Zeszyty Naukowe
Szkoły Głównej
Gospodarstwa Wiejskiego
w Warszawie

Polityki Europejskie, Finanse i Marketing

nr 30 /79/ 2023

ZESZYTY NAUKOWE

Szkoły Głównej Gospodarstwa Wiejskiego
w Warszawie

SCIENTIFIC JOURNALS

Warsaw University of Life Sciences – SGGW

POLITYKI EUROPEJSKIE, FINANSE i MARKETING

NR 30 (79) 2023

EUROPEAN POLICIES, FINANCE AND MARKETING

NO 30 (79) 2023

Wydawnictwo SGGW
Warszawa 2023

Warsaw University of Life Sciences – SGGW Press
Warsaw 2023

ADRES KORESPONDENCYJNY
Szkoła Głowna Gospodarstwa Wiejskiego w Warszawie
Instytut Ekonomii i Finansów
ul. Nowoursynowska 166, 02-787 Warszawa
tel./fax: 22 593 41 94; e-mail: ojs_ieif-pefim@sggw.edu.pl

ISSN 2081-3430

Wydawnictwo SGGW
ul. Nowoursynowska 161, 02-787 Warszawa
tel. 22 593 55 23 (-27 – sprzedaż)
e-mail: wydawnictwo@sggw.edu.pl
https://wydawnictwo.sggw.edu.pl

SPIS TREŚCI

Polityki Europejskie, Finanse i Marketing
30 (79) 2023
DOI 10.22630/PEFIM.2023.30.79.11

Received: 15.07.2024
Accepted: 12.08.2024

Sławomir Juszczyk[1]✉, ***Daria Pawęda***[2]✉
[1] University of Piotrkow
[2] University of Navarra, IESE Business School

FINANCIAL EFFICIENCY OF POLISH COOPERATIVE BANKS AFTER THE IMPLEMENTATION OF BIOMETRIC TECHNOLOGIES

ABSTRACT
The main aim of the research was to identify the impact of the costs of biometric technologies in Polish cooperative banks on net profit and other measures of the financial efficiency of these banks. It was established, among others, that cooperative banks with implemented biometric technology are characterised by higher financial efficiency – measured by the level of net profit, ROE and C/I ratios compared to those that have not implemented any biometric technology.

Key words: biometrics, biometric banking, finger vein, palm vein, cooperative banking, costs, financial efficiency
JEL codes: G20, G21, G29, G30

Introduction

The topic of the financial efficiency of cooperative banks in the context of implemented biometric technologies is new, important and interesting – and, therefore, worth subjecting to scientific research. Moreover, in this area, there is a research gap between the rapidly and realistically changing biometric banking sector and the modest theoretical achievements in this area. The conducted research may contribute to answering the question of whether the implementation of biometric technologies has an impact on the financial efficiency of cooperative banks that have decided to implement such a solution. It is worth adding in this context that:

✉Sławomir Juszczyk, University of Piotrkow, slawomir.juszczyk@apt.edu.pl, https://orcid.org/0000-0003-3790-6247

✉Daria Pawęda, University of Navarra, IESE Business School, daria.paweda@iese.net, https://orcid.org/0009-0004-0333-7271

- according to J.P. Morgan Chase & Co [2023], global biometric payments will reach USD 5.8 trillion and 3 billion users by 2026;
- the biometric systems market will grow from USD 42.9 billion in 2023 to USD 82.9 billion in 2027, recording a CAGR[1] of 14.1%, and the growing use of biometric systems in the BFSI[2] sector is one of the most important factors driving market development[3];
- the global biometric card market size will grow from USD 0.17 billion in 2023 to USD 8.45 billion in 2028, at a CAGR of 117.76%[4];
- according to Mastercard, globally 74% of consumers have a positive attitude towards biometric technologies, and by 2026, the market for contactless biometric solutions is expected to reach USD 18.6 billion [Marciniak 2022].

Biometric technologies have been widely used around the world for many years – not only in banking, but also in other areas of the economy, including the military, aviation and automotive industries. They constitute an important branch of global economic systems. Modern technologies support the needs of banks and are indispensable for modern bankers who must use inventions in the field of IT, telecommunications and communications [Janc and Kotliński 2004]. These solutions must be distinguished by specific application values – such as reliability, speed or security – and additionally be characterised by the possibility of widespread use by banking customers [Janc and Kotliński 2004]. It can be considered that the use of biometric technologies in banking is a contemporary trend [Rudke 2017].

Materials and methods

The main aim of the research was to identify the impact of the costs of biometric technologies in Polish cooperative banks on the net profit and other measures of the financial efficiency of these banks.

One of the fundamental issues in economic research is sample selection. Researchers can choose to include all objects in the study or select only certain units. The research covered 50 cooperative banks from the BPS Group. All 25 cooperative banks in this group that had implemented finger vein biometric technology[5] or palm vein technology[6] since at least 2015 and used this technology continuously for at least three full years were examined (2016–2018), and for comparison, 25 similar cooperative banks that did not have implanted biometric technology were also examined. The research period spanned six years, from 2013 to 2018. It included the years 2013 and 2014, which were before the implementation of biometrics,

[1] *Compound Annual Growth Rate*, (CAGR) – an indicator used to calculate the average annual growth of a certain amount over the research period.
[2] BFSI – *Banking, Financial Services, Insurance*.
[3] Report: Global Biometric Systems Market with COVID-19 Impact, Analysis by Authentication Type (Single Factor, Fingerprint, Iris, Face, Voice; Multi-factor), Type (Contact-based, Contactless, Hybrid), Offering Type, Mobility, Vertical, and Region – Forecast to 2027, Markets and Markets.
[4] Report: *Biometric Card Market Size & Share Analysis – Growth Trends & Forecasts (2023–2028)*, Mordor Intelligence, Mordorintelligence.com/industry-reports.
[5] Finger vein – biometric technology developed by Hitachi, taking advantage of the individual uniqueness of the blood vessel system of the human finger.
[6] Palm vein – biometric customer identification technology, using the structure of blood vessels of the human hand, invented by the Japanese company Fujitsu.

as well as the years 2016, 2017 and 2018, which were after the implementation. Additionally, the year 2015 saw the highest number of biometric implementations, taking place at various quarters and months. However, while this year was analysed from an organisational perspective, it was not analysed from a financial perspective.

To select twin cooperative banks that did not have biometric technology implemented, a modification of the Euclidean method and the Manhattan city-block method was used, taking advantage of the similarity of the following features:

- balance sheet total;
- total own funds;
- loans and other gross receivables from the non-financial sector and local government institutions;
- the bank's area of operation and headquarters (village or city);
- economic region (i.e., the smallest possible distance from a bank with biometric technology, but no more than 150 km).

The source material for the research included:

- primary data from our own research;
- financial results published by cooperative banks, including documents such as information on the economic and financial situation of the cooperative bank, report on the financial audit of the cooperative bank, reports by independent auditors, information on the risk profile and capital level, balance sheets and profit and loss accounts of cooperative banks for a given research year, as well as additional information;
- materials from cooperative banks;
- statistical data of cooperative banks in Poland;
- materials from scientific conferences.

In our financial efficiency studies, the following efficiency measures were used:

- net financial profit [PLN] (i.e., the difference between the sum of revenues and extraordinary profits and the sum of the costs of obtaining them, extraordinary losses, income tax and other obligatory charges on the result);
- rate of return on equity ROE [%] (i.e., the rate of return on equity or profitability of equity);
- rate of return on total assets ROA [%] (i.e., the profitability ratio of total assets);
- C/I ratio [%], cost effectiveness (i.e., the cost-to-income ratio).

Two types of models were used – multiple regression models and panel models estimated based on panel data. The research used balanced panel data from 50 cooperative banks from the BPS Group, from 2013–2014 and 2016–2018, regarding 12 explanatory variables, these were:

- balance sheet total (thousands PLN);
- loans and other receivables from the non-financial sector and local government institutions (gross carrying amount), (thousands PLN);
- loans and other receivables from the non-financial sector and local government institutions with recognised impairment (gross carrying amount), (thousands PLN);
- NPL ratio [%];
- working income assets (thousands PLN);
- tangible fixed assets (thousands PLN);
- total own funds (thousands PLN);
- Tier 1 capital (thousands PLN);

- deposits of the non-financial sector and local government institutions (thousands PLN);
- total capital ratio TCR [%];
- bank operating costs (thousands PLN);
- binary variable: Has biometrics been implemented? [0 – no biometric technology, 1 – biometric technology implemented].

The models also provide the coefficient of determination R^2. Its complement is the convergence coefficient:

$$\varphi^2 = 1 - R^2$$ [Shanteau 1977, p. 134–136]

Taking into account the adopted research objective, panel models explaining the level of net financial result (thousands PLN) were estimated. PLN (Polish New Zloty), ROE [%] (Retrn on Equity), ROA [%] (Return on Assets), C/I [%] (Cost to Income) in the surveyed coopertive banks in the period before and after the implementation of biometric technology.

Results and discussion

During the research, the share of the costs of maintaining biometric technologies was recognised in total operating costs in the surveyed cooperative banks, as shown in Figure 1.

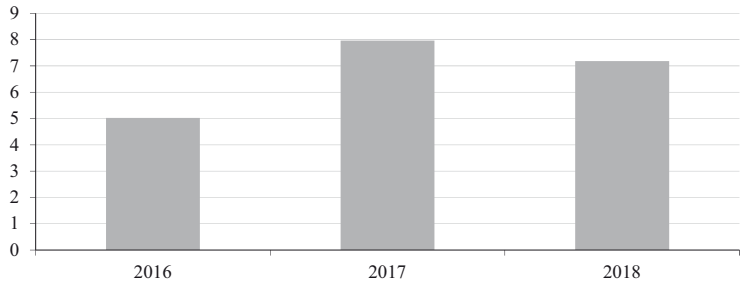

Figure 1. Share of biometric technology maintenance costs in total operating costs cooperative banks with this technology [%]

Source: Own research.

The trend line is described by the following equation:

$$\boldsymbol{y = 4{,}5609 + 1{,}0783x}$$

and $R^2 = 0{,}5026$

Research shows that in the years 2016–2018, the share of the costs of maintaining biometric technology in the operating costs of cooperative banks with this technology was approximately 7% and was characterised by an increasing trend. A year after the implementation of biometric technology, the average share of these costs in the operating costs of these banks amounted to 5.02%. In 2018, this share reached 7.18%. Moreover, the trend line shows that each year the share of biometric technology maintenance costs in the total operating costs of cooperative banks increased on average by approximately 1.0783 percentage points (p.p.). Furthermore,

the level of the determination coefficient indicates that the increase in the share of the costs of maintaining biometric technology in the total operating costs of cooperative banks with this technology resulted in 50.26% from the passage of time, and the remaining 49.34% of the variability in this increase resulted from other reasons. It is also important to note that the costs of maintaining biometric technologies in cooperative banks grew faster than the sum of other total operating costs of cooperative banks. Therefore, despite the incentives of companies providing and servicing these biometric technologies in cooperative banks, they are expensive and place a heavy burden on these banks. Additionally, it should be emphasised that during the research period, the highest level of this relationship was recorded in 2017 (i.e., two years after the implementation of biometric technology). This level was close to 8%. This was due to the fact that the costs of servicing biometric technology usually increased in the second year of its use due to the introduced maintenance fee, resulting in a significant increase in these costs. Taking the above into account, the research concluded that the share of the costs of maintaining biometric technologies in Polish cooperative banks in the structure of total operating costs is characterised by an increasing tendency, which should be assessed negatively.

During the research, it was also determined that there was a difference in net profit depending on whether the surveyed cooperative banks had or did not have biometric technology. The research was conducted in two groups. The first group consisted of banks that had implemented biometric technology by the end of 2015, and the second group included similar banks that did not have this technology. Then, the average level of financial results per cooperative bank was estimated in these groups. The results of the analyses are presented in Figure 2.

Research has shown that from 2016 to 2018, cooperative banks that implemented biometric technology and incurred costs for this purpose were, on average, characterised by a higher level of net profit than banks that did not have this technology. In 2016 and 2018, these differences reached nearly 7%, while in 2017, the difference in the level of average net profit between banks with and without biometric technology was approximately 30%. This indicates a positive impact of this technology on the financial results of cooperative banks, despite the high costs. Due to the fact that net profit may be calculated as the sum of revenues less the sum of costs, which also includes the cost of biometric technology, it is worth noting

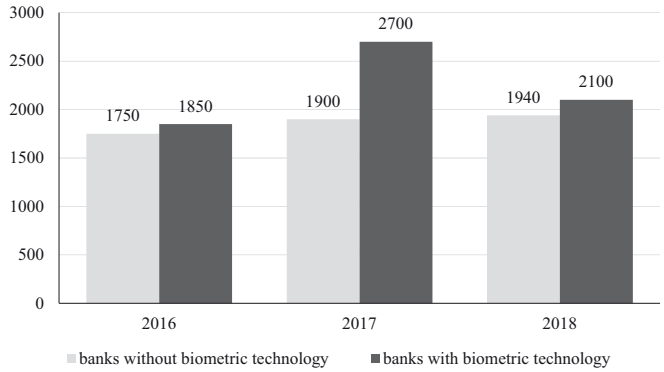

Figure 2. Level of net profit in the surveyed cooperative banks with implemented biometric technology and without this technology (thousands PLN)

Source: Own research.

that with each year of research, the profit in banks with implemented biometric technology was higher. This suggests that the costs for this technology were lower than the financial benefits, leading to an increase in the financial efficiency of cooperative banks with implemented biometric technology, as measured by net profit.

The research used balanced panel data from 50 cooperative banks from 2013–2014 and 2016–2018, regarding 12 explanatory variables. Taking into account the adopted main objective of the research, panel models explaining the level of net financial result (thousands PLN) were estimated. PLN, ROE [%], ROA [%], C/I [%] in the surveyed cooperative banks in the period before 2015 and after 2015.

First, potential factors influencing the net financial result of the surveyed cooperative banks were identified. Regression models of net profit were estimated using a panel model constructed for the two above-mentioned subperiods (i.e., 2013–2014 and 2016–2018). It is worth emphasising that the estimated net financial result models for the surveyed cooperative banks, divided into the period before and after the implementation of biometric technology, were characterised by a high level of determination coefficient exceeding 85%. The estimated models are presented in Table 1.

The research revealed that prior to the implementation of biometric technology (i.e., 2013–2014), the level of net financial results in the surveyed cooperative banks was influenced by six variables. Two of these variables were stimulants, meaning that an increase in them led to an increase in the net financial result. The stimulants included the balance sheet total and loans and other receivables from the non-financial sector and local government institutions. An increase of PLN 1,000 in the balance sheet total resulted in a net profit increase of PLN 90, while an increase of PLN 1,000 in loans and other receivables resulted in a net profit increase of PLN 10.On the other hand, there were four variables that acted as destimulants, meaning that an increase in them contributed to a decline in the net financial result. These destimulants included loans and other receivables from the non-financial sector and local government institutions with recognised impairment, tangible fixed assets, deposits from the non-financial sector and local government institutions, and bank operating costs. An increase of PLN 1,000 in each of these variables resulted in a net financial result decrease of PLN 80, PLN 130, PLN 90 and PLN 100, respectively.

It is important that, after the implementation of biometric technology (i.e., in the years 2016–2018), ten variables were considered important. These variables include the balance sheet total, loans and other receivables from the non-financial sector and local government institutions, loans and other receivables from the non-financial sector and local government institutions with recognised impairment, tangible fixed assets, bank operating costs, working assets, total own funds, Tier 1 capital, TCR and a binary variable indicating whether biometrics have been implemented. Five of these variables were consistent with the model developed for 2013–2014. Specifically, two variables acted as stimulants: the balance sheet total and loans and other receivables from the non-financial sector and local government institutions. Additionally, three variables acted as destimulants: loans and other receivables from the non-financial sector and local government institutions with recognised impairment, tangible fixed assets and bank operating costs. A larger negative regression coefficient for bank operating costs following the introduction of biometric technology may confirm the high cost of this technology. After implementing biometrics, additional explanatory variables included in the model are: working income assets, total own funds, Tier 1 capital, TCR and

Table 1 . Multiple regression model of net financial result (thousands PLN) in the surveyed cooperative banks

Variable	Years 2013–2014		Years 2016–18	
	Regression coefficient	Level of significance	Regression coefficient	Level of significance
Const.	–147.63	*	130.556	**
Total balance sheet (thousands PLN)	0.09	***	0.18	***
Loans and other receivables from the non-financial sector and local government institutions – gross carrying amount (thousands PLN)	0.01	**	0.01	**
Loans and other receivables from the non-financial sector and local government institutions with recognised impairment – gross carrying amount (thousands PLN)	–0.08	***	–0.20	***
Tangible fixed assets (thousands PLN)	–0.13	***	–0.35	***
Deposits of the non-financial sector and local government institutions (thousands PLN)	–0.09	***	———	———
Bank operating costs (thousands PLN)	–0.10	*	–0.27	***
Working income assets (thousands PLN)	———	———	0.18	***
Total own funds (thousands PLN)	———	———	0.17	***
Tier 1 capital (thousands PLN)	———	———	–0.10	*
TCR (%)	———	———	–53.23	**
Has biometrics been implemented? [0 – no biometric technology; 1 – biometric technology implemented]	———	———	301.35	*
R^2 (%)	93%		88%	
Level of significance: *** $p = 0.01$; ** $p = 0.05$; * $p = 0.1$				

Source: Own research.

the implementation of biometric technology. The key point here is that implementing biometric technology in a cooperative bank resulted in an annual average increase in net profit of PLN 301.35 thousand. It is worth noting that the model with 10 explanatory variables had a lower coefficient of determination, indirectly suggesting that managing a cooperative bank after implementing biometric technology is more complex.

It is worth emphasising that the regression coefficient for the balance sheet total doubled from 0.09 thousand PLN to 0.18 thousand PLN after the implementation of biometric technology. This means that a 1,000 PLN increase in the balance sheet total resulted in a 180 PLN increase in the net financial result per year. In contrast, loans and other receivables from the non-financial sector and local government institutions had a stronger negative impact after the implementation of biometric technology. An increase of 1,000 PLN in these loans resulted in a reduction of the financial result by 200 PLN annually due to costs and write-offs. This suggests that managers should pay attention to the quality of loans after implementing biometric technology. Additionally, the regression coefficient for property, plant, and equipment had a higher absolute value. An increase of 1,000 PLN in these assets resulted in a decrease of 350 PLN in the net financial result annually. Therefore, it can be assumed that cooperative

banks, after implementing biometric technology, should reduce tangible fixed assets while increasing their balance sheet total. This is related to the importance of increasing current assets, such as high-quality loans granted.

