digital ruble, it is important to mention that, in addition to being a means of payment, it is currently the only financial asset capable of securing transactions that will be made under smart contracts in Russia.

One of the main problems that smart contracts can address is facilitating the development of small businesses, specifically by providing protection for purchase/sale transactions of movable property between legal entities. The national project "Small and Medium-sized Entrepreneurship and Support for Individual Entrepreneurial Initiative" is being actively promoted in Russia. This project aims to support businesses at all stages of their development, with a primary focus on small businesses. However, it does not adequately address the primary concern of small businesses: the security of transactions. Often, to secure their transactions, small firms resort to financial instruments such as bank letters of credit, which require a portion of the company's revenue to cover bank charges.

To understand how much money small businesses spend on securing transactions, we studied which major banks offer letters of credit for legal entities in the sale and purchase of movable property in Russian rubles (see Table 3).

Table 3. Russia's largest banks by asset volume as of December 2023 and their ability to provide letters of credit for movable property

Bank	Total value of assets as of December 2023 in thousands of rubles	Possibility to provide legal entities with letters of credit for movable property for settlements in Russian rubles
1. Sberbank	50 695 718 774	Yes
2. VTB Bank	26 188 218 945	Yes
3. Gazprombank	15 296 029 418	Yes
4. Alfa-Bank	8 411 400 483	None
5. Moscow Credit Bank	4 971 033 526	None
6. Rosselkhozbank	4 672 004 684	None
7. Otkritie Bank	3 245 494 960	None
8. Sovcombank	3 007 306 113	None
9. Bank DOM.RF	2 361 924 750	None
10. Rosbank	2 173 517 945	None

Source: compiled by the author

The survey revealed that not all major banks in Russia provide this service. Some banks, such as Otkritie Bank, Sovcombank, and Rosbank, do not offer letters of credit for legal entities. Others, like Alfa-Bank, Moscow Credit Bank, Rosselkhozbank, and Bank DOM.RF, provide letters of credit only for immovable property or for import/export of goods and services. However, Sberbank, VTB Bank, and Gazprombank do offer the required service for legal

entities. For clarity in calculations, we have created a table detailing the size of bank commissions (see Table 4).

Table 4. Comparison of bank commissions for opening a letter of credit

Bank	Fee for opening a letter of credit	Amount of financial costs for small business
Sberbank	0.2% of the letter of credit amount, min. 500 RUB, max. 10 thousand rubles	from 500 rubles to 10 thousand rubles per transaction
VTB Bank	0.15% of the letter of credit amount, min. RUB 16.5 thousand	from RUB 16.5 thousand to RUB 120 thousand per transaction
Gazprombank	0.6% of the letter of credit amount, min. RUB 3 thousand, max. RUR 120 thousand	from RUR 3 thousand to RUR 120 thousand per transaction

Source: compiled by the author

From Table 4, we can conclude that, on average, a small business has to spend between 3,000 and 120,000 rubles to secure each transaction when opening a bank letter of credit. Although this percentage seems small, the costs can accumulate significantly if a firm regularly conducts transactions involving the purchase and sale of products or services. For example, if a small business completes an average of 10 software transactions per year, each averaging 10 million rubles, and 5 larger transactions averaging 50 million rubles, the firm could spend around 1.8 million rubles annually to ensure that counterparties conduct transactions honestly and pay the required amount for delivered software.

Smart contracts, in contrast, help small businesses secure transactions while allowing them to significantly reduce their spending on bank fees. According to the Concept of the Digital Ruble presented by the Bank of Russia on April 8, 2021, transaction fees in digital rubles are planned to be "at a level no higher than in the Fast Payment System." This means that if the aforementioned firm had chosen to utilize a smart contract secured by a digital ruble instead of opening a bank letter of credit, it would spend only 21,500 rubles in commissions—over 80 times less than the commissions for bank letters of credit from commercial banks.

Additionally, the property of smart contracts that prevents dual interpretation will help reduce the burden on arbitration courts. This is particularly relevant given the current overload in the Russian court system. To alleviate this, the government has raised state fees, encouraging firms to resolve disputes in pre-trial proceedings. For example, for claims between 100,000 and 1 million rubles, the state fee will be 10,000 rubles plus 5% of the amount exceeding 100,000 rubles. For claims starting from 50 million rubles, the plaintiff will pay a fee of 725,000 rubles plus 0.5% of the amount that exceeds 50 million rubles.

We believe that increasing state fees is not an effective measure, as pre-trial proceedings often do not lead to favorable outcomes for either party. The introduction of smart contracts could alleviate the judicial system's burden without increasing fees for two reasons:

1) Reduction of Time: Smart contracts will reduce the time spent by arbitration courts on cases due to their lack of dual interpretation. According to Clause 1 of Article 152 of the Arbitration Procedure Code of the Russian Federation (APC RF), a case must be considered within six months from the date of receipt of the application. However, Article 152, paragraph 3, states that time during which proceedings are suspended or postponed is not included in this six-month period. Consequently, a case can take years to be heard due to its complexity and court

overload. Smart contracts, being less flexible than traditional contracts, offer fewer loopholes for delaying proceedings.

2) Automatic Fund Transfer: Smart contracts facilitate automatic fund transfers, making payment delays impossible as the system checks the ordering company's account for available funds and freezes them until payment is completed. This feature ensures timely payments in digital ruble transactions.

As previously mentioned, blockchain technology is transparent, and the smart contracts and transactions recorded within it cannot be erased or altered. This property is expected to decrease the growth of the shadow economy in Russia and simplify law enforcement agencies' efforts to combat public procurement crimes.

Regarding the shadow economy, the state strives to curb the activities of corrupt officials exploiting the lack of transparency in public procurement. However, this task is challenging. The introduction of smart contracts would enhance the transparency of public contracts and their execution. The state, as a service customer, needs to ensure transparency in budget fund usage and guarantee service quality. A.G. Aksakov, head of the State Duma Committee on the Financial Market, believes that the state "can quickly get involved in using the digital ruble to finance state projects, as it allows clearer visibility on how budget funds are allocated for various projects. The state will quickly activate the smart contract to ensure that funds are allocated for projects and state tasks precisely when needed."

Moreover, due to the immutability of smart contracts, it will be impossible to change or erase signed documents and executed contracts from the system. This feature will eliminate opportunities for offenders to destroy evidence, simplifying law enforcement agencies' efforts to apprehend corrupt individuals and organizations and preventing further offenses.

Conclusion

Thus, we can conclude that, despite the digital ruble project currently being in the pilot stage and not yet in mass use, its gradual development and integration into the Russian economy, alongside the formation of an innovative payment infrastructure, will likely lead to a rapid and steady increase in users among both legal entities and individuals. This growth will be driven by the emergence of new financial services, such as smart contracts, which will enable fully secure transactions.

Furthermore, it is anticipated that the state will utilise smart contracts in a proactive manner. The inherent transparency, invariability, and impartiality of these contracts will empower the government to effectively monitor the expenditure of budgetary funds. This, in turn, is expected to contribute to the mitigation of illegal enrichment, a phenomenon that has been observed to arise from the prevailing deficiencies within the public contract system.

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POTENTIAL CONSEQUENCES OF IT DISRUPTIONS ON THE VALUE OF COMPANIES

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Abstract: *The ever-increasing usage of technology and upsurge of tech companies brings attention to an important topic, related to the consequences of disruptions that may occur with these technologies. In this research paper the analysis is based on the effects these outages have on a company's value, more specifically isolating potential consequences the latest outage would have on the affected company, based on an analysis of previous cases. These cases showed that the effects depend on the company itself, what are it functions in and the grade at which technology is integrated in its activities, and logically the most affected by tech disruptions are tech companies. These effects can be both monetary, as well as reputational and have a possibility of affecting the company's value as well.*

Keywords*: IT disruption, finance, value, dependency*

JEL: *G39*

1. Introduction

Digitalisation and the technological upsurge in modern times lead to both a large number of benefits and significant risks and negatives in terms of scale and impact. Newer and more comprehensive technological tools are being introduced in companies every day, impacting both labour productivity and the overall structure of companies. The dependence on technology is becoming clearer and more extensive, bringing with it the necessity of these technologies to be constantly up and running properly.

These growing dependencies, coupled with the increasingly advanced implementation of all shapes and sizes of technological tools in companies' operations, raises the question of what the impact would be on the value of these companies in the event of a potential failure of these systems.

The topic is interesting because the daily development of technology implies the increasing risk of potential problems coming with their implementation. Uncovering the potential effects that a significant IT disruption could have on companies and their value could provide an impulse towards the development of prevention mechanisms.

The purpose of this research paper is, by examining the manifestation of significant size disruptions in technology infrastructure and their effects on companies over the years, to answer what are the potential effects of the 2024 CrowdStrike IT disruption on the company based on similar events that have occurred in the past. The main thesis is that an IT outage could have a negative impact on a company's value, depending on the company's reaction to it.

The main task, which has been realized in this paper, consists in identifying the effects on the value of companies of previous IT disruptions and the potential effects of the latest such issue.

2. Exposition

The adoption of technology in the operations of companies is happening faster and on a larger scale than ever before. One of the many examples of an invaluable technological tool used by almost every company are the ERP systems. This software provides significant improvements to the company environment, and this is revealed in a study by Panorama consulting group which showed that after implementing these systems more than 90% of the companies that have implemented them have realized improvements in "Productivity and Efficiency", "Reduction in Maintenance Costs", "Improvement in Customer Experience", etc (Panorama consulting group, 2024). These improvements also inevitably lead to an improvement in the value of the company, due to the direct relationship between value and revenue increase, as well as cost reduction.

As it would seem, the technological expansion of a company is a key element in its normal and successful development. However, the implementation of these technologies entails significant risks in terms of many factors such as: security, normal functioning of processes, data integrity, etc. This is confirmed by a report published by IBM, which studied the effects of cyber-attacks on 604 companies, mentioning that 70% of them experienced either significant or very significant consequences of a cyber-attack. It also mentions that the average cost to a company of such an attack on its technology infrastructure to be around $4.88 million, which included delayed operations, loss of customers, etc. It is also important to note that only 12% of the affected organizations were able to fully recover from these outages (IBM, 2024). IBM define cyber-attacks as an intentional effort to disrupt the normal functioning of IT systems, which include stealing, altering, disabling, or destroying data, causing issues with applications or similar activity, through unauthorized access to a network, computer system or digital device (IBM). Other definitions are more or less identical, for example CISCO define a cyberattack as a malicious and deliberate attempt to breach unauthorized information of another individual or organization (CISCO). In terms of a definition for an IT outage, the National Institute of Standards and Technology have given a definition, which sums up those given by other organizations, which is: *"A period when a service or an application is not available or when equipment is not operational."* (NIST)

Because of the potential negative effects a similar outage or disruption would have on a company, it is necessary to have a clear understanding of the potential risks and their countermeasures. Respectively, this would lead to the creation of prevention mechanisms. After the most recent outage in July 2024, the Columbian school of professional studies outlined 4 specific risks, which are evident and appeared: Automation Risks, quality assurance failures, the illusion of control and human element (Bhujle, 2024). Each of these risks bears significance to a company's operation, as it's very highly likely that they need to take them into account when planning their IT strategy and infrastructure. Columbia SPS also point out that even tech giants like Microsoft have significant cybersecurity risks, which also need to be studied, and the vulnerable points need to be further improved upon.

Since the IT disruption that occurred in 2024 was of a massive scale, impacting multiple systems, it is necessary to examine similar disruptions in information technology. For the purpose of the analysis, historical data on 3 significant size disruptions in the technology infrastructure of companies are examined.

The analysis is performed in terms of the main company that suffered this collapse. The focus is mainly on what are the effects on it from a financial perspective, how have its key financial ratios changed. The ratios chosen for the analysis are the company's profit margins, return on equity, current liquidity are chosen as well as its value before and after the disruption. This has

been done through 3 valuations applying the market method to value the company based on market data for the company and close peer companies:

- *One year prior to the occurrence of this collapse, which will be used as a base year for comparison*
- *One year after its occurrence*
- *Three to seven years after its occurrence.*

This will give an idea of the short- and long-term effect that such a collapse would have on a company of significant scale.

Based on the data obtained, conclusions will be drawn about the effects of these disruptions on companies and their value, and corresponding predictions will be made about the effects of the recent IT disruption that occurred in June 2024.

The approach chosen for this study is the market valuation method, which is part of the comparative models. It was chosen because of the ability to isolate different periods without the need to make forecasts or extrapolate future company performance. In this way, it becomes possible to perform multiple valuations of a company, taking into account the market situation, by means of the selected analogues. The definition of this model is wide-ranging, but all authors agree that it is a method based on the market performance of the company and the selected market analogues. Some of the definitions considered include that of Professor Damodaran, which considers the value of a company under this approach as a comparison of the share price of a company with that of a selected group of similar 'analogue' companies (Damodaran, 2006), and the definition Professor Nenkov defines, which considers the market approach as one in which assets are valued based on the market price of similar assets (Nenkov, 2015). It is also important to consider the international valuation standards on which valuations under this approach are based. In them, it is defined as an approach to determine the value of an asset by comparing it to identical or comparable assets for which price information is available (IVS, 2023). Comparable companies are selected based on their scale, line of business, and selected financial metrics (Net Margin, EBITDA Margin, ROE and ROA). Through these constraints, it is possible to isolate suitable peer companies to provide a clearer picture of the state of the companies being evaluated. The maximum number of peers for each valuation will be 3. These financial ratios will also be analysed in order to determine the internal financial performance of the affected companies.

For the purpose of the analysis, a template has been constructed in which to place the information on the market performance of the companies, based on historical data from the stock exchanges on which they are traded. The financial information is in currency US dollar in order to eliminate exchange rate effects. All the amounts are taken in their native currency and translated to USD through computation using the provided exchange rates by the European Central Bank. The data are derived based on the 3 periods described earlier in this paper and refer to the company whose systems experienced this disruption. The technology disruptions that have been selected for analysis are:

- The British Airways IT disruption that left 75,000 people without a flight in May 2017. (Reuters, 2024)
- Google's temporary 1-hour service outage in December 2020 (Reuters, 2024)
- The collapse of META services (Facebook, Instagram, Whatsapp), which for 6 hours were unavailable in October 2021. (Reuters, 2024)

The analysis of these 3 of what are considered some of the most significant technological disruptions are used as the basis for deriving the potential consequences for the June 2024 technological disruption.

3. Analysis and results

3.1. First case - International Consolidated Airlines Group SA

The first analysed case is that of British Airways, owned by the company International Consolidated Airlines Group SA. This case study looks at the company described and what effect this disruption has had on it. All flights on the 27th of May were cancelled, which led to a significant disruption in the normal operations of the company. (CNN, 2017). The company affected is International Consolidated Airlines Group SA. For the purpose of the valuation, the following peer companies are considered: Delta Air Lines; Ryanair Holding; Singapore Airlines. All of them are functioning companies, which are selected as peers, as their financial data, size of the business and margins are very similar to those of the affected company and thus make for an adequate valuation. The three valuations described were carried out as follows:

3.1.1. Valuation based on financial data 1 year before the crash (2016).

For the purpose of the analysis, data as of 31.12.2016 was used, which represents a completed fiscal year, in order to maximize the objectivity of the financial results, as this year is used as the baseline for the comparison. When computing the market multiples of the 3 selected companies and their subsequent integration in the valuation model, we receive a value for International Consolidated Airlines Group SA of 11.36 USD per share, while the market price for the company is recorded as 5.35 USD per share. This means that the company should be undervalued with more than 100% according to the valuation. The ROE is equal to 33%,while the Net margin = 8%, EBITDA Margin = 15%. The current liquidity is 1.05. The detailed valuation can be seen in the table below:

Table 1. Valuation of International Consolidated Airlines Group SA as of 31.12.2016

International Consolidated Airlines Group SA USD	**Market multiples**		
	P/E	**EV/EBITDA**	**EV/Revenue**
Implied Enterprise value	34 410 629 256,12	18 341 961 459,45	26 751 065 769,62
Total Debt	9 434 195 000,00	9 434 195 000,00	9 434 195 000,00
Total Cash on hand	7 073 011 000,00	7 073 011 000,00	7 073 011 000,00
Implied Market value	32 049 445 256,12	15 980 777 459,45	24 389 881 769,62
Shares outstanding	2 120 000 000,00	2 120 000 000,00	2 120 000 000,00
Price per multiple	**15,12**	**7,54**	11,50
Weight of each price	40%	40%	20%
Weighed price per multiple	6,05	3,02	2,30
Final price	11,36 USD		

Source: Personal calculations

3.1.2. Valuation based on financial data 1 year after the crash (2018).

For the purpose of the analysis, data as of 31.12.2018 is used, which represents a completed fiscal year, in order to maximize the objectivity of the financial results. This is the year following the IT disruption. The aim of analysing it is to see if there are any visible short-term effects of it on the firm's value. The picture shown is interesting, because, although the company suffered a big IT outage, which caused severe delays and cancelled flights, the

valuation model provided a price of 13.09 USD per share, while the market price of the company is 7.81 USD per share as of 31.12.2018. Once again, the company is undervalued, but significantly less in terms of percentile difference (only 68%). Of course, it's important to note that the company has 7% less shares outstanding in this period and part of the increase in price can be attributed to that as well. The ROE and margins have seen a minor increase, ROE = 36%, Net Margin = 10%, EBITDA Margin = 18%. The current liquidity is lower, equal to 0.91. The detailed valuation is shown in the table below:

Table 2. Valuation of International Consolidated Airlines Group SA as of 31.12.2018

International Consolidated Airlines Group SA USD	**Market multiples**		
	P/E	**EV/EBITDA**	**EV/Revenue**
Implied Enterprise value	36 624 313 500,00	19 935 003 345,72	25 520 008 946,66
Total Debt	9 835 550 000,00	9 835 550 000,00	9 835 550 000,00
Total Cash on hand	8 152 400 000,00	8 152 400 000,00	8 152 400 000,00
Implied Market value	34 941 163 500,00	18 251 853 345,72	23 836 858 946,66
Shares outstanding	1 990 000 000,00	1 990 000 000,00	1 990 000 000,00
Price per multiple	**17,56**	**9,17**	**11,98**
Weight of each price	40%	40%	20%
Weighed price per multiple	7,02	3,67	2,40
Final price	13,09 USD		

Source: Personal calculations

3.1.3. Valuation based on financial data 7 years after the crash (2024).

For the purpose of the analysis, data as of 31.12.2023 is used. This analysis aims to outline any long-term effects which the IT outage may have had on the company. The valuation provides us with a price of 5.41 USD per share, while the market price is 3.42 per share as of 31.12.2023. It is important to note that the shares outstanding of the company have doubled, therefore significantly dropping the share price. It's interesting to note that the company is once again undervalued but only with 58%. This means that its market price is slowly getting closer to the real price of it. The ROE has increased to 83%, due to the lowering of the shareholders equity, while the margins have remained more or less unchanged, Net Margin = 9%, EBITDA Margin = 19%. The current ratio is even lower – 0.63. The detailed valuation can be seen on the table below:

Table 3. Valuation of International Consolidated Airlines Group SA as of 31.12.2023

International Consolidated Airlines Group SA USD	**Market multiples**		
	P/E	**EV/EBITDA**	**EV/Revenue**
Implied Enterprise value	35 126 173 464,96	31 987 683 922,67	30 699 493 035,71
Total Debt	19 635 850 000,00	19 635 850 000,00	19 635 850 000,00
Total Cash on hand	8 309 600 000,00	8 309 600 000,00	8 309 600 000,00
Implied Market value	23 799 923 464,96	20 661 433 922,67	19 373 243 035,71
Shares outstanding	4 000 000 000,00	4 000 000 000,00	4 000 000 000,00
Price per multiple	5,95	5,17	4,84
Weight of each price	40%	40%	20%
Weighed price per multiple	2,38	2,07	0,97
Final price	5,41 USD		

Source: Personal calculations

3.1.4. Conclusion on the first valuation

From the analysis we could see that no significant effect on the value of the company can be derived solely from the effects of the IT outage neither in the short-, nor the long-term. A positive effect can be seen, in which the share price on the market is slowly approaching the real price as per comparison with the market peers. The reason for this can be attributed to a multitude of factors and therefore cannot be connected solely with the effects of the outage. However, it is important to note, that as of the occurrence of this disruption, the company has raised the risk significance of cyber-attacks and data security as well as events causing significant network disruptions, which in itself shows that they have reacted and are actively investing in prevention mechanisms as well as new and improved digital products. This in itself could be counted as an attributing factor to the stability of the company and its further growth. This case is a good example of how an enterprise should react in the event of a similar outage, but it's also important to consider these risks beforehand. It's also important to note that the company affected is not a tech company and therefore there are a multitude of factors, which could compensate a potential IT disruption and its effects. This is evident from the financial ratios as well, as the only one that saw a decrease is the liquidity ratio, while the other saw either a very significant increase in the face of the ROE, or a moderate increase in the face of the Margins. Therefore it's highly unlikely that any changes to the financials were closely related to the IT outage.

3.2. Second case - Alphabet Inc.

The second case is that of Google and the interruption of services provided by it. The company affected is its owner Alphabet Inc. On December 14, 2020, Google's services ceased to function for 1 hour, affecting tens of thousands of users. The first step of the analysis is to look at the company's financial ratios. Google is a tech giant and therefore it's only logical that the analogues will be similar companies. For the purpose of the valuation, the following peer companies are considered: NVIDIA Corporation; Apple Inc.; Microsoft Corporation. All of them are functioning companies, which are selected as peers, as their financial data, size of the business and margins are very similar to those of the affected company. It's also important to note that an IT crash could be detrimental to a tech-based company and this case is especially interesting to be studied.