The analysis also compared the profitability of equity in the surveyed cooperative banks, depending on whether they had implemented biometric technology or not. The data in Figure 3 shows that from 2016 to 2018, banks without biometric technology achieved a lower level of ROE compared to banks that had implemented this technology. In 2017, banks with biometric solutions implemented achieved a significantly higher ROE than those without this technology.

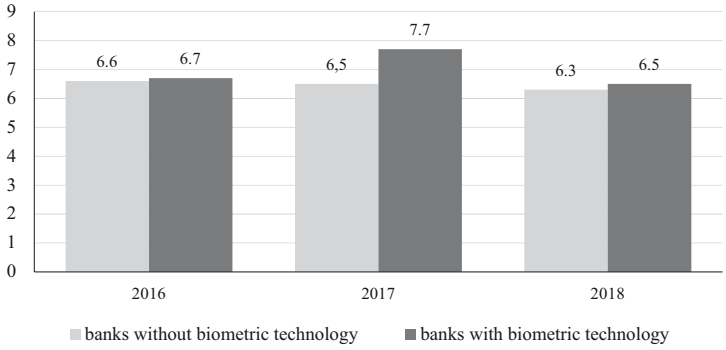

Figure 3. Returns on equity in cooperative banks with biometric technology and without this technology [%]
Source: Own research.

Research shows that the implementation of biometric technology resulted in an increase in ROE. However, the largest differences in this regard between banks with and without biometric technology were observed in 2017, which is mostly two years after the implementation of biometric technology.

With respect to the return on total assets, the differentiation of this measure was assessed in relation to cooperative banks with and without biometric technology. Figure 4 presents the research results, which show that banks that had implemented biometric solutions achieved a higher level of ROA in 2017. However, in the remaining years of the research, the return on total assets in these banks was lower compared to banks that did not have this technology. This may indicate that banks with biometric technology have a lower ROA level due to greater sales at a lower margin, but still profitable, which slowly increased the net financial result.

It can be assumed that banks with implemented biometric technology significantly accelerate lending and become more technologically and price competitive. However, due to the scale effect, a decreasing profitability of total assets can be observed. The ROA ratio in these banks is decreasing, but net profit, balance sheet total and ROE are increasing. Overall, this is a positive phenomenon.

The last of the analysed efficiency measures was the level of the C/I ratio. The results in this respect are presented in Figure 5. In the case of this efficiency measure, it was found that the implementation of biometric technology translated into improved cost efficiency of cooperative banks. Throughout the research period, cooperative banks that had these technologies were characterised by a lower C/I level than banks that did not have such solutions.

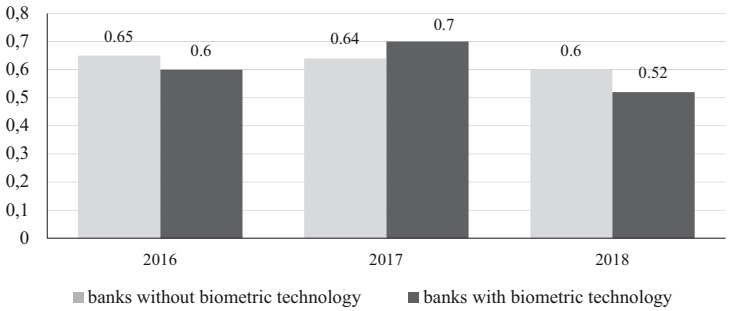

Figure 4. Impact of biometric technology costs on the level of total asset profitability in the surveyed cooperative banks [%]

Source: Own research.

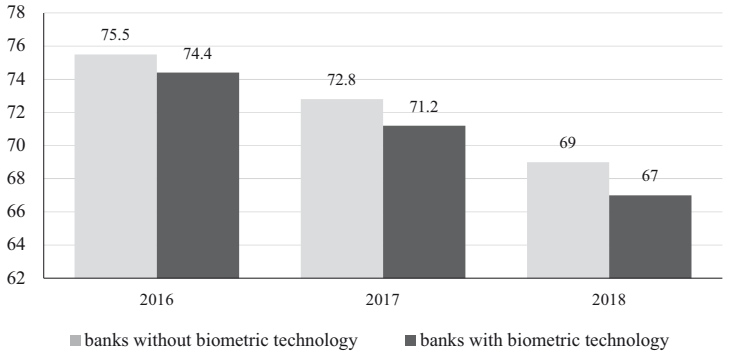

Figure 5. The level of the C/I ratio in the surveyed cooperative banks [%]

Source: Own research.

Based on the research results, it can be concluded that cooperative banks that incur costs for the implementation and maintenance of biometric technologies are characterised by a higher level of financial efficiency compared to those that have not implemented any biometric technology, taking into account the financial result (net profit), ROE and C/I ratios and, partially, the ROA indicator.

Conclusions

1. In the years 2016–2018, the share of the costs of maintaining biometric technologies in the operating costs of cooperative banks with this technology was approximately 7% and was characterised by an increasing tendency. The costs of maintaining biometric technologies in cooperative banks grew faster than the sum of other total operating costs of cooperative banks (i.e., biometric technologies in cooperative banks clearly burden these banks). During the research period, the highest level of this relationship was recorded in 2017 (i.e., two years after the implementation of biometric technology), which resulted

from the fact that the costs of servicing biometric technology most often increased in the second year of its use due to the introduction of, among others, a maintenance fee, which resulted in an increase in these costs.

2. Net profit after the implementation of biometric technology increased, which is a positive phenomenon. In the years 2016–2018, cooperative banks that implemented biometric technology and incurred costs for this purpose were, on average, characterised by a higher level of net profit than banks that did not have this technology.
3. The correlation between the implementation of biometric technology and financial results, specifically ROE, ROA and C/I indicators, was significant. The coefficient of determination, R^2, was calculated in the models. It was found that for the net financial result, the R^2 coefficient for the years 2016–2018 (after the implementation of biometric technology) was 88%. Implementing biometric technology in a cooperative bank led to an average annual increase of over PLN 301,000 in net profit. For the return on equity (ROE) ratio, the R^2 coefficient for the years 2016–2018 was 70%. Implementing biometric technology resulted in an average increase of 0.58412 p.p. in ROE. Similarly, for the return on total assets (ROA) ratio, the R^2 coefficient for 2016–2018 was 71%. Implementing biometrics led to an increase of 0.02191 percentage points in ROA. These findings highlight the significance of biometric technology in shaping the return on total assets (ROA) in the surveyed cooperative banks.
4. The implementation of biometric technology is not the most important factor in shaping financial efficiency, but it is an important factor for both financial and prestige reasons. Therefore, it is worth implementing this technology and making it available to customers of cooperative banks.

References

Janc, A., Kotliński, G. (2004). Nowe technologie we współczesnym banku. Poznań: University of Economics.

J.P. Morgan Chase & Co. (2023). J.P. Morgan is a pilot of biometrics-based payments for merchants, www.JPmorgan.com/insights/payments/payment-trends/ [accessed: 23.03.2023].

Marciniak, A. (2022). With a smile or a wave of your hand – paying in the store has become possible even more personal. Mastercard, www.mastercard.com/news/europe/pl-pl/centrum-press/news/pl-pl/2022 [accessed: 19.05.2022].

Report: Global Biometric Systems Market with COVID-19 Impact, Analysis by Authentication Type (Single Factor, Fingerprint, Iris, Face, Voice; Multi-factor), Type (Contact-based, Contactless, Hybrid), Offering Type, Mobility, Vertical, and Region – Forecast to 2027. Markets and Markets.

Report: Biometric Card Market Size & Share Analysis – Growth Trends & Forecasts (2023–2028). Mordor Intelligence, www.Mordorintelligence.com/industry-reports [accessed: 03.06.2023].

Rudke, M. (2017). Biometria i satelity – tego oczekują klienci. Rzeczpospolita.pl, https://cyfrowa.rp.pl/biznes-ludzie-startupy/art16905161-biometria-i-satelity-tego-oczekuja-klienci [accessed: 23.03.2023].

Shanteau, J. (1977). Correlation as a deceiving measure of fit. Bulletin of the Psychonomic Society, 10(2), 1977, 134–136.

EFEKTYWNOŚĆ FINANSOWA POLSKICH BANKÓW SPÓŁDZIELCZYCHPO IMPLEMENTACJI TECHNOLOGII BIOMETRYCZNYCH

STRESZCZENIE

Celem głównym badań było rozpoznanie wpływu kosztów technologii biometrycznych w polskich bankach spółdzielczych na zysk netto oraz inne miary efektywności finansowej tych banków. Ustalono m.in., że banki spółdzielcze z zaimplementowaną technologią biometryczną charakteryzują się wyższą efektywnością finansową mierzoną poziomem zysku netto, wskaźnikiem C/I oraz ROE wobec tych, które nie wdrożyły żadnej technologii biometrycznej.

Słowa kluczowe: biometria, bankowość biometryczna, *finger vein*, *palm vein*, bankowość spółdzielcza, koszty, efektywność finansowa

Polityki Europejskie, Finanse i Marketing
30 (79) 2023
DOI 10.22630/PEFIM.2023.30.79.12

Received: 24.01.2024
Accepted: 18.03.2024

Dorota Korenik✉
Wroclaw University of Economics and Business Poland

THE RELEVANCE OF THE "SME FINANCING GAP" IN THE OPERATION OF REGIONAL DEVELOPMENT FUNDS IN POLAND. THE CONTEXT OF REDUCING THE FINANCING GAP IN THE REGIONS

ABSTRACT
The primary objective of the study was to establish the significance of the "financing gap" category (in the regional SME sector) in the activities of Regional Development Funds in Poland. For the purposes of the study, a critical analysis of the economic category "financing gap" was carried out in terms of conceptual-interpretation and measurement; analysis of documents constituting formal-legal requirements for the implementation of financial engineering instruments by the Regional Development Funds in Poland, in particular the applicable legal acts and documented Investment Strategies, which are implemented by the Regional Development Funds; analysis of the size of the existing financing gap in the regional and nationwide dimension and the degree of coverage as a result of the activities of the Regional Development Funds in Poland. The research results include the limitations of the category of the financial gap in the regional SME sector as a premise for the activities of the Regional Development Funds and an assessment of the contribution of these institutions to bridging the financial gap in the regions (voivodeships). Conclusions are formulated on the obtained picture of the coverage of the financial gap with the participation of the Regional Development Funds and recommendations for the practice of such funds in the direction of a closer link between their activities and the levelling of the effects of the financial gap in the regional SME sectors.

Keywords: regional financial institution, SME financing, SME financial gap
JEL codes: G23, R11, R58

Introduction

The activities of Regional Development Funds (RDFs) are closely associated with the economic category "financing gap" in relation to the SME sector. In Poland, Regional Development Funds (RDFs) have been or will soon be set up to support regionally the development

✉Dorota Korenik, Wroclaw University of Economics and Business Poland, dorota.korenik@ue.wroc.pl, https://orcid.org/0000-0002-8418-2571

of mainly the SME sector. The RDF is owned by the voivodeship local-government (the provincial government can only own one RDF) and operates in the region for which the owner is responsible. Hence, the field of vision of the RDF involves the SME entrepreneurs who are operating or starting up in the relevant region for the RDF. The Regional Development Funds are indeed financial institutions, but specific ones. They have been assigned a dual role in the economy, i.e. they are supposed to be entities of the public finance sector, but acting as market financial sector entities. It is intended that the RDF should not have a disruptive effect on competition in the banking and financial market in the region, that its product offer should be complementary to that of market financial institutions and that it should not cause substitution of financial products. The RDF is expected to make a positive contribution to reducing the effects of the market mechanism's failure by meeting the financial needs of SMEs, but at the same time fulfilling the condition of the Fund's long-term profitable operation. In a similar way, these assumptions are articulated by the practitioner community (National Association of Regional Development Funds) and are reflected in EU policy on public financial engineering instruments. This dual nature of RDFs' activities, in the context of their role in the economy, has also been scientifically demonstrated as factual in the monograph by Korenik and Ignor [2024].

The reduction of the effects of the market mechanism failure by the RDF and the RDFs sector has been associated in the EU regulatory community and economic practitioners with the phenomenon of the financing gap for small and medium-sized enterprises (SMEs), also known as the "SME financing gap" or "MSME finance gap", meaning that there are significant numbers of SMEs that could use funds productively if they were available, but cannot obtain finance from the formal financial system [OECD 2006, p. 89, IFC 2017, p. 2]. In this view, RDFs are supposed to make a real contribution to addressing the financing gap in the regional economy, i.e. they are supposed to contribute to closing the financing gap in the regional SME sector. While the category of "financing gap" in the SME sector is often recognized in studies on Regional Development Funds, little attention has been given to its relevance in the practice of such funds and to assessing their contribution to reducing the effects of market mechanism failure (bridging the SME financing gap phenomenon in the region).

Methodological aspect of the study

The research problem concerns the application of the economic category 'financing gap' (in relation to the SME sector), known as the 'SME financing gap', to the activities of the Regional Development Funds in Poland. Two research questions are posed:

- Why is the SME financing gap category problematic in the practice of the Regional Development Funds?
- Why is the 'SME financing gap' category problematic in assessing the legitimacy of the activities carried out by the Regional Development Funds?

In essence, both questions are closely related to the limitations of the 'financing gap' category in the SME sector, in particular the informational and cognitive and formal limitations. Hence, the structure of the content breakdown reflects the presence of such constraints.

In the search for answers, cognitive objectives are required:

- Identifying the implications of the cognitive, informational and formal limitations of applying the SME financing gap category to RDFs' activities;

- Attempting to assess the contribution of RDFs to bridging the financing gap in the SME sector, using the 'SME financing gap' category.

An additional objective of the study is of a utilitarian nature. Postulates will be made for the practice of RDFs towards its closer association with bridging the effects of the financing gap in the regional SME sector.

Results and conclusions on the informational and cognitive limitations of the financing gap in the SME sector in context, i.e. in the context of the activities of the Regional Development Fund, are presented on the basis of a critical analysis of the conceptual and interpretative issues and the measurement of this gap. With that said, the author stipulates that there is no room in this paper for a complete and detailed review of the literature on the SME financing gap and a detailed consideration of both issues of the gap; these issues deserve a separate study and are of interest to many researchers in general. This article also does not fit directly into the debate on the methodology of calculating the financing gap. In the context of the activities of Polish RDFs and justifying the rationale of their existence, the article may lead to the need to start a debate on the methodology of calculating the financing gap in the SME sector by region (voivodeship).

The results and conclusions on the formal constraints were obtained primarily from an analysis of source documents that define the formal and legal requirements for the implementation of financial engineering instruments by RDFs in Poland; in particular, these are documents defining the directions, objectives, principles and methods of implementation of the Financial Instruments under the Regional Operational Programmes (called 'Investment Strategies'). The practical knowledge gained from the Poland Association of Regional Development Funds is also useful.

In turn, for the purpose of assessing the contribution of RDFs to bridging the SME financing gap, an analysis was carried out, in particular benchmarking and using data from epsec and ipopema, fi-compass, the Poland Association of Regional Development Funds reports.

Results and discussion

Cognitive and informational limitations of the SME financing gap category.

In the light of the analysis of the empirical knowledge to date on the financing gap in the SME sector, including Poland, the following can be concluded. The need to finance SME entrepreneurs with foreign capital has been increasing in Poland in recent years. In the light of forecasts for the period up to 2029, the financing gap (with its various types) for the SME sector in Poland will increase [epsec and ipopema 2020]. Although there are many sources of market-based financing, an enterprise must meet a number of conditions to guarantee its repayment and reckon with the cost of using capital. The financing of SME development, no matter in which country, differs significantly from the financing of large enterprises, which has consequences for SME preferences regarding sources of financing, as well as for the relationship between the SME and the provider of external financing [OECD 2006]. Both the consequences for SMEs' preferences and the relationship with the provider of market financing are widely discussed in the aforementioned OECD study and are the subject of much research and academic debate, e.g. Masiak, Moritz and Lang [2020], Ayadi and Gadi [2013], Hallberg [2001], Kuntchev, Ramalho, Rodriguez-Meza, and Yang [2014].

The negative experience of the global financial crisis gave rise to a number of initiatives to monitor access to corporate finance. For example, after 2008, monitoring of SMEs' access to finance began in the form of comparative tables for OECD member countries and selected economies. After 2008, there has been a significant increase in the diversification of SME financing instruments with a relatively slow increase in traditional debt. This has resulted in increased resilience to changes in credit/loan market conditions. However, these developments are not without risks and challenges for global policymakers and regulators, who need to ensure an adequate level of investor protection and promote a level playing field between different financial instruments [DFI Working Group 2019, OECD 2020, 2022]. This kind of responsibility is also incumbent on the provincial government, for which the RDF is an institutional tool for the implementation of regional development policies and interventions in the local banking and financial market.

There is a large body of work on specific issues concerning the SME financing gap phenomenon in various countries, including Poland. These include: a) the barriers of SMEs in accessing external capital; b) the causes of the financing gap in the SME sector and in different research contexts, such as the different phases in the life cycle of a business (e.g. Wilson, Wright and Kacer [2018]), the stages of the innovation process (e.g. Frank et al. [1996], Auerswald and Branscomb [2003], Wessner [2005], Ford, Koutsky and Spiwak [2007]), the context of the organisation of the financial system especially banking (e.g. Gama, Sol Murta and Vieira [2024]), the context of the efficiency of the public financing system for the SME sector developed by special financial institutions, such as ADB, EBRD, EIB, World Bank, the context of the existing legal system; and c) the measurement and problems of measuring the financing gap (e.g. Galizia [2003], Wilson, Wright and Kacer [2018], IFC [2017]). There are also many studies on the financial gap in the Polish SME sector, its scale and structure, and estimation methods. Some of the studies are international studies carried out by international organisations and institutions. In the light of the experience to date, which Polish RDFs share on the forum of the Poland Association of Regional Development Funds, the following are particularly noteworthy: the fi-compass report [2019] for the European Commission and the report of the European Investment Bank, which estimates the equity financing gap and the debt financing gap for SMEs in Poland and in other EU countries, as well as comparative tables for member countries presenting SME access to finance [OECD 2020]. The advantage of these publications is that international comparisons can be made. On the other hand, among Polish publications, the annual reports of Bank Pekao SA [2021, 2022] on the situation of micro, small and medium-sized companies based on telephone interviews with owners of 7,500 companies employing up to 249 persons (99.8% of all active companies in Poland), and the 'Report on the estimation of financing needs and the financing gap' prepared for the Ministry of Funds and Regional Policy [epsec and ipopema 2020], are useful for RDFs. The advantage of these publications is their in-depth nature, as they focus on SMEs in Poland and consider the regional (and local) dimension, resulting in a presentation of the financing gap, including in a regional dimension.

However, the wide and varied body of empirical and expert knowledge has not translated into a universal and authoritative solution (tool) for measuring and assessing the contribution of RDFs and the RDFs sector to solving the SME financing gap on a regional scale (neither nationally nor in international comparisons). The multiple meanings and terminologies of the financing gap in the theoretical literature do not help either. Numerous interpretations of the

concept and terms of the financing gap are in operation, such as: the Macmillan gap [Stamp 1931], the financing gap in the light of the concept of credit rationing [Stiglitz and Weiss 1981, De Meza and Webb 1987], the equity gap [Cosh, Cumming and Hughes 2009, Cressy 2012, McCahery et al. 2015] and the liquidity gap [Klonowski 2009], the equity gap equated with the equity gap or the Macmillan gap [Górka 2012], and the financing gap in the sense of the Macmillan gap [Masiukiewicz 2017]. Also a slightly different terminology is used by fi-compass [2019] in a report for the European Commission and the European Investment Bank on estimating the financing gap for European SMEs. It defines and estimates two types of financing gap: the equity financing gap and the debt financing gap. According to the authors of the report, the estimation of both gaps aims to identify the unmet demand for each financial product by financially viable SMEs that have not been successful in receiving financing. Estimating these gaps involves, on the one hand, measuring the size of the population of SMEs that should receive financing (because it is financially viable but, for various reasons, do not receive it) and estimating how much these SMEs should receive financing (if market mechanisms are operating inefficiently). The equity financing gap and debt financing gap are even estimated differently by epsec and ipopema. The estimates are much more detailed and include both data and results for individual provinces, as well as data on the components of these gaps. In the case of the debt financing gap, these are the guarantee gap (the value of capital needed to provide guarantees for loans with collateral problems) and the loan gap, while in the case of the equity financing gap, these are the growth-phase financing gap and the early-stage financing gap.

Estimates of the financing gap vary and can potentially paint a surprisingly different picture. This is exemplified by the estimates contained in epsec/ipopema [2020] and the findings of fi-compass [2019], which are usually in the field of view of Polish RDFs and the National Association of Regional Development Funds. In light of the fi-compass report [2019], the relatively low level of the debt financing gap in Poland compared to many EU countries may be due to the fact that SMEs in Poland are financed not only by commercial banks, but also by cooperative banks and non-bank institutions, such as savings banks or foundations. This means that such SMEs, which are not considered viable by the banking system, can receive financing from other entities.

In analysing the epsec and ipopema [2020] data on the size of both gaps, i.e. PLN 6.38 billion for the debt financing gap and PLN 2.23 billion for the equity financing gap in 2019, and confronting them with the fi-compass [2019] estimates of PLN 46.7 billion and PLN 19.1 billion in 2018 respectively, a large discrepancy is evident, which would be difficult to justify by changes in macroeconomic conditions. The discrepancies are due to the methodological differences in the estimation of the gaps. However, leaving aside the methodological differences, it can be seen that the value of the debt financing gap – both in the guarantees and loans part – is significantly higher for micro and medium-sized enterprises than for small enterprises. Moreover, the highest debt financing gaps are characteristic for those voivodeships in Poland where more enterprises are located, i.e. such voivodeships as Mazowieckie, Śląskie, Dolnośląskie, Wielkopolskie, Małopolskie and Pomorskie. In turn, the equity financing gap consists of two gaps - financing in the growth phase (PLN 1.2 billion) and financing in the early phase (PLN 1 billion). The regional distribution of this gap is similar, with the highest gap values recorded in the Mazowieckie, Śląskie, Dolnośląskie, Wielkopolskie, Małopolskie and Pomorskie voivodeships.

For analyses of any changes in the financing gap over time, comparisons of the research results based on the same research method and comparable data sources should be used. Such studies for the Polish economy are not available, although their systematic conduct and repetition is desirable, including for the RDFs sector. Only to a limited extent is the picture of the changing financing gap signalled by the results of surveys among entrepreneurs and made available by Bank Pekao S.A. in its annual reports on the situation of micro, small and medium-sized companies. Bank Pekao's reports provide material on the trends and changes in SMEs' access to external financing by province and in the context of changes in the bank's appetite for credit risk and by NUTS2. For example, in the light of the epsec and ipopema analyses [2020] and their link to the analyses of Bank Pekao [2021], a picture has emerged of a sharply reduced availability of market funding for SMEs from 2020 onwards, in view of the increase in risk aversion on the part of banks and the tightening of credit conditions for companies, as shown in turn by NBP reports [2020, 2021, 2022].

Worth highlighting and dedicating to RDFs is a point made by fi-compass [2019, p. 17], that the estimates should be taken as indicative of the value of additional financing that should be provided to the SMEs. Indeed, the level of the estimated financing gap is influenced by various factors, such as the bank's appetite for credit risk in a given market situation (especially for the assessment of the debt financing gap), the maturity and depth of the equity market (the number of venture capital and private equity funds investing in a given country, their risk strategies, the SME's familiarity with the capital market and their willingness to apply for such financing in the context of, for example, a preference to share control), the interdependencies between different markets (the debt financing gap may indicate a lack of microfinance in some countries or the equity financing gap may indicate a very low bank appetite for credit risk, which may be due to the fact that obtaining equity financing is easier than debt financing), the financial skills of the SMEs and their ability to apply for financing.

Formal-legal constraints for the application of the SME financing gap category to the activities of Regional Development Funds. Implications for RDFs

The RDFs' activities consist in implementing financial instruments, in particular repayable financing with public funds. RDFs should plan and build their product offer in a thoughtful and responsible manner, considering the dual nature of their activities. To this end, planning and implementation documents are produced, such as investment strategies, financial product charters, analyses and recommendations. The recommended planning process should be based on an analysis of the following conditions: regional (e.g. strategy of a given voivodeship), market (e.g. supply of public and private offers of financial products), institutional (e.g. choice of implementation model), financial-economic (e.g. economic effects in relation to the assumed goals of intervention), legal (e.g. in the scope of regulations on public aid), and organisational (e.g. applied solutions in the RDF system of regional support). At the same time, a sine qua non for the design and implementation of instruments in the region's economy is their inclusion in the applicable legal framework.

It should be emphasised that the repayable financing of the SME sector in the legal aspect needs to be improved, as there is a growing awareness in the business environment of the RDFs (the Polish Agency for Enterprise Development, the Institute for Market Economy

Research, the Polish Association of Loan Funds, the National Association of Guarantee Funds, and the Poland Association of Regional Development Funds) urgent need to solve numerous legal problems, which is discussed in more detail in Korenik and Ignor [2024].

The next stage is the implementation process supported by appropriate strategic and operational documentation. Each financial instrument is described and justified in an 'Investment Strategy' and its basic assumptions and boundary conditions are presented in a product fiche. Investment Strategies are documents that evolve (in response to new demands of the regional development objectives or the market) and change over time. They are subject to internal consultation and analysis, and in some provinces special investment boards are established for this purpose and/or special studies are carried out. On the basis of the Investment Strategies, annual action plans are created, which are material and financial plans that define the planned course of the Investment Strategy implementation in the future period, i.e. the calendar year. Both the Investment Strategy and the activity plan are approved by the provincial board.

For the implementation of financial engineering instruments, RDFs can make use of financing gap studies, which regional governments are obliged to carry out on the basis of Article 37 of the General Regulation [Dz. Urz. UE z 20.12.2013 r., L 347] and now Article 17(3) and Article 52(3) [Dz.U. L 231 z 30.6.2021]. However, funding gap studies are not directly documented in the 'Investment Strategies' that implement the RDFs. This has to do with the vague provisions and indications of this regulation, which boil down to the conundrum that the activities of institutions implementing financial instruments should only fill the financing gap in areas where market-based financing is not available. There are no specific directional regulations for the provincial government. In addition, the activities of RDFs should be subjected to evaluation studies, in terms of their impact on the existing financial gap phenomenon. Admittedly, for the implementation of financial instruments in the 2014–2020 and 2021–2027 financial perspectives, a legal requirement has been introduced that an *ex-ante* evaluation is mandatory, which will indicate the existence of market mechanism failures or sub-optimal levels of investment, as well as the estimated level and extent of demand for public investment. This assessment should also identify the types of financial instruments best suited to the situation. However, in light of the commentary by the Ministry of Funds and Regional Policy [MFiPR 2021], there is no requirement to verify the *ex-ante* assessment and the reliability of the assumptions made for it before deciding on the amount of initial capital equipment for a given financial instrument. This still implies the configuration of the monitoring, reporting and control system in the RDF and the provincial government. The RDF system is oriented towards the requirements directed by the Marshal's Office, i.e. the fulfilment of the requirements of the Investment Strategy in areas like: indicated investment/financing directions, restriction to a specific target group, concretely characterised financial products, including by means of their metrics, the level of implementation of allocations to individual financial products, the level of assumed and actual claims for each financial product. The provincial government also has the ability to encroach on the activities of RDFs through the relevant local government body, including the use of experts. However, the supervision of the local government serves to protect against irregularities in public finance discipline and to ensure the security of funds. As a consequence, evaluation studies in terms of their impact on bridging the financial gap in the region are not carried out, nor are they required to be carried out, by the Marshal Offices (boards of provincial local

governments). RDFs are not obliged to conduct analyses on the incidence of the financing gap, or the scope and area of intervention. In this respect, they have no imposed requirements and thus their action can only result from substantive needs.

An attempt to quantitatively assess the contribution of the Regional Development Funds to date in bridging the SME financing gap

When analyzing the economic effects of RDFs' activities, a comparison should be made between the market needs (value of the financing gap) among the SME population and the value of the funds that RDFs manage (distribute). Table 1 summarizes the results and outcomes of the potential ability of RDFs to cover the SME financing gap identified in the epsec and ipopema [2020] report in terms of the value of the funds they manage.

Table 1. Bridging the SME financing gap by RDFs (in terms of voivodeships)

Regions (voivodeships)	Estimated SME financial gap [PLN million]	Value of funds managed by RDFs [PLN million]	SME financing gap that RDF/ RDFs can reduce [%]
Poland	8611	3965	46.05
Dolnośląskie	707	400	56.58
Kujawsko-Pomorskie	333	620	186.19
Lubelskie	282	155	54.96
Lubuskie	166	*	*
Łódzkie	387	210	54.26
Małopolskie	760	170	22.37
Mazowieckie	2288	*	*
Opolskie	153	30	19.61
Podkarpackie	356	120	33.71
Podlaskie	179	160	89.39
Pomorskie	560	520	92.86
Śląskie	859	85	9.90
Świętokrzyskie	157	185	117.83
Warmińsko-Mazurskie	190	*	*
Wielkopolskie	889	890	100.11
Zachodniopomorskie	344	420	122.09

* RDF is not present (work on launch is ongoing).

Source: Own calculations based on data from epsec and ipopema [2020], OSRFR [2021].

The RDFs sector can reduce the existing SME financing gap by approximately 46%. Furthermore, the summary shows that there is no correlation between the potential allocations of RDFs and the estimated gap in the voivodeships. In four regions, the value of the money supply distributed by RDFs is larger than the estimated gap, and in nine voivodeships it is smaller. It might seem that in some regions RDFs are able to close the regional funding gaps.

However, when confronted with the gap estimation results reported in the fi-compass [2019] report, the magnitude of gap satisfaction by RDFs drops significantly. Table 2 presents the gap values from the two reports cited earlier and the potential gap covered by RDFs.

Table 2. Bridging the SME financing gap by RDFs in Poland

Specification	Volume of funds [PLN million]	SME financing gap adressed by RDFs	Volume of funds missing [PLN million]
Financial gap according to epsec/ipopema	8 611	46%	-4 646
Financial gap according to fi-compass	65 800	6%	-61 835
Regional Development Funds	3 965		

Source: Own calculations based on data from epsec and ipopema [2020], OSRFR [2021].

It appears that the difference in bridging the SME financing gap by RDFs, by comparing the two studies in Table 2, is as much as 40 percentage points, which translates into a value of PLN 57.18 billion.

It can be assessed that the RDFs' activities contribute to reducing the financing gap, but do not close it. The assessment is all the more valid given that the projections for the size of the financing gap up to 2029 are unfavorable, with a tendency to increase. However, with such a wide divergence of results (epsec/ipopema and fi-compass), the degree of impact is ambiguous and debatable.

In light of the results in Table 2, one would still have to ask to what extent the product offer of RDFs fits the needs of satisfying the different types of gap: equity financing gap and debt financing gap for SMEs, resulting from the failure of market mechanisms in Poland. Table 3 presents the equity and debt financing gaps according to epsec and ipopema [2020] and fi-compass [2019], and their satisfaction by RDFs.

Table 3. Addressing in the equity and debt financing gaps by RDFs in Poland

Specification	Financial gap according to epsec/ipopema	Financial gap according to fi-compass	Regional Development Funds
Total volume of measures [PLN million]	8 611	65 800	3 965
Volume of funds for equity instruments [PLN million]	2 230	19 100	55
Volume of funds for debt instruments [PLN million]	6 381	46 700	3 910
Addressing in the equity financing gap by RDFs [%]	2.47%	0.29%	
Addressing in the debt financing gap by RDFs [%]	61.28%	8.37%	

Source: Own calculations based on data from epsec/ipopema [2020], OSRFR [2021].

RDFs are barely able to reduce the equity financing gap, at 2.47% and 0.29% respectively. This suggests that there is a serious deficit in the RDFs' equity financing offer. Only two RDFs, i.e. the Dolnośląskie Development Fund and the Śląskie Development Fund, decided to launch equity financing, allocating PLN 25 million and PLN 30 million respectively. It should be stressed that in both of these voivodeships the total financing gap, including the debt financing gap, remains seriously unmet.

RDFs are far more important in terms of bridging the debt financing gap, as evidenced by the product offering, which consists primarily of debt financial instruments. In the case of some voivodeships (Kujawsko-Pomorskie, Zachodniopomorskie, Świętokrzyskie), it is not clear whether, despite the seemingly almost completely closed the SME financing gap, which

is de facto the debt financing gap, there is nonetheless an equity financing gap. The lack of knowledge is due to the lack of systematic research in the area of the financing gap, including its types in the regional (voivodeship) dimension.

Conclusions

Overall, RDFs in Poland do not close the existing SME financing gap. In the face of multi-year forecasts of the growing financing gap in the SME sector, the contribution of RDFs to bridging the gap is still insignificant; more is needed. On a regional level, the situation is not so clear-cut, although it may appear that some RDFs have closed the financing gap occurring in their regions. It cannot be ruled out that the picture of a solved financing gap by some RDFs in their regions is misleading. Unconducted surveys of the state of the regional financing gap in a purposeful and systematic way do not make it possible to verify the actual state of such gaps.

Although defining and estimating the SME financing gap is problematic in itself, it is undeniable that a financing gap exists in a market economy, causing negative consequences, including for regional economies. Therefore, at the EU, member state and regional levels, analyses to estimate the financing gap are used to assess the necessary public intervention. The gap estimation reports cited in the paper, as well as the regulatory obligations of the provincial governments, provide a rationale for targeting RDFs to bridge the SME financing gap.

Since the premise of a RDF is to meet the financial needs of SMEs operating in the region of the RDF in question and, at the same time, affected by the financing gap, it is necessary to operationalize this premise by means of two mutually equivalent objectives: bridging the financing gap in the region and considering the limiting criterion, i.e. the long-term viability of an RDF.

Following this, it is imperative to oblige RDFs to conduct regional analyses in the area of the incidence of the financing gap, including an evaluation. In the current legal state, such studies are not obligatory for RDFs. Therefore, this issue should be regulated at the national level and can already be regulated at the level of the provincial governments. This, in turn, in the environment of practitioners of the developing Polish RDF sector and in cooperation with researchers, would force a debate on the methodology of calculating the financing gap in Polish conditions, in regional terms, and the inscription of the task of analyzing and assessing the state and changes in the financing gap in question in the RDF system in Poland. This means that RDFs in Poland should be looked at from a systemic perspective and not only from a sectoral one. That is, it is more a question of organizing this task within a system of RDFs in which the individual RDFs cooperate with each other in a coordinated manner.

The obligation of RDFs to conduct research and evaluation in the area of the financing gap (within the RDFs system) should simultaneously translate into the design of financial products and services and Investment Strategies. In turn, the proper design of the spectrum of financial products and services, based on the financing gap research, should have a positive impact on the state of the financing needs of SME enterprises. Referring to this criterion, RDFs should offer continuous improvement of their financial products and services.

References

Auerswald, P.E., Branscomb, L.M. (2003). Valleys of Death and Darwinian Seas: Financing the Invention to Innovation Transition in the United States. The Journal of Technology Transfer, 28, 227–239, https://doi.org/10.1023/A:1024980525678

Ayadi, R., Gadi, S. (2013). Access by MSMEs to Finance in the Southern and Eastern Mediterranean: What Role for Credit Guarantee Schemes? MEDPRO Technical Report, 35/April.

Bank Pekao S.A. (2021). Raport o sytuacji mikro, małych i średnich firm w roku 2020. Warszawa: Bank Pekao S.A.

Bank Pekao S.A. (2022). Raport o sytuacji mikro, małych i średnich firm w latach 2021–2022. Warszawa: Bank Pekao S.A.

Cosh, A., Cumming, D., Hughes, A. (2009). Outside entrepreneurial capital. The Economic Journal, 119, 1494–1533, https://doi.org/10.1111/j.1468-0297.2009.02270.x

Cressy, R. (2012). Funding gaps. [In:] Cumming, D. (ed.). Oxford Handbook of Entrepreneurial Finance. Oxford: Oxford University Press.