3.2.1. Valuation based on financial data 1 year before the crash (2019).

For the purpose of the analysis, data as of 31.12.2019 is used, which represents a completed fiscal year, in order to maximize the objectivity of the financial results, as this valuation will be used as the baseline for the comparison. The first thing to note is that Alphabet inc. has very high profit margins, as do the selected peers. The company's market price as of 31.12.2019 is 66.9 USD per share, while the valuation shows a price of 70.04 USD per share. This is a gap of just 5% between the implied price and the market price, which means that the company is close to being valued at its real price. The ROE is equal to 17.05%, the Net Margin = 21.22% and the EBITDA Margin = 28%. The current liquidity ratio is 3,374. The detailed valuation can be seen in the table below:

Table 4. Valuation of Alphabet inc. as of 31.12.2019

Alphabet Inc. USD	Market multiples		
	P/E	EV/EBITDA	EV/Revenue
Implied Enterprise value	696 193 015 057,19	963 800 710 089,49	1 379 956 924 165,67
Total Debt	15 960 000 000,00	15 960 000 000,00	15 960 000 000,00
Total Cash on hand	119 670 000 000,00	119 670 000 000,00	119 670 000 000,00
Implied Market value	799 903 015 057,19	1 067 510 710 089,49	1 483 666 924 165,67
Shares outstanding	14 902 000 000,00	14 902 000 000,00	14 902 000 000,00
Price per multiple	53,68	71,64	99,56
Weight of each price	40%	40%	20%
Weighed price per multiple	21,47	28,65	19,91
Final price	70.04 USD		

Source: Personal calculations

3.2.2. Valuation based on financial data 1 year after the crash (2021).

For the purpose of the analysis, data as of 31.12.2021 is used, which represents a completed fiscal year, in order to maximize the objectivity of the financial results. This period represents 1 year after the IT crash that occurred and interfered with the normal company activity. The image is significantly different than before. The market price of Alphabet Inc. as of 31.12.2021 is 144.7 USD per share, while the value as per the valuation and the peers is 219.35 USD, which is a gap of 51.52%. This shows that the company's value, although increasing, is significantly further from the market equivalent as per the valuation. The ROE has increased to 30%, as have the margins to a Net margin = 29% and EBITDA margin = 34%. The current liquidity ratio is lowered to 2.92. The detailed valuation can be seen on the table below:

Table 5. Valuation of Alphabet inc. as of 31.12.2021

Alphabet Inc. USD	Market multiples		
	P/E	EV/EBITDA	EV/Revenue
Implied Enterprise value	2 587 917 500 000,00	2 682 107 132 668,32	3 427 059 784 964,85
Total Debt	28 395 000 000,00	28 395 000 000,00	28 395 000 000,00
Total Cash on hand	139 649 000 000,00	139 649 000 000,00	139 649 000 000,00
Implied Market value	2 699 171 500 000,00	2 793 361 132 668,32	3 538 313 784 964,85
Shares outstanding	13 242 420 000,00	13 242 420 000,00	13 242 420 000,00
Price per multiple	203,83	210,94	267,20
Weight of each price	40%	40%	20%
Weighed price per multiple	81,53	84,38	53,44
Final price	219.35 USD		

Source: Personal calculations

3.2.3. Valuation based on financial data 4 years after the crash (2024).

For the purpose of the analysis, data as of 31.12.2023 is used, which represents a completed fiscal year, in order to maximize the objectivity of the financial results. This period represents 4 years after the IT crash that occurred and interfered with the normal company activity. This aims to show if there are any long-term effects of the disruption. The image is more or less the

same as it was 1 year after the crash. The market price of Alphabet Inc. is 140.90 USD per share, while the valuation shows a share price of 227.81 USD. This shows a gap 62% between the two prices. Once again, there are many other attributing factors to this, but one of them is also highly likely to be the network crash. The ROE has decreased to 26%, as have the margins: Net margin = 24% and EBITDA margin = 31%. The current liquidity ratio is also lower to 2.09.

Table 6. Valuation of Alphabet inc. as of 31.12.2023

Alphabet Inc. USD	**Market multiples**		
	P/E	**EV/EBITDA**	**EV/Revenue**
Implied Enterprise value	2 419 238 500 000,00	2 618 638 560 403,75	3 704 598 812 461,55
Total Debt	28 504 000 000,00	28 504 000 000,00	28 504 000 000,00
Total Cash on hand	110 916 000 000,00	110 916 000 000,00	110 916 000 000,00
Implied Market value	2 501 650 500 000,00	2 701 050 560 403,75	3 787 010 812 461,55
Shares outstanding	12 460 000 000,00	12 460 000 000,00	12 460 000 000,00
Price per multiple	200,77	216,78	303,93
Weight of each price	40%	40%	20%
Weighed price per multiple	80,31	86,71	60,79
Final price	227.81USD		

Source: Personal calculations

3.2.4. Conclusions on the second case

Alphabet Inc. is a tech giant and as such it is of great importance for its systems to be up and running 100% of the time. Of course, there are maintenance schedules etc., but in the case of an unplanned disruption, it could cost the company significantly. A tech disruption in a company like Alphabet creates several issues, which have a snowball effect. For example, the search engine "Google" is the most used in the world, it also offers an enormous amount of engagement to advertisements. A disruption of this, for multiple hours, creates losses for the company as well as the advertising companies. This in turn could lead to a loss of trust in the Alphabet, which could also lead to losses. All these factors, combined with the fact that 2020 was subject to many crises, it is safe to assume that an IT outage of that scale could prove to be an important factor in the value of the company. This is also confirmed by the company itself, which has stated in its reports that *"Interruption, interference with, or failure of our complex information technology and communications systems could hurt our ability to effectively provide our products and services, which could harm our reputation, financial condition, and operating results."* (Alphabet Inc., 2020). It's also important to note that there is fluctuations in the financial ratios. One year after the outage we can see an increase in margins and ROE, while a lowering of liquidity, while in the long-term the ratios are slowly approaching their starting values as of 2019, but the liquidity keeps lowering. This could be correlated to a number of factors, but there is high likelihood of the company trying to maintain its margins and returns by sacrificing a little liquidity and investing in systems, which could help the business maintain its level and grow even further. This cannot be directly correlated to the IT outage, but there is a possibility, that the company aims to invest to lower the risks of a similar thing occurring again, so it can also be counted as a factor in a way.

3.3. Third case - META

The most recent case study is that of META and the technological failure suffered. The company affected is META. On 04 October 2021, the services of the platforms provided by META, namely Facebook, Instagram, WhatsApp ceased to function for 6 hours. The selected company is also, as in the previous case, a tech giant and therefore the selected peers for it reflect upon that as well. The selected peer group contains: Tencent Holdings Inc., Apple Inc.; Microsoft Corporation. All of them are huge tech companies, similar to META and have very close margins and financial ratios.

3.3.1. Valuation based on financial data 1 year before the crash (2020).

For the purpose of the analysis, data as of 31.12.2020 is used, which represents a completed fiscal year, in order to maximize the objectivity of the financial results, as this valuation will be used as the baseline for the comparison. In this case it's interesting to note that the market price of META as of 31.12.2020 is 273.16 USD per share, while according to the peers and the valuation it is 273.83 USD per share. The gap between the two is just 0.25%, which is incredibly close. This means that META during this period has had a market price almost identical to the real price as per the valuation. The ROE ratio is 23% and the margins are relatively high at 33% - Net margin and 46% for the EBITDA margin. The current liquidity ratio is 5.05. The detailed valuation can be seen in the table below:

Table 7. Valuation of META Platforms as of 31.12.2020

META USD	**Market multiples**		
	P/E	**EV/EBITDA**	**EV/Revenue**
Implied Enterprise value	627 556 630 954,10	828 086 878 900,46	732 950 243 966,03
Total Debt	10 654 000 000,00	10 654 000 000,00	10 654 000 000,00
Total Cash on hand	61 954 000 000,00	61 954 000 000,00	61 954 000 000,00
Implied Market value	678 856 630 954,10	879 386 878 900,46	784 250 243 966,03
Shares outstanding	2 849 000 000,00	2 849 000 000,00	2 849 000 000,00
Price per multiple	238,28	308,67	275,27
Weight of each price	40%	40%	20%
Weighed price per multiple	95,31	123,47	55,05
Final price	273.83 USD		

Source: Personal calculations

3.3.2. Valuation based on financial data 1 year after the crash (2022).

For the purpose of the analysis, data as of 31.12.2022 is used, which represents a completed fiscal year, in order to maximize the objectivity of the financial results. The analysis aims to show the short-term effect if any of the IT crash of META's systems. The market price of the company as of 31.12.2022 is 122.37 USD per share, while according to the valuation and the market peers, it should be 341.29 USD per share. This is by far the biggest deviation, with an 178% gap between the prices. There is also a notable change in the ROE, which is now equal to 18% and significantly lower margins: Net margin=19.90% and EBITDA margin=32%. The current liquidity ratio is 2.20, almost twice as low as before. The detailed valuation can be seen in the table below:

Table 8. Valuation of META Platforms as of 31.12.2022

META USD	Market multiples		
	P/E	EV/EBITDA	EV/Revenue
Implied Enterprise value	809 453 000 000,00	928 850 525 230,18	913 305 655 846,90
Total Debt	26 591 000 000,00	26 591 000 000,00	26 591 000 000,00
Total Cash on hand	40 738 000 000,00	40 738 000 000,00	40 738 000 000,00
Implied Market value	823 600 000 000,00	942 997 525 230,18	927 452 655 846,90
Shares outstanding	2 614 000 000,00	2 614 000 000,00	2 614 000 000,00
Price per multiple	315,07	360,75	354,80
Weight of each price	40%	40%	20%
Weighed price per multiple	126,03	144,30	70,96
Final price	341.29 USD		

Source: Personal calculations

3.3.3. Valuation based on financial data 3 years after the crash (2024).

The last valuation done is that of META, using data as of 31.12.2023, as a completed fiscal year. This analysis shows an interesting trend. The company has bounced back and has reached the market price, which was implied in the previous period valuation. The market price as of 31.12.2023 is 355.18 USD per share, showing that the company has managed to recuperate. This is evident when comparing with the price per valuation, which is 529.17 USD per share. Although there is once again a gap, it is significantly smaller, only 49%. There is also a bounce back in terms of the ROE, which is now equal to 25% and better margins, nearing those before the IT outage: Net margin=28.9% and EBITDA margin=44%. The current liquidity ratio is 2.67, which has also seen an improvement. The detailed valuation can be seen in the table below:

Table 9. Valuation of META Platforms as of 31.12.2023

META USD	Market multiples		
	P/E	EV/EBITDA	EV/Revenue
Implied Enterprise value	1 136 951 400 000,00	1 581 912 319 503,05	1 197 410 018 304,38
Total Debt	37 234 000 000,00	37 234 000 000,00	37 234 000 000,00
Total Cash on hand	65 403 000 000,00	65 403 000 000,00	65 403 000 000,00
Implied Market value	1 165 120 400 000,00	1 610 081 319 503,05	1 225 579 018 304,38
Shares outstanding	2 561 000 000,00	2 561 000 000,00	2 561 000 000,00
Price per multiple	454,95	628,69	478,55
Weight of each price	40%	40%	20%
Weighed price per multiple	181,98	251,48	95,71
Final price	529.17 USD		

Source: Personal calculations

3.3.4. Conclusion on the third case

The analysis of another tech giant, in the face of META, provides an interesting insight on the topic. During this period, META has also been subject to other issues, once again related to the technical infrastructure of the company, so it's important to note, that there is a sum of factors, which contribute to the financial development and value of the company. Isolating one factor is nothing short of impossible, but similar to Alphabet, all of META's applications and services are digital and therefore the safety and integrity of this infrastructure is extremely important for the company's functionality and well-being. Once again, there is a huge risk for the company's

reputation, as well as its availability to advertisers and other revenue sources, as confirmed by the company's annual report *"Our products and internal systems rely on software and hardware that is highly technical, and any errors, bugs, or vulnerabilities in these systems, or failures to address or mitigate technical limitations in our systems, could adversely af ect our business."* (META, 2023). This is evident from the changes in the margins, the return and liquidity ratios, which are lower after the IT disruption, but in the long-term slowly begin to recuperate and start returning to their base levels as per the basis year.

4. Potential consequences of the latest IT outage on the company affected. Conclusion

The latest IT outage that occurred affected the company CrowdStrike. It is a cybersecurity company, providing services to many big companies, not only in the tech industry, but outside of it as well. They have introduced a special sensor, called "CrowdStrike Falcon" which uses AI and machine learning to protect customer systems by identifying and remediating the latest advanced threats. (CrowdStrike, 2024) The IT crash that occurred on July 19, 2024, is caused by a Rapid Response Content update, which was delivered to Windows hosts. The introduced sensor was prepared to expect 20 input fields, but the update provided 21, which created a mismatch resulting in an out-of-bound memory read, which in turn caused a system crash. The company confirmed that the issue was not exploitable by a third party (CrowdStrike, 2024).

This crash resulted in many different companies losing the ability to function properly. An outage of this severity could prove to be detrimental to any company, let alone being a tech company focused on providing software services to other companies. It is safe to assume, learning from the effects of the previously analyzed cases, more specifically those of Alphabet and META, as tech companies, the outages of which were related to the main activity of the company, it is highly likely that CrowdStrike's market will most likely stray from its real price, as the market will be mistrustful and careful. This will undoubtedly influence the company's reputation and potential ability to generate revenue, as its main source of this was jeopardized and there is a high probability of risk occurrence, which the market will not take lightly. This is evident from the price fluctuations as of the occurrence of this outage (yearly the price ranges from 183.60 USD per share to 398.33 USD per share) (Yahoo Finance, 2024). There is also a high likelihood that the financial ratios of the company and its financial performance will see a decrease in the short-term, but if the reaction of the enterprise is adequate, it will most likely bounce back to levels, similar of those before the crash.

The company has of course introduced preventive measures, which if improved further and deployed in a timely manner, will help improve the company's reputation and help it recover from this issue.

In conclusion the effects of an IT outage on a company's value depend mostly on the company's main sources of income and the area in which it functions. While a tech outage could be detrimental to a tech company, it might not have the same effect on a company which only uses technology as a supporting activity. Of course, it is always a matter of scale as well, as the studied companies are big companies, 2 of which - tech giants, which are staples in the market and could hardly be ruined by a single outage, unlike a small company, which is far from being irreplaceable, where a similar occurrence could prove to be catastrophic for it. We could also see that although an IT outage impeded the normal functioning of IAG's processes, no significant harm was done to the financials, on the contrary, the company's market price was approaching slowly it's true price as per the valuation. There is also a condition regarding the amount of technology being implemented in a company. For example if the entire database of a company is in the digital environment, if it is subject to a breach or an outage, the affected

enterprise might not be able to function at all ever. There are many factors, which could increase or decrease the effect of these disruptions and it‘s not possible to calculate an exact amount a similar occurrence would have on different individuals. However, it’s important to note that all companies should integrate preventive measures when using technology in any form, in order to prevent potential risks to its reputation, financials etc. This is especially important for tech companies, as seen in the analysis, even tech giants could have difficulties recovering from a similar event in the short-term.

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BULGARIA ON THE ROAD TO THE EUROZONE: NOMINAL CONVERGENCE CRITERIA AND POLICIES ADJUSTMENT

Tatiana Houbenova-Delisivkova [1]

Abstract: *The paper discusses the adjustment of the Bulgarian economy to the integration process in the EU and the European Monetary Union as regards the prospects to join the EMU. The economic and financial integration of Bulgaria since the start of its official membership in 2007 coincided with the Global financial and economic crisis and with the European sovereign crisis in the European Moneraty Union (EMU) as the "core' of the EU integration. The last decade the integration process has been challenged by the deep institutional reforms as crucial for deepening and enlarging the EMU. The macroeconomic performance of Bulgaria is revealed with regard to the compliance with the macroeconomic nominal convergence criteria for the EMU. The real convergence is discussed to outline the ongoing reforms to speed up economic growth and competitiveness in compliance with the EU law and regulation. Conclusions and future prospects are summarized for the Bulgaria's EMU entry as a challenge and opportunity for further integration of Bulgaria the EU.*

Key-words*: European integration, EMU, Maastricht criteria, financial stability, EU reforms in the financial sector, financial integration.*

JEL: G12,G28,G32,F36,F450.

1. Introduction

The preparation for adoption of the Euro in Bulgaria has been perceived as a priority goal of the EU accession since the conclusion of the Treaty of Accession of Bulgaria to the EU on April 25, 2005 until present. As regards the process of structural adjustment Bulgaria has embarked on the road to economic and monetary integration with the EMU much earlier at the very beginning of the its EU preaccession period since mid 90s and especially since the adoption of the Currency Board regime in 1997. Choosing the German mark to be the monetary anchor of the Currency board regime Bulgaria followed the strategy to replace it with the Euro since its introduction in 1999 at the third stage of the EMU of the EU. The Euro as an anchor of the Currency board in Bulgaria has been a strong factor of Bulgaria's financialisation during the transition from centrally–planned to market economy by fulfillment of the Copenhagen criteria. Bulgaria's EU membership has opened new possibilities and challenges to adjust to the EU single market's free movement of goods, services, capital and work force on the basis of the EU law, i.e. the acquis communitaire.
According to the 2005 Stategy of the Bulgarian National Bank the preparedness for the EMU could have been achieved in a foreseable medium term due to the favourable economic growth

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trends and the fiscal and monetary stability of the Bulgarian economy by that time. Besides since Bulgaria has started its EU membership as of January 1st, 2007 there has been a rather optimistic belief among policy makers in Bulgaria that the compliance with Maastricht criteria is to be on the basis of the well functioning Currency board.
The case of Bulgaria's experience on the road to the EMU is indicative of the complexity of the process of country's progress in achieving compliance with the criteria for the EMU as well as of the role of the political factors to achieve the preparedness for the EMU. The analysis reveals that Bulgaria' s progress to join the EMU has depended on the structural adjustment to the EU Single market as well as on the improvement of the institutional capacity and economic governance to comply with the Union's requirements in favour of achieving convergence criteria.

The acknowledgement of the EMU's success in its progress to enlarge and deepen the European monetary integration involves also the jugdement that the EMU has developed further its institutional architecture and regulatory capacity. Following the Global financial crisis and the European sovereign crisis the progress of the EMU governance has raised the significance of the EMU for the regulatory changes in the macroprudential policy, banks' risk management and banking supervision systems of EU member states. Bulgaria has been involved in this process of banks' çonsolidation and financial sector risk management by deepening the compliance with the EU law. Thus the postponement of Bulgaria's entry to the EMU has become as part of differentiated integration a challenge of raising the costs of compliance to the newly designed institutional architecture of the EMU and regulations of its capacities and instruments. [2]

Since 2014 the banking system and financial intermediation of Bulgaria have been the main sphere of the process of compliance on the road to the EMU. On the 10th of July 2020, Bulgaria was accepted as a member of the ERM II and the Banking Union (the so-called "euro area waiting room") in response to the country's efforts and the political will to join the euro area expressed in the Official letter submitted at the end of June 2018 expressing the committment to enter into a "close cooperation" agreement with the European banking union. For the last 4 years as being a member of the Banking Union and ERM II Bulgaria has undertaken steps for the introduction of the Euro being on clear terms that achieving compliance with the EMU criteria is necessary. But the political crisis in the last three years has led to subsequent changes of Government causing the failure to meet the accession criteria, as well as the non-adoption of the legislative framework. Thus the original euro adoption plan has not been accomplished as expected. An updated "National Plan for the Introduction of the Euro in the Republic of Bulgaria" with a new target date of 1 January 2025 was adopted by Decision 797 of the Council of Ministers of 13 November 2023.
Since Bulgaria joined the ERM II of the EMU in 2020 much more comprehensive approach has been applied that relies on the political will and commitment to prepare for the Euro by mobilising efforts to raise public confidence and information in all sectors, public institutions and the private sector for preparation to join the euro area.
Since 2021 the political turmoil in Bulgaria has been prolonged for nealy 3 years and the unfavourable economic performance due to the external and domestic factors of the energy crisis and the war in Ukraine have caused slowdown of growth in 2023 to 1.8 percent driven by a decline in private investment due to uncertainty and by the unwinding of the inventory buildup of 2021–2022. In spite of the fact that headline inflation decelerated to 3.1 percent in

[2] As stated in the Article1(3)Treaty of European union(TEU) and the Treaty on the Functioning of the European Union within or outside the Treaties of the EU in the field of European economic and monetary policy the differentiated integration is the cooperation of some but not all EU member states.

March 2024 as a result of the lower energy and food prices, core inflation remains stickier (3.9 percent), with services prices still growing by 5 percent. The inflation has remained higher than the price criterion for the EMU. Despite sustained wage and pension growth and inflationary pressures of 2024 budget, inflation is projected to continue declinining, but it has remained higher than required by the criterion of price stability.

The European Commission, in a Convergence Report dated 10/06/2024, announced that the Republic of Bulgaria is not yet fully ready to join the Eurozone on the 1st of January 2025 due to the non-fulfilment of one of the accession criteria - price stability. Therefore, the new target date for the introduction of the euro remains open for the time being and is subject to a decision of the Government of the Republic of Bulgaria following a favourable convergence report of the European Commission and a Decision of the Council of the European Union on the adoption of the euro by the Republic of Bulgaria adopted in accordance with Article 140(2) of the Treaty on the Functioning of the European Union.

The analysis comprises three main parts of discussion of the present issues of Bulgaria's EU economic and financial integration. The first part presents the outstanding characteristics of the main stages of the preparation of Bulgaria to the EMU.

The second part discusses the macroeconomic performance of Bulgaria with focus on the public finances's compliance with the Maastricht criteria as required by the framework for EU convergence. The third part presents the real convergence of Bulgaria as an ongoing further adjustment to the requirements for the EMU entry. Conclusions are drawn with regard to medium term official forecasts for the economic development and the achievement of further progress to join the EMU.

2. The Macroeconomic performance of Bulgaria and the nominal convergence with the Maastricht criteria

The issues of the entry criteria for the EMU as a set of Maastricht criteria from the first stage of the EMU in the 90s have raised a number of questions about the proper *"fitness" of a country to comply*. As regards the set of Maastricht criteria of convergence for example, Kozluk (2005, p. 439-474) finds that some of the EU accession countries are better prepared for the single currency membership than some of the more established members had been at the introduction of the EMU.The differentiation between the strictness of Maastricht criteria for EMU entry, on one hand and the reconsidered since 2005 framework of the Stability and Growth pact applied to member states of the EMU allowing flexibility to adapt, has been considered with regard to some recommendations for unification of fiscal deficits requirements for both EU members and the EMU entry (Nuti, 2006).