De Meza, D., Webb, D.C. (1987). Too much investment: a problem of asymmetric information. The Quarterly Journal of Economics, 102 (2), 281–292.

Development Finance Institutions (DFIs). (2019). DFI Working Group on Blended Concessional Finance for Private Sector Projects. Joint Report, October, https://www.adb.org/sites/default/files/institutional-document/532646/dfi-blended-concessional-finance-joint-report-2019.pdf [accessed: 03.10.2019].

Epsec, ipopema (2020). Raport z szacowania potrzeb finansowych oraz luki finansowej, zrealizowanych w ramach badania pt. Opracowanie metodologii szacowania potrzeb finansowych oraz luki finansowej w obszarach polityki rozwoju wraz z pierwszym oszacowaniem". Warszawa, https://www.ewaluacja.gov.pl/strony/badania-i-analizy/wyniki-badan-ewaluacyjnych/badania-ewaluacyjne/raport-z-szacowania-potrzeb-finansowych-oraz-luki-finansowej-w-ramach-badania-pt-opracowanie-metodologii-szacowania-potrzeb-finansowych-oraz-luki-finansowej-w-obszar/ [accessed: 15.06.2020].

Fi-compass (2019). Gap analysis for small and medium-sized enterprises financing in the European Union. Brussels: European Commission – European Investment Bank.

Ford, G., Koutsky, T., Spiwak, L. (2007). A Valley of Death in the Innovation Sequence: An Economic Investigation, http://dx.doi.org/10.2139/ssrn.1093006

Frank, C., Sink, C., Mynatt, L., Rogers, R., Rappazzo, A. (1996). Surviving the "valley of death": a comparative analysis. The Journal of Technology Transfer, 21 (1), 61–69, https://doi.org/10.1007/BF02220308.

Galizia, F. (2003). Measuring the 'financing gap' of European corporations. Working Papers and Studies. Luxembourg: Office for Official Publications of the European Communities.

Gama, P.M., Sol Murta, F., Vieira, E.S. (2024). Local banking development and SME conservative financing policy. Does bank branch density matter? Small Business Economics https://doi.org/10.1007/s11187-024-00910-6

Górka, K. (2012). Zjawisko luki kapitałowej w finansowaniu mikro-, małych i średnich przedsiębiorstw w Polsce w latach 2007-2011. Ekonomia, 4(21), 210–225.

Hallberg, K. (2001). A Market-Oriented Strategy for Small and Medium-Scale Enterprises. Discussion Paper, 40. Washington DC: International Finance Corporation.

IFC (2017). MSME finance gap: Assessment of the shortfalls and opportunities in financing micro, small and medium enterprises in emerging markets. Washington DC: International Finance Corporation.

Klonowski, D. (2009). Innowacyjność sektora MSP w Polsce. Rządowe programy wsparcia a luka finansowa, Program Ernst&Young. Warszawa: Sprawne Państwo.

Korenik, D., Ignor, M. (2024). Regionalne systemy finansowe gospodarki – podejście instytucjonalne. Wyzwania dla rozwoju systemu pośrednictwa finansowego w Polsce. Wrocław: Uniwersytet Ekonomiczny we Wrocławiu.

Kuntchev, V., Ramalho, R., Rodríguez-Meza, J., Yang J. (2014). What Have We Learned from the Enterprise Surveys Regarding Access to Credit by SMEs? World Bank Policy Research Working Paper, 6670.

Masiak, C., Moritz, A. and Lang, F. (2020). European SME Financing: An Empirical Taxonomy. [In:] Moritz, A., Block, J.H., Golla, S., Werner, A. (eds). Contemporary Developments in Entrepreneurial Finance. FGF Studies in Small Business and Entrepreneurship. Switzerland: Springer Cham, https://doi.org/10.1007/978-3-030-17612-91

Masiukiewicz, P. (2017). Analyses of financing gap in the SME sector. Ekonomika i Organizacja Przedsiębiorstwa, (12), 187–198.

Mc Cahery, J., Lopez de Silanes, F., Schoenmaker, D., Stanisic, D. (2015). The European capital markets study: Estimating the financing gaps of SMEs. Duisenberg School of Finance, 1 (3), .

Ministerstwo Funduszy i Polityki Regionalnej [MFiPR] (2021). Komentarz do Rozporządzeń UE dla Polityki Spójności na lata 2021–2027, 133–145, https://www.poir.gov.pl/media/103390/Komentarz_do_rozporzadzen_PS_2021-2027.docx [accessed:].

NBP (2020). Raport o stabilności systemu finansowego. Ocena skutków pandemii COVID–19. Warszawa: Narodowy Bank Polski.

NBP (2021). Raport o stabilności systemu finansowego. Grudzień 2021. Warszawa: Narodowy Bank Polski.

NBP (2022). Statystyka monetarna i finansowa. Dane finansowe sektora bankowego, https://www.nbp.pl/home.aspx?f=/statystyka/pieniezna_i_bankowa/naleznosci.html [accessed: 17.11.2023].

OECD (2006). The SME Financing Gap: Theory and Evidence. Financial Market Trends, 2, 9, https://doi.org/10.1787/fmt-v2006-art11-en

OECD (2020). Financing SMEs and Entrepreneurs 2020 an OECD Scoreboard. Paris: OECD Publishing.

OECD (2022). 2022 Updated G20/OECD High-Level Principles on SME Financing. Indonesia: G20.

Ogólnopolskie Stowarzyszenie Regionalnych Funduszy Rozwoju [OSRFR] (2021). Wewnętrzna dokumentacja pozyskana od członków stowarzyszenia.

Ogólnopolskie Stowarzyszenie Regionalnych Funduszy Rozwoju [OSRFR] (b.d), https://osrfr.org/aktualnosci/ [accessed:].

Rozporządzenie Parlamentu Europejskiego i Rady (UE) 2021/1060 z dnia 24 czerwca 2021 r. ustanawiające wspólne przepisy dotyczące Europejskiego Funduszu Rozwoju Regionalnego, Europejskiego Funduszu Społecznego Plus, Funduszu Spójności, Funduszu na rzecz Sprawiedliwej Transformacji oraz Europejskiego Funduszu Morskiego i Rybackiego i Akwakultury oraz zasady finansowe dla nich oraz dla Funduszu Azylu, Migracji i Integracji, Funduszu Bezpieczeństwa Wewnętrznego i Instrumentu Wsparcia Finansowego Zarządzania Granicami i Polityki Wizowej [Dz.U. L 231 z 30.6.2021].

Rozporządzenie Parlamentu Europejskiego i Rady (UE) nr 1303/2013 z dnia 17 grudnia 2013 r. ustanawiające wspólne przepisy dotyczące Europejskiego Funduszu Rozwoju Regionalnego, Europejskiego Funduszu Społecznego, Funduszu Spójności, Europejskiego Funduszu Rolnego na rzecz Rozwoju Obszarów Wiejskich oraz Europejskiego Funduszu Morskiego i Rybackiego oraz ustanawiające przepisy ogólne dotyczące Europejskiego Funduszu Rozwoju Regionalnego, Europejskiego Funduszu Społecznego, Funduszu Spójności i Europejskiego

Funduszu Morskiego i Rybackiego oraz uchylające rozporządzenie Rady (WE) nr 1083/2006 [Dz. Urz. UE z 20.12.2013 r., L 347, s. 320].
Stamp, J.C. (1931). The Report of the Macmillan Committee. The Economic Journal, 41(163), 424.
Stiglitz, J.E., Weiss, A. (1981). Credit Rationing in Markets with Imperfect Information. The American Economic Review, 71(3), 393–410.
Wessner, C. (2005). Driving Innovations Across the Valley of Death. Research Technology Management, https://www.questia.com/read/1G1-127161950/driving-innovations-across-the-valley-of-death [accessed: 24.12.2015].
Wilson, N., Wright, M., Kacer, M. (2018). The equity gap and knowledge-based firms. Journal of Corporate Finance, 50, 626–649, https://doi.org/10.1016/j.jcorpfin.2017.12.008

Znaczenie kategorii „luka w finansowaniu MŚP" w działalności Regionalnych Funduszy Rozwoju. Kontekst redukowania luki finansowej w regionie

STRESZCZENIE

Podstawowym celem opracowania było ustalenie znaczenia kategorii „luka finansowa" (w regionalnym sektorze MSP) (ang. *s*) w działalności regionalnych funduszy rozwoju w Polsce. Na potrzeby pracy przeprowadzono krytyczną analizę kategorii ekonomicznej "luka finansowa" w odniesieniu do sektora MŚP w zakresach pojęciowo-interpretacyjnym i pomiaru; analizę dokumentów stanowiących wymogi formalno-prawne dla wdrożenia instrumentów inżynierii finansowej przez regionalne fundusze rozwoju w Polsce, w szczególności obowiązujących aktów prawnych oraz udokumentowanych strategii inwestycyjnych, które wdrażają regionalne fundusze rozwoju; przeprowadzono analizy wielkości występującej luki finansowej w wymiarze regionalnym i ogólnopolskim oraz stopnia pokrycia wskutek działalności regionalnych funduszy rozwoju. Rezultaty badawcze obejmują ograniczenia kategorii luki finansowej w regionalnym sektorze MŚP jako przesłanki działalności regionalnych funduszy rozwoju oraz ocenę wkładu tych instytucji w niwelowanie luki finansowej w regionach. Sformułowano konkluzje dotyczące uzyskanego obrazu pokrycia luki finansowej przy udziale regionalnych funduszy rozwoju oraz zalecenia dla praktyki takich funduszy w kierunku ściślejszego związania ich działalności z niwelowaniem skutków luki finansowej w regionalnych sektorach MŚP.

Słowa kluczowe: regionalne instytucje finansowe, finansowanie MŚP, luka w finansowaniu MŚP

Polityki Europejskie, Finanse i Marketing
30 (79) 2023
DOI 10.22630/PEFIM.2023.30.79.13

Received: 09.12.2023
Accepted: 10.04.2024

Aneta Kosztowniak✉
SGH Warsaw School of Economics

THE EVOLUTION OF BANKING BUSINESS MODELS IN THE EUROPEAN UNION CONSIDERING THE REGULATION AND SUSTAINABILITY TAXONOMY

ABSTRACT
The aim of this study is to provide a mechanism for the impact of European Union (EU) sustainability and non-financial reporting regulations on the business models of banks operating in the EU and the opportunities and risks arising from the ESG transformation. An overview of EU directives and regulations applicable to ESG and non-financial corporate reporting has been applied. The main practices used by banks in adapting to regulatory and supervisory requirements have been identified, including in the area of business model components relevant to the ESG transformation. The research conclusions indicate the importance of the CSRD, ESRS and CSDD regulations. Of the different components of business models, the banks in the EU are adjusting primarily by customer profile and product range. The business models of the banks are evolving towards increasing product offers that finance green investments in the form of green loans and bonds. The measures taken are all in the areas of: Governance (corporate governance, e.g. business strategy, risk, responsible banking, sustainable supply chains), Environmental (green finance products, environmental impact of operations or TCFD reporting, etc.) and Social (stakeholder relations, e.g. relations with employees, customers and society). These activities determine the pro-environmental evolution of the business models used by the banks. An added value of the study is that it provides an overview of the applicable ESG legislation and non-financial taxonomy (as of November 2023), indicating the direction of changes in the business models, including the identification of the main components being adapted by banks.

Key words: banks, business models, ESG, taxonomy, non-financial reporting, EU
JEL codes: G15, G18, G20, Q54

Introduction

The sustainability regulations cover: Environmental, Social, Corporate Governance (ESG) and financial reporting. These regulations are being developed and standardised, covering an ever-broader range of subjects as well as entities. The largest entities are already subject to

✉ Aneta Kosztowniak, SGH Warsaw School of Economics, Collegium of Management and Finance, Department of Applied Economics, Monetary Economics Unit, https://orcid.org/0000-0001-6088-1899

EU regulations in this area, and more groups of smaller entities will be subjected to them in future years. Banks are one of the groups of financial entities that became the earliest to be obliged to comply with the ESG rules and the non-financial taxonomy. This means that banks are obliged to align their operational, financial, and capital activities with EU regulations, and that the business and value-creation models developed by the banks form the basis for all implementations of sustainability regulations.

According to the European Commission, ESG risk is defined as "the risk of losses arising from any 'adverse' financial impact on an institution, caused by the current or future impact of ESG factors on the institution's counterparties or on the assets in which the institution invests" [EC 2022/2453].

The aim of this article is to present the mechanism of the evolution of the EU sustainability regulation, non-financial reporting on the adaptation of business models by banks operating in the EU and the opportunities and risks of ESG transformation.

Review of the EU Sustainable Development Legislation

The ESG regulation has been developed for several years by the European Commission through the work of institutions like the European Central Bank (ECB), European Banking Authority (EBA), European Financial Reporting Advisory Group and the Sustainability Reporting Board (EFRAG/EFRAG SRB).

The main EU regulations include the *Sustainable Finance Disclousure Resolution* (SFDR), the taxonomy on reporting: the Non-Financial Disclosure Reporting Directive (NFRD), the Corporate Sustainability Reporting Directive (CSRD), the European Sustainability Reporting Standard (ESRS), the Corporate Sustainability Due Dilligence Directive (CSDD) and the *Task Force on Climate – Realised Financial Disclosures* (TCFD) guidelines.

As of May 2020, the European Central Bank's guidance on climate risk-related disclosures is now in force. The SFDR on Sustainable Investment Disclosure by Financial Market Participants (Regulation 2019/2088) aims to increase market transparency and prevent greenwashing. It covers two groups of actors: financial market participants offering financial products as defined in the SFDR (Article 2) and financial advisers providing insurance and investment advice. The SFDR entered into force in March 2021. (replacing the previously operational NFRD) and requires financial market participants to demonstrate how ESG risks are integrated into the investment process.

The NFRD [OJ L 330, 15.11.2014] set out the basis for non-financial reporting. The directive was an amendment to Directive 2013/34/EU on the annual financial statements, consolidated financial statements and related reports of certain types of undertakings. The initial personal scope of the directive covered what are called 'public interest entities'<?>. These entities were required under the NFRD to include additional statements on non-financial ESG information in their management reports. While the NFRD did not impose a specific form of disclosure by reporting entities and it was difficult to compare the non-financial reports of different entities, the CSRD guidelines have already standardised the rules and requirements for non-financial reporting.

The CSRD [OJ L 322, 16.12.2022] is part of a comprehensive package of legislative changes for the sustainable financing of growth to achieve EU climate neutrality by 2050. The CSRD is a directive of the European Parliament and of the Council (EU) 2022/2464 of

14 December 2022 and one of the most important pieces of EU legislation defining which entities and from which year are subject to ESG reporting. The Unified Framework for Non-Financial Reporting has been prepared in line with the ESRS standards (31 July 2023), as a mandatory and common standard for sustainability reporting. The unified reporting standards are intended to ensure the comparability and reliability of the data disclosed, which will be subject to mandatory verification by auditors and, depending on the arrangements in each Member State, by other certified assurance providers.

The European Sustainability Reporting Standards (ESRS) include three principles of disclosure of material information:

- three layers (sector-independent, sector-specific, entity-specific),
- three areas of reporting (strategy, implementation, performance measurement),
- three themes (environment, society, corporate governance).

In terms of the ESRS [2023] materiality analysis, the principle of dual materiality has been introduced, i.e. impact on the environment or only on the financial consequences for the company, or meeting both criteria.

From 2024, the CSDD (Corporate Sustainability Due Diligence Directive) will apply. This directive emphasises the obligations of companies to identify actual and potential adverse impacts on human rights and the environment, and defines the liability for breaches of these obligations. The scope of the CSDD covers the companies' own activities, the activities of subsidiaries, and entities within the value chain with which the company has a regulated business relationship - direct or indirect.

In addition, banks and other financial institutions have been subject to guidelines on lending and credit monitoring (EBA/GL/2020/06) since 30 June 2021. From June 2022, ESG risk disclosures have become part of the Pillar III disclosures under CRR 2 (*Capital Requirements Regulation*).

For the report and opinion published by the EBA on 1 March 2021 – a methodology has been proposed for the calculation of a new performance indicator for banking activities, the *Green Asset Ratio* (*GAR)*. This measure is designed to determine whether a bank's activities qualify as environmentally sustainable within the meaning of the relevant provisions of Regulation EU 2020/852 of the European Parliament and of the Council of 18 June 2020 on establishing a framework to facilitate sustainable investment. The proposed indicator reflects the share of assets related to the financing of environmentally sustainable investments, as a proportion of an institution's total balance sheet exposure (considering certain exemptions).

Non-financial reporting obligations

The first guidelines for non-financial reporting, albeit initially in any form of reporting by Public Interest Entities (PIEs), were contained in the NFRD, which was further developed under the CSRD, which already introduced uniform standards and extended the range of entities required to comply with it.

In the case of Poland, in accordance with the NFRD, the Accounting Act of 29 September 1994 introduced in 2016 Article 49b in the form of a separate reporting section for entities:

- which employ more than 500 people (in terms of annual average FTEs),
- whose total assets at the end of the financial year exceeded PLN 85 million or whose net revenue from the sale of goods and products for the financial year exceeds PLN 170

million. The first reporting year in Poland was 2017. This in turn translated into a non-financial reporting obligation for around 300 entities in 2018.

The CSRD provides for mandatory use of EU reporting standards, i.e. ESRS (European Sustainability Reporting Standards), for the entities subject to it. Among the identified indicators covered by the CSRD reporting obligation were:

- in the environmental sphere: climate change, drought and water scarcity, biodiversity, land use, raw material management, pollution and waste;
- in the sphere of social impact: labour issues, health and safety at work, human rights, relations with the environment, and product safety;
- in the area of corporate governance: corporate governance, ethical standards, anti-corruption and anti-bribery, privacy and data security.

Under the CSRD, reporting entities are required to incorporate and demonstrate the impact of ESG factors into business decisions as well as energy and climate transformation programmes. The requirements require the confirmation of the need for the company to conduct a robust analysis of the financial and business impact of the ESG factors on its value and strategy. This means integrating non-financial factors into operational processes. Thus, in taking care of the company's value in business models, banks are forced to integrate ESG assumptions into their long-term management and business strategy.