But the compliance with the fiscal sustainability criteria has gained new aspects of importance as the European sovereign debt crisis has evolved since 2010. As previewed by Mongelli (2002, p.34) the costs from negative external effects have become "very high for the EMU because not one, but more, member countries were to run sizeable and protracted budget deficits, accumulating an unsustainable public debt, eventually some pecuniary externalities might ripple through the currency area." The negative consequences of the crisis have made the compliance with *the nominal and real convergence indicators* need a much more essential prerequisite for the EMU entry.

As the COVID-19 crisis has hit hard the European economies and the recovery has been slow and not good enough (in spite of significant differences among countries) to stimulate growth. The questions about the growth model and the reforms of the European integration have been raised again. The EU membership of Bulgaria could not facilitate the the catch-up model of growth due to the multifold crisis implications as well as because of the ongoing search of proper national policies. These policies are a decisive factor for differences among the growth

performance of the countries of Central and Eastern Europe as EU member states. Bulgaria's integration to the EU is important as it supports sound fiscal and financial policies by the strengthening of the EU's current macro-finance assistance arrangements and economic governance improvements. However, the role of proper fiscal policy has become more important not only as instrumental for the EMU entry but because it has to take into account the need to stimulate economic growth. (Becker et al., 2010).

The fiscal vulnerability often arises from implicit liabilities towards the financial sector and for this reason sustainability assessments should also consider private-sector fragility. EU countries' budgets have been involved with providing great amounts of state aid to rescue banks and non-financial intermediaries. The post crisis institutions newly created to tackle the financial instabiliy provide new capacities for of the EMU. Thus for the EU member states like Bulgaria being 'outs' to the EMU, it is important to join the EMU as it may help growth by joining new cooperation agreements that are targeted to increasecompetitiveness and financial stability. The implementation of the Banking and Capital Union is assigned to contribute to the break of the vicious circle between the public debt and banking sector's debt and improve the fiscal consolidation in favour of the EMU (Zimmermann, 2015). By joining the Banking Union in 2020 Bulgaria has undertaken the implementation of banking regulations in favour of financial and fiscal stability.

Macroeconomic performance has allowed to maintain stability but the rate of growth has remained low in recent years. The unsatisfactory growth record has been accornpanied by relatively modest fiscal deficits, low inflation and a stable currency. Growth has been deprived of new capital inflows from abroad as direct and portfolio investments have fallen considerably as result of the Global and the European sovereign crisis. The economic growth has become largely dependent on domestic factors and only to some extent driven mainly by growth in services and manufacturing, the latter aided by an expansion in exports of labor-intensive goods. The acceleration of economic growth is considered a necessary prerequisite to diminish the gap between the GDP per capita of Bulgaria and the average GDP per capita of EU-27 in the period (2003-2023). Since 2012 Bulgaria has performed some improvement of the indicator GDP per capita (PPP) and it has been raised from 47 per cent in 2013 to 64% in 2023 of the average GDP per capita for the EU. but still this is the lowest level among the EU27.

3. Government finances' compliance with nominal convergence criteria

As a new EU member state Bulgaria has no opt-out choice as regards the EMU and thus has the status of a Member State with a derogation. The convergence with the EMU requirements has been most pertinent by the gradual process of alignment of Bulgaria's *fiscal polic*y with EU requirements. With the efforts for the implementation of Maastricht criteria for EMU Bulgaria has achieve progress towards macroeconomic nominal convergence (criterion on price stability, sound public finances, exchange rate, short-term and long-term interest rates).

Objectively the economic growth in terms of positive rates since 2004 has made possible to *maintain the public finances adequately* and to achieve a Government budget surplus since 2004 up to 2009. At the same time complex political and economic reasons justify the postponement of Bulgaria's participation in ERM II as the Convergence report points out to the need of decreasing the external imbalances and improve the laboour market. In practice, the deterioration of the indicator for government deficit for 2009 up to 4.3% of the GDP led to the imposition by the European Commission to Bulgaria a procedure for excessive deficit. In the subsequent years, by adhering to the new rules and requirements to the government finances, during the period (2010-2013).

As seen in Table 2, due to the higher level of public expenditures in 2014, the Government budget deficit was increased to 5.4 % of GDP. In 2015 Bulgaria has again restored the compliance with Maastricht criterion by adhering to consolidation of fiscal policy and improving the discipline of execution of the Government budget.

Table 1: Bulgaria compared to EU27 and Euro area: Government budget deficit/surplus (2014-2023) (as % of GDP, annually)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Bulgaria	-5.4	-1.9	0.3	1.6	1.7	2.1	-3.8	-3.9	-2.9	-1.9
European Union - 27 countries (from 2020)	-2.5	-1.9	-1.4	-0.9	-0.4	-0.4	-6.7	-4.7	-3.4	-3.5
Euro area - 19 countries (2015-2022)	-2.6	-2.0	-1.5	-1.0	-0.4	-0.5	-7.0	-5.2	-3.7	-3.6

Source: Eurostat, datasets Government deficit/surplus, debt and associated data, 2024,gov_10dd_edpt1

In 2015-2019 Bulgaria has performed steadily with adequate fiscal discipline the compliance with the Maastricht criteria as a main target of the Government fiscal policy in its Convergence Programmes. Since 2020 due to the COVID-19 crisis and the Ukranian war Government budget deficit raised by introducing temporary fiscal support for businesses and households during the Pandemic and subsequent energy crisis.. Bulgarian household consumers were protected from rising energy costs through regulated prices. They were frozen in December 2021 at levels from July 2021 to March 2022 and increased by 3.4% for electricity and 24% for heating in the second half of 2022. Heating prices increased by 8% in July and then by 14% in November. Targeted heating aid for the heating season linked to income has also been introduced. Non-household consumers were compensated through a support scheme that applied to all companies, regardless of their consumption. The scheme currently covers all non-domestic consumers for electricity costs above €102/MWh. The scheme to support non-household consumers was partially financed by a special levy on windfall profits of certain state-owned enterprises in the energy sector in 2022. Bulgaria applies the EU solidarity levy in the implementation of Council Regulation (EU) 2022/1854.

From January 2023, the country also applies caps on the profits that energy producers can receive from the wholesale market. These caps include approximately EUR 90/MWh for nuclear power plants and EUR 180/MWh for renewable electricity generators. The revenues from this measure are transferred to the "Security of the Electricity System" Fund.[3] Although energy prices have decreased, uncertainty remains regarding, which requires continued efforts

[3] Bulgaria has taken steps to guarantee the security of energy supplies. It fulfilled its gas storage obligations, filling 91.53% of the only Chiren underground gas storage facility by November 1, 2022. It secured supplies of liquefied natural gas (LNG) to compensate for natural gas supplies interrupted by Gazprom in April 2022, the operation of the gas interconnector between Greece and Bulgaria began in October 2022, while the construction of the Kostinbrod natural gas pipeline to connect Bulgaria and Serbia began in February 2023.

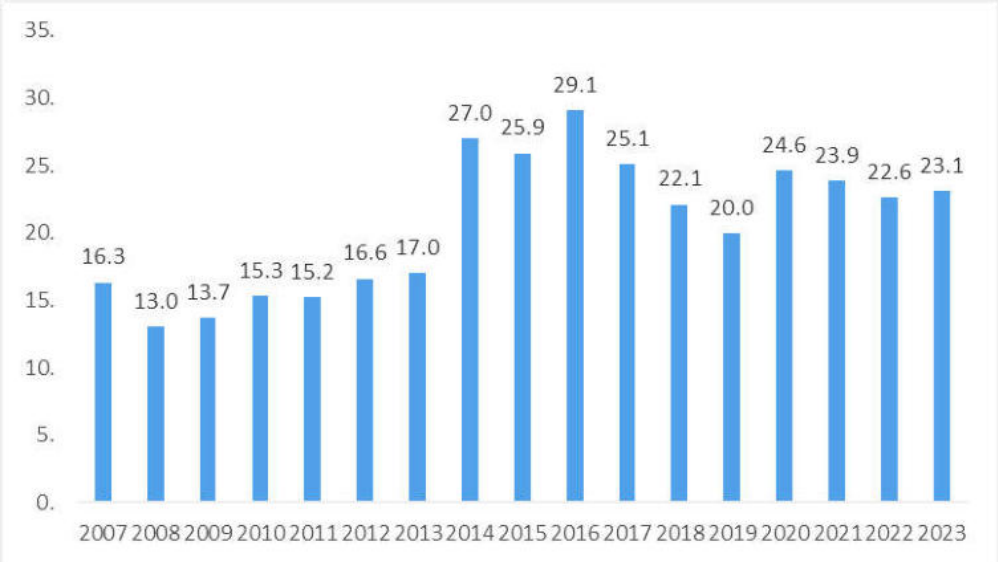
to structurally reduce gas demand.[4]

The public deficit was 2.8% of GDP in 2022, a decrease of more than 1 percentage point compared to the previous year. Revenue growth more than offset spending growth in part due to higher prices for some products subject to indirect taxes, such as food and energy. Continued wage increases also contributed positively to revenues through higher labor taxes. Measures to minimize the impact of high energy prices had a net budgetary effect of around 1% of GDP in 2022, as they were partly financed by a tax imposed on the windfall profits of state-owned enterprises in the energy sector.

Bulgaria has reduced considerably the Government deficit in 2022-2023 and being below the EMU threshold is among the countries with moderate fiscal risks. The primary budget deficit on a cash basis for 2023 is 1.5% of GDP. The low level of interest costs of Govennment debt (0.4% of GDP for 2023) explains the still weak pressure of servicing the government debt. This helps better maintainance of fiscal capacity. According to the European Commission Spring Forecast for 2024 the budget deficit is projected to reach 2.8% and 2.9% in 2024 and 2025, driven mainly by increased public expenditures on pensions and wages. General government debt is set to increase to 24.6% of GDP by 2025. (EC, 2024)

As regards the *EMU criterion for an average annual rate of growth of the public debt-to-GDP* Bulgaria has had consistently consolidated its fiscal policy throughout the period (2011-2023) and fiscal discipline has been much strict to keep much lower level of Government debt than the EMU treshold of 60 percent of GDP. (See Fig.2)

Figure 1. Bulgaria: Government debt as % of GDP, annual)



Source: Eurostat (2024).

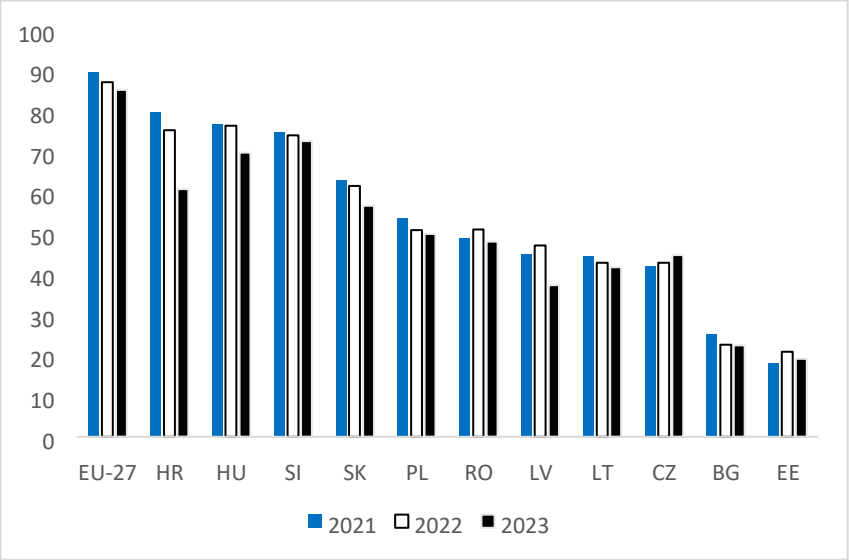
The need to provide state aid to cover the deposit guarantees repayments after the closure of Corporate commercial bank and to apply the liquidity support for other 2 domestic banks in crisis had caused rapid increase of the Government debt-to-GDP ratio in 2014 to 26 %. The steep rise of this ratio caused the assessment of Bulgaria as a country with imbalances by the

[4] COMMISSION STAFF WORKING DOCUMENT, 2023 Country Report – Bulgaria,{COM(2023) 602 final}

European Commission's Alert mechanism for greater macroeconomic imbalances for 2014. In 2016 the Government debt raised up to 29.1 % of the GDP which is the highest level reached since Bulgaria's accession to th EU.

In the period (2027-2020) Bulgaria followed medium-term path of maintaining the fiscal stability by the implementation of the Convergence Programmes of the Ministry of Finance until 2022. As seen on Graph 5 the ratio of Government debt to GDP of Bulgaria is lower compared to this indicator for EU member states from Central and Eastern Europe. According to the 2023 Convergence programme, the general government debt-to-GDP ratio is expected to increase from 30.7% at the end of 2024 to 37.1% by the end of 2026.The forecast set in 2024 by the Convergence programme previews the level of Government debt of Bulgaria to increase in the next three years (2025-2027) both in nominal level and as a ratio of GDP under the assumption to secure the fiscal capacity by larger volumes of new debt financing. (Ministry of Finance,2024)

Figure 2. Bulgaria: Government Debt in comparison with EU27, Euroarea and EU Member States in Central Europe, 2021-2023 (% of GDP)



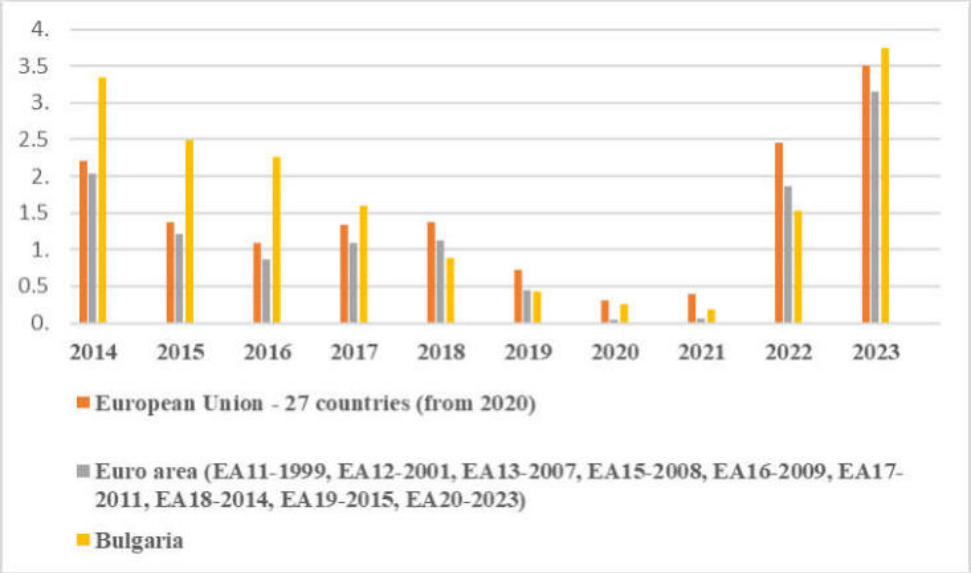
Source: Eurostat, 2024.

According to the EU spring forecast in 2024 projections an increase of the General Government debt-to-GDP ratio is expected to reach 27.3% in 2025, 30.0% in 2026 and 30.7% in 2027, with an average annual growth rate for the period 2025–2027 of 1.9 p (EC,2024).

Long term interest rates

The Maastricht EMU convergence criterion series relates to interest rates for long-term government bonds denominated in national currencies. Based on Bulgaria's government bond yields on the secondary market, gross of tax, with a residual maturity of around 10 years.4

Figure 3. Interest rate: EMU convergence criterion bond yields of Bulgaria compared to EU and Euro area (2014-2023)



Source:Eurostat, 2024

Bulgaria has performed progress of convergence of the long term interest rates on the Bulgarian Government debt. Bulgaria has had average long-term interest rates that were – to different degrees in separate years – much below the reference value for the interest rate convergence criterion.

As seen on Fig.6, since 2015 up to 2022 the long term interest rates on the Bulgarian Government securities have fallen considerably which had also been a factor to lessen the pro-inflationary impact of both servicing the debt as well as resorting to issuance of new debt. The higher level of the values of the long term interest rates on the 10-th year Government securities of Bulgaria since 2022 reflects the overall change of the inflation trends in the EU but may be regarder as a consequence of the specifics of Bulgaria's worsened economic situation and political uncertainty in this period.

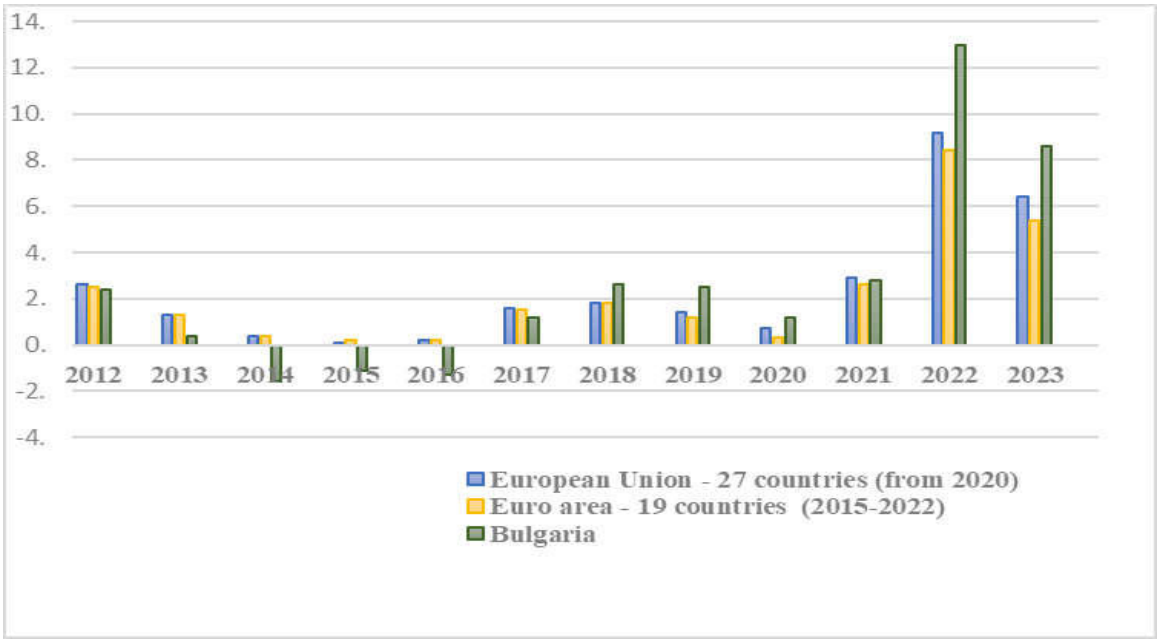
The price stability and price convergence have been a target of the Bulgarian Government and Bulgarian central bank's policies since the pre-accession period to present times. For assessment of the level of inflation as EMU criterion of nominal convergence are used the Harmonised Indices of Consumer Prices (HICPs) as required under Article 121 of the Treaty of Amsterdam. Bulgaria has complied with the requirements of the Eurostat methodology of measuring the HICP. The comparison of Bulgaria's HICP trends with the Euro area and EU27 show the differences and similarities in price adjustment as a result of the integration process.

For the period (2004-2008) Bulgaria has not accomplished the price criterion as the inflation was higher than the referent valueof EMU threshold. The structural readjustment and credit expansion related to the higher rates of Bulgaria's growth caused higher rates of inflation in the period (2004-08). The economic decline had caused a reversal of this trend since 2009 onwards by the recorded relatively stable process of deflation.

The fall of the Bulgaria's HICP index since 2014 was partly a result of lower commodity prices and the overall deflation trend due to the slow recovery after the Global and European sovereign

debt crisis,. Since 2014 the external factors have played a bigger role in the domestic price formation of Bulgaria due to the high openness of the Bulgarian economy and the high degree of import dependencies that influence the import prices. Energy and food prices have been a major component of imported inflation especially if it is taken in consideration that these commodities have large share of the Bulgarian basket of the Harmonised index of Consumer Prices (HICP). Their influence on the price level in Bulgaria is big and due to this, after the Global crisis the observed decline of international prices of oil, energy resources and foods has been reflected in the prolonged deflationary trends in
Bulgaria in 2014-2016.

Figure 4. Bulgaria compared to EU27 and Euro area: HICP- Inflation in 2012-2023 (as rate of change, annual)

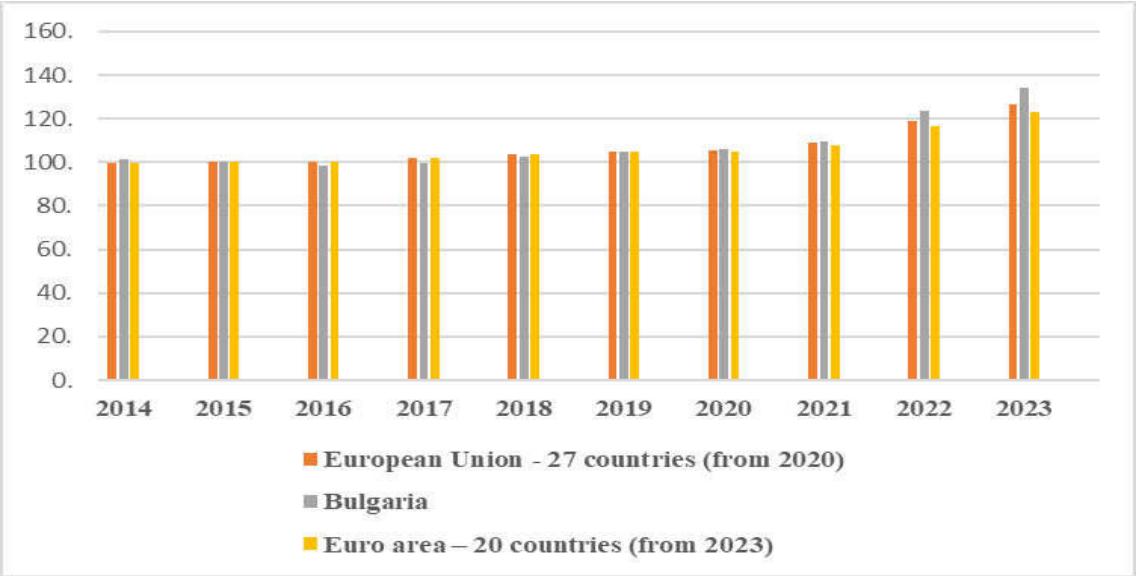


Source: Eurostat,2024.