The mandatory elements of non-financial reporting under the CSRD include:

- conducting a materiality study in accordance with the principle of two-way materiality,
- preparing the report in accordance with the ESRS uniform EU sustainability reporting standards,
- analysis and the inclusion in the report of a 'taxonomy,' i.e. information on how and to what extent this company's activities are related to business activities that qualify as environmentally sustainable (percentage of turnover, CapEx and OpEx),
- presentation in the form of an XHTML report with appropriate tagging,
- submission of the report to be audited by an independent entity - a firm authorised to audit financial statements.

In line with the evolution of reporting requirements for SPUs, the CSRD provides for successive reporting years in 2024–2028 for entities depending on their fulfilment of 2 out of 3 criteria, i.e.: balance sheet total, net sales revenue and number of employees. The reporting obligations include:

- from 1 January 2024 (first reports in 2025), companies in accordance with Directive 2014/95/EU or NFRD,
- from 1 January 2025 (first reports in 2026), other large companies according to CSRD requirements,
- from 1 January 2026 (first reporting in 2027), small and medium-sized enterprises (SMEs) listed on the stock exchange,

from 1 January 2028 (first reports in 2029), companies outside the EU with branches/subsidiaries in accordance with the CSRD (Table 1).

Banks as well as other entities can choose the reporting modalities that suit their needs as well as the legal conditions; however, one of three modalities is usually chosen:

- Performance report with added ESG data, which presents key ESG indicators in the annual report complemented by broader information, e.g. on the bank's website.

Table 1. Non-financial reporting obligations according to the CSRD

Financial year	Deadline for submission of the report	Entities	Balance sheet total	Net sales revenue	Number of employees
2024	2025	Large and public interest entities (PIEs)			>500
2025	2026	Other large companies	≥ EUR 20 million	≥ EUR 40 million	≥250
2026	2027	Medium and small enterprises with issuer status*	< EUR 20 million	< EUR 40 million	<250
			< EUR 4 million	< EUR 8 million	<50
2028	2029	Non-EU companies	Turnover > EUR 150 million		

*The number of medium and small enterprises in the EU as a whole is over 50 000 and in Poland a total of 3 500 companies (as of 30.06.2022).

Sources: CSRD [2023].

- A report in the form of a sustainability report, i.e. a separate report in addition to the annual financial statements.
- An integrated report, which combines both a financial report and sustainability issues in a single document, showing the strategy and value-building model of the company. This form of integrated report is most often chosen by the largest banks, which treat this form as information for customers and investors interested in cooperating with an active financier of ESG transformation. Such activities effectively support the competitiveness and growth of the bank's market value.

The reported ESG indicators of 'greenness' according to the EFRAG Group guidelines include two cross-cutting standards and three thematic standards, which were adopted on 23 October 2023 [EFRAG 2023]. The scope of the reporting data and the level of detail is significant. Thus, these indicators will provide an in-depth diagnosis of the reporting company's situation and its investment intentions, as well as cooperation with supply chain collaborators in addition to the financial data published as part of the annual financial reporting. The transparency of information about the company's activities will have a broad impact on the operational, financial and investment activities and thus on the adaptation of business models to ESG considerations and ultimately on the financial performance, competitiveness and value of the company (Table 2).

The purpose of non-financial reporting is to obtain information by those raising finance (borrowers, debt issuers) and those providing finance. Banks will be able to analyse the risks associated with a given borrower (financed project) more accurately, i.e. to determine risk weights and capital adequacy more precisely. Purchasers of securities, e.g. green bonds, will have more accurate knowledge of the use of the funds from these bonds for investment purposes.

In the banking business, the entire reporting process (in line with the supply chain concept) includes environmental reporting:

- providers of funding for the purpose (of the project),
- beneficiaries of funding for a particular purpose (project),
- entities related to the entity benefiting from the financing of a given investment process or project.

Table 2. ESG indicators according to CSRD cross-cutting and thematic standards, according to EFRAG nomenclature

Type of standard	Designation and name	
Cross-cutting	General	ESRS 1 General requirements
		ESRS 2 General disclosures
Thematic	environmental	ESRS E1 Climate change ESRS E2 Pollution ESRS E3 Water and marine resources ESRS E4 Biodiversity and ecosystems ESRS E5 Resources and circular economy
	social	ESRS S1 Own workface ESRS S2 Workers in the value chain ESRS S3 Affected communities ESRS S4 Customers and end-users
	governance	ESRS G1 Governance, risk management and internal control ESRS G2 Business conduct.

Sources: EFRAG [2022].

Such a reporting process implies a wide spectrum of individual data to be collected: not only between the lender-borrower, but also more broadly with the counterparties. That is, the decision-making processes will start in the supply chain: from the borrower (the bank) through the borrower to its last counterparty. This means that all actors will become inter-dependent, and the result may be a reduction in cooperation with low ESG transformation actors.

It is worth noting that in the EU, non-financial statements (ESG) will be subject to verification by statutory auditors for the financial year 2024, i.e. in 2025. In addition to compliance with the regulations (NFRD, SFRD, TCFD), this assessment will be subject to comparison with the data presented in the financial statements. If an inconsistency between the non-financial reporting and the financial statements is detected during such an audit, the ESG statement must be corrected. In order to settle the financial activities of enterprises for a given financial year, it is required that the statutory auditors approve both statements, while maintaining their consistency.

Another obligation of public interest entities, e.g. banks, insurance companies or investment funds, will be to provide information in the area of sustainable activity to national financial supervisory institutions. These financial regulators will also monitor the activities and impose possible sanctions.

Due to the ongoing process of developing sustainable development regulations, as indicated in the EBA milestones until 2025, no sanctions or financial penalties have been imposed so far. However, the obligation to comply with the guidelines rests directly with the management boards of the public-interest entities. In the near future, after the completion of the ESG legislation, company authorities must consider any possible sanctions in the event of a violation.

The ESG regulations oblige financial entities, including banks, to report both in the form of:

1) reports evaluated by audit firms,
2) publication of data in an abbreviated form (on websites).

From 2024, this obligation applies to large public-interest entities, such as listed companies, banks, insurance companies and private companies employing more than 500 people (Table 1).

ESG reporting and public disclosure by listed companies is aimed at providing stakeholders with comprehensive information on their operations, including sustainable operations.

Moreover, ESG reporting obligations in the EU apply to both domestic companies and enterprises with foreign capital. Non-EU companies (e.g. US, UK and others) cooperating with EU companies will have to obtain a decision on the equivalence of their standards with EU standards. The necessity to obtain an equivalence decision is intended to prevent the acquisition of competitive advantages. Such decisions will include ESG ratings issued by the European Securities and Markets Authority (ESMA) for European providers of ESG ratings, as well as those requiring equivalence decisions for suppliers from non-EU countries.

An ESG rating issued by licensed suppliers will be formal, e.g. published by listed companies. On the other hand, ESG assessments prepared by companies according to their own criteria and for internal needs will be informal [EC, 2024].

It is also worth noting that in the field of ESG (sustainable) reporting, a number of guidelines and recommendations (voluntary) as well as legal regulations (mandatory) have already been issued: 1) the group of recommended guidelines includes: Global Reporting Initiative (GRI) standards, guidelines of the International Integrated Reporting Council (IIRC) and TFCD recommendations, 2) in the group of mandatory regulations: NFRD (2014/95), CSRD [OJ L 322, 16.12.2022] and ESRS.

Pro-environmental direction of change in the banks' business models

In the literature, many authors point out that the business model reflects the operating philosophy of the company and describes all the elements of the market and company environment as well as the relationships between them that are relevant to the realisation of the company's objectives and value creation [e.g. Santos et al. 2009, Zoot and Amit 2010, Saebi and Foss 2014]. According to Nosowski [2012], a business model is a conceptual tool to express the business logic of a company, which concretises the strategic assumptions in the area of how value is created in it [Pyka 2013].

In general, a bank's business model is a long-term strategy that should ensure the effective use of its resources to increase profits and to maintain a competitive advantage, and a key area is the creation and delivery of value to customers. Important elements in the models are the defined customer segments, the strategic resources of the company, including financial resources, and the strategic processes, including how value is communicated and delivered to the customers. Furthermore, in addition to commercial objectives, financial security (deposited funds) and market activity objectives are important in the banks' business models, considering the role of the banks in the economy as public trust units.

According to Roengpitya, Tarashev and Tsatsaronis [2014], there are three basic business models in banking: a bank financed by retail deposits (retail bank), a bank financed by wholesale deposits (wholesale bank) and a bank oriented towards capital markets (investment bank). The first two models differ in the structure of their business financing, while the third is distinguished by a significant share of capital market operations.

Among the determinants affecting business models, in addition to economic determinants, new regulations that affect banking activity profiles are also important, as highlighted by: Altunbas, Manganelli and Marques-Ibanez [2011]; Ayadi, Arbak, Pieter, and De Groen [2011]; and Biron, Córdova and Lemus [2019]. Therefore, the analysed changes in the ESG regulation and the economic and social environment of banks are driving the need to adapt banking business models. Gaining competitive advantage and operating satisfactorily in the market is therefore becoming increasingly difficult, due to the growing number of determinants that banks have limited influence over and must adapt to [Kosztowniak 2023].

For banks as well as other financial institutions, the EU sustainability regulations have a clear impact on the lending, investment and internal governance activities as well as changes in the strategy of the whole institution. As the successful implementation of ESG strategies is only possible with the full commitment at different levels of the organisation: from the governing bodies to the front-office staff, the key success factors are: 1) an appropriately shaped internal organisation and a transparent accountability system, 2) the expansion of credit and investment analysis, 3) effective internal reporting (performance indicators), 4) adequate control mechanisms, 5) a remuneration policy that takes ESG into account, 6) the role of compliance (new product introduction process) and an internal audit.

Although the banks' business models are evolving due to the ESG regulation, primarily in terms of these components: 1) customer profile (building their environmental awareness and preferences) and 2) product offering (the rise of 'green financing'). That said, the ongoing process of expanding the scope of the ESG regulations and taxonomy over the last few years is causing numerous spillover effects in all components of business models, differently determined by individual banks (Table 3).

In response to the ESG regulations, banks have to prepare various specific reports outlining the required reporting elements and their individual implementation practices. In the case of Santander BP S.A. Group [2023], such key policies and regulations are:

G-Corporate governance: 1) Corporate governance model for the Group and its subsidiaries; 2) Specific corporate governance principles and General Code of Conduct; 3) Information and conflict of interest policy; 4) Code of conduct for the securities markets; 5) Anti-money laundering policy, anti-corruption programme; and 6) Sustainability and remuneration policy.

E-Environmental: 1) Minimising the environmental impact of banking facilities and activities (considering the internal environmental footprint e.g. energy consumption, operation of facilities); 2) Promoting environmentally friendly products and services and considering and assessing the impact of financed projects on climate change; 3) In terms of operations, offering 'green products and solutions', supporting the transformation of the economy to low- and zero-carbon, educational activities, complying with the requirements of international ESG regulations, leading initiatives to reduce the bank's environmental footprint.

S-Social – relationships with: (1) bank employees, (2) customers and stakeholders, and (3) with the public.

Sustainability regulations are important determinants of the models, or strategies undertaken by banks, which decide in practice on the opportunities as well as the challenges. In **terms of opportunities,** one can mention: 1) the increase in demand for green financial products, related to the 2022+ fuel crisis and the search for alternative sources of investment financing, e.g. in the area of energy, construction of new renewable energy sources, 2) the

Table 3. Key components of business models and the value creation of selected EU banks

Banks	Components	ESG-related main goal	Key Regulations
BNP Paribas Credit Suisse Group Deutsche Bank Intensa Sanpaolo J.P. Morgan Chase MBank Mitsubishi UFJ Financial Group Grupa Kapitałowa Santander Bank	Strategic goal	• advancing sustainable banking	Taxonomy, TCFD
	Key Partners	• cooperation with ESG/CSR-oriented stakeholders	Taxonomy, SFRD (2019/2088), Regulation of the European Parliament and of the Council on European Green Bonds COM/2021/391
	Key Resources	• Human Resources (Management Board, Employees), • capital and financial	Taxonomy, TCFD
	Value Proposition	• sustainable products and services, and biodiversity restoration • customer loyalty • reducing the carbon footprint of the portfolio	Taxonomy, TCFD, NFRD, MIFID (2021/1269), Regulation of the European Parliament and of the Council on European Green Bonds (COM/2021/391)
	Customer segments, relationships	• ESG/CSR-oriented clients • ethics in internal and external relations • ESG education • shaping the pro-ecological customer segment • governance	Taxonomy, TCFD, SFRD, and CSRD
	Distribution channels	• increase in the availability of services • digitization and the digitization of banking services and products	Taxonony
	Revenue streams	• sustainable (ecological) products and services • issuance of green bonds	Taxonomy, CRD/CRR and Solvency
	Cost structure	• reducing the capital intensity of operations by financing sustainable projects • limiting projects in the 'dirty industries' with a higher ESG risk and requiring higher capital collateral and special purpose provisions	

Source: Own preparation based on: Deutsche Bank [2024], Intensa Sanpaolo [2024], Santander Bank Group [2024], mBank [2024].

growing expectations of investors and customers of financial institutions not only in the area of profitability, but the impact of the investment or product on the environment, which is why banks see ESG not only as a regulatory necessity, but also as a developmental impulse and an opportunity to improve their competitive position, 3) increasing amounts of "green financing" (loans, bonds) are made available in the product offer for financing renewable energy sources, projects increasing the share of green energy in the 'energy mix' or financing the increase of electrification, e.g. in transport.

Among the **challenges** to be noted are: 1) the needs to expand source systems to include ESG data, 2) some banks' business models and exposure portfolios may be particularly exposed to climate-related risks, e.g. related to climate-sensitive physical sectors of the economy, EU CO regulations, or the transition towards a low-carbon economy, 3) the implementation of new strategies and business models in the context of ESG requirements requires adequate staff competences, which can be challenging to acquire, and 4) the increase of ESG risks in banks, due to their multidimensionality, may simultaneously escalate an increase in credit, market, liquidity, operational or reputational risks.

Although the development of sustainable banking in the EU has accelerated, especially in the last five years, ESG regulations are being implemented all over the world. According to FinTech Magazine, the top 10 most sustainable banks in the world in 2023 include: KfW (Germany), ING Bank (Netherlands)**,** Standard Chartered (UK), Swedbank (Sweden), DBS Bank (Singapore), Crédit Agricole (France), BNP Paribas (France), Rabobank (Netherlands), Nordea (Sweden) and Bank Triodos (Netherlands) [England 2023].

Conclusions

Due to the dynamic process of ESG-related regulatory developments in the EU, many banks as well as other non-financial institutions are undertaking compliance processes. The actions taken are driven by ESG risks that, when disclosed internally within the bank as well as in the bank's environment (customers, cooperators, investors, other actors in the supply chain, etc.), may generate additional costs or affect reputation and ultimately market position and stakeholder relations. Therefore, proper management of ESG risks within the bank is key to protecting the value of the business.

The CSRD is part of a comprehensive package of legislative changes for the sustainable financing of growth to achieve EU climate neutrality by 2050. A uniform non-financial reporting framework has been prepared in accordance with ESRS standards (31 July 2023) and will apply to the following groups of entities, i.e. from 1 January 2024 companies in accordance with Directive 2014/95/EU (NFRD); from 1 January 2025 other large companies according to the CSRD requirements, from 1 January 2026 listed small and medium-sized enterprises (SMEs) and from 1 January 2028 companies outside the EU with branches/subsidiaries in accordance with CSRD. The ESG indicators include two groups of cross-cutting standards (ESR:S1-2) and three thematic groups: Environmental (ESRS:E1-E5), Social (ESRS:S1-4) and Governance (ESRS:G1-2)

The SFDR regulations, the NFRD taxonomy, the CSRD, the ESRS, the CSDD and the TCFD guidelines are the pillars of the changes being implemented across the financial sector of EU countries. An individual bank's ability to implement these regulations determines its chances of strengthening or weakening its competitive position. Among the main opportunities arising from the ESG are an increase in demand for green financial products and customer-friendly attitudes. The challenges include the limitations on access to ESG statistics, the specificity of some banks' business models and exposure portfolios related to the 'dirty' sectors of the economy (mining, extraction, transport, trade), the acquisition of staff with relevant ESG competences, to the numerous challenges related to non-financial reporting.

In summary, regulatory and market pressures as well as the impact from capital owners are leading to a pro-environmental evolution of business models and value creation by banks. This pro-environmental evolution of models involves the integration of ESG regulations into all its components, most noticeably in terms of the customer profile and product range.

Acknowledgements

The study is the result of the research project: The financial system and economic growth and development, SGH, No. KZiF/S23:1.31.

References

Altunbas, Y., Manganelli, S., Marques-Ibanez, D. (2011). Bank risk during the financial crisis: do business models matter? ECB Working Paper Series Posted, 11, 1–51.

Ayadi, R., Arbak, E., Pieter, W. (2011). De Groen, Business Models in European Banking: A Pre-and Post-Crisis Screening. Brussels: Center for European Policy Studies.

Biron, M., Córdova, F., Lemus, A. (2019). Banks' Business Model and Credit Supply in Chile: The Role of a State-Owned Bank, BIS Working Paper, 800, 1–30.

BNP (2023). Business Model, Paribas, https://group.bnpparibas/en/group/about-us/business-model [accessed: 03.11.2023].

Deutsche Bank (2023). Business Model, https://vizologi.com/business-strategy-canvas/deutsche-bank-business-model-canvas [accessed: 03.11.2023].

Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022 amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU, as regards corporate sustainability reporting (Text with EEA relevance) [OJ L 322, 16.12.2022].

Directive 2014/95/EU of the European Parliament and of the Council of 22 October 2014 amending Directive 2013/34/EU as regards disclosure of non-financial and diversity information by certain large undertakings and groups Text with EEA relevance [OJ L 330, 15.11.2014].

EC (2024). ESG rating activities, https://finance.ec.europa.eu/sustainable-finance/tools-and-standards/esg-rating-activities_en [accessed: 05.04.2024].

EFRAG (2022). Draft European Sustainability Reporting Standards, November, https://www.efrag.org/en/sustainability-reporting/esrs/sector-agnostic/first-set-of-draft-esrs [accessed: 03.11.2023].

EFRAG (2023). EFRAG Welcomes the Final Adoption of The ESRS By The European Institutions, https://www.efrag.org/News/Public-453/EFRAG-welcomes-the-final-adoption-of-the-ESRS-by-the-European-Institutions [accessed: 03.11.2023].

England, J. (2023). The top 10 most sustainable banks in the world in 2023. Fintech Magazine, February 20, https://fintechmagazine.com/banking/the-top-10-most-sustainable-banks-in-the-world-in-2023 [accessed: 05.04.2024].

ESRS (2023). Sustainability Reporting Standards. EFRAG, https://www.efrag.org/lab6 [accessed: 03.11.2023].

Intensa Sanpaolo (2024). Our Business Model, https://group.intesasanpaolo.com/en/editorial-section/the-strength-of-the-group/our-business-model [accessed: 05.04.2024].

Kosztowniak, A. (2023). Climate Policy Relevant Sectors in the Polish commercial banks. Central European Review of Economics & Finance, 42 (1), 50–70, https://doi.org/10.24136/ceref.2023.004

mBank (2024). Business model and value model of mBank Group, https://www.mbank.pl/en/annual-report/2020/o-grupie-mbanku/about-mbank-group-2/model-biznesowy-banku-i-model-wartosci-grupy/ [accessed: 05.04.2024].
Nosowski, A. (2012). Models, strategies and management methods in credit institutions. [In:] A. Gospodarowicz, A. Nosowski (eds.), Managing credit institutions. Warsaw: C.H. Beck.
Pyka, I. (2013). Commercial banking. Katowice: Wydawnictwo Uniwersytetu Ekonomicznego w Katowicach.
Roengpitya, R., Tarashev, N., Tsatsaronis, K. (2014). Bank business models, BIS Quarterly Review, 55–65.
Saebi, T., Foss, N.J. (2014), Business models for open innovation: Matching heterogeneous open innovation strategies with business model dimensions. European Management Journal, https://www.doi.org/10.1016/j.emj.2014.11.002
Santander Bank Group (2024). Business Model, https://www.santander.com/en/about-us/our-business-model [accessed: 05.04.2024].
Santos, J., Spector, B., van der Heyden, L. (2009), Toward a theory of business model innovation with incumbent firms. Working paper no. 2009/16/ EFE/ST/TOM, 5–13.
Zott, C., Amit, R. (2010). Business Model Design: An Activity System Perspective. Long Range Planning. Business Models, 43 (2–3), 216–226.

Ewolucja modeli biznesowych banków w Unii Europejskiej uwzględniających regulacje prawne i taksonomię zrównoważonego rozwoju

STRESZCZENIE

Celem artykułu jest przedstawienie mechanizmu wpływu unijnych regulacji prawnych w zakresie zrównoważonego rozwoju i raportowania niefinansowego na modele biznesowe banków funkcjonujące w UE oraz szans i zagrożeń wynikających z transformacji ESG. Zastosowano przegląd unijnych dyrektyw i rozporządzeń obowiązujących w zakresie ESG oraz sprawozdawczości niefinansowej przedsiębiorstw. Wskazano główne praktyki stosowane przez banki w zakresie dostosowań do wymogów regulacyjnych i nadzorczych, w tym w obszarze komponentów modeli biznesowych istotnych w transformacji ESG. Wnioski badawcze wskazują na ważność regulacji CSRD, ESRS oraz CSDD. Spośród komponentów modeli biznesowych banki w UE dostosowują przede wszystkich: profil klienta oraz ofertę produktową. Modele biznesowe banków ewoluują w kierunku zwiększania oferty produktowej finansującej zielone inwestycyjne w formie zielonych pożyczek, kredytów oraz obligacji. Podejmowane działania dotyczą wszystkich działań w obszarach: *Governance* – ładu korporacyjnego np. strategii biznesowej, ryzyka, odpowiedzialnej bankowości, zrównoważonych łańcuchów dostaw, *Environmental* – np. produktów w zakresie zielonego finansowania, wpływu działalności operacyjnej na środowisko czy raportowania TCFD oraz *Social* – relacji z interesariuszami np. relacje z pracownikami, klientami oraz ze społeczeństwem. Wymienione działania decydują o proekologicznej ewolucji modeli biznesowych banków. Wartością dodaną artykułu jest przegląd obowiązujących przepisów w zakresie ESG, taksonomii niefinansowej (stan na listopad 2023 r.) oraz wskazanie kierunku zmian taksonomii niefinansowej (stan na listopad 2023 r.), wskazanie kierunku zmian modeli biznesowych z określeniem głównych komponentów dostosowywanych przez banki.

Słowa kluczowe: banki, modele biznesowe, ESG, taksonomia, niefinansowe raportowanie, UE

Polityki Europejskie, Finanse i Marketing
30 (79) 2023
DOI 10.22630/PEFIM.2023.30.79.14

Received: 03.07.2024
Accepted: 18.07.2024

Piotr Ptak[1]✉***, Michał Wielechowski***[2]✉
[1] Helena Chodkowska University of Technology and Economics – UTH
[2] Warsaw University of Life Sciences – SGGW

FISCAL DISCIPLINE IN CZECHIA'S PUBLIC FINANCE: THE NECESSITY OF FISCAL RULES

ABSTRACT
The primary objective of the study is to illustrate the evolution of Czechia's fiscal stance from before the financial crisis up to the pandemic. Secondly, the paper seeks to identify the factors influencing the direction and speed of fiscal consolidation, aimed at reducing debt and implementing counter-cyclical fiscal policies. Thirdly, the study explores the reasons behind Czechia's eventual adoption of fiscal rules into its framework. This study's methodology combines the authors' analytical expertise with a review of literature, research publications and analytical reports. It also includes data and statistical analysis, using reports from the European Commission and OECD. The research, conducted from 1995 to 2019, includes a debt sustainability analysis of Czechia's public debt and forecasts extending to 2024, using data from the AMECO database. The analysis conducted indicates that Czechia was a strong candidate for the implementation of fiscal rules to ensure long-term fiscal discipline. Prior to the adoption of these rules, Czechia's public debt remained well below the EU's threshold. However, from the 1990s leading up to 2017, there was a steady increase in the debt-to-GDP ratio, reaching 20%. Notably, even during times of strong economic growth, reductions in the debt-to-GDP ratio were not substantial or prolonged enough to counterbalance past escalations. Furthermore, Czechia is expected to face higher-than-average growth in age-related expenditure pressures, which could be more effectively managed through a framework of fiscal rules. The medium to long-term impact of ageing-related costs on public finances is significant. The debt sustainability analysis for Czechia's public debt emphasises this point, further supporting the need for the introduction of fiscal rules.

Key words: fiscal policy, public debt, primary balance, fiscal rules
JEL codes: E62, H62, H63

✉ Piotr Ptak, Helena Chodkowska University of Technology and Economics, piotr.ptak@uth.edu.pl, https://orcid.org/0000-0002-0784-595X

✉ Michał Wielechowski, Warsaw University of Life Sciences – SGGW, michal_wielechowski@sggw.edu.pl, https://orcid.org/0000-0002-1335-8971

Introduction

Keit and Turcu [2022] argue that the issue of balancing macroeconomic stabilisation with sustainable long-term public debt growth is a central concern in policy discussions. Fiscal policy is considered procyclical when governments increase spending and cut taxes during economic booms, or do the opposite during recessions, thereby exacerbating the effects of the business cycle. Factors that contribute to procyclical fiscal policy include limited access to international credit markets, financial shallowness and political distortions. In contrast, saving fiscal revenues during prosperous times for use during downturns, thus implementing countercyclical fiscal policy, is considered optimal for debt management and macroeconomic stability.

Economic theory indicates that optimal fiscal policy must fulfil two basic conditions: it must be sustainable and counter-cyclical. Fiscal policy is sustainable if the public debt-to-GDP ratio converges toward a constant value in the long run. In turn, a counter-cyclical policy is one that reduces the amplitude of business cycle fluctuations. This means it is expansionary during economic slowdowns and contractionary during economic expansions [Janikowski and Rohmanyi 2018]. Gaspar and Eyraud [2017] present five keys to a smart fiscal policy: it should be countercyclical, growth-friendly, supported by a strong tax capacity, prudent and promote inclusion. Theoretical support for the effectiveness of countercyclical policy is found in studies by Christiano et al. [2011] and Nakata [2011]. Under typical conditions, a countercyclical fiscal strategy should depend on "automatic stabilisers". These are expenditures and revenues that adapt in response to economic fluctuations [Gaspar and Eyraud 2017].

Fiscal regulations establish long-lasting limitations on fiscal policy by imposing numerical restrictions on budgetary aggregates. These regulations are designed to correct distorted incentives and restrain tendencies towards excessive expenditure, particularly during periods of economic prosperity. The objective is to uphold fiscal prudence and maintain the sustainability of public debt.

Fiscal rules serve as potential counter-cyclical stabilisers for the future, offering early warnings against scenarios that might jeopardise the sustainability of public finances and ensuring the optimality of fiscal policy. These rules are embedded in the Maastricht Treaty, which sets a public debt limit at 60% of GDP and a fiscal deficit cap at 3%. More stringent constraints are outlined in the Treaty on Stability, Coordination and Governance in the Economic and Monetary Union, commonly known as the Fiscal Pact. This treaty stipulates that the structural fiscal deficit should not exceed 0.5% of GDP, or 1% in countries with lower debt levels. Additionally, fiscal rules have been incorporated into national laws and can manifest as legal statutes, regulatory measures, governmental declarations or even constitutional amendments. However, their presence does not inherently ensure a policy focused on fiscal equilibrium and low debt levels.

In the European Union, Czechia presents a unique case compared to the majority of European nations. Czechia has achieved a relatively high standard of living, as measured by GDP per capita. Prior to the pandemic, Czechia shared several fiscal policy characteristics with other European countries. Notably, Czechia managed to maintain a budget surplus for several years and reduce its debt-to-GDP ratio. Like many European nations, Czechia faces significant challenges due to an ageing population. However, until 2017, Czechia's distinctiveness

lay in its institutional approach to fiscal policy. Unlike other European countries that had integrated fiscal rules into their frameworks in line with EU regulations, Czechia had no such rules until 2017. Yet, it appeared to follow a responsible and disciplined fiscal approach. Additionally, Czechia was the only EU member state not to initially sign the Fiscal Pact, which was enforced in 2013. Since 2017, Czechia has adopted fiscal rules and established a Fiscal Council to oversee them, and it has ratified the Fiscal Pact.

The primary objective of this study is to illustrate the evolution of Czechia's fiscal stance from before the financial crisis up to the pandemic. Secondly, the paper aims to identify the factors influencing the direction and speed of fiscal consolidation, which aimed to reduce debt and implement counter-cyclical fiscal policies. Thirdly, the study explores the reasons behind Czechia's eventual adoption of fiscal rules into its framework. This adoption occurred despite many years of maintaining a robust fiscal policy without such rules, in contrast to numerous other countries that had established credible fiscal frameworks much earlier.

A considerable number of empirical studies have focused on the effectiveness of fiscal rules; however, only a few have explored countries that maintained sound fiscal policies for many years without such rules before ultimately deciding to implement them. This study is important for understanding fiscal discipline within the Czech context, offering critical insights for policymakers. By analysing Czechia's fiscal policies, especially in the face of demographic changes and economic challenges, the study sheds light on the effectiveness of fiscal rules and their impact on maintaining sustainable public finances. The findings may be important for formulating and implementing fiscal policies that balance economic growth and fiscal responsibility, providing a blueprint for other nations facing similar fiscal challenges.

The remainder of our paper is structured as follows: Following this **introduction**, the next section provides the **literature review**. The subsequent section presents the **materials and research methods** used. The **results and discussion** section sets out the empirical findings and discussion. The last section summarises and presents the main **conclusions**.

Literature review

Theoretical framework on fiscal discipline and fiscal rules reveals a multifaceted understanding of their impact and effectiveness. Bergman and Hutchison [2015] highlight that fiscal regulations are highly effective in restraining a procyclical fiscal approach once a foundational level of governmental efficiency or quality is established. Bova et al. [2014], Combes et al. [2014] and Guerguil et al. [2017] deduce that fiscal regulations might correlate with a more countercyclical approach to fiscal policy, assuming their flexibility design, encompassing appropriate proper escape clauses, cyclically adjusted targets, or an elongated period for evaluating adherence to the fiscal guideline. Şimşek and Bekâr [2008] emphasise that fiscal rules, including balanced budget and debt rules, are crucial for ensuring budget balance and public finance solvency. Kotia and Lledo [2016] note that the discipline-enhancing effect of fiscal rules is diminished when there are large vertical fiscal imbalances. Roberts [2015] argues that fiscal rules have played a minor role in advanced democracies, highlighting the resilience of democratic systems during fiscal crises. Conesa et al. [2004] suggest that rules restricting fiscal management promote discipline and growth by reducing uncertainty. Debrun and Kumar [2007] suggest that budget-

ary transparency and democratic accountability are crucial for establishing credibility in fiscal institutions. Kantorowicz [2014] discovered a connection between national fiscal rules and improved budget balance, highlighting the importance of formal enforcement mechanisms being crucial for their effectiveness. Hansen [2020] contends that fiscal rules and transparency contribute to better fiscal balances, but financial markets do not directly discipline fiscal policies.

The global perspective on fiscal rules reveals a diverse landscape in terms of their adoption and impact across various countries. Barbier-Gauchard, Baret and Minea [2021] found that fiscal rules significantly improve the Global Financial Performance Index. The type of rule and structural factors play a critical role in this improvement. Sawadogo [2020] observed that fiscal rules reduce sovereign bond spreads and enhance debt ratings, particularly benefitting developing countries' financial market access. Thornton and Vasilakis [2018] observed that the adoption of numerical fiscal rules reduces government borrowing costs in both international and domestic markets. Elbadawi, Schmidt-Hebbel and Soto [2014] identified motives for adopting fiscal rules, including fiscal solvency, macroeconomic stabilisation and resilience to corruption. Miyazaki [2014] highlighted the varied impacts of fiscal rules, with different outcomes in Australia and Sweden. Kopits [2001] argued that recent fiscal rules contribute to stability and growth in both advanced and emerging economies. Fincke and Wolski [2013] found that EU fiscal rules led to more counter-cyclical discretionary fiscal policies.

The impact of fiscal rules on economic stability and growth, as well as their effectiveness in crisis situations, has been extensively studied. Marneffe et al. [2010] found that fiscal rules have some impact on fiscal balances, which – in turn – may affect economic stability and growth. Kim [2014] emphasised the role of fiscal rules in stabilising the economy and determining economic stability and growth. Doménech Vilariño and Andrés Domingo [2005] noted that the tightness of fiscal rules does not affect their effectiveness as macroeconomic stabilising instruments. Gomez-Gonzalez, Valencia and Sánchez [2022] found that fiscal rules significantly reduce sovereign risk and the probability of a sudden stop in countries that implement them. Dimitra [2021] highlighted the importance of fiscal rules and fiscal councils in improving fiscal performance. Kielin [2021] argued that constitutional fiscal rules can be an effective tool in times of financial crisis. However, Działo [2016] and Truger [2020] pointed out that fiscal rules were not always effective in ensuring fiscal discipline in times of crisis, suggesting the need for more effective enforcement and a strong legal basis for macroeconomic stability.

The existing literature on Czechia's fiscal policy and the need for fiscal rules reveals several gaps and opportunities for further research. Rolák and Cigán [2015] noted that Czech fiscal policy was mostly random rather than anti-cyclical during 1998–2013, indicating room for improvement in using fiscal policy to stabilise the economy. Hedbávný and Schneider [2003] suggested the need for a simple and transparent fiscal rule in Czechia to avoid a governmental bias toward budget deficits. Melecký and Macháček [2010] emphasised the importance of enforceability in Czechia's fiscal targeting mechanism and EU fiscal rules. Gawthorpe [2022] highlighted that the only fiscal policy that would maintain both labour income and well-being unaltered in the presence of aging in Czechia is reducing social-security payments. Michl [2019] suggested that expansionary fiscal policy via higher government investment can lead to faster stabilisation of the Czech economy.

The literature review on fiscal discipline and fiscal rules in public finance has produced several key findings. Fiscal rules have been shown to enhance public finance discipline by increasing predictability and limiting irresponsible political behaviour, as demonstrated in Poland [Ciak 2019]. They play a crucial role in maintaining fiscal discipline and supporting fiscal credibility in EU member states, with their effectiveness influenced by various factors such as type, legal basis and transparency [Dziemianowicz and Kargol-Wasiluk 2017]. However, during economic crises, fiscal rules have not always been effective in maintaining fiscal discipline and macroeconomic stability [Działo 2016, Guziejewska 2017].

In the European Union, balanced budget rules have been identified as the most effective in promoting sustainable public finances [Bergman et al. 2016]. Clear and simple rules, along with incentives for compliance and a 3% deficit limit, are essential for anchoring expectations of fiscal discipline [Schuknecht 2004]. The literature also suggests that fiscal rules can promote fiscal discipline in subnational governments, but their effectiveness depends on the specific context and implementation [Ter-Minassian 2007, Kotia and Lledo 2016].

Materials and methods

The methodology used in this study is based on the authors' analytical and professional expertise. It includes a thorough review of existing literature, research publications and available analytical reports. Additionally, data and statistical analysis were used to supplement the findings. The approach taken in this article is supported by well-correlated reports from authoritative sources, including the European Commission and OECD. Following this methodology, the analysis of Czechia's public debt sustainability was conducted using the formula outlined below.

In reality, no formula exists that can precisely decompose changes in the debt ratio into its key determinants such as interest rates, inflation, fiscal adjustments and others. However, Equation 1, closely aligned with Escolano's [2010] approach, offers a near approximation for this purpose:

$$d_t - d_{t-1} = \frac{i_t}{1+y_t} d_{t-1} - \frac{y_t}{1+y_t} d_{t-1} + p_t \tag{1}$$

where:
d_t – debt at the end of period t, as a ratio to GDP at t;
d_{t-1} – debt at the end of period t–1, as a ratio to GDP at t–1;
i_t – nominal interest rate in period t; paid in period t on the debt stock outstanding at the end of t –1;
y_t – nominal GDP growth rate between t–1 and t;
p_t – primary fiscal deficit in t, as a ratio to GDP at t.