In 2021 -2023 the inflation gradually picked up again, largely reflecting an increases of the commodity prices,wage growth and sharp increases of energy prices, etc. Domesstic factors (especially including labour shortages and tight labour market) brought to sharply rising nominal unit labour costs. After several years of some increases, the wage growth has been the highest in the EU in recent times. The level of domestic inflation has become important for the nominal convergence as it has two-sided risks. On one side, the higher rate of inflation worsens the cost competitiveness as compared with the euro area trading partners and the rest of the EU. On the other side, the wage growth is indispensable for diminishing the deepness of differences of the level of incomes in Bulgaria with the EU. The HICP and core inflation-based real effective exchange rates have followed trend of appreciation, with nominal appreciation playing only a small role under the Currency board arrangement and the large share of trade with the euro area.
In 2020-2023 the increased values of HICP of Bulgaria reflect higher rate of inflation as a result of the economic slowdown due to the COVID-19 and the war in Ukraine. Domestic factors of inflation include labour shortages, lack of adequate market competition and incomplete regulation of consumer protection. Following certain moderation, the inflation has followed a declining trend in 2024 but the risks of uncertainty of the international and

domestic environment remain. There is still a risk of core inflation being persistent. The convergence adjustments could take the form of further increases of energy and services'prices as well as a rise of nominal wages.

Figure 5: Harmonised index of consumer prices (HICP): Bulgaria compared to EU and the Euro area (2014-2023) , average index and rate of change annually

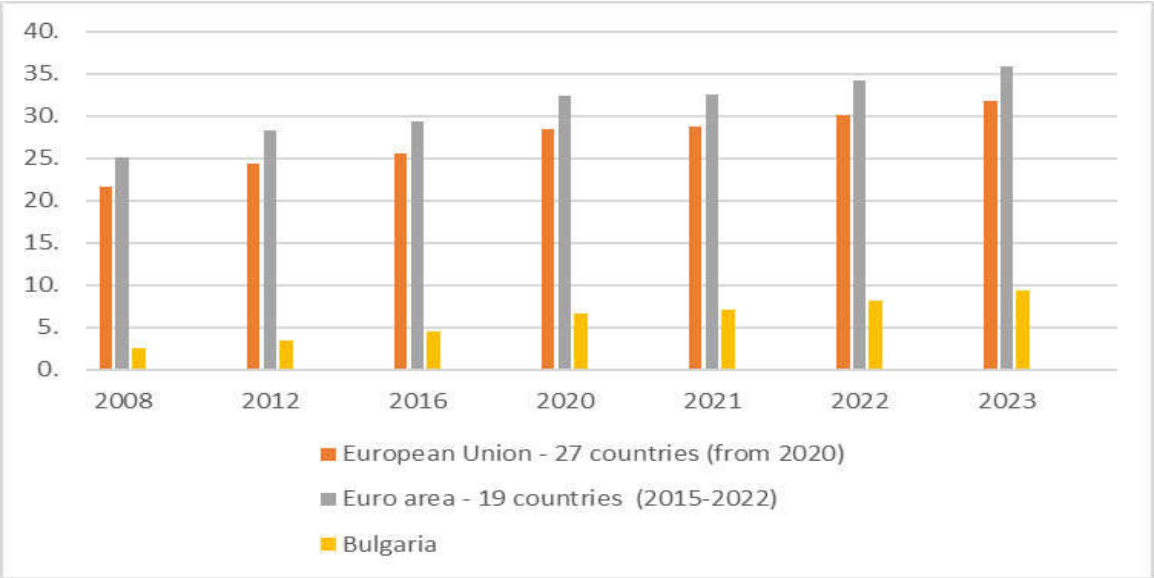


Sourece of data: Eurostat, 2024.

Source: Eurostat, 2015 (Bulgaria – HICP – Overall index, Annual rate of change, Eurostat, Neither seasonally nor working day adjusted, Unit Percentage).

The overall trend of price convergence of Bulgaria is indicative of the raised degree of interdependences with the Euro-area which inevitably have led to adjustments of prices and incomes at a higher degree in crisis times.(Fig. 6).
But as regards the adoption of the euro the problem of the pro-inflationary factors and their evaluation is an important issue of the forecast of medium and long term inflation trends and the ongoing readjustment of the Bulgarian economy to the global trends. Many new EMU countries have experienced a rise of inflation after joining the EMU. In a monetary union, there are a number of factors that exercise upward pressures on inflation and due to this inflation may become self-sustained and give rise to an abrupt adjustment. Since the nominal interest rate is fixed at the union level, any shock bringing inflation above the union average will reduce the real interest rate and fuel further inflationary pressures, in a self-reinforcing mechanism for instance by stimulating credit expansion.
However, also being out of the EMU has its risk of adverse impact of the pro-inflationary trends through the channels of imported inflation. These risks may be even higher for a country that is out of the EMU if one takes into consideration the exchange rate risks related to impact of the import prices in euros and import prices in US dollars.

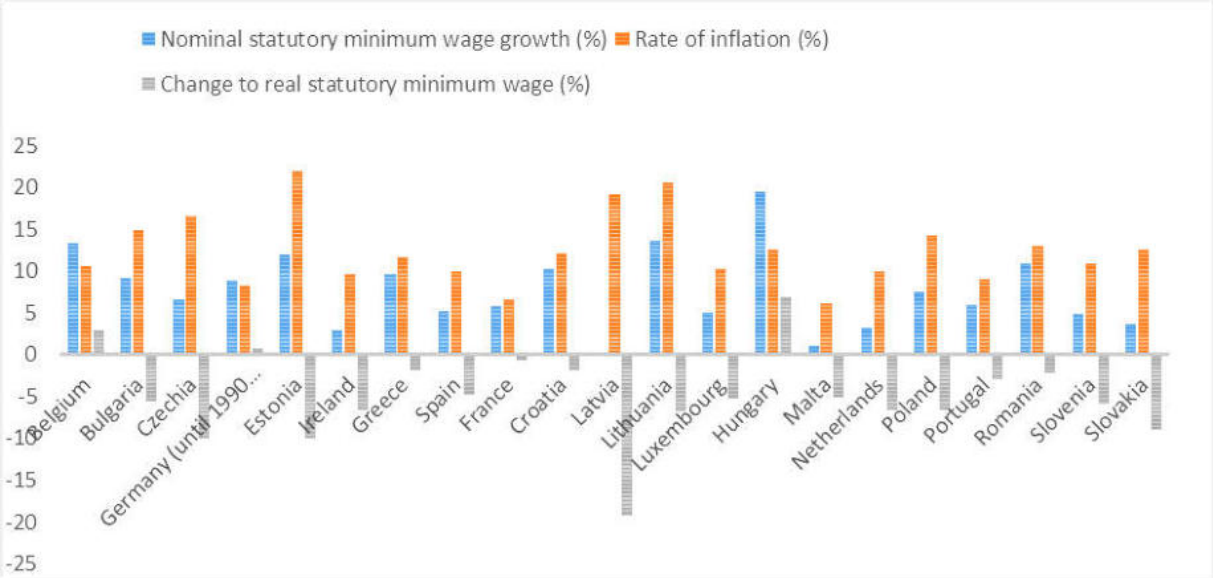
Figure 6. Bulgaria compared to EU27 and Euro area: Labour costs in the period (2008 – 2023), **(annual data - NACE Rev. 2)**



Source: Eurostat,2024. Last data update 11/04/2024.
Labour Costs (D) cover Wages and Salaries (D11) and non-wage costs (Employers' social contributions plus taxes less subsidies: D12+D4-D5)

The data shown in Fig, 7 confirm the great differences of labour costs per hour in Bulgaria compared with the average values of this indicator for the EU27 and the Euro-area.This indicator shows the low level of labour costs in the country during the last decade as a factor of stagnation of wages and incomes and inadequate labour policies.The resulting differences have caused higher labour migration out of the country as well as labour shortages that exert pressures for wage growth and are pro-inflationary because of need to raise the wages.
In Bulgaria, the situation is indicative of the negative impact of the inflation since 2021, not only because of the lowest amount of the statutory nominal minimum wage compared to EU member states, but also because of insufficient increase of the nominal minimum wage by 9.2% from April 1,2022 as it was already "consumed" by the rising inflation. As of June, 2023 the purchasing power of the statutory nominal minimum wage actually decreased by 6.6% compared to the same period in 2022. Almost 1/5 of the persons employed under the labour and public service legal contracts earn wages anchored to the nominal statutory minimum wage. Thus the workers and employees assigned to the statutory minimum wage have encountered serious difficulties to adjust to the rising cost of living, as the inflation has increased at higher rate due to the rising prices of energy and essential goods and services, which have a high share of expenses in the households'budgets.
As the Fig.8. shows that in Bulgaria the statutory minimum wage is set so low that it left workers living at risk of poverty even before the cost-of-living crisis began. Since 2021 the inflation, also driven by huge increases in profit margins, in addition to supply-side issues, has pushed the value of minimum wages down to a record low.

Figure 7. Rate of Inflation and its Impact on the Nominal Statutory Minimum Wage growth and on the Statutory Minimum Wage in EU Member states in 2022



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Source:Eurostat, 2024

The lowering of inflation rate in Bulgaria will be challenging in the medium term, given the limited scope for any active monetary policy under the existing currency board arrangement. Active labour policies are on the agenda of improving the flexicurity of the labour market in line with the policies of the European Pillar of social rights.

Due to the fact that the GDP per capita in Bulgaria is significantly lower than in the euro area, it is difficult to foresee the exact size of the inflation effect resulting from the structural adjustment of incomes and wages that is underway. On the Government agenda is to introduce an increase of the minimal wage from 2025 onwards as well as to proceed further with the liberalisation of the market for energy supplies which may cause higher inflation. In medium term the economy is expected to grow at a higher rate and as the income convergence proceeds, price level convergence is to continue. The outcome will depend also on the choice of the model of growth of the Bulgarian economy.

The EMU has undergone important institutional and functional changes while the euro area tackles the crisis and reforms its policies and institution. It is acknowledged that the "in-or-out" of the EMU is a question that has become more complex (Rehn, 2013). The design of the EMU reforms is still shaping due to the different approaches of the member states to the issues and the political process (Ville et al., 2015). Surely the present state of the EMU (as considered to be "EMU 2.0.") raises the requirements and the mechanisms and instruments for a higher degree of common system of sharing the burden of making the EMU a more effective and robust functioning Union.

The costs of entering the EMU have grown as a result of the post crisis reforms in the financial integration not only due to enhanced needs of compliance with new legal provisions. The differentiated integration within the EMU gives solid grounds for better access of the EMU member states to the new institutions for sharing the risks and costs of financial integration and its new modalities. The challenge is that the EMU is at a stage to be completed by common policies to ensure a well-functioning monetary union. The problem is to access the implications

of the "shift from rules to institutions" in the EMU in order to accomplish completely the Monetary Union. For the future enlargement of the EMU the differentiated integration will play a very important role. Bulgaria's preparation for the EMU has to take into consideration the fiscal capacity's needs to join the EMU in its present state of EMU 0.2.

Conclusion

The main macroeconomic challenges to Bulgaria are: (i) how to sustain high GDP growth, and (ii) how to ensure that this growth translates into new employment opportunities. Success in both dimensions will depend on the country's ability to implement the necessary structural reforms. The implementation of the requirements for the EMU entry at the present stage of its new design as EMU 2.0 may be demanding higher costs before being admitted to the full membership. But it is much more rational to get on track of preparation for the EMU entry at a time when the reforms in the EMU are to be introduced

The accession to the euro area has been a strategic goal for Bulgaria for more than a decade but since mid2015 it has entered the stage of undertaking operationally planned activities to make the right choice and engage resourceful means to achieve full integration to the European supervisory and financial architecture. Bulgaria has become involved in the institutional reform process in favour of further deepening the integration in the EU but the reforms tend to raise the transitional costs of joining the new instititutional architecture of the EU integration.

The EMU has gone through a difficult but useful period of analysing the flaws in its original design, and has taken major steps to repair them. The new regulation contains tougher rules for fiscal policies, stronger oversight of macroeconomic imbalances, and a lender of last resort for sovereigns in the form of the European Stability Mechanism.The crisis has pushed the changes for the better to design prospective reforms by focusing on ensuring financial stability and in pursuing financial integration. The newly designed institutions and rules raise higher the requirements to comply with the EMU governance principles and institutions. The Single Market of the EU will be changing as the differentiated integration within the EU proceeds further. Beyond this, it is equally crucial that the reforms will contribute to a more effective and robust functioning of EMU as the core of the European integration.

In summarizing the main trends influencing Bulgaria's integration to the EMU, one may underline the concerns that the EU integration process could not generate higher centripetal force for improving the rates of growth. Thus there is a need to foster new model of growth in the transformation to climate neutrality. The enlargement of the EMU may proceed further driven by shared policies for convergence support to the "catching-up" development of the new member states from Central and Eastern Europe.

At the present stage the EU faces challenges to implement a comprehensive programme to consolidate the Single market and the Economic and Monetary Union. By choosing priorities for further deepening of integration in the EMU through completion of the Banking and Capital Union and completing the further development of the Single Internal Market European Union's leadership has laid the focus on policies to boost growth and the competitiveness of the Union. In the context of the ongoing difficulties in the Eurozone and the EU as a whole out of the economic depression and overcoming the crisis, the medium-term prospects for restoring economic growth are important. Delayed recovery of economic growth in the EU inevitably has an adverse effect on the Bulgarian economy for which the external environment and European integration dependencies do not provide positive incentives for post-crisis development, but much rather determine the necessity of rethinking the alternatives to stimulate the national economy by domestic demand and economic co-operation and trade with all EU partner countries.

As major problems facing the prospects for economic growth in the EU and implications for Bulgaria can be viewed the following structural aspects:

- the challenges facing Bulgaria in relation to structural reforms in the EU post-crisis are determined by the development of the integration concept for Europe of "two speeds". Economic growth in the EU has sustained lower rates. Unemployment reached high levels that determine profound changes in social policy of nation states towards the implementation of the European Pillar of social rights introduced since 2017.. Economic convergence in Bulgaria has to proceed with taking consideration of social cohesion and active labour policies.
- the transition to long-term investment and growth as a priority for economic governance in the EU is crucial for Bulgaria. The question remains topical how to foster growth and raise competitiveness in order to avoid the risk to enter the second “lost "decade due to low rates of economic growth.

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THE BULGARIAN ECONOMISTS ON THE COLLECTIVIZATION AND THE PLANNING IN THE AGRICULTURE DURING SOCIALISM (1945-1960)

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Abstract: *This paper aims to present the leading ideas and debates among the renown Bulgarian economists on the collectivization of land and planning in agriculture after the WWII and during socialism (1945-1960). This process was in relation to the development of the socialist integration and the great transformation of the Central and Eastern European economies following the USSR experience, but having national specifics.*

Keywords: *socialism, Comecon, Second World War, collectivization, planning, history of economic thought.*

JEL: B24, F12, F15, P21, P30

Introduction

Eighty years after the Bretton Woods Conference (1944) and the establishment of the post-war international monetary system, the fragmentation of the global economy and finance are relevant and topical. After the WWII the division of the world into two major and competing political, economic and ideological blocs (the socialist and the capitalist) had enormous impact and consequences for the international relations. The Central and Eastern European countries (CEE) became part of the Soviet bloc, where the socialist model of a centralized and planned economy was implemented.

This paper aims to present the leading ideas and debates among the renown Bulgarian economists on the collectivization of land and planning in agriculture during socialism (1945-1960). This process was related to the development of the socialist integration and

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the great transformation of the Central and Eastern European economies following the USSR experience, but also habing national specifics.

The first part of the paper is focused on the development of the Bulgarian agriculture after the Liberation from the Ottoman rule and during the capitalist period (1878-1944). The second part discusses the agrarian (land) reform after the WWII. The third part presents the debates on the collectivization of land and planning among the Bulgarian economists during the period 1945-1960.

1. Bulgarian agriculture during the capitalist period (1878-1944): extensive and underdeveloped

Within the Ottoman Empire (XIV-XIX centuries) 80% of the Bulgarian population was employed in agriculture. The development of commodity-monetary relations, the increase of the tax burden and of the pressure of the Ottoman authorities to collect more money brought the peasants to extreme poverty and hardship. In the accelerated decay of Turkish feudalism during XVIII – XIX centuries. various forms of cooperative work appeared, like zadruga, through which the Bulgarians ensured their reproduction and sustenance and existence within a closed natural economy[2].

After the Liberation from the Ottoman rule in 1878, Bulgaria continued to develop as an agrarian state with a small-scale agricultural tenure and production based on personal labour and a limited size of land. The major problem was the growing indebtedness and tax burden as well as the impoverishment among peasants which hindered the overall development of the sector and the country till the WWI.

During the Great Depression the agricultural prices fell on average by 2.2 times, while industrial prices fell by 1.3 times. There was a strong reduction in the purchasing power of the peasantry and higher poverty rates among the farmers. The high indebtedness and poverty persisted till the WWII[3].

During the Interwar period there was a rapid and massive development of the agricultural (multiservice) cooperatives that spread all over the country. Those organisations functioned on voluntary participation, mutual help, solidarity and democratic governance. Those coopeartives played an important role in financing and modernising the agricultural farms and in increasing

[2] See Todorova (2010), Nenovsky, Marinova (2017)
[3] See Nenovsky, Marinova (2022)

peasants' wellbeing. Nonetheless, the agriculture remained extensive and lagging behind the other European countries.

The WWII strongly influenced the development of the agriculture. The farmers' incomes decreased by 79% and the agrarian sector fell into a deep crisis. In 1946 small farms up to 50 decares represented over 67% of all 1,094,904 agricultural farms, and medium-sized holdings with land from 51 to 100 decares accounted for over 25% of the total number of farms.

One of the major characteristics of the agrarian sector in the CEE was the land fragmentation. After the WWII the share of small land ownership was the biggest in Bulgaria (67%), and the smallest in Germany (19.6%), followed by Poland (32%) and Czechoslovakia (29%). In Bulgaria the technical armament of labour was extremely bad and the agriculture was extensive and primitive regarding tools and equipment[4].

2. The agrarian reform in Bulgaria and in the other socialist countries in the CEE after the WWII

In 1949 Bulgaria became a founding member of the Council for Mutual Economic Assistance (CMEA or Comecon). Comecon was established as the Soviet response to the US economic recovery plan (Marshal plan) for Eastern European countries. The main principles and institutions of the socialist bloc were:

- Full nationalization of the means of production, state monopoly of foreign trade, foreign exchange monopoly, collectivization of land, national planning, autarchy;
- International socialist development of labour, specialization and cooperation
- Industrialization and building harmonious industrial national structures;
- Prevalence of bilateral trade and clearing despite attempts for multilateralism, Comprehensive programme (1971);
- Creation of the International Bank for Economic Cooperation (IBEC) and the transferable ruble in 1964 as well as the establishment of the International Investment Bank (IIB) in 1971.

[4] See Popov, Miloshevsky, Kostov (eds) (1972)

The Comecon membership brought to the front the problem of the non-equivalent exchange between the countries related to the transfer of surplus value from the agrarian countries to the industrial countries as well as the problem of pricing in the bloc[5].

In Bulgaria, one of the major political discussions immidiately after the WWII was about the amount of land owned, the remuneration for the expropriated land as well as the payment for the acquired land. The Bulgarian Communist Party considered it as a means to improve the lives of the majority of the rural population and to increase their economic interest and diligence in land cultivation. The Democratic Party spoke out most strongly against the reform as the peasants were attaching themselves to cooperative farms and compared them to the collective farms in the USSR. In 1946 the Labour Land Tenure Act was adopted which fixed a maximum amount of land owned by different categories of landowners – from 200 decares (20 hectares) to 300 decares (30 hectares).

According to the law, State Land Fund was created in order to provide land to low-income peasants by building viable working farms on the principle that "the land belongs to the person who cultivate it". In the beginning, the State Land Fund paid for the expropriated land but after 1949 the payments were discontinued.

In 1947 the land reform was accelerated and State Agricultural Farms were set up under the Ministry of Agriculture. Nevertheless, the Bulgarian agriculture remained a small-scale, fragmented and low-productive. The reform had a limited effect due to the shortage of arable land, and did not cover all regions and settlements. There was a reduction in the size of the public farms and an almost entire abolition of large-scale private farms in the country[6].

Table 1. Agrarian reforms in the socialist countries after WWII

Countries	Year	mit of land ownership, decares	urch property excluded from expropriation	ompensation of the old owners	ayment by the new owners	Term of payment	owers and maximum amount of land they can use
Albania	1945	400	Yes	No	-	-	

[5] See Faudot, Nenovsky, Marinova (2022), Nenovsky, Marinova (2024)
[6] See Zlatev (1993)

Bulgaria	1946	200-300	No	Yes	1935 land tax assessment X 5 times	20 years	ndless and small farmers up to 50 acres and up to 80 decare in Southern Dobrudja
GDR	1945	1000	Yes	No	0-150 kg rye per 1 decare	10-20 years	
Poland	944/1945	500-1000	Yes	no	One year income from land	10-20 years	
Romania	945, 1949	500	Yes	No	00 kg wheat per 1 decare or 120 kg maize	10-20 years	
Hungary	1945	185-570 140-1710	Yes	Yes	nnual harvest 600-700 kg per 5-7 decares	10-20 years	
zechoslovakia	45, 1947, 1948	2500-500	No	No	t prices set by the State	-	
Yugoslavia	945, 1953	300-450 100-150	no	no	nnual income per 1 decare	-	

Source: Popov, 1990

3. The debate on the collective farming in Bulgaria

3.1 Before the WWII

After the WWI the first collective farms were established based on the experience of the kolkhoz in the USSR. In the beginnig they functioned as part of the exisitng agricultural cooperatives and later on several independent collective farms were created. Nevertheless, there was a big opposition to their establishment by some of the leading economists such as Yanaki Mollov and Naum Dolinsky who considered that they undermined the principle of private ownership of the means of production. In 1938 Stoyan Nikiforov, Minister of Trade, Industry and Labour

wrote: *"in these kolkhozes the land becomes alien in the subconscious of the land owner. He no longer has the sense of lord, of master of the land, which makes him proud".*

The first cooperative farms were etsablished by communists or by adherents to the Communist party. These organisations were praised by Stoyan Syulemezov[7]:

"The establishment of cooperative farms as independent organizations or as departments of multi service cooperatives was the peak in the development of the Bulgarian cooperative movement before the socialist revolution. The highest type of a cooperative was achieved, through which the working peasantry recognized the power of common cooperative work, of organized joint labour in the struggle to improve their economic situation.

So far as we know, there has been no successful attempt elsewhere in the world to organize cooperative farms under private land ownership on the scale and with the results that have been achieved in this country" (Syulemezov, 1975, p. 29-30).

In 1939, a special delegation of Bulgarian agronomists visited the USSR to study the organisation and functioning of the Soviet kolkhozs in order to transfer and adopt their experience and practices.

3.2 Stages of the collectivization

The collectivization of land and the great transformation of the agriculture were among the first political priorities of the Bulgarian Communist Party which came to power after the WWII. The first stage of the collectivization started on 9th September 1944 and lasted till the end of 1947. It was characterized by the emergence and establishment of the Labour cooperative agricultural farms (LCAFs) as the leading form of production cooperative of farmers.

The major principles of the LCAFs were:

- Bringing into the farm all means of production owned by the cooperator and its family members;
- Bringing in all the land owned by the cooperator for collective use;
- Participation of all cooperators in the costs of furnishing the LCAF with means of production, initial and mandatory inventory contribution and the implementation of a differentiated approach in its determination;

[7] Stoyan Syulemezov (1910-1980) founded the first collective farm in Vesselinovo, Yambol, Bulgaria. Later, he was Deputy Minister of Agriculture in the period 1949-1951 as well as Deputy Chairman of the State Planning Committee from 1956 to 1967. As deputy minister he played a key role in the collectivization of land.

- Leaving part of the land, inventory and livestock to farmers' personal subsidiary farm.

The second stage started in the end of 1947 and lasted till the end of 1949. In 1947 the Communist Party executed the nationalization of industry, banks and agricultural equipment. The first Biennial State Economic Plan was adopted by the Party which stipulated the transition to and accelerated and massive collectivization. The main share of the working farmers became members of the collective farms.

The third stage took part in the period 1950-1956 when the organizational, economic and political strengthening of the LCAFs was completed. The communist party prepared the country for full collectivization.

During the fourth stage which covered the period 1956 - 1958 the collectivization of land was fully completed. The tables below show the collectivization process in Bulgaria and in the other socialist countries from CEE. By 1959 98% of the land was collectivized making Bulgaria the second (after the USSR) country in the socialist bloc with the biggest state sector in the agriculture[8].

Table 2. Collectivization in Bulgaria

Years	Number of Labour cooperative agricultural farms	Collectivized farms	Thousand decares	ercentage of land to be collectivized
1944	110	7	265	0,6
1945	382	34	1466	3,1
1946	480	41	1726	3,7
1947	579	46	1902	3,8
1948	1100	124	2924	7,2
1949	1501	156	5543	13,6
1950	2501	502	21 563	51,1
1951	2739	582	25 704	56,4
1952	2747	553	25 125	60,5

[8] See Popov, Miloshevsky, Kostov (eds) (1972), Kunin (1977)

1953	2744	569	25 562	61,1
1954	2723	569	25 472	61,3
1955	2735	591	25 622	62,5
1956	3100	911	34 614	77,4
1957	3202	1017	36 765	86,5
1958	3290	1244	41 576	93,2
1959	972	1290	44 894	98,0

Source: Popov, Miloshevsky, Kostov (eds),1972

Table 3. Collectivization in the socialist countries

countries	Year of the establishment of socialism	Beginning of collectivization	hare of the socialist sector in 1950		Share of the socialist sector in 1960		Share of the socialist sector in 1970		Share of the socialist sector in 1980	
			Total	ncluding cooperative	ota l	ncluding cooperative	ota l	ncluding cooperative	ota l	ncluding cooperative
USSR	1917	1917	99,9	-	,6	56,4	,5	37,5	,2	30,9
Bulgaria	1944	1944	12,0	10,2	,5	79,9	,3	68,0	,3	-
zechoslovakia	1945	1948	22,1	-	,4	62,1	,1	55,7	,0	62,5
GDR	1945	1946	5,7	3,0	,0	72,8	,3	78,2	,3	82,5
Poland	1945	-	10,4	-	,7	1,1	,2	1,2	,1	3,6
Hungary	1945	1949	11,0	2,9	,0	48,6	,2	9,5	,7	71,8

Romania	1944	1949	23,6	-	,6	50,2	,2	54,1	,4	54,7
Albania	1945	1946	5,6	-	,0	-		-	,6	-
ugoslavia	1944	1945	-	-	,1	-	,1	-	,0	15,3

Source: Popov, 1990

3.3 Planning in agriculture

The state planning in the agriculture started by the elaboration and launch of the most important legal documents. The Communist Party adopted a new Constitution in 1947 which stated that: *"Labour-cooperative agricultural farms are encouraged and supported by the state and enjoy its special protection".*

The development and expansion of the state sector and the production cooperatives were included in the First Biennial State Economic Plan in the period 1947-1948. The material and technical base of the national economy was supposed to be developed as well as the mechanisation of the most labour-intensive production industrial processes.

In 1948 the Prime Minister of Bulgaria Georgi Dimitrov[9] said: *"The growing needs of the industry, the urban population and the army cannot be successfully met by individual, small-stock and low-productivity agriculture. This raises the issue of the socialist reconstruction of agriculture at the same time as the socialist reconstruction and development of the industry"* (Dimitrov, 1948). The Communist Party decided that the reconstruction of agriculture went together with the industrialization[10].

Unlike to USSR and other CEE countries, the reconstruction of the Bulgarian agriculture was executed without nationalisation. At the Fifth Congress of the Communist Party Georgi Dimitrov explained the approach that was implemented:

> *"By the gradual incorporation of the peasants and middle farmers into the labour-producing farms, by the development of the machine-tractor stations, and by the prohibition of the lease of the land, the restriction and eventually the prohibition of the purchase and sale of the land, the reduction and eventually the abolition of the*

[9] Georgi Dimitrov (1882-1949) was the Prime Minister of Bulgaria in the period 1946-1949. He became also the first general secretary of the Central Committee of the Bulgarian Communist Party during 1948-1949. Dimitrov was General Secretary of the Comintern in the period 1935-1943.
[10] See Marcheva (2016)

rent by the decision of the co-operating peasants themselves, when conditions allow it, the question of the nationalisation of the land will be practically settled by leaving all the land in perpetual use by the farmers" (Dimitrov, 1948, cited by Popov, Miloshevsky, Kostov (eds.), 1972)

Furthermore, in 1949, at the Fifth Congress of the Communist Party, the Five-year state economic plan was adopted with the following goal: *"The main economic task of the five-year plan is to lay the foundations of socialism along the path of industrialization and electrification of the country, cooperation and mechanization of agriculture".*

The reconstruction of the agriculture was very topical among the leading economists such as Nikola Popov, Angel Miloshevsky and Ivan Kostov. A number of important value categories, such as cost, profit, price, differential rent were underestimated. The cost of production was not calculated, which gave the opportunity for wide arbitrariness and subjectivity in determining the prices of agricultural products in the national economy.

The final stage of the reconstruction started after the April Plenum of 1956. It took important decisions on the role and place of commodity-money relations, prices, differential rent, material interest, cost of agricultural products, basic funds and depreciation, net income and profitability. After that the Bulgarian economists and policymakers began to calculate and use the cost of production as an indicator to determine the level of profitability and the economic profit in the agriculture. By 1958 the task of completing the socialist restructuring of agriculture had been successfully accomplished.

According to Petko Kunin[11], one of the leading agrarian economists and party member, under socialism the planning in agriculture should be combined with a certain degree of initiative of the LCAFs to adopt decisions:

"What economic profit of a socialist type can exist in the LCAFs, when they themselves cannot decide, in their own opinion and in their own interest, the ways and forms of using their objective factors of production: land, machines, animals, permanent crops, water, their supply and placement of their production….

[11] Petko Kunin (1900-1978) was a propagated the Soviet collective farm system and collectivization. In the period 1944 - 1946, he headed the newly created "Economic" ("Stopanski") department at the Central Committee of the Bulgarian Communist Party as well as he was appointed secretary of the Central Committee of the Party (1946 – 1947). Kunin was Minister of Industry and Crafts (1947 – 1949) and Minister of Finance (1949).

The conditions of the socialist system and the objective economic laws of socialism require a combination of planned development with the planning and initiative of individual enterprises" (Kunin, 1967)

Kunin criticised the planning:

"The administrative methods and ways of imposing, the effect of the centralized norms of the state sector in the economic life of the LCAFs remove the economic conditions for the operation of the socialist principle of economic profit and self-support as a form of development of the productive forces and are a way to overcome the contradiction between personal and collective interest" (Kunin, 1967)

The nature and the use of the rent were among the major issues discussed by the economists as well as in the major documents adopted by Communist Party:

"The main feature and the main difference of our LCAFs from the kolkhozs is that in our country the land is not nationalized, that private ownership of the land is preserved, which is expressed in the rent received" (BCP, Report VII Congress)

The LCAFs mostly paid the rent in the form of a percentage of the distributed income among the members of the collective farm. One of the major opponents to that rule was Titko Chernokolev[12] who was the Minister of Agriculture during 1949-1951. According to him:

"It should be adopted that the payment of the rent should not be made as a percentage of the distributed income, but that the value of a certain number of working days should be given as a rent.

The attempts to destroy the rent, but also raising the question of its abolition, impose a barrier, an obstacle to the development of LCAFs. Those who raise this question are fantasists and they are causing a big harm to LCAFs and the socialist reconstruction of our countryside. They are leftists that we need to expose." (Chernokolev, 1949)

The Communist Party considered that the rent represented a labour income and its size and relative share gradually decreased until its complete abolition in 1958/1959.

[12] Titko Chernokolev (1910-1965) was a member of the Politburo of the Central Committee of the Bulgarian Communist Party (1949-1951) and played a leading role in the implementation of collectivization. He was Deputy Minister from 1948 to 1949. and Minister of Agriculture in the period 1949-1951. Chernokolev was directly responsible for the of collectivization - initially as the head of the Rural Department in the Central Committee of the Communist Party and from December 1947 also as the Deputy Minister of Agriculture, responsible for collectivization.

The other most debated issue became the state administered agricultural prices as well as pricing of agricultural products in the Comecon. The pricing problem was that there were volatile prices on international capitalist markets and stable prices under socialism. There were price scissors of agricultural goods, raw materials and manufactured goods. Moreover, the price ratios on the capitalist markets did not match socially necessary labour cost ratios of different production categories produced by the Comecon countries[13]. The socialist integration was based on non-equivalent exchange between countries, transfer of surplus value from agrarian countries to industrial countries. There were opposing views at the Comecon sessions (1949, 1957, 1966) between the more developed, industrialized countries and the less industrialized and agrarian countries. The Bulgarian state leaders like Vasil Kolarov[14], Todor Zhivkov were in favour of the establishment of a regional price system. In Comecon, pricing in the trade sector was based on the setting of contract prices fixed in trade agreements. Since1958 the Bucharest formula was applied – prices on the international capitalist markets averaged and smoothed on quinquennial basis. Since 1964 the prices were expressed in transferable ruble (TR). The debate on pricing intensified in the 1960s and continued in the 1970s by the famous economists like Evgeni Kamenov, Jacques Arroyo, Tsvetko Golubarev and others.

The reconstruction of the Bulgarian economy during the first two decades under socialism resulted in an accelerated industrialization of the state. The industry created 14.5% of the national income reaching 48.5% in 1965. Unlike the industry, the share of agriculture decreased two times from 71.6% in 1944 to 27.5% in 1965.

Table 4 Sectoral structure of the national income of the People's Republic of Bulgaria, %

Year	Industry	Construction	Agriculture	Forestry	Transport	Communications	Trade	Other
1939	15,0	3,0	65,0	0,0	2,0		12,0	3,0
1944	14,5		71,6		2,9		11,0	-
1948	23,3	4,1	57,8	0,5	1,8		8,0	4,5
1950	33,0	6,0	45,0	0,0	3,0		8,0	5,0

[13] See Faudot, Nenovsky, Marinova (2022)

[14] Vasil Kolarov (1877-1950) became provisional president of Bulgaria in 1946. He remained president until the formation of the government headed by Georgi Dimitrov in December 1947, which he entered as Deputy Prime Minister and Minister of Foreign Affairs. In July 1949 Kolarov became prime minister until his own death on 23rd January 1950.

1955	32,0	7,0	35,0	1,0	3,0	0,0	19,0	3,0
1960	47,4	7,4	26,6	0,7	4,1	0,1	11,4	2,3
1961	49,0	8,0	24,0	1,0	4,0	0,0	12,0	2,0
1962	48,9	7,6	23,5	0,6	4,4	0,2	12,5	2,3
1963	47,0	7,0	30,0	1,0	4,0	0,0	9,0	2,0
1964	47,0	8,0	30,0	1,0	4,0	0,0	8,0	2,0
1965	48,7	7,7	27,5	1,0	4,3	0,3	8,4	2,1

Source: Shapkarev, 1982

In 1971 the Communist Party acknowledged that:

> *"The most complex and difficult task of the transition period from capitalism to socialism was the reconstruction of agriculture. The task of reconstruction was difficult because, unlike in industry, in agriculture capitalism had failed to create the high material base necessary for the emergence and development of socialist forms of economy. Not only are the working peasants insufficiently organized, but their political consciousness, culture and revolutionary readiness are at a lower level.*
>
> *Private property traditions kept the peasants attached to the old forms of economy for a long time. Overcoming private-property traditions and involving the peasants in the path of collective socialist economy is obviously a process that requires more time and persistent struggle" (Communist Party Programme, 1971, cited by Popov, Miloshevsky, Kostov (eds.), 1972)*

Conclusion

The Socialist reconstruction of agriculture has been controversial from theoretical, political and economic view. During socialism, the leading agrarian economists debated on the collectivization process, economic profitability, the rent, the pricing, etc. taking into account the Soviet experience and guidance. Moreover, they tried to reflect the national peculiarities and to develop the sector in the context of the ultimate goal – full industrialization of the country.

After the collapse of the socialist regime there have been polar views and opposing arguments in interpreting the ideas, the processes and the results of that deep and entire transformation of the sector and the national economy as a whole. The collectivization of land, the abolishment of the private property and the establishment of the state sector in agriculture have become the major symbols of the communist regime that changed the life and affected the wellbeing of the whole population. In this regard the Socialist experience should be further studied in a transperant and impartial way in order to reconsider the past and to emerge new ideas and paths for economic development.

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NATURAL RESOURCES AS A KEY FACTOR IN FORECASTING GDP IN EUROPE

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Abstract: *A Mixed-Frequency Bayesian Vector Autoregressive (MF-BVAR) model is developed in this work to forecast GDP growth in Europe. To improve forecast accuracy, the model incorporates data on natural resources, macroeconomic variables, and monetary policy instruments. The dynamic interaction between these factors is captured by the model through the integration of mixed-frequency data and Bayesian inference. Furthermore, we employ a Bayesian framework to integrate prior distributions and revise them with observed data, ensuring our model remains robust and adaptable to new information. By including data on natural resources, forecasting errors as determined by metrics such as Theil inequality coefficient and Root Mean Standard Errors (RMSE) can be reduced. The findings show how well the model predicts GDP growth, giving economists and policymakers important information.*

Keywords*: mixed-frequency Bayesian VAR, GDP growth forecasting, performance, monetary policy tools, Brent and precious metals prices.*

JEL Classification*: E37, C11, C53, Q4, O13.*

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1. Introduction

In the field of economic forecasting, Mixed-Frequency Bayesian Vector Autoregression (MF-BVAR) models have gained importance, particularly for predicting GDP growth (Ghysels, 2016; Cordoni et al., 2024). Because these models are designed to handle data gathered at various intervals, including quarterly and monthly, it is possible to analyze economic aggregates in a more rapid and sophisticated manner.

The use of natural resources, such as oil and precious metals, could offer a pertinent contrast to conventional monetary policy measures, such as M1, interest rates, inflation, and unemployment, in the context of GDP growth forecasting. Because of their effects on trade balances, investment flows, and production costs, natural resources directly affect economic activity. As an example, changes in the price of oil can have a substantial impact on the building expenses across many industries, which in turn can affect the growth of the economy as a whole. Precious metals, such as gold, silver, and so forth, similarly frequently act as a hedge against inflation and economic unpredictability, influencing investment choices and market stability.

On the other hand, central banks employ traditional monetary instruments to control economic activity and uphold financial and price stability. We can include the money supply, interest rate, and inflation as examples of these tools. In order to improve the forecast quality as measured by various metrics commonly used in the related literature (i.e., root mean square error (RMSE) and Theil's inequality coefficient).

Our analysis has two objectives. First, it illustrates the benefit of employing mixed frequency models to evaluate GDP growth forecasting mistakes more precisely. Second, we investigate how natural resources might enhance forecasts by lowering errors through the use of several indicators.

The paper is organized as follows: Section 2 outlines and justifies our MF-BVAR specifications. In the following section, we present the datasets and discuss our findings. it concludes with a final section that summarizes the key points.

2. Selection of the model and the datasets

The specification used in this study belongs to the VAR family and this latter is often used by central banks to assess the impact of their policies on growth and previsions (Goldman and Zhelyazkova, 2024). Indeed, VAR method analyses the relationship between variables and the famous Granger causality test assesses the variables forecasts. Besides, the Impulse Response Function (IRF) studies the behaviour of one variable after a shock in another. Indeed, the monetary policy is not neutral and have significant impacts on growth and unemployment. One of the conventional prudential tools of the central banks is the interest rate. For instance, during financial crises and the COVID-19 crisis, the ECB did not hesitate to decrease the interest rate below zero to avoid a systemic crisis. This period is characterized by a rapid development of VAR specification literature (Guo, 2024). The variables introduced in several models are different and provide very interesting conclusions, namely mixed frequency are relevant to analyse forecasts and interlinkage of variables.

After having briefly justify our choice to use MF-VAR models, we focus on the famous model of Schorfheide and Song (2013). They develop a vector autoregression (VAR) model dedicated to time series, which are observed at mixed frequencies, namely, quarterly and monthly.

The MF-VAR model studies the joint dynamics of quarterly GDP, which is obtained from monthly indicators. The specification is described by the following paragraphs.

In a nutshell, the MF-VAR is represented as a state-space model where the state-transition equations are given by a VAR at months and the assessment equations describe the observed series to the underlying, potentially unobserved monthly time series that are stacked in the state vector. To deal with the high dimension of parameters, the MF- VAR approach utilizes Minnesota prior and estimated Bayesian methods (Schorfheide and Song, 2020).

Hence, a complex development in econometric modeling is the Mixed-Frequency Bayesian Vector Autoregressive (MF-BVAR) model. Without requiring the aggregation of high-frequency data to lower frequencies, it expands the conventional Bayesian VAR framework to handle data available at varied frequencies, such as monthly and quarterly. This capacity is

especially useful for financial and economic analysis, as variables of interest frequently appear at different temporal resolutions.

The MF-BVAR model functions based on the idea that weighted averages of unobserved lower-frequency observations (like quarterly data) can be used to represent higher-frequency variables (like monthly data). Such models are able to fully utilize the richness of the data that is accessible, capturing more complex economic dynamics. The robustness and adaptability of the MF-BVAR model to shifting economic conditions are improved by utilizing Bayesian inference to update these beliefs based on new data and include previous knowledge.

The MF-BVAR model's capacity to increase forecast accuracy is one of its greatest benefits. The granularity and timeliness provided by high-frequency data may be lost in traditional models that only use low-frequency data. The MF-BVAR model can produce more accurate and fast forecasts by incorporating both, which is essential for practitioners and policymakers who must make decisions quickly.

Another important advantage of the MF-BVAR model is its adaptability in handling mixed-frequency data. Its versatility allows it to effortlessly mix many data types without requiring them to be standardized to a single frequency. This characteristic makes the model particularly effective in complex economic systems where data availability and frequency may differ significantly.

A noteworthy strength of the MF-BVAR model is its Bayesian foundation. Forecasts using Bayesian approaches are more believable and trustworthy because they incorporate past knowledge and estimate uncertainty. This method is especially helpful in economic forecasting, where expert judgment and uncertainty play important roles.

3. Empirical results: Main results

This section aims to explain our choice of data and highlight the key findings from the MF-BVAR specifications.

Although all of the factors included in the specification are considered to be drivers of economic growth and monetary policies may be seen as an indirect means of fostering growth,

the choice of variables is related to the literature (Amaral et al., 2022; ECB Economic Bulletin Issue 4, 2024).

Table 1. Variables

Variables	Period	Frequency	Sources
GDP	1999Q1-2024Q2	Quarters	European Central Bank (ECB-SDW) (https://data.ecb.europa.eu/)
Inflation rate (INF)	1999M01-2024M08	Months	European Central Bank (ECB-SDW) (https://data.ecb.europa.eu/)
Strict Money aggregate (M1)	1999M01-2024M07	Months	European Central Bank (ECB-SDW) (https://data.ecb.europa.eu/)
Short interest rate (SIR)	1999M01-2024M08	Months	European Central Bank (https://data.ecb.europa.eu/)
Unemployment rate (UN)	1999M01-2024M07	Months	European Central Bank (https://data.ecb.europa.eu/)
Oil prices (Brent)	1999M01-2024M04	Months	European Central Bank (https://data.ecb.europa.eu/)
Precious metals (PREC)	1999M01-2024M07	Months	European Central Bank (https://data.ecb.europa.eu/)

Source: ECB Data Portal.