Equation 1 shows that the change in the debt ratio is determined by the cumulative effects of interest rates (with a positive impact), nominal GDP growth (with a negative impact) and the primary deficit. When simplifying Equation 1 and assuming that the stock-flow adjustment factor has no impact, it transforms into Equation 2.

$$d_t - d_{t-1} = p_t + d_{t-1}\left(\frac{i_t - y_t}{1+y_t}\right) \tag{2}$$

Equation 2 illustrates that the change in the debt-to-GDP ratio is the sum of the primary fiscal deficit and the "snowball effect". This effect represents the combined impact of the interest rate on government bonds and the growth rate of nominal GDP on the debt-to-GDP ratio. In order for the debt-to-GDP ratio to remain stable, the left side of Equation 2 must be zero. Stabilising the debt-to-GDP ratio at a predetermined level necessitates ensuring that:

$$-p_t = d_{t-1}\left(\frac{i_t - y_t}{1 + y_t}\right) \tag{3}$$

Equation 3 indicates that to maintain a stable debt-to-GDP ratio, the ratio of the primary deficit to GDP must be equal to the snowball effect. In other words, public debt does not increase if the primary deficit is offset by the surplus generated from nominal GDP growth exceeding the average nominal interest rate on the debt. If the nominal interest rate exceeds the nominal GDP growth rate, the debt ratio will continue to rise unless there is a significant primary budget surplus to counteract this effect. Often, preventing the increase of debt requires not only achieving a primary balance but also establishing a primary surplus, a situation currently faced by some European countries. The sign of the expression $i_t - y_t$ in Equation 3 is pivotal for debt dynamics. To stabilise the debt-to-GDP ratio, the value of the primary balance must equal the right side of Equation 3. However, with a high and positive value of the expression $i_t - y_t$ in Equation 3, stabilising the debt-to-GDP ratio necessitates not only achieving a primary balance, but also ensuring a sufficient primary surplus.

The research period spans the years 1995–2019 and is further divided into three distinct subperiods for detailed analysis: the pre-global financial crisis era (1995–2008), the period that includes the global financial crisis (2008–2012) and the post-crisis phase (2012–2019). To provide a forward-looking perspective, the study also includes data and forecasts for the period 2019–2024. All data used in this analysis is sourced from the AMECO database, including the latest economic forecast from May 2023, provided by the European Commission.

Results and discussion

Figure 1 illustrates the fiscal performance of Czechia in the years leading up to the onset of the global financial crisis.

Upon a quick examination, Czechia's fiscal situation appears relatively positive, especially in terms of its debt-to-GDP ratio, which was considerably lower than the European Union average prior to the financial crisis: 28% of GDP compared to 64% of GDP in preceding years. However, a closer look at the fiscal deficits reveals a persistent issue. The primary fiscal balance serves as the most reliable indicator of the overall fiscal situation within the government's control. This balance is calculated by subtracting government spending (excluding debt servicing costs) from government revenue, thus accurately reflecting the government's fiscal policy decisions. When analysing Czechia's fiscal status through the lens of the primary balance, it becomes evident that the authorities consistently maintained a primary deficit before the crisis, indicating an expansionary fiscal

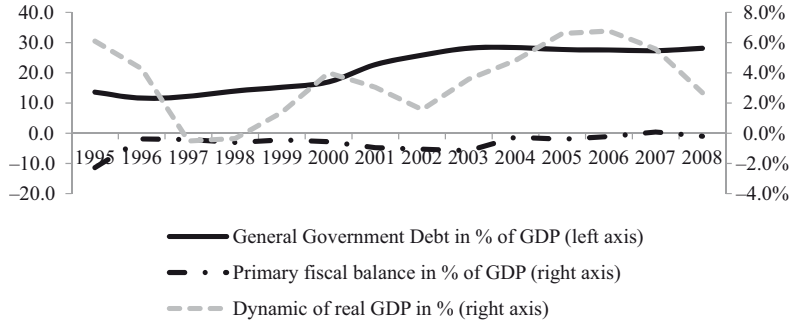

Figure 1. Public debt, primary balance and economic growth in Czechia in years 1995–2008
Source: own calculations based on AMECO database.

stance throughout this period. This low debt-to-GDP ratio effectively concealed this trend. Notably, this occurred during periods of strong economic growth, and while there were occasional declines in the debt ratio, they were too brief and insufficient to counterbalance the preceding increases. The inference from the pre-crisis period is clear: Czechia exhibited a significant deficit bias, with the government incurring deficits not only during recessions and periods of below-average growth, but also in times of economic prosperity [Baxa and Paulus 2016].

The onset of the global financial crisis and its impact on the Czech economy mirrored trends observed in other countries. A marked contraction in GDP, with a 4.7% decline in 2009, led to a substantial drop in tax revenues. This downturn, coupled with the government's implementation of stimulus packages to invigorate the economy and support the financial sector, resulted in a notable escalation in both the public finance deficit and public debt (as illustrated in Figure 2). However, it is important to recognise that the gradual yet consistent rise in public finance imbalances was not solely a consequence of the severe economic downturn triggered by the financial crisis. It was also, in part, a result of inadequate fiscal policies that had been in place prior to the crisis.

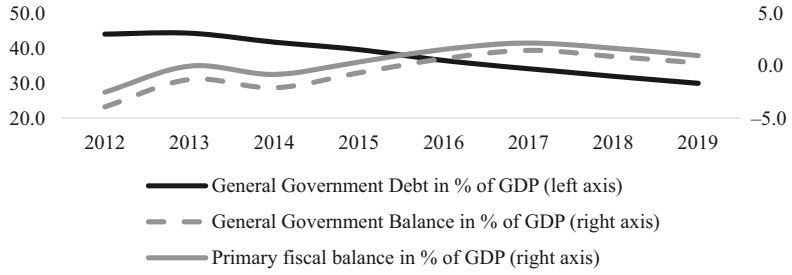

Figure 2. Public debt and fiscal balance during the financial crisis in Czechia in % of GDP
Source: own calculations based on AMECO database.

The fiscal consolidation process in Czechia primarily focused on reducing expenditures. Significant efforts in the initial phase were directed towards curbing spending and enhancing the efficiency of the tax system, among other strategies [Klyuev and Snudden 2011]. Implementing this consolidation proved challenging, particularly as the Czech economy slipped into a second recessionary phase in 2012, registering a 0.8% contraction, followed by a moderate decline of 0.05% in 2013. Consequently, the fiscal deficit initially decreased before beginning to rise again. Nonetheless, improvements in the primary balance from 2014 onwards steered the debt-to-GDP ratio onto a declining trajectory.

In the years following the global financial crisis and preceding the pandemic, Czechia exemplified a gradual yet consistent reduction in its debt-to-GDP ratio, underpinned by concerted fiscal efforts. The country succeeded in achieving a fiscal surplus for four consecutive years and even extended this to a primary surplus for an additional year. This fiscal prudence occurred amidst strong real GDP growth, averaging nearly 4% between 2012 and 2019. Despite these positive economic indicators, it's noteworthy that the level of debt remained significantly higher than in the early 2000s or the period before that. This scenario underscores the complexity of fiscal management and the challenges in reducing public debt levels, even in times of economic prosperity.

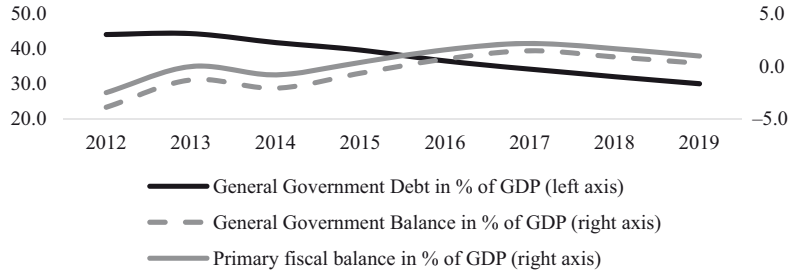

Figure 3. Public debt and fiscal balance after the financial crisis in Czechia in % of GDP

Source: own calculations based on AMECO database.

Given the impending spending pressures from an ageing population and the requirement for all European Union members to implement EU fiscal rules (Council Directive 2011/85/EU of November 8, 2011) into their national legislation, it was a logical step for the Czech government to adopt such measures. Notably, Czechia was the only EU member state that initially did not sign the Fiscal Pact, which came into effect in 2013. However, since 2017, in addition to ratifying the Fiscal Pact, Czechia has established fiscal rules and a Fiscal Council to oversee them.

Czechia's fiscal policy has tended to be moderately expansionary, leading to a gradual increase in the debt-to-GDP ratio over time. Despite a reduction in this ratio in the years preceding the pandemic, Czechia, like many other countries, exhibited a natural inclination towards what is known as a "deficit bias". Consequently, some experts argue that Czechia was an ideal candidate for the implementation of fiscal rules aimed at enhancing fiscal discipline [Baxa and Paulus 2016].

Moreover, the steady growth of public debt over the past two decades occurred despite the previous fiscal framework introduced in 2004. This framework was based on fiscal tar-

gets aimed at limiting the government's discretionary policy. However, it proved to be overly lenient, as successive governments were able to breach these targets without facing sanctions. This further exacerbated the deficit bias [OECD 2016].

To promote responsible fiscal behaviour and ensure long-term fiscal sustainability, Czechia implemented significant enhancements to its fiscal framework in 2017. These improvements included the integration of EU fiscal rules into national legislation, with the objective of enhancing and maintaining the overall financial well-being of Czechia's public finances. Specifically, Czechia implemented three fiscal rules through the enactment of the [Fincke and Wolski 2016]:

- The Balanced Budget Rule: This rule is based on the medium-term objective (MTO), targeting a structural deficit of 1% of GDP. The MTO is a key element in ensuring fiscal discipline by maintaining a sustainable budget deficit level.
- Debt Brake at 55% of GDP: This rule sets a ceiling on the amount of debt that the government can accumulate, capped at 55% of the country's GDP. It serves as a safeguard against excessive government borrowing and debt accumulation.
- Debt Brake for Regional and Local Governments: This rule imposes a maximum debt limit of 60% of their income for regional and local governments. It aims to ensure that subnational levels of government maintain fiscal discipline and do not contribute excessively to the overall public debt.

The Act on Budgetary Responsibility establishes an expenditure framework for the state budget and state fund budgets, aligned with the MTO. This framework is designed to ensure the long-term sustainability of public finances. The MTO is defined in terms of a "structural budget balance", adjusted for cyclical variations and one-off factors. Fiscal policy is required to either meet the MTO or demonstrate progress towards it by adjusting the structural budgetary position at a rate of 0.5% of GDP per year. This adjustment mechanism implies that maximum government spending should align with expected revenues, factoring in the anticipated impact of the economic cycle. Consequently, higher spending is permissible during economic downturns. Additionally, expenses can exceed cyclically adjusted revenues by up to 1% of expected nominal GDP, providing a degree of flexibility in fiscal management.

Czechia's fiscal framework includes a robust correction mechanism that automatically activates under certain conditions, with predetermined consequences. This mechanism is designed to ensure fiscal discipline and the long-term sustainability of public finances. Key aspects of this mechanism include:

- An automatic correction mechanism: This mechanism is triggered when specific fiscal parameters are breached, ensuring immediate corrective action to maintain fiscal stability.
- Exit clauses for increased expenditures: The framework allows for increased expenses under certain exceptional circumstances:
  - Costs related to the deterioration of state security;
  - Costs arising from natural disasters or the implementation of international agreements if these costs are expected to exceed 3% of the projected GDP;
  - Costs associated with an economic downturn, specifically if a decline in real GDP of at least 3% is forecasted by the ministry.
- Debt brake at 55% of GDP: This rule stipulates that the general government sector debt, minus cash reserves, should not surpass 55% of the nominal GDP. The debt brake is an extraordinary measure, intended to be used if the expenditure rule fails to stabilise the

debt ratio at lower levels. If the debt-to-GDP ratio exceeds 55%, the government must submit a revised budget proposal and a medium-term budget forecast to parliament, both aimed at restoring fiscal sustainability.

- Further measures above 60% debt-to-GDP ratio: If the debt-to-GDP ratio escalates above 60%, the government is obligated to propose specific measures to reduce the debt.
- Restrictions on public institutions: When the debt-to-GDP ratio exceeds the specified level, restrictions are imposed on various public entities:
  - Health insurance companies and local authorities must maintain balanced budgets. Local and regional governments can only have deficits if they are financed through their own cash reserves from previous budget surpluses or if temporary deficits are necessary for pre-financing EU co-financed projects;
  - Insurance companies are required to maintain balanced budgets without using funds from previous years;
  - Other public institutions may borrow from each other, provided these transfers do not increase the total public sector debt.
- Escape Clauses for the Debt Brake: The obligation to submit a new budget proposal and the restrictions on public sector finance are waived under specific conditions:
  - A severe economic downturn, defined as a two-year period following a quarter in which real GDP declines by 2% or an annual decline of 3%;
  - Situations where the country's security is threatened, including wartime scenarios;
  - The need to respond to natural disasters or meet costs arising from international agreements if such costs are expected to exceed 3% of estimated GDP.

The fiscal framework in Czechia also includes specific regulations for local governments. These rules state that the debt of a local government entity must not exceed 60% of its average revenue over the past four financial years. If a local government's debt-to-income ratio exceeds this 60% threshold, it is required to reduce the debt by 5% of the difference between the actual debt amount and the 60% limit. If a local government decides not to comply with this debt reduction requirement, an equal amount of tax revenue is temporarily withheld to enforce compliance.

This debt-to-income ratio calculation considers the total income and debt of a local government without differentiating between various sources and purposes. This methodology aims to maximise the coverage of the rule and minimise exceptions. However, this broad approach can lead to several unintended consequences. Notably, local government revenues are not solely comprised of tax income but also include transfers from the central government, which are often earmarked for specific purposes. As a result, local governments have limited flexibility in managing these transfers, which only marginally influence their financial health. The proportion of such transfers in the total income varies significantly across different local authorities. For example, statutory cities – on average – have 19% of their total income from transfers, while for regional governments, this figure is approximately 60%, thus exceeding their tax revenue.

The 2017 reform in Czechia established two independent bodies to enhance fiscal governance:

- The National Budgetary Council, tasked with monitoring adherence to fiscal rules and evaluating their long-term impact on public finance sustainability;

- The Committee for Budgetary Forecasts, responsible for assessing the reliability of macroeconomic and fiscal projections used in budgetary planning (OECD, 2020).

The advent of the pandemic prevented a comprehensive evaluation of this new framework. The debt-to-GDP ratio, which had declined to 30% in 2019, subsequently experienced a rapid increase. Currently, due to these extraordinary circumstances, fiscal policy has deviated from the established rules, with the European Commission allowing member states to activate escape clauses. In response to the COVID-19 crisis, the structural balance fiscal rule was temporarily adjusted to accommodate necessary fiscal support. This amendment aligns with the European Commission's activation of the Stability and Growth Pact's escape clause. Following the crisis, the structural balance rule was revised for the 2021–2028 expenditure framework, as outlined by the Ministry of Finance [2020b]. The revision stipulates a minimum annual improvement of 0.5 p.p. in the structural budget balance from 2022 to 2028 [OECD 2020]. In the years leading up to the COVID-19 pandemic, as depicted in Figure 3, Czechia successfully achieved and sustained a primary surplus over an extended period. This notable progress can be attributed to the implementation of fiscal consolidation measures, complemented by the contribution of robust real GDP growth. Table 1 showcases the sustainability of general government debt in Czechia post-pandemic, incorporating three sensitivity scenarios. These scenarios are designed to provide a clearer understanding of the variations in relation to the necessary level of primary balance, as determined by Equation 3.

Table 1. Sustainability of general government debt in Czechia

Czechia	Primary balance in % of GDP			Level of primary balance beyond which the debt starts to fall		
	2020	2023*	forecast 2023*	scenario 1**	scenario 2***	scenario 3****
	–5.0	–2.3	–2.8	–2.0	–3.5	–2.4

*based on European Economic Forecast, Winter Autumn, Institutional Paper 160, European Commission 2023; **scenario 1 reflects lower inflation and real GDP rates by 1.0 p.p. compared to Forecast 2023; ***scenario 2 reflects higher inflation and real GDP rates by 1.0 p.p. compared to Forecast 2023; ****scenario 3 reflects higher government long term interest rates by 1.0 p.p. compared to data (Reuters).

Source: own calculations based on AMECO database.

In accordance with Equation 3, the projected primary balance for Czechia in 2023 was insufficient to begin reducing the debt-to-GDP ratio. This was primarily due to the impact(s) of the pandemic and the war between Russia and Ukraine. The government implemented measures to revive economic growth, which resulted in the transformation of a primary surplus into a deficit over the past two years. Scenario 1 assumes lower inflation and real GDP rates by 1.0 p.p. compared to the European Commission's forecast for 2023. Under this scenario, the threshold primary balance required to begin reducing the debt starts to decrease, necessitating a significant fiscal effort in Czechia to stabilise the debt-to-GDP ratio. Conversely, Scenario 2 projects higher inflation and real GDP rates by 1.0 p.p. relative to the 2023 Forecast. In this case, the threshold primary balance for debt reduction significantly increases compared to Scenario 1, suggesting that a more relaxed fiscal policy could be enough to stabilise the debt-to-GDP ratio.

Scenario 3, which anticipates a 1.0 p.p. increase in long-term interest rates on government bonds compared to 2023 data, shows a slight decrease in the threshold primary balance compared to the European Commission's forecast for 2023. This indicates a need for modest fiscal consolidation. These scenarios collectively suggest that the Czech government must strategically address the fiscal gap. It is important to note that the primary balance calculations occur during a period of high inflation. The GDP deflator is projected to be above 11% for 2023, which accelerates nominal GDP growth and aids in debt reduction and economic recovery. Although Czechia's public debt-to-GDP ratio remains relatively low compared to other EU Member States, its growth rate between 2020 and 2022 exceeded the EU average. It increased from 30% in 2019 to 44% in 2022. With high nominal GDP growth and a shrinking public deficit, the public debt-to-GDP ratio is expected to marginally decrease and stabilise at around 43.1% in 2023 and 43.4% in 2024, according to the European Commission (2023).