To prevent biases (in terms of harmonization, definition, sources, etc.), we utilize the same data providers. The database was chosen in accordance with conventional literature, which holds that these factors influence GDP-based economic growth (Mojon and Peersman, 2001; Barsoum and Stankiewicz, 2015; Amaral et al. 2022; Guo, 2024).

To find the optimal model, which is defined by well-behaved residuals and a low error prediction, we run two distinct specifications. Thus, Model 1 considers GDP growth along with all the variables of the monetary policy tools (M1, short interest rate, inflation rate); Model 2 includes GDP, variables related to natural resources, and inflation.

Table 2. Empirical Results

GDP	RMSE	Theil's inequality coefficient
Model 1	0.013091	0.485020
Model 2	0.012773	0.436779

Source: Authors

Theil inequality coefficient and RMSE measurements show a decline in mistake predictions. In other words, Model 2 performs better than Model 1. The assumption that natural resources directly contribute to GDP growth is supported by these empirical findings.

4. Conclusion

In conclusion, MF-BVAR models have proven to be a highly beneficial tool for projecting GDP growth on a worldwide scale, particularly when combined with other natural resource prices, including those of precious metals and oil. These resources directly and significantly affect trade, investment flows, and manufacturing costs in the economy. Compared to the variables included in monetary policy instruments, the inclusion of these variables in MF-BVAR models enables a more thorough and accurate description of economic dynamics. These datasets are still necessary to manage development and stability in the economy. Their ability to forecast economic activity, however, may occasionally be limited by their indirect influence. Natural resources, on the other hand, have an immediate and palpable impact on the economy, which makes them useful predictors in forecasting models.

Although MF-BVAR models are useful for economic forecasting, they are not perfect, particularly when it comes to natural resources with highly volatile prices. Therefore, utilizing more advanced methods to simulate the volatility and non-linear interactions could help improve the accuracy of MF-BVAR models for natural resources. To better understand the effect of natural resource pricing on GDP growth, for example, non-linear transformations or the use of GARCH models to handle volatility could be used.

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ACHIEVEMENTS AND PROBLEMS IN IMPLEMENTING INNOVATIONS IN MUNICIPAL FINANCE

Borislav Borisov

Abstract: *The topic of the relationship between science and practice has always been a subject of discussion, and in the absence of such, criticisms were directed either at the representatives of science, because their works are detached from real reality, or at the representatives of practice, because they do not follow and do not perceive the scientific achievements. This fully applies to the public sector, where declarations of modernization are constant, but the results are not always sufficient. This report asserts the thesis that in the field of public finances, and in particular those of municipalities, there are quite a few innovative developments that are successfully implemented in some of them, but still insufficient, making an attempt to reveal the reasons for this .*

Keywords: *public finance, innovation*
JEL: *H70*

Introduction

State administration is basically a conservative system and it should be. We cannot imagine how after every political change and the coming to power of a new government, reforms will be made in accordance with the temporary moods of the rulers. Changes in the work of public administration structures must be done carefully and for a long time. However, this does not mean that the state administration in its set of executive bodies at the central and territorial level should be immune to innovation and improvement, on the contrary, the modernization of the administration should be a constant process, just as the requirements are constant of society to her work.

What are the challenges facing public administration today? The "black box syndrome" is particularly typical. People see that the administration works, but do not know exactly how, and judge its work by the subjective criteria of how they themselves have been served. Sometimes there is a feeling that processes are not particularly efficient without reference to objective measures. The heads of the administrative units, for their part, prefer not to undertake changes in the ways of working, in order not to make mistakes and not to be reprimanded by superiors, and no one is punished for doing his job routinely. The budgets of administrative structures do not depend on the competitive environment or on innovations. If we add to all this the fact that changes require additional effort and resources with an unclear end result, one can understand why the desire to maintain the status quo is always stronger than the desire to change.

Last but not least, the great politicization of the state administration should be mentioned. Our everyday life is filled with examples of personnel reshuffles at the change of each government, which can be justified when it comes to the composition of the political cabinets or the top management of the administrative structures, but not when it is done at the lower expert levels.

However, there are good examples of innovations introduced in public administration. In this report, we will examine some innovative models developed or applied by the author in the field of municipal finance, trying to explain the reasons for the reluctance to implement them, despite the generally recognized benefit they have for better management

1. Bond financing

Economists are still divided over the debate over which is the better option – a balanced, deficit or surplus budget. In the socialist period of our country's development, it was considered that a budget with a surplus meant great economic opportunities, but this practice continued even after the transition to a market economy, when at the end of the year there were unused budget surpluses, which were spent hastily and in a non-transparent manner. A deficit budget implies greater efforts to collect revenue and satisfy more of the public needs, but it is necessary to indicate the sources of its financing. The assumption of public debt is mainly done by issuing securities, while municipalities prefer bank loans. Issuing bonds, although still an insufficiently popular source of income in municipal budgets, already has its history in our country. After the replacement of the Law on Securities, Stock Exchanges and Investment Companies with the Law on Public Offering of Securities, and above all after the control of inflation and stabilization of the leva exchange rate, real opportunities were created for debt financing of municipalities through the issuance of municipal bonds. These were prepared and implemented by the municipalities of Varna, Sliven, Shumen, Dupnitsa, etc. The fact that the municipality of Varna has already issued three bond issues, the last of which, registered in the Central Depository (CD) on June 30, 2010, was at interest rates more favorable than those of government securities speaks for the attractiveness of municipal bonds. papers issued at the same time (5.52% yield on municipal bonds versus 6.15% on government securities on the date of their entry in the CD.)

Issuing municipal bond loans allows municipalities to overcome their financial difficulties related to:

- Financing of the current deficit of the municipal budget.
- Redemption of previously issued debts. In this way, the refinancing of the liabilities is actually carried out.
- Smoothing out fluctuations in the receipts from tax payments in the local budget.
- Attracting significant financial resources to finance local programs and capital-intensive projects without increasing the tax burden.

Despite the improved regulatory and legal environment and the obvious possibilities of bond financing to solve budget problems, municipalities still refrain from using this financial instrument. The reasons for this are rooted in the lack of experience and ignorance of the specific matter related to the operation of the capital markets.

The main types of bonds that can be used for municipal debt financing are:

- General obligation bonds. They are guaranteed by the issuer, which is obliged to use all its tax power to make the loan payments. Because of this characteristic, they are considered risk-free and are highly rated by rating agencies. Their main direction is the financing of municipal objects that do not bring direct income, such as public buildings, streets, schools, parks, etc. The municipal budget revenues are used for debt payments.
- Bonds guaranteed by revenues from projects (revenue bonds). They are usually used for capital investment that has a certain group of users and that accumulates cash receipts (for

example, commercial establishments, sports facilities, parking lots, etc.). This type of bond is not guaranteed by the budget, but by the proceeds from the operation of the constructed object, which is why they are considered a bit more risky.

- Special tax bonds (special tax bonds). Payments under them are guaranteed with the proceeds from certain fees and service prices. These can be a household waste fee, the price of water, the price of advertising or other services. Unlike general obligation bonds, here the sources of income are limited.
- Industrial revenue bonds. They are usually issued by economic development agencies to municipalities. The purpose of the agency is to support the construction of industrial and commercial property for the benefit of private users. The funds from the issue of this type of bond are used to build new objects that are sold on lease. The security of this type of bond depends on the creditworthiness of the lessee.
- Housing bonds. This type of bond is issued to raise funds for the construction of new homes. They are guaranteed by the mortgage payments on the homes. In the USA, they are additionally guaranteed by federal subsidies for socially weak families, private insurance against mortgages, insurance from the federal housing authorities. This type of bond is extremely popular in Russia. They occupy 85% of the municipal securities market in the country.
- Bonds with mixed coverage (double barrel bonds). This type combines the security of general obligation bonds and those guaranteed by project revenues. Although they are not commonly used in the US and most European countries, in our country they offer a certain amount

Economists are still divided over the debate over which is the better option – a balanced, deficit or surplus budget. In the socialist period of our country's development, it was considered that a budget with a surplus meant great economic opportunities, but this practice continued even after the transition to a market economy, when at the end of the year there were unused budget surpluses, which were spent hastily and in a non-transparent manner. A deficit budget implies greater efforts to collect revenue and satisfy more of the public needs, but it is necessary to indicate the sources of its financing. The assumption of public debt is mainly done by issuing securities, while municipalities prefer bank loans. Issuing bonds, although still an insufficiently popular source of income in municipal budgets, already has its history in our country. After the replacement of the Law on Securities, Stock Exchanges and Investment Companies with the Law on Public Offering of Securities, and above all after the control of inflation and stabilization of the leva exchange rate, real opportunities were created for debt financing of municipalities through the issuance of municipal bonds. These were prepared and implemented by the municipalities of Varna, Sliven, Shumen, Dupnitsa, etc. The fact that the municipality of Varna has already issued three bond issues, the last of which, registered in the Central Depository (CD) on June 30, 2010, was at interest rates more favorable than those of government securities speaks for the attractiveness of municipal bonds. papers issued at the same time (5.52% yield on municipal bonds versus 6.15% on government securities on the date of their entry in the CD.)

Issuing municipal bond loans allows municipalities to overcome their financial difficulties related to:

- Financing of the current deficit of the municipal budget.
- Redemption of previously issued debts. In this way, the refinancing of the liabilities is actually carried out.

- Smoothing out fluctuations in the receipts from tax payments in the local budget.
- Attracting significant financial resources to finance local programs and capital-intensive projects without increasing the tax burden.

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- Bonds with mixed coverage (double barrel bonds). This type combines the security of general obligation bonds and those guaranteed by project revenues. Although they are not commonly used in the US and most European countries, in our country they offer certain advantages to issuers, which is why they are preferable.
- Lease rental agreement bonds. In countries with a developed capital market, they have become increasingly popular in recent years. Typically, these bonds are issued by nonprofit corporations, community hospitals, or universities. They are most often used for the purchase of movable property (trucks, construction machinery, etc.), but are applicable to any type of property. With them, the municipality purchases the property and leases it to the relevant municipal company or institution in the form of a lease agreement. The leasing contract is structured as a revenue bond and includes all legal provisions, such as interest rates and additional requirements for the bonds.

- Bonds for the refinancing of old issues (refunded bonds). They are usually issued by municipalities when there is a change in interest rates.

What type of bonds a public institution with an independent budget will issue depends on the purpose of the bond loan and on its financial policy. The relatively limited use of municipal bond loans for debt financing of municipal budgets can be explained both by the aforementioned ignorance of the relatively complex matter of issuing securities, and by the expansive policy of banks to offer loans to municipalities with minimal risk (Борисов, 2004).

2. Long Term Financial Planning Model

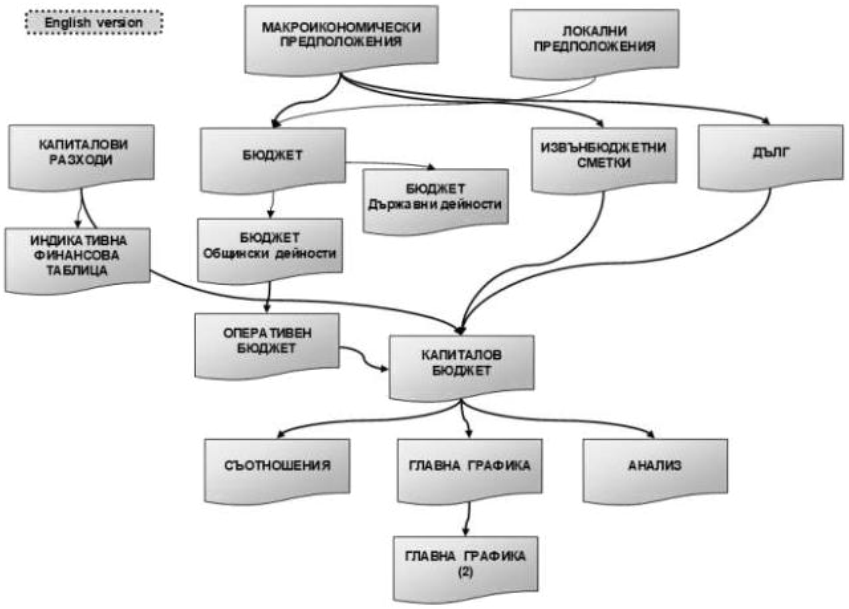
During the period 1998 - 2001, a team of Bulgarian and American experts developed a Model for long-term financial planning of municipal budgets under the "Local Government Initiative" Program of the American Agency for Development and Cooperation (USAID). It was and continues to be successfully implemented in municipalities whose financial managers take into account the long-term impact of their decisions.

The model is based on Microsoft Excel and enables:

- Extrapolation of the revenue and expenditure data of the municipality for a ten-year period, based on macroeconomic assumptions and historical data for four previous years.
- Calculation of the financial ratios that are related to the financial health of the municipality, with the determination of those that are at safe levels, the limit values and the risk values.
- Calculation of the operating budget by expenditure paragraphs and determination of the amount of operating surplus that can be set aside for investment costs.
- Ability to "play" different options for the amount of local taxes, fees and service prices and their impact on the operating budget.
- Calculation of the necessary additional funds for the implementation of the capital program of the municipality.
- Introduction of options to cover the shortfall of capital funds by taking on debt, with certain parameters.
- Assessment of the impact of various debt-taking decisions on the long-term financial health of the municipality.
- Making changes to the capital program to reduce financial risk.
- Visualization of budget values and parameters.

This model was successfully implemented in the municipalities of Sofia, Ruse, Varna, Shumen, Sevlievo, etc. when drawing up their budgets and before deciding to take on municipal debt, in order to see what the long-term consequences would be on the financial health of the municipality concerned. However, it is still not sufficiently popular and in demand, mainly due to the requirement that its application for financial forecasting be carried out by external experts who possess the relevant certificate for its use (Борисов Б. , Иновативни методи и модели за управление на общините, 2019)

Figure 1. Structure of the multi-year financial planning model



3. Business process management

It is a generally accepted finding that in the modern world the processes are dynamic and take on a risky nature. Belief in management's ability to predict future events and control them leads to the search for non-traditional solutions, flexible organization and quick adaptation to the external environment. Constant improvement of both adopted strategies and routine activities related to the achievement of specific results is sought. The dynamically developing business environment led to the emergence of qualitatively new concepts in management, perceived for some time as a model for effective management. Among them, the concepts, theories and management models developed in the last 30-40 years stand out, such as the concept of "Continuous improvement (Kaizen)", the concept of "Organizational excellence", the concept of "Total Quality Management - TQM", the concept of "Total Equipment Service" - TPM, the Six Sigma concept, the Proactive Management concept, the Lean Production concept, the Theory of Constraints (TOC), the Sustainable Development concept, the Management by Values concept, the Management of customer relations (CRM), the concept of "Supply Chain Management (SCM), management through the Balanced Scorecard (BSc), the concept of "Business Process Management - Business Process Management", etc. It is noteworthy that if the market concept that conquered the world in the 70s and 80s of the last century and was directed towards markets and customers, then in later years we observe a look inward, towards business processes, but not so much towards capacity opportunities of production technologies as much as to improve management.

Specific processes take place in public sector organizations, the main ones of which can be reduced to the following:

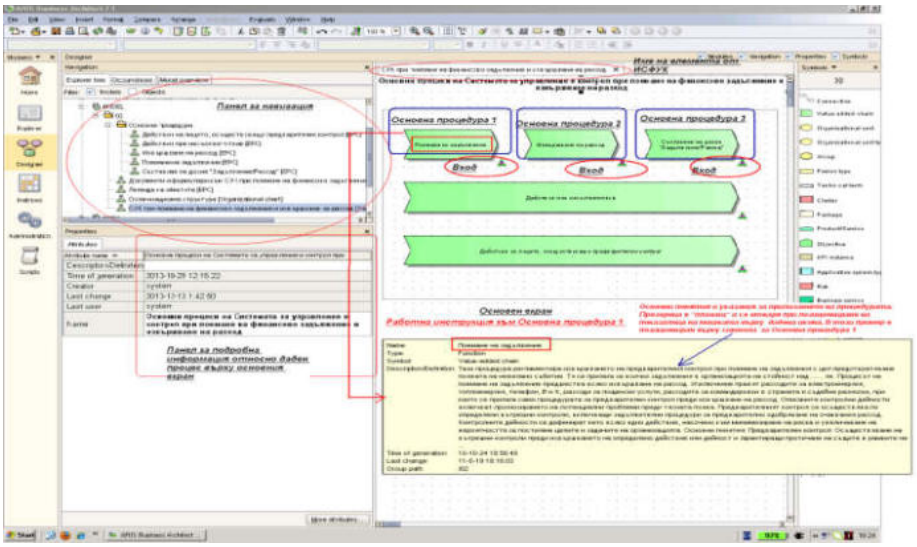
- Process of developing strategic planning documents;
- Budget process;
- Process of providing administrative and technical services;
- Investment process;
- Human resources management process;

- Public procurement management process;
- Contracts and obligations management process;
- Project management process;
- Property and asset management process;
- Information management process;
- Risk management process;
- Knowledge management process, etc.

Each of these processes includes sub-processes at lower levels. The question of their number comes down to a decision on the degree of detailing and dissection of individual processes into sub-processes. For each independent process and sub-process, written standard procedures should be developed, which describe the steps for their implementation, deadlines, responsible persons, accompanying documents, control procedures, etc.

Work processes can be described in several ways: in tabular form, in graphical format, through diagrams, or in both tabular and graphical format. Creating diagrams is an important part of the process description and analysis approach. The modeling method, also called notation, is a specific language for describing real-world objects using a special syntax that contains graphical symbols, attributes, and relationships between them. There are various technical means of notation that allow not only graphical visualization of processes, but also quick connections between processes of different hierarchical levels, connection with the organizational structure and staffing, generation and movement of various documents, retrieval of reports on deadlines, participation of officials, etc. Such tools are Casewise Corporate Modeler and ARIS Business Architecture. It is a modern software solution and methodology for description, analysis and optimization of business processes. These software products allow process tracking and detailed insight into sub-processes to the required level of detail, detailed information about each step of the process, visualization of the documents to be generated at a given stage, their filling and movement. The big difference is that they are not just pictures of a process element like drawing graphs, but have specific content that can be seen by positioning the marker over the corresponding symbol. This can be a description of a specific step, information about who performs it, when and in what way, etc.

Figure 2. Visualization of the processes related to internal control described at the high level of ARIS



In 2011, with the help of the ARIS Business Architecter product, some business processes taking place in municipalities were developed, such as the process of drawing up and implementing strategic documents and that of internal control. For the municipality of Sliven, they covered not only the processes in the central administration, but also those in the town halls of the municipality and secondary budget managers. Unfortunately, during one of the changes of the municipal management, at his discretion, the use of the product was discontinued, although seminars were held and employees were trained for this.

4. WEB-based systems for financial management and control (FSMC)

One of the most important changes in the activities of public sector organizations in countries that transitioned from totalitarian to democratic governance was the decentralization of municipal finances. The new powers of the local authorities to draw up, accept, implement and report the municipal budgets also required increased attention to internal control.

Almost twenty years since the beginning of the changes in the regulatory framework of financial control and the setting of a requirement for the introduction of financial management and control systems (FMCS) in public sector organizations, the situation is not clear-cut. There are such institutions that have introduced and implement effective systems, constantly taking care of their updating and improvement. In others, they were introduced formally, either due to a misunderstanding of the nature of the systems, or due to an underestimation of their necessity, and in others there are none at all. External audit authorities are sufficiently consistent in their efforts to carry out inspections and sanction those managers who do not comply with the requirements of the legislation. The state of SFUK that they describe in their annual reports to the Ministry of Finance does not always correspond to the actual situation. Respectively, the Consolidated annual report on the internal control in the public sector in the Republic of Bulgaria of the Ministry of Finance, which is issued every year, represents a true summary of not entirely true findings.

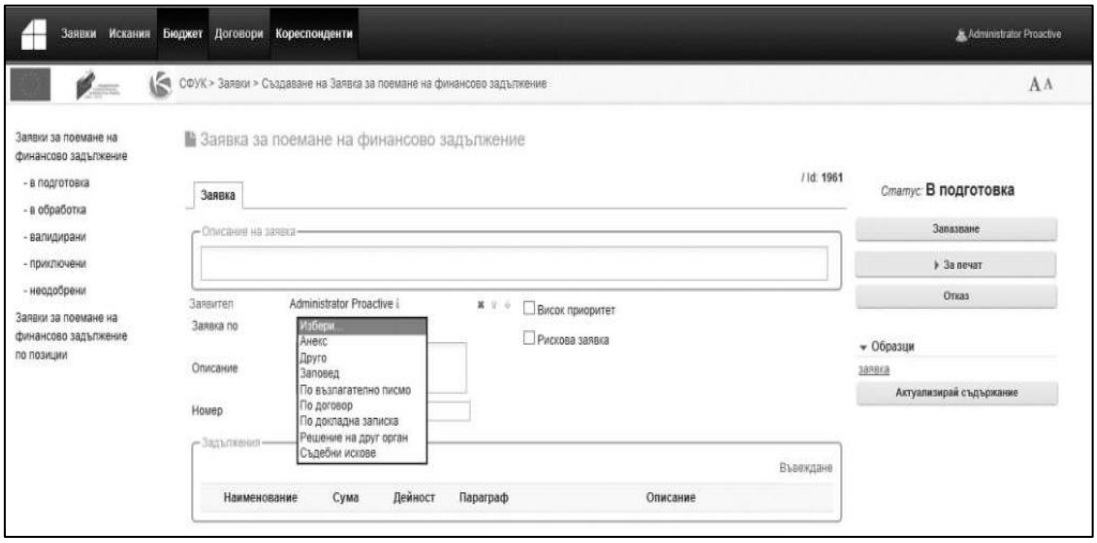
These conclusions are not frivolous, but are based on the author's long-term experience in the development and implementation of financial management and control systems in a number of organizations. More than half of the municipalities in the country, as well as some ministries and other central departments, work according to a model developed by a team under his leadership. However, if 15 years ago certain methods and technical means were used in the development of the SFC, now information and communication technologies provide new opportunities that should be used to modernize the SFC and increase their effectiveness.

As a result of the implementation of the project "New model for internal control, based on cloud technologies", financed by the Operational Program "Development of the competitiveness of the Bulgarian economy 2007-2013", a WEB-based specialized software for electronic document flow of procedures was created under the author's leadership when assuming obligations and making expenses, as an element of the Financial Management and Control Systems, called Cross Control (Борисов Б. и., 2019). It achieves:

- Instant correspondence between available, requested and spent funds under the organization's budget;
- Warning information when reaching certain critical levels of expenses on budget paragraphs, functions or those related to contracts with external contractors;

- Traceability of the performed control activities when assuming financial obligations or when making expenses;
- Full management of the internal document flow in the organization;
- Coverage of all levels in the management structure of the administration, including but not limited to outsourced units;
- Organization of a complete electronic archive, that is, archiving and copying/scanning of documents, preservation of original documents, working with archival ones and convenience in working with them;
- Easy access to information arrays;
- Convenient and lightweight interface with network and local scanning and printing tools;
- Quickly find all registered documents and extract reference information about them;
- Provides up-to-date information on the movement and actions on the documents at each stage of the work, according to the access rights;
- Has the ability to generate any reports related to the spending of public funds.

Figure 3. Request screen for assuming a financial obligation of the WEB-based financial control system Cross Control



The Cross Control product has been successfully used for more than 8 years in the Lukovit municipality administration and other public organizations. However, the formal attitude towards control procedures in many administrations is an obstacle to the implementation of any innovations in the field of internal control.

5. Strategic planning and program budgeting

The development of strategic documents - concepts, strategies, plans and programs, not only legitimizes the policy of a public institution in a given area, but also provides an opportunity for control and accountability, for the inclusion of interested parties in achieving the strategic goals of development, for risk assessment and from there – for more effective management. The Council of Ministers' 2023 State of Administration Report states that "an effective strategic planning process is a key condition for achieving good governance. One of the main functions

of the "management center", according to the definition of the Organization for Economic Cooperation and Development (OECD), is related to the provision of a clear strategic vision for development, planning and prioritization of goals and measures, coordination in the process of development and implementation of policies as well as subsequent monitoring and evaluation of progress“ (Министерски съвет на Република България, 2023). The report concludes that there are over 200 national strategic documents that have no connection with each other, much less with the budgets of the relevant administrative structures. The review of a number of national, regional and municipal plans and programs shows that a large part of them contain large and meaningless analytical parts, and their prospective part is dominated by good wishes for the future, not supported by the necessary resources. A large part of them do not have measurable performance indicators, which prevents effective monitoring and civil control.

Linking the strategic documents and policy goals with the possibilities for their financial provision through the budget is a basic guarantee for transparency and accountability of the state administration. Taxpayers have the right to know and control what the objectives of each budget program are, what measures and actions the institutions want to finance and whether they actually lead to the achievement of these objectives. In the international comparative index "Open Budget Bulgaria shows a number of weaknesses precisely in the full use of program budgeting - lack of connection between strategic goals and the activities carried out, lack of clear and measurable indicators of the success or failure of individual programs, lack of analysis of past results periods and closing or reforming failed programs, etc.

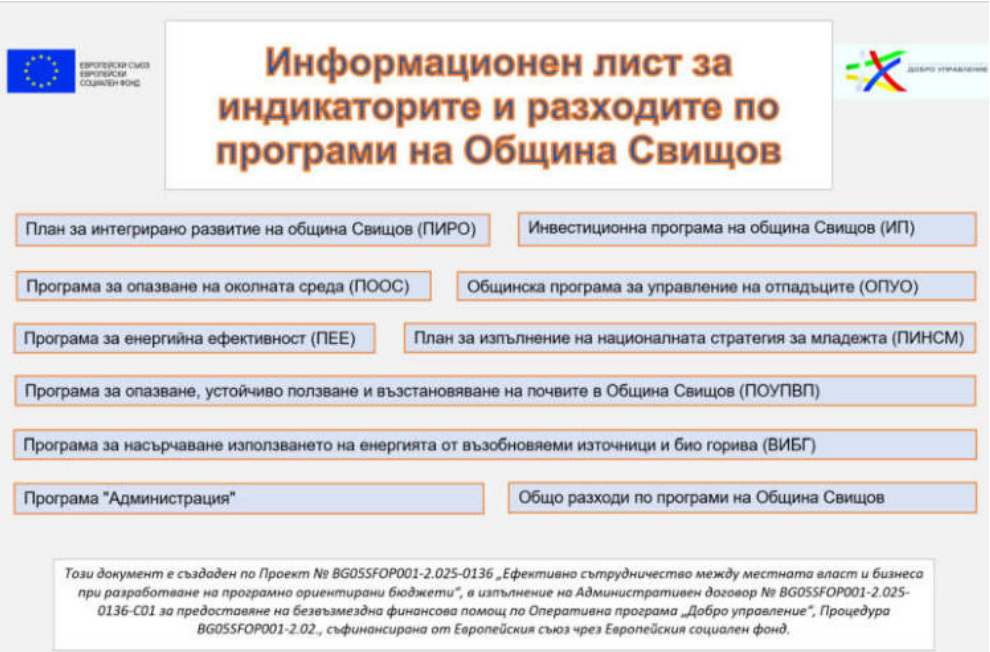
The normative regulation of the development of program budgets in our country is contained in the Law on Public Finances. In Art. 18. (2) of this law it is said that "The primary budget managers under the budgets of the Council of Ministers, of the ministries and of the state agencies also apply a program budget format", and in paragraph 4 it is specified that "The Council of Ministers approves a classification of policy areas/functional areas and budget programs under para. 3. With the classification, other indicators can be determined, which are elements of the budget structure in a program format". In Art. 67. (4) with the budget procedure, the Council of Ministers is given the opportunity to determine primary budget managers, other than those under Art. 18, para. 2 to implement a program budget format. Specifically for program budgeting in municipalities in Art. 82. (1) it is stated that "The Municipal Council adopts an ordinance on the conditions and procedures for drawing up the budget forecast for local activities for the next three years, for drawing up, adopting, implementing and reporting the municipal budget, developed in compliance with the principles, rules and the procedures under this law. With the ordinance, it can be determined that the municipality's budget is drawn up, adopted, implemented and reported in a program format as well."

Regardless of the legal possibility for municipalities to implement a program format of the budget, no such attempts have been made so far. The draft budget for 2007 of the Municipality of Mezdra, but this practice was not continued.

Only in the current year 2024, in the successful implementation of the project "Effective cooperation between local authorities and business in the development of program-oriented budgets", carried out with the financial support of the Operational Program "Good Governance", a team under the leadership of the author developed a Methodology for compiling a program oriented budgets of municipalities, which was implemented in the municipality of Svishtov (Borisov, 2023). The methodology describes the procedures for developing the strategic planning and program documents of the municipality and their relationship with the

budget expenditures, and it is envisaged that reporting forms for the funds spent on programs and the results achieved should also be filled in when reporting the budget.

Figure 4. Navigation screen of the information sheet for the indicators and costs under programs of the municipality of Svishtov



The real reasons for the municipal administrations' reluctance to introduce program budgeting is that it is not mandatory, but optional, and that it requires additional efforts to prepare statements of expenditures under budget programs. However, the benefits of program budgeting are incomparably more significant than the need for a little more effort from the financial specialists in the municipalities.

6. Other innovative developments for the benefit of municipal finances

We will briefly dwell on several other innovations in the field of public finance, and in particular municipal ones, which have been successfully implemented in some of them, but which are not yet widely used, due to the reasons stated above. Among them are:

6.1. Methodology for determining the prices of local fees and prices of services based on the actual costs of providing them.

In contrast to the well-known method of calculating the costs of the production of a given product or the provision of a given service through direct costing, called Direct costing, the activity based costing method is more suitable for public services. By using this method and in accordance with the requirements of Art. 8 of the Law on Local Taxes and Fees, the amounts of fees and the prices of services in the municipalities of Svishtov and Sozopol were determined, tens of financial specialists were trained and methodologies were issued for the application of this method (Борисов, Определяне на разходите за публичните услуги чрез остойностяване на база дейности., 2001). However, the municipalities are the units that can

prove and justify the amount of the fees and prices of services accepted by them with the real costs of providing them, as required by the Law.

6.2. Methodology for determining the actual amount of the "Household waste" fee through activity-based valuation

Municipalities in Bulgaria accept the amount of the largest fee - that for garbage collection, garbage removal and disposal of solid household waste and cleaning of public places on the basis of the so-called a plan-account, in which the necessary expenses for the individual types of activities and the per milles for taxation of enterprises and households are indicated. The problem is that these plan-accounts do not contain a calculation of the actual costs for the cleanliness of populated areas. Such a methodology for calculating all associated costs was developed by the "Local Self-Government Initiative" Program of the US Agency for International Development back in 2000. The discussions on determining a new basis for taxing the users of this service, which currently do not corresponds to the "user pays" principle, but despite this, neither the necessary regulatory changes nor an attempt to create a new organization for the collection of household waste have yet been made.

6.3. Methods for evaluating financial management

One of the well-known methodologies for evaluating the financial management of public institutions is the PEFA Framework for the Evaluation of Public Expenditure and Financial Accountability, created in 2001 by seven international development partners: the European Commission, the International Monetary Fund, the World Bank and the governments of France, Norway, Switzerland and the United Kingdom. The framework was created to establish a standard methodology and reference tool for evaluating the management of budget funds. PEFA is a model for evaluating the management of public finances, which should provide a basis for dialogue on strategies and priorities for their reform, as well as a set of information that could contribute to deepening research and analysis of their management. Since 2001, PEFA has become the recognized standard for evaluating public finances. As of 31 December 2015, more than 500 reports have been produced by 149 countries to assess public sector financial management (PEFA Secretariat, 2016). The performance evaluation system includes a set of general indicators that allow monitoring the effectiveness of public finance management systems, the relevant procedures and institutions responsible for their management and a report that presents the results of the evaluation of the effectiveness of the use of budget funds . As a result of the evaluation, a general report on the state of public finances is prepared, with the following structure:

1. Realism of the budget
2. Transparency and completeness
3. Budgeting in line with policy objectives
4. Predictability and control in the budget execution process
5. Accounting, documentation and reporting
6. External control and audit
7. Donor practices
8. Country-specific issues (if applicable).

TADAT (from Tax Administration Diagnostic Assessment Tool) is also an assessment framework or matrix, but it further narrows the object of assessment which is the tax administration system. TADAT is designed to give an objective assessment of the health of the main components of a country's tax administration system. This framework targets nine key enablers (POAs) that cover most tax administrations, functions, processes and institutions. The

evaluation of the results is based on 28 high-level indicators, each of which is built from 1 to 4 dimensions, or a total of 47 dimensions.

As of the end of 2024, there is no data on the implementation of PEFA and TADAT in Bulgarian practice, which is a challenge for scientists and financiers, as it is also recommended by the European Commission. The Commission's 2016 document, „Communication from the Commission to the European Parliament and the Council on an external strategy for effective taxation“, said: „Other areas the EU will focus on will include ensuring capacity building in the field of tax policy and tax administration through direct technical assistance or through partnership programs; supporting international initiatives to strengthen legislation and regulation, particularly in the area of transfer pricing; and assisting in the development and implementation of fiscal assessment tools such as the Tax Administration Assessment Diagnostic Tool (TADAT) or the Public Expenditure and Financial Accountability Tool (PEFA)“ (Европейска комисия, 2016).

In several Bulgarian municipalities, a simpler and adapted to Bulgarian practice model for the assessment of financial practice, called the Financial Management Assessment Framework, was used. The following 10 elements are analyzed, the condition of which is assessed with specific indicators. These are:

1. Financial planning
2. Budgeting
3. The collection of local revenues
4. Debt management
5. The assumption of financial obligations
6. Making financial expenses
7. Property and Asset Management
8. The investment process
9. The financial provision of projects
10. Financial control and audit.

The financial management assessment framework was successfully used in the preparation of functional analyzes of the municipalities of Silistra, Lovech, etc.

Conclusion

Discussed in this report, cutting-edge practices in managing municipal finances are not the only ones. Under the author's leadership alone, a number of methods and methodologies supporting financial management were developed, such as a risk management methodology, a methodology for subsequent performance control, an economic-mathematical model of a public-private partnership, a system for the management and control of public property and assets, contract management and control system, knowledge and information management and control system, etc. All of them have found their practical application in certain Bulgarian municipal administrations, but despite the proven effect of improving financial management, their application is limited. The reasons for this basically boil down to two:

1. Lack of an active marketing policy to promote innovative practices among public administration structures.

2. The well-known conservatism of public authorities and especially of public finances, which does not stimulate them to implement innovations. These are mainly done when regulatory requirements are introduced.

If we accept as true the statement that science without practice is useless, and practice without science is blind, then it is necessary to make more efforts to "examine" the Bulgarian institutions from the public sphere in terms of innovations. This can be done by introducing regulatory requirements for implementing innovative approaches in the work of public sector organizations, developing and popularizing typical innovative methodologies, attracting external specialists, introducing standards for certain work processes and certifying public organizations for their compliance .

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ON THE PSYCHOLOGICAL DETERMINANT OF PERSONNEL MANAGEMENT

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Abstract. *The article "On the Psychological Determinant of Personnel Management" discusses three issues: 1 The human subsystem as the main component of the company; 2. The psychological types and characteristics of humans; 3. Scientists on the importance of the psycho-physiological state of humans in the labor process. In the first issue, the three subsystems of the company are compared - the material, the organizational, the human, and the conclusion is that only the human system can "bring to life" the material and organizational subsystems and is thus the company's most valuable asset.*

In order to prove that a person, in addition to professional knowledge, needs corresponding psycho- physiological characteristics to be employed, the author has conducted a survey by questionnaire in Georgian company, which is about psychological compatibility of employees with the occupied position. The survey found that 70% of employees do not work by profession, 83% do not like their job, 84% do not like the company, 82% think that as interesting job appears elsewhere, they will leave the company, 90% of employees think that there are no partnership relations in the company, 100% think that the company needs to open a psychological cabinet, 60% believe that employees relationship is unfavorable, etc.

The second issue states that there are no two persons with identical psycho-physiological characteristics. Therefore, even if they are on the same professional level, exactly due to these distinctive characteristics, they produce differentiated results in labor. This part of the work presents 16 groups of humans' psycho-physiological types and characterizes them, expresses opinions about the determination of job seekers' types via their testing during the recruitment process carried out by Georgian companies and specifies most productive jobs for some types.

This selection is made according to the Meyer-Briggs Indicator Test. In addition, the article discusses the tests of other scientists - R. Jatella test, Bassa Darck test, J. Ravenna test, G. Spielberg test, Luscher test, etc.

The third issue introduces the opinions of various scientists - P. Drucker, N. Eriashvili, Z. Ghudushauri, etc. - on the psychological determinant of company personnel management and gives conclusion on its necessary involvement in the management.

In the third part of the article, specifically on this subject, all scientists unanimously acknowledge that the company's successes are the result of the will and wisdom of those working there. Their character, mood, emotion, interest and other psycho-physiological characteristics are revealed in the will. These scientists conclude that if the interests of the employees match the interests of the employer, such people create creatures of epochal significance.

Keywords*: Psycho-physiological characteristics; personnel; management; introvert; extrovert; psychological type.*

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Introduction

The psychological component in human resource management was introduced by humanitarian management. From that point, the understanding and realization began that human behavior is not only determined by knowledge, skills, and competence but also by psychological characteristics such as personality, mood, interests, emotions, and others. Large international companies have long been using this approach. Regrettably, this innovation is only now beginning to be implemented in Georgia.

1. The human subsystem as a core component of an economic entity.

Any subject, whether private or governmental, represents a system. It consists of three subsystems:

1. The material subsystem (buildings, raw materials, products, and others).

2. The organizational subsystem (contracts, instructions, and others).

3. The human subsystem (personnel with their intellect).

Despite the fact that the material and organizational subsystems play a significant role in the operational life of an economic entity, and even though the construction (architecture) of these entities begins with them — such as the erection of the building, the introduction of equipment and raw materials, the creation of regulations and instructions, etc. — the role and importance of the human subsystem in the life of the entity surpasses these elements. Unlike the first two subsystems, the human subsystem represents the psychological and spiritual component of the economic entity, and it is precisely this subsystem that animates the others and brings them into operation. To put it artistically, without people and without the "breath of the soul" from people, no matter how expensive the technology, raw materials, licenses, or other similar resources are, if they are placed in a company, they remain lifeless, soulless things.

However, there are distinct forms of "breathing life." Even when individuals share the same age, gender, worldview, and professional level, it is evident that different people "breathe life" into the lifeless elements of a company in varying ways. Consequently, they do not produce the same volume or quality of results. This discrepancy can be attributed to the psychological differences between individuals.

To assess the psycho-physiological compatibility of employees with their positions, a sociological survey was conducted at a Georgian company with the code name "Kolkheti." The survey covered 50 individuals, which represents 62.5% of the employees. The survey consisted of a 20-question questionnaire. The overall results of the survey can be found in Table 1.

Table 1. The comprehensive results of the survey on the psycho-physiological climate at the company "Kolkheti" (in percentages)

The total number of respondents - 50		
		The level of dissatisfaction and incompatibility
1	They are not employed by occupation	(38 · 100) : 50 = 76%
2	They do not like work to be completed	(44 · 100) : 50 = 88%
3	They are not loyal to the company	(28 · 100) : 50 = 56%
4	They dislike coming to work and are motivated solely by the salary	(42 · 100) : 50 = 84%
5	When addressing problems, managers do not consult employees for their opinions	(38 · 100) : 50 = 76%
6	They do not feel personal freedom while performing their work and are dependent on the supervisor	(47 · 100) : 50 = 44%
7	Upon finding a job that interests them, they will leave the company	(41 · 100) : 50 = 82%
8	A large part of the company's employees experience stress with such employment	(37 · 100) : 50 =74%
9	They do not view the company's workforce as being interconnected or affiliated	(40 · 100) : 50 = 80%
10	They view the company's workforce as lacking solidarity	(36 · 100) : 50 = 72%
11	There is no collaborative relationship within the company	(45 · 100) : 50 = 90%
12	The interactions between employees are unfavorable	(30 · 100) : 50 = 60%

13	**Employees lack any hope for promotion**	**(50 · 100) : 50 = 100%**
14	**Employees make fun of their superiors**	**(43 · 100) : 50 = 86%**
15	**When facing difficulties, there is no expectation of support from either superiors or colleagues**	**(42 · 100) : 50 = 84%**
16	**There is no and has never been any determination of psychological types**	**(50 · 100) : 50 = 100%**
17	**Individual meetings with employees are not held to understand their interests**	**(50 · 100) : 50 = 100%**
18	**They have no friends in the company**	**(47 · 100) : 50 = 94%**
19	**They attach great importance to satisfaction with the completed work**	**(31 · · 100) : 50 = 62%**
20	**They attach great importance to the respect from colleagues**	**(21 · 100) : 50 = 42%**
21	**They place great importance to the expression of their own abilities**	**(28 · 100) : 50 = 56%**
22	**They are inclined towards an unregulated day**	**(36 · 100) : 50 = 72%**
23	**They dislike the centralized leadership style and cite this reason for conflicts**	**(46 · 100) : 50 = 92%**
24	**They regard the violation of dignity as a cause of conflicts**	**(36 · 100) : 50 = 72%**
25	**They consider ignoring the opinions of subordinates as a cause of conflicts**	**(40 · 100) : 50 = 80%**
26	**They demand the presence of a psychological counseling office in the company**	**(50 · 100) : 50 = 100%**

As demonstrated in the table, 70% of employees are not working in their field of expertise, 88% are dissatisfied with their jobs, 84% do not feel positively about their company, 82% believe that they will leave the company as soon as they find

an interesting opportunity elsewhere, 90% think there are no collaborative relationships within the company, and 100% believe the company needs a psychological counseling office. Additionally, 72% believe that it would be better for the company to operate with an unregulated schedule, (where "day people" work during the day and "night owls" work at night). Furthermore, 94% have no friends within the company, 60% find the relationships between employees unfavorable, and so on.

The fact that a certain percentage of employees in a company (on average, 15-20%) are completely satisfied with everything suggests that these individuals are either closely connected to the leadership or avoid answering the questions in surveys.

There is no desirable psycho-social atmosphere in "Kolkheti." In most cases, subordinates would gladly be neighbors and even friends with each other, but they do not desire the same kind of relationship with the company's superiors. However, the initiators of creating a favorable environment in the company should be the scientists themselves. This might be due to the fact that both the company owner and the leading managers are not young (50-55 years old), while the workforce is mostly younger. They manage the company not in a modern democratic style, but rather in a traditional, centralized style. This style is administrative management, and it must be changed immediately. Companies worldwide are gradually adopting moral-psychological management methods, where individuals are hired based on their psychological traits (such as personality, temperament, etc.) and are managed accordingly. In highly developed countries, people are aware of their psychological type in addition to their profession (while in Georgia, not everyone even knows their blood type), and this information is often recorded in their curriculum vitae (CV). Unfortunately, in Georgia, zodiac signs receive more attention and are more widely promoted than psychological traits. It is our firm belief that the practices of highly developed countries in this area should be implemented in Georgia.

To ensure that every working-age person in Georgia is aware of their psychological type, it is essential to establish psychological offices (in polyclinics) throughout the country. Additionally, organizations should be required to consider psychological traits along with professional qualifications when hiring. This is supported by the fact that individuals who are engaged in work that interests them are ten times more productive. From such a job, they bring home not only money but also the happiness of job satisfaction. They are content, cheerful, smiling, filled with joy for life, excited for the new day, and eager to continue doing the work they love...