However, the analysis reaffirms that the sign and magnitude of the primary balance, as per Equation 3, are highly sensitive to both the sign and value of expression $i_t - y_t$.

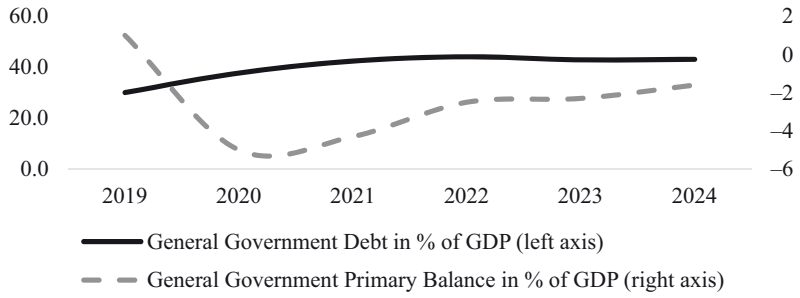

Figure 4. Trajectory of the fiscal primary surplus and government debt in Czechia, as projected in the spring forecast of 2023

Source: own calculations based on AMECO database.

The public debt in Czechia increased significantly during the pandemic and the conflict between Russia and Ukraine. As a result, by the end of the forecast horizon in 2024, Czechia is far from achieving a primary surplus and starting a permanent reduction in its debt-to-GDP ratio. This situation requires the Czech government to implement necessary measures to address the fiscal deficit. It is clear that a return to fiscal rules will play a crucial role in this process, emphasising the improved efficiency of fiscal policy when supported by fiscal rules.

Over the last two decades, the debt-to-GDP ratio in Czechia has escalated by approximately 30 p.p. Therefore, the Czech government's decision to implement fiscal rules was judicious, as the analysis indicates that Czechia was a natural candidate for such measures, despite its public debt being relatively low compared to the European Union average for most of the period under review. Additionally, the looming age-related spending pressures that Czechia faces can be more effectively managed with a fiscal framework that includes fiscal rules.

Conclusions

The conducted analysis provides a comprehensive overview, demonstrating that Czechia was an ideal candidate for implementing fiscal rules that require long-term fiscal discipline. This need was emphasised by the country's fiscal history and emerging economic challenges. Prior to adopting these rules, Czechia's public debt, although consistently remaining well below the European Union's threshold, exhibited a concerning trend. Specifically, from the 1990s onwards, there was a noticeable and steady increase in the debt-to-GDP ratio, which began to escalate from a baseline of 20%. This upward trajectory of debt accumulation was particularly alarming given that it occurred despite periods of robust economic growth. Notably, during these times of economic prosperity, any reductions in the debt-to-GDP ratio were insufficiently substantial or prolonged to effectively counterbalance the prior escalations. This pattern indicated a potential vulnerability in fiscal management and highlighted the need for stricter fiscal controls.

Moreover, Czechia's fiscal landscape is complicated by demographic shifts. The country is projected to experience higher-than-average growth in age-related expenditure pressures. These pressures stem primarily from an ageing population, which is expected to significantly increase the costs associated with healthcare, pensions and other social services related to ageing. Managing these escalating costs effectively is crucial for maintaining fiscal stability and requires a robust framework of fiscal rules. The medium to long-term impact of ageing-related costs on public finances is not only significant, but also potentially destabilising if not addressed proactively.

The debt sustainability analysis for Czechia's public debt further under-scores the necessity of these fiscal rules. The analysis clearly demonstrates that the sign and value of primary balance in accordance with equation (3) is highly sensitive about the sign and value of expression $i_t - y_t$ so the macroeconomic conditions. This analysis also reveals the long-term implications of current fiscal policies and demographic trends on the country's financial stability. It highlights the importance of implementing measures that can ensure fiscal sustainability in the face of demographic changes and economic fluctuations.

The public debt increased substantially during the pandemic. That is why, at the end of the forecast's horizon (2023), Czechia is quite far from achieving a primary surplus and starting to lower its debt-to-GDP ratio. This will require the Czechia government to take appropriate measures to address the fiscal deficit. Needless to say, fiscal rules incorporated into its fiscal framework will be of great importance in that process. The reasons for implementing fiscal rules in Czechia are multifaceted and extend beyond mere economic indicators. A key prerequisite for the success of reforms related to the fiscal framework, and thus for the long-term conduct of responsible fiscal policy, is political will. This involves a commitment from policymakers to adhere to fiscal constraints and to make difficult decisions that may sometimes be politically unpopular but are necessary for economic stability. However, comprehensively examining all factors, including the uncertainty stemming from the nature of the political cycle, presents significant challenges. Political dynamics often introduce a level of unpredictability in fiscal policy-making, which can complicate efforts to maintain consistent and disciplined fiscal management. Therefore, the implementation of fiscal rules in Czechia not only addresses immediate economic concerns, but also represents a strategic approach

to mitigating the impact of political uncertainties on fiscal policy. This study has limitations, including a focus on Czechia's specific fiscal context – potentially limiting broader applicability. Additionally, the analysis may not fully account for unforeseen economic or political shifts, and the reliance on historical data may not accurately predict future fiscal trends or policy outcomes.

Future research could explore the adaptability of Czechia's fiscal framework in varying economic climates and its applicability to other contexts. Investigating the long-term effectiveness of fiscal rules in dynamically changing global economies presents a significant challenge for further study.

References

Barbier-Gauchard, A., Baret, K., Minea, A. (2021). National Fiscal Rules Adoption and Fiscal Discipline in the European Union. Applied Economics, 53(20), 2337–2359, https://doi.org/10.1080/00036846.2020.1859453

Baxa, J., Paulus, M. (2016). New fiscal rules for the Czech Republic: Analysis of the proposal No. 1/2016. Prague: Charles University in Prague, Institute of Economic Studies (IES).

Bergman, U.M., Hutchison, M. (2015). Economic stabilization in the post-crisis world: Are fiscal rules the answer?. Journal of International Money and Finance, 52, 82–101, https://doi.org/10.1016/j.jimonfin.2014.11.014

Bergman, U.M., Hutchison, M. M., Jensen, S.E.H. (2016). Promoting sustainable public finances in the European Union: The role of fiscal rules and government efficiency. European Journal of Political Economy, 44, 1–19, https://doi.org/10.1016/J.EJPOLECO.2016.04.005

Bova, M.E., Carcenac, N., Guerguil, M.M. (2014). Fiscal rules and the procyclicality of fiscal policy in the developing world. IMF Working Papers 2014/122. International Mone-tary Fund.

Christiano, L., Eichenbaum, M., Rebelo, S. (2011). When is the government spending multiplier large?. Journal of Political Economy, 119(1), 78–121, https://doi.org/10.1086/65931

Ciak, J.M. (2019). The influence of fiscal rules on the discipline in the public finance in Poland. Journal of Management and Financial Sciences, (36), 31–43, https://doi.org/10.33119/jmfs.2019.36.2

Combes, J.L., Minea, A., Sow, M. (2017). Is fiscal policy always counter-(pro-) cyclical? The role of public debt and fiscal rules. Economic Modelling, 65, 138–146, https://doi.org/10.1016/j.econmod.2017.05.017

Conesa, A., Schwartz, M.J., Somuano, A., Tijerina, J. (2004). Fiscal Rules in Mexico: Evolution and Prospects. [In:] Rules-Based Fiscal Policy in Emerging Markets: Back-ground, Analysis, and Prospects. London: Palgrave Macmillan UK, 131–145, https://doi.org/10.1057/9781137001573_9

Debrun, X., Kumar, M.S. (2009). The discipline-enhancing role of fiscal institutions: theory and empirical evidence. [In:] Policy Instruments for Sound Fiscal Policies: Fiscal Rules and Institutions. London: Palgrave Macmillan UK, 51–88, https://doi.org/10.1057/9780230271791_3

Dimitra, M. (2021). Does the Quality of Fiscal Institutions Matter for Fiscal Performance? A Panel Data Analysis of European Countries. International journal of economics and finance, 13(1), 1–33.

Doménech Vilariño, R., Andrés Domingo, J. (2005). Fiscal Rules and Macroeconomic Stability. Hacienda Publica Espanola/Revista de Economía Pública, 176(1), 9–41.

Działo, J. (2016). Are fiscal rules an effective instrument in consolidating public finances? Conclusions from the economic crisis. Ekonomia i Prawo. Economics and Law, 15(1), 59–71. https://doi.org/10.12775/EIP.2016.005

Dziemianowicz, R., Kargol-Wasiluk, A. (2017). The Influence of Fiscal Rules on the Fiscal Stability in the EU Member States. European Journal of Economics and Business Studies, 3(2), 212–224, https://doi.org/10.26417/ejes.v8i1.p212-224

Elbadawi, I.A., Schmidt-Hebbel, K., Soto, R. (2015). Why Do Countries Have Fiscal Rules? Journal Economía Chilena, 18(3), 28–61.

Escolano, J. (2010). A practical guide to public debt dynamics, fiscal sustainability, and cyclical adjustment of budgetary aggregates (No. 2010/002). Washington, DC: International Monetary Fund.

European Commission (2021a). European Economic Forecast. Autumn 2021, Institutional Paper 160, https://doi.org/10.2765/199989

European Commission (2021b): The 2021 Ageing Report: Economic and Budgetary Projections for the EU Member States (2019–2070). Institutional Paper 148, https://doi.org/10.2765/84455

Fincke, B., Wolski, M. (2016). Are European fiscal rules that bad? Discretionary fiscal policies in New Member States. Empirical Economics, 51, 517–546, https://doi.org/10.1007/s00181-015-1006-z Fiscal Responsibility Act. (2017). Act No. 23/2017 Coll., Act on the Rules of Budget Responsibility.

Gaspar, V., Eyraud, L. (2017). Five Keys to a Smart Fiscal Policy. IMF blog, https://www.imf.org/en/Blogs/Articles/2017/04/19/five-keys-to-a-smart-fiscal-policy [accessed: 25.11.2023].

Gawthorpe, K. (2022). Population ageing and sustainable fiscal policy in Czechia. Eastern Journal of European Studies, 13(1), 81–105, https://doi.org/10.47743/ejes-2022-0104

Gomez-Gonzalez, J.E., Valencia, O., Sánchez, G.A. (2022). How fiscal rules can reduce sovereign debt default risk. Emerging Markets Review, 50, 100839, https://doi.org/10.1016/j.ememar.2021.100839

Guerguil, M., Mandon, P., Tapsoba, R. (2017). Flexible fiscal rules and countercyclical fiscal policy. Journal of Macroeconomics, 52, 189–220, https://doi.org/10.1016/j.jmacro.2017.04.007

Guziejewska, B. (2017). Numerical fiscal rules: framework or barrier for public policymaking?. In Proceedings of International Academic Conferences (No. 5407329). International Institute of Social and Economic Sciences, https://doi.org/10.20472/IAC.2017.032.011

Hansen, D. (2020). The effectiveness of fiscal institutions: International financial flogging or domestic constraint?. European Journal of Political Economy, 63, 101879, https://doi.org/10.1016/j.ejpoleco.2020.101879

Hedbávný, P., Schneider, O. (2003). Fiscal Policy: Too Political? Czech Journal of Economics and Finance, 53, 462–476.

Janikowski Ł., Rohmanyi B. (2018). Is a Fiscal Policy Council needed in Poland? mBank – CASE Seminar Proceedings No. 157/2018, https://doi.org/10.2139/ssrn.3300793

Kantorowicz, J. (2014). Are (Fiscal) Rules Made to Be Broken? The Law and Economics Analysis of the Numerical Fiscal Constraints. The Law and Economics Analysis of the Numerical Fiscal Constraints, http://dx.doi.org/10.2139/ssrn.2412534

Keita, K., Turcu, C. (2022). Promoting counter-cyclical fiscal policy: fiscal rules versus institutions. Comparative Economic Studies, 1–46, https://doi.org/10.1057/s41294-022-00197-0

Kielin, Ł. (2021). Constitutionalisation of Fiscal Rules in Times of Financial Crises – a Cure or a Trap? Financial Law Review, 22(2), 94–112, https://doi.org/10.4467/22996834FLR.21.014.13982

Kim, Y.H. (2014). A Study of the Development of a National Financial Health Maintenance in Response to Economic Crisis. Journal of Digital Convergence, 12, 23–36, https://doi.org/10.14400/JDPM.2014.12.1.23

Klyuev V., Snudden S. (2011). Effects of Fiscal Consolidation in the Czech Republic. IMF Working Paper WP/11/65.

Kopits, G. (2001). Fiscal Rules: Useful Policy Framework or Unnecessary Ornament? Available at SSRN 2094462. http://dx.doi.org/10.2139/ssrn.2094462

Kotia, A., Lledo, V. (2016). Do Subnational Fiscal Rules Foster Fiscal Discipline? New Empirical Evidence from Europe. IMF Working Paper WP/16/84, https://doi.org/10.2139/ssrn.2765192
Marneffe, W., van Aarle, B., van der Wielen, W., Vereeck, L. (2010). The Impact of Fiscal Rules on Public Finances: Theory and Empirical Evidence for the Euro Area. CESifo Working Paper Series. 3303, http://dx.doi.org/10.2139/ssrn.1742765
Melecký, A., Macháček, M. (2010). The Role Of National And Supranational Fiscal Rules - International Evidence And Situation In The Czech Republic. Journal of Applied Eco-nomic Sciences, 5(4), 375–382.
Michl, A. (2019). Ten Years Later: Lessons for DSGE Builders and Czech Policy Makers. Review of Economic Perspectives, 19, 159–174, https://doi.org/10.2478/revecp-2019-0009
Miyazaki, T. (2014). Fiscal reform and fiscal sustainability: Evidence from Australia and Sweden. International Review of Economics & Finance, 33, 141–151, https://doi.org/10.1016/j.iref.2014.04.002
Nakata, H. (2011). Informative advertising with spillover effects. International Journal of Economic Theory, 7(4), 373–386, https://doi.org/10.1111/j.1742-7363.2011.00170.x
OECD (2016). OECD Economic Surveys: Czech Republic 2016. Paris: OECD Publishing, https://doi.org/10.1787/eco_surveys-cze-2016-en
OECD (2020). OECD Economic Surveys: Czech Republic 2020. Paris: OECD Publishing, https://doi.org/10.1787/1b180a5a-en
Roberts, A. (2015). No Simple Fix: Fiscal Rules and the Politics of Austerity. Indiana Journal of Global Legal Studies, 22(2), 401–431, https://doi.org/10.2979/indjglolegstu.22.2.401
Rolák, M., Cigán, M. (2015). Is the Fiscal Policy of the Czech Republic Procyclical? Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis, 63, 1719–1728, https://doi.org/10.11118/ACTAUN201563051719
Sawadogo, P.N. (2020). Can fiscal rules improve financial market access for developing countries?. Journal of Macroeconomics, 65, 103214, https://doi.org/10.1016/j.jmacro.2020.103214
Schuknecht, L. (2004). EU fiscal rules: issues and lessons from political economy. Available at SSRN 631661. http://dx.doi.org/10.2139/ssrn.631661
Şimşek, H., Bekâr, A. (2008). The Effects of Fiscal Policy Rules on Fiscal Balance: The Perspectives on Turkish Economy. Sosyoekonomi Journal, 8(8), 100–126.
Ter-Minassian, T. (2007). Fiscal rules for subnational governments: Can they promote fiscal discipline?. OECD Journal on Budgeting, 6(3), 1–11, https://doi.org/10.1787/budget-v6-art17-en
Thornton, J., Vasilakis, C. (2018). Fiscal Rules and Government Borrowing Costs: International Evidence. Economic Inquiry, 56(1), 446–459, https://doi.org/10.1111/ecin.12484
Truger, A. (2020). Reforming EU fiscal rules: More leeway, investment orientation and democratic coordination. Intereconomics, 55(5), 277–281, https://doi.org/10.1007/s10272-020-0915-z

DYSCYPLINA FISKALNA W FINANSACH PUBLICZNYCH CZECH: KONIECZNOŚĆ REGUŁ FISKALNYCH

STRESZCZENIE

Po pierwsze głównym celem badania było zilustrowanie ewolucji polityki budżetowej Czech od okresu sprzed kryzysu finansowego aż do pandemii. Po drugie, w artykule podjęto próbę identyfikacji czynników wpływających na kierunek i tempo konsolidacji fiskalnej, której celem była redukcja zadłużenia i wdrażanie antycyklicznej polityki fiskalnej. Po trzecie, w badaniu przeanalizowano przyczyny ostatecznego przyjęcia przez Czechy reguł fiskalnych w swoich ramach. Metodologia tego badania łączy

wiedzę analityczną autorów z przeglądem literatury, publikacji badawczych i raportów analitycznych, wzmocnionym danymi i analizą statystyczną. Opiera się na raportach Komisji Europejskiej, OECD i MFW. Badanie, obejmujące lata 1995–2019, zawiera analizę zdolności obsługi czeskiego długu publicznego oraz prognozy na 2024 rok z wykorzystaniem danych z bazy danych AMECO. Z przeprowadzonej analizy wynika, że Czechy były idealnym kandydatem do wdrożenia reguł fiskalnych wymagających długoterminowej dyscypliny fiskalnej. Przed przyjęciem tych przepisów dług publiczny Czech utrzymywał się znacznie poniżej progu UE. Jednak do 2017 roku stosunek długu do PKB stale rósł z 20% w latach 90. XX wieku. Warto zauważyć, że nawet w okresach silnego wzrostu gospodarczego redukcje relacji długu do PKB nie były wystarczająco znaczące ani długotrwałe, aby zrównoważyć wcześniejszą eskalację. Ponadto przewiduje się, że Czechy staną w obliczu wyższego niż przeciętny wzrostu presji wydatkowej związanej ze starzeniem się społeczeństwa, którą można skuteczniej zarządzać w ramach reguł fiskalnych. Średnio- i długoterminowy wpływ kosztów związanych ze starzeniem się społeczeństwa na finanse publiczne jest znaczący. Analiza zdolności obsługi długu publicznego Czech podkreśla tę kwestię, dodatkowo uzasadniając wprowadzenie reguł fiskalnych.

Słowa kluczowe: polityka fiskalna, dług publiczny, saldo pierwotne, reguły fiskalne

Wydawnictwo SGGW
Warszawa 2023