Psychologists encourage business owners to thoroughly understand the psychological traits of their employees and hire them only for roles that match these traits. To ensure this, during the recruitment process, candidates should be required to provide proof of their psychological type, and its accuracy should be verified on-site by a psychologist using various detection tools.

2. Human psychological types and their characteristics

The determination of psychological types and their characteristics is done through psychodiagnostics. For this purpose, a variety of tests are used, such as the test by R. Jatela (created in 1949), the test by Bass and Dark (created in 1957), the test by

Eysenck (created in 1977), the Myer-Briggs test, the test by scientist J. Raven, the test by G. Spielberger, the test by Lüscher (created in 1948), and many others.

The Myer-Briggs test is the most widely used abroad today. It divides people into 16 psychological types. These are [1, p. 5-6]:

1. **ISTJ**: Introverted, Sensing, Thinking, Judging
2. **ISFJ**: Introverted, Sensing, Feeling, Judging
3. **INFJ**: Introverted, Intuitive, Feeling, Judging
4. **INTJ**: Introverted, Intuitive, Thinking, Judging
5. **ISTP**: Introverted, Sensing, Thinking, Perceiving
6. **ISFP**: Introverted, Sensing, Feeling, Perceiving
7. **INFP**: Introverted, Intuitive, Feeling, Perceiving
8. **INTP**: Introverted, Intuitive, Thinking, Perceiving
9. **ESTP**: Extraverted, Sensing, Thinking, Perceiving
10. **ESFP**: Extraverted, Sensing, Feeling, Perceiving
11. **ENFP**: Extraverted, Intuitive, Feeling, Perceiving
12. **ENTP**: Extraverted, Intuitive, Thinking, Perceiving
13. **ESTJ**: Extraverted, Sensing, Thinking, Judging
14. **ESFJ**: Extraverted, Sensing, Feeling, Judging
15. **ENFJ**: Extraverted, Intuitive, Feeling, Judging
16. **ENTJ**: Extraverted, Intuitive, Thinking, Judging

ISTJ types are people of duty. They are calm, reserved, self-controlled, and somewhat unemotional and introverted individuals. They prefer subordination and systems of hierarchy.

ISFJ types are cautious, quieter, and reserved. They find satisfaction in explanatory tasks and aim to live in an organized manner with moderate responsibility.

INFJ types are oriented towards serving others. They tend to have an organized and planned lifestyle and are caring towards others.

INTJ types are stable, confident, competent, and possess sharp intellect. Independence is their primary goal, and they are capable of strategic thinking.

ISTP types are independent workers. They perform tasks with high readiness and complete them on time. They are drawn to practical actions such as analysis, gathering, and processing information.

ISFP types are modest, gentle, calm, and reserved. They tend to remain unnoticed. Their natural talent lies in serving those around them.

INFP types are characterized by flexibility and adaptability. They are competent and possess a far-sighted ability.

INTP types are idea generators. They love abstract concepts and questions. They are analytical thinkers, deeply contemplating cause and effect.

ESTP types are open, realists who observe events with a realistic approach. They act with inspiration and enjoy making sure everyone is aware of it. They approach life with an open attitude, focusing on the present moment.

ESFP types love surprises. They are lively, fun-loving, and cheerful individuals. They overcome challenges with ease. Their work style is marked by high energy and humor-infused interactions.

ENFP types are characterized by enthusiasm and vibrant energy. They have a great reserve of trust and enjoy participating in multiple projects. They possess strong interpersonal skills.

ENTP types are defined by unmatched energy and optimism. They are constantly seeking new ideas and bringing change to situations. Their strength lies in their thirst for an active life.

ESTJ types are straightforward. They view the world through the lens of practical situations. They have a strong sense of responsibility and duty.

ESFJ types have a strong drive to achieve harmony and goodwill in any situation. They are active and sociable, standing out for their exceptional attentiveness to those around them.

ENFJ types are masters of persuasion. They are gifted with the ability to teach others and are characterized by their attentive listening skills.

ENTJ types are natural-born leaders. Their traits include organization, completion, orderliness, responsibility, and objectivity. For them, life is a continuous learning process.

These 16 personality types are determined through the Myers-Briggs Type Indicator (MBTI) tests. A company can use this method for recruitment purposes, but there is one significant issue: the company must either have a psychologist who can determine the psychological type of a candidate using the MBTI tests before deciding on the appropriate position, or the candidate must have already taken this test at a psycho-diagnostic center, with a valid status and certification confirming the results. It is unfortunate, but the fact remains that most companies in Georgia do not have psychologists (with a few rare exceptions), and there are no psycho-analytical centers in the country specifically designed to determine people's psychological types.

Indeed, this is a highly necessary issue. If company leaders resolve to have a highly qualified psychologist on staff, one who is knowledgeable about determining the psychological types of candidates through testing in job competitions, alongside evaluating their professional qualifications, the employment or non-employment decisions will be made in the most acceptable and optimal way, in our opinion.

In our opinion, the psychologist's role should be limited to determining the psychological type of job-seeking candidates. As for assigning them to specific job positions, this task should be carried out by the personnel management manager, as the decision is based not only on the individual's psychological type but also on

their professional skills, the evaluation of which falls within the competence of the personnel management manager.

In our estimation, if a company is newly established, an ENTJ type person would likely be well-suited as the general manager, as they are natural-born leaders. For the purchasing and sales manager, an ENTJ type would also be ideal, as they are skilled persuaders. An ESFP type would work well as the public relations manager due to their ability to engage in humor-infused interactions. An INTP type would be the best choice for the innovation manager, as they are known for their analytical and creative thinking. An ISFJ type would excel as the office manager, as their natural talent is serving others. An ISFJ type would also be suitable as an accountant, as this type is organized and enjoys solitary tasks, and so on.

In our strong belief, companies in Georgia should address this issue as quickly as possible, as the psychology of employees can play both a positive and a negative role in the workplace.

3. The scientists' views on the importance of the psycho-physiological state of individuals in the labor process.

An organization has both visible and invisible resources for the successful implementation of its activities. The material-technical base, courageous and informational resources, raw materials, products, and the number of self-employed individuals are visible resources, while the skills of these employees and their psycho-physiological characteristics are invisible, hidden resources [1, p. 43].

The great management specialist Peter Drucker frequently repeats in all of his works: "People are our most important asset" [3, p. 387]. We would not be correct to understand this asset as merely the physical energy of people, as it has its limits. Peter Drucker includes in this the spiritual energy of individuals—intellect, which is conditioned by their psycho-physiological characteristics. "The successes of the organization," writes the scientist N. Eriashvili, "are the merit of the people working here, the result of their will and intellect" [4, p. 315]. It is in the will that the moods, personalities, emotions, interests, and willpower of individuals are manifested, as well as their capacity to execute tasks, and so on.

Psychologists advise managers to study the physical and psychological values of individuals and to employ them accordingly. It is from such employees that the company's management should expect not just results but exceptional outcomes. They also advise job seekers, cautioning them: "If a conflict arises between your values and the strong employment opportunities, this job is not worth dedicating your life to" [5, p. 641]. The same advice is given by the Georgian scientist Z. Gudushauri: "If the opportunity for employment conflicts with their views on honesty and integrity, they should reject such an employment opportunity" [6, p. 23-24].

And finally, young Georgian scientists also advise company managers to "respect employees and acknowledge their abilities, take their interests into account, recognize their work, and appreciate it exceptionally" [7, p. 101-102].

Conclusion

Based on the discussed material, it can be concluded that today, the personnel of Georgian companies are not managed with consideration of their psycho-physiological characteristics. These characteristics are not taken into account either when staffing the companies or later on. In most cases, companies do not have psychologists whose role would be to test employees to determine their psychological types.

Therefore, the situation in this area in Georgia requires immediate attention and correction, which will not only benefit employers and employees but ultimately contribute to the well-being of the entire country.

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10th ANNUAL
MONETARY AND ECONOMIC SCIENTIFIC CONFERENCE
DIGITAL TRANSFORMATION AND
ECONOMIC RECOVERY IN THE POST-CRISIS PERIOD
18-20 November 2024, UNWE, Sofia, Bulgaria

MONDAY - NOVEMBER 18th		
09:30 - 10:00	**Registration/ Coffee**	
10:00 – 11:00	**Welcome speeches** *MAXIMA HALL* */In Bulgarian/*	**Prof. Dr. Dimitar DIMITROV,** Rector of UNWE, Bulgaria **Lyudmila PETKOVA -** Deputy Prime Minister and Minister of Finance **Dimiter RADEV,** *Governor of the Bulgarian National Bank* **Zornitsa ROUSSINOVA –** *Chairperson of the Economic and Social Council* **Petia DIMITROVA –** Chairperson of the Executive Board of the Association of Banks in Bulgaria **Nikolay NENOVSKY**, Director of MRC, UNWE, member of MB at BNB
11:00 – 12:30	**Roundtable discussion** *MAXIMA HALL* */In Bulgarian/*	**EURO IN BULGARIA – ON THE ROAD TO ACCEPTING THE EURO AS A NATIONAL CURRENCY /in Bulgarian/** **Moderator: Assoc. Prof. Dr. Yanko HRISTOZOV, Director of IEP, UNWE** *Participants:* **Metodi METODIEV** - *Deputy Minister of Finance* **Petar CHOBANOV** - Deputy governor and member of MB at BNB **Petia DIMITROVA -** *CEO and Chairperson of MB of Eurobank Bulgaria AD* **Tsvetanka MINCHEVA** - *CEO Unicredit Bulbank* **Nikola BAKALOV -** *CEO First Investment Bank* **Delyana IVANOVA** - *Chair of Supervisory Board Bulgarian Development Bank*
12:30-13:30	**Lunch/Coffee break**	
13:30 - 14:00	**Keynote speech 1** *Large Conference Hall* Link for online	**Moderator: Prof. D.Sc. Nikolay Nenovsky**, MRC, UNWE **Emilia Campeanu,** *Head of Finance Department at Bucharest University of Economic* studies */ Fiscal sustainability to sustainable economic development in the Era of digital transformation/*
14:00 – 15:15	**Presentation session 1** *Large Conference Hall* Link for online	**DIGITAL MONEY** **Moderator: Prof. D.Sc. Nikolay NENOVSKY,** Director of MRC, UNWE **Xiaopin Liang, Siyi Chen** *Hebei University of Economics and Business, China / Research on the Impact of Digital RMB Cross border Payment on RMB Internationalization/* **Saikak Moulaydriss**, *PhD in economics. Independent, Morocco,* **Sara Boughanou**, *Laboratoire economie appliqué, Fsjes Rabat Agdal University Mohamed V at Rabat Morocco /Central bank transparency and macroeconomic performance: evidence from Morocco/* **Alexander Orlov,** *RUDN, /Implementation of smart contracts secured by digital ruble into the Russian economy/* **Daniel Akhmetdzhanov, Daniil Beletsky, Polina Ivanova** *PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA, / The degree of implementation and development of the BRICS digital money system/*

15:15 – 15:30	**Coffee break**	
15:30 – 16:00	**Keynote speech 2** *Large Conference Hall* Link for online	**Moderator: Diyana Miteva, MRC, UNWE** **Jovan ZAFIROVSKI,** *Ss. Cyril and Methodius University, Skopie /Digital transformation and the monetary challenges in the post crisis period/*
16:00-18:00	**Presentation session 2** *Large Conference Hall* Link for online	**Moderator: Rossitsa Toncheva, MRC, UNWE** **Tatiana HOUBENOVA-DELISIVKOVA,** *ERI of the Bulgarian Academy of Sciences, Union of Economists / Bulgaria on the Road to the Eurozone: Nominal Convergence Criteria and Policies Adjustmen/*: **Iskra CHRISTOVA-BALKANSKA,** *ERI of the Bulgarian Academy of Sciences, /Real convergence of Bulgarian economy in the euro area: evidence and implications/* **Ljubomir GEORGIEV**, */Digital technologies, market frictions and financial system structure/* **Dimiter NENKOV, Diyana MITEVA,** UNWE */Determining the Cost of Equity in the Developing Capital Market of Bulgaria: Up-to-Date Approaches and Methods/* **Galia MANCHEVA,** UNWE */ EU AI ACT WENT LIVE: EUROPE ENTERED INTO NEW ERA/* **Levani KERESELIDZE,** *Ivane Javakhishvili Tbilisi State University, Georgia /On the Psychological Determinant of Personnel Management/* **Kiril TOCHKOV,** *Texas Christian University /Risk sharing and monetary policy in the Euro Area/*
TUESDAY - NOVEMBER 19th Link for online attendance		
09:30 – 10:00	**Keynote speech 3** *Large Conference Hall*	**Moderator: Diyana Miteva, MRC, UNWE** **Gordon KERR,** *Cobden Partners UK, /The dangers of policy focus on digital transformation/*
10:00 - 12:00	**Plenary Session 2** *Large Conference Hall*	**International financial architecture and the Bretton-Woods institutions** **Moderator: Daniela BOBEVA,** BAS **Participants:** **Geoff Gottlieb,** *Senior Resident Representative for Central and Eastern Europe, IMF /TBC* **Daniela BOBEVA,** BAS **Nikolay NENOVSKY,** MRC, UNWE / *The French plan of the Bretton Woods conference and its relevance today/* **Dr. Stefka Savova,** *World Bank/ Challenges for the world financial system/* **Tsvetan Manchev,** Sofia University, */ Challenges for the world financial system/* **Mikhail RAEV,** *PhD Sofia University / Leo Pasvolsky's ideas and role for the establishment of the IMF and the IBRD pre- and during WWII/*
12:00 – 13:00	**Lunch**	

13:00 – 14:30	**Session Presentation session 3** *Large Conference Hall*	**Moderator: Rossitsa Toncheva, MRC, UNWE** **Moustapha AMAN,** *Associate Researcher, LEFFMI, University of Picardy Jules Verne /The Secret Chessboard of Superpowers: From Bretton Woods to the 21st Century – The Case of Djibouti./* **Dimiter CHOBANOV**, *IEP, UNWE /Fiscal Policies and Post-crisis Recovery in Central and Eastern European Countries/* **Tsvetelina MARINOVA** *New Bulgarian University /The Bulgarian economists on the collectivization and the socialist planning in the agriculture in the period 1945-1960/* **Nikolay BOGATZKY,** *Cusano University of Rome, /*Public Debt and Social Transformations: the Italian Case/ **Sarah GOLDMAN,** *Lux-SIR (Scientific International Research), Luxembourg /Natural Resources as a Key factor in forecasting GDP in Europe/*
14:30 – 14:45	**Coffee Break**	
14:30-15:30	***MAXIMA HALL*** Parallel session	**EURO CURRENCY CHALLENGES AND PERSPECTIVES** /in Bulgarian / **Moderator:** Yanko Hristozov, IEP, UNWE **Speakers:** **Dimiter SHOUMAROV,** *Deputy CEO, Chief Financial Officer and Member of the Management Board* **Lyubomir KARIMANSKI,** IEP, UNWE /The different dimensions of the Digital Euro and its cross-border interoperability./ **Stefan TZVETKOV**, BNB
14:45-17:30	**Parallel sessions : Presentation session 5** *Large Conference Hall*	**Moderator: Diyana Miteva, MRC,UNWE** **Bo Shen, Zihao Wang, Xiying Zhang, Guijun Li** *Hebei University of Economics and Business, China The impact of the combination of science and technology and finance on economic resilience-Empirical evidence based on the quasi-natural experiment of " promoting the combination of science and technology and finance "/* **Borislav BORISOV**, *IEP/ ACHIEVEMENTS AND PROBLEMS IN IMPLEMENTING INNOVATIONS IN MUNICIPAL FINANCE /* **Anna VERENIKINA**, *RUDN University, Russia /Development of ESG bond market in Russia/* **Rossitsa TONCHEVA,** *MRC, UNWE /Money as collective public mechanism of wealth distribution: a piece of ontology/* **Spartak KEREMIDCHIEV**, *Economic Research Institute at Bulgarian Academy of Sciences/Protectionism and Liberalism in foreign Investments/* **Yanko HRISTOZOV,** IEP, UNWE, **Ani Dimitrova**, *IEP /Euro Adoption Challenges for Bulgaria and Croatia /* **Diyana METALOVA,** IEP,UNWE/ The new EU fiscal rules - an attempt to restore budgetary discipline/ **Diyana MITEVA**, *UNWE, /Digital challenges in investor protection /*

		Galya TASEVA, *UNWE /Cash holdings and indebtedness of publicly traded companies in Bulgaria during Covid-19 pandemic/* **Nelly POPOVA**, *UNWE, / Taxation of digital companies – current state and prospects/* **Gergana MIHAILOVA-BORISOVA,** *UNWE, / Mortgage Lending in Bulgaria/*
20:00 -22:30		**Official Dinner**
WEDNESDAY - November 20th Link for online		
09:00-11:00	**Plenary session 5** *Large Conference Hall*	**Moderator: Shouyi ZHANG, LEFMI, University of Picardie Jules Vernes** **Xinping Fu, Yuxuan Zheng,** *Hebei University of Economics and Business, China /Research on the efficiency and potential of China's agricultural exports to RCEP countries—Based on stochastic frontier gravity model/* **Yan Cai, Wei Li, Xiying Zhang, Hui Du** *Hebei University of Economics and Business, China /Is Household Education Spending an Investment or Consumption? A Perspective on Family Resilience/* **Danni Lang, Xiying Zhang, Meng Zhao** *Hebei University of Economics and Business, China /The Impact of the Establishment of Pilot Free Trade Zones on the High-Quality Development of China's Agricultural Product Trade/* **Zijing Jin, Zipeng Hui, Xiaopei Liu** *Hebei University of Economics and Business, China /Research on internationalization docking of China's digital trade rules in post-crisis period/* **Shuai Cui, Xiaoran Zhao, Jiaxi Tian, Xiying Zhang** *Hebei University of Economics and Business, China /Cross-border e-commerce, digital finance and economic resilience/* **Shouyi ZHANG,** *LEFMI, University of Picardie Jules Vernes /Distributed Ledger Technology for reinforcement of Sovereignty and Legitimacy: Chinese tradition on History Record/* **Iana PALIOVA**, *ERI of the Bulgarian Academy of Sciences/ The benefits of digital transformation for government/*
11:00 -11:30	**Coffee Break**	
11:30-11:45	**PRICE GIVING CEREMONY** *Large Conference Hall*	**Giving award to winners of student essays contest of Institute of Economics and Politics–** **Yanko HRISTOZOV**, Director of IEP, **Gergana MIHAILOVA**, Head of Department of Finance, UNWE
11:45-13:30	**Plenary session 5** *Large Conference Hall*	**Moderator: Yanko HRISTOZOV, Rossitsa TONCHEVA, MRC,UNWE** **PHD and Student session /Part 1/** **Elitsa KANTARDZIEVA**, PhD student, Plovdiv university /*INTERNATIONAL FINANCIAL INSTITUTIONS AS CROSS POINT OF SEVERAL THEORIES/*

		Stoyan Stoyanov, UNWE /Potential consequences of it disruptions on the value of companies/ **ANTONINA Toncheva** */The Digital Euro: A Catalyst for Economic Recovery and Digital Transformation in the Post-Crisis Period/* ***DINIȘOAE Silviu Maximus, IDITA Bogdan-Florin, LAZĂR Alexia**, Bucharest University of Economic Studies/ AI and the Future of Labor Markets in the EU/* **Yana PAVLOVA, UNWE, /** Monetary policy in the post-crisis period**/** **Danka KAPSAZOVA,UNWE /** Environmental, social and solidarity economy/
13:30-14:30	**Lunch**	
14:30-17:00	**Parallel Session** **Plenary session 5** *Large Conference Hall*	**Moderator: Rossitsa Toncheva, MRC, UNWE** **PHD and Student session /Part 2/** **Simona Bojinovska,** *PhD, Skopie University /tbc/* **STOIAN Mihaela, TUDOR Robert-Cristian, ȚUVEC George,** *Bucharest University of Economic Studies/ Analysis of the evolution of income inequality – causes and effects. Comparative analysis: Romania - EU27/* **NĂFORNIȚĂ Claudiu, ZHU Yao-Guo-Iulian, KAREEM Nofal, SHAMSAN Amr Adel Ameen**, *Bucharest University of Economic Studies/ Informational effects of Finance & Monetary Economics/* ***ȘEICĂRESCU Lavinia, STRUGARIU Lorena-Sunamita,** Bucharest University of Economic Studies / Case study: the importance of monitoring public finances. Why efficiency matters and how the population is directly affected by the state's decisions/* **OBREJA Carmen, STOICA Naty-Cristina-Georgiana, BUHUȘ Marius-Iulian, MITU Florin, AVRĂMESCU Adelin-Florian**, *Bucharest University of Economic Studies / tbc/*
14:30-17:00	**Parallel Session** **Plenary session 6** *Small Conference Hall*	**Moderator: Diyana Miteva, MRC, UNWE** ***Gabriela* KRASTEVA**, *UNWE /Digital Finance/* **BUSUIOC Cristian, BALAN Cristian, VOLCOV Alexandru, BUNEA Teodora- Gabriela, BUDA Paula-Gabriela**, *Bucharest University of Economic Studies / tbc/* **RADU Daria-Maria, PIRNEA Carla-Ștefania, STAMATIN Dragoș-George, RUZSA Darius-Ionuț**, *Bucharest University of Economic Studies / tbc/ '* **MUNTEANU Ana-Cristiana, VADUVA Jack James, RADU Andrei**, *Bucharest University of Economic Studies / tbc/* ***DERMENJI Nicoleta, COBÎLEANSCHI Daniel, COȚOFAN Artur**, Bucharest University of Economic Studies, /The financial crisis of Greece: from collapse to recovery/*
17:00-17:15	**Closing remarks** *Large Conference Hall*	**Nikolay NENOVSKY, Yanko Hristozov, Tatyana HOUBENOVA-DELISIVKOVA, Diyana MITEVA**