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Michał Bernardelli✉, *Mariusz Próchniak*✉
SGH Warsaw School of Economics

A COMPARISON OF THE FINANCIAL SECTOR AND MACROECONOMIC PERFORMANCE USING TURNING POINTS ANALYSIS

ABSTRACT
The paper aims to assess the financial sector's stability compared to the real economy's stability. The analysis is based on identifying turning points (peaks and troughs) in the process of the financial sector development. Five financial variables represent the financial system: non-performing loans, capital adequacy ratio of the banking sector, return on equity, domestic credit (% of GDP) and broad money (% of GDP). The analysis also compares the turning points of the financial variables with those of the real variables. The study covers seven European and two non-European countries and the 2010-2022 period. The results indicate that the financial behaviour was different from the real sector's. There is no resemblance in the distribution of turning points between the single financial variables and the financial and real variables within a given country. Financial variables may behave procyclically, countercyclically or acyclically compared to GDP.

Keywords: economy's stability, financial sector, turning points, peak, trough
JEL codes: E32, E51,G21, O47

Introduction

The stability of the financial sector development has been an important area of macroeconomic research for many years. This issue significantly increased its importance after the 2008-2009 global economic and financial crisis, when it turned out that instability in the financial sector highly affects the real economy and financial turbulence may lead to recessions comparable to those observed during the Great Depression at the beginning of the 20th century. The goal of the paper is twofold. Firstly, the study aims to assess the stability of the financial sector in seven European countries that adopted the inflation targeting (IT) strategy of monetary policy: Albania, Czechia, Hungary, Poland, Romania, Serbia and Turkey, as well as – for comparison purposes – in two non-European countries: Brazil and Canada. To achieve the goal, we identify turning points (peaks and troughs) in the process of the financial sector development. The distribution of turning points will allow inferring about the financial sector's stability.

The second goal is to compare the financial sector's stability with the real economy's stability. Comparing the distributions of financial and real variables' turning points will enable the identification of parallels between the financial and economic

✉ M. Bernardelli, Instytut Ekonometrii, Kolegium Analiz Ekonomicznych, Szkoła Główna Handlowa w Warszawie, https://orcid.org/0000-0002-5504-257X
✉ M. Próchniak, Katedra Ekonomii II, Kolegium Gospodarki Światowej, Szkoła Główna Handlowa w Warszawie, https://orcid.org/0000-0003-2642-9510

development pathways. Additionally, we are interested in inferring whether the financial variables are leading, coincident or lagging indicators against the output growth. The time distribution of peaks and valleys in the financial variables and their comparison with structural breaks in GDP growth will enable the assessment of the interdependencies between the variables under consideration.

The main research hypothesis is that analysing the distribution of turning points makes it possible to compare different countries' financial sectors and macroeconomic performance. Such outcomes shed new light on the nature of the behaviour of the financial sector – including variables measuring financial stability – compared to macroeconomic performance.

The additional hypothesis is that the financial sector can be characterised in many dimensions, and the complete assessment of its stability requires the analysis of numerous indicators that do not include redundant information. This hypothesis results from our initial expectation that the financial sector variables include many uncorrelated aspects, and it is not sufficient to choose a single financial variable as a proxy for the development of the whole financial sector. The individual financial variables behave differently, and it is necessary to use a broad range of them to fully assess the financial system's behaviour.

The analysis covers the 2010-2022 period. In 2008-2009, when the global crisis hit, most of the economies in the world were excluded to avoid significant biases in the distribution of turning points. However, the considered period is characterised by some disturbances, mainly from the COVID-19 pandemic, but also – although to a lower extent – by the Euro area crisis and the Russia-Ukraine war.

The sample of countries represents homogenous economies from the point of view of the study's goal; this is the main reason for the selection of countries. All the countries (both European and non-European) adopted the inflation-targeting monetary policy regime: Albania – in 2008, Czechia – in 1998, Hungary – in 2001, Poland – in 1999, Romania – in 2005, Serbia – in 2009, Turkey – in 2007, Brazil – in 1999 and Canada – in 1991. In terms of the official nature of monetary policy, the examined nations are, thus, relatively similar. During the 2010-2022 period, all of them were inflation targeters, and differences between financial sector stances in these countries caused by different goals and ways of conduct of monetary policy should have been limited.

The paper is composed as follows: 1) the next section, which appears after this introduction, includes the literature review; 2) later in the paper, the data and the research methodology are presented; 3) the main section includes a presentation and interpretation of the results; 4) the last section concludes.

Review of the literature

In empirical studies, financial sector stability and development are measured in various ways. We present here selected empirical studies in which the authors analyse multiple issues related to the financial sector. This literature review focuses on the type of variables treated as proxies for financial sector stability and development.

A prevalent indicator of financial sector stability is the volume of non-performing loans. For example, non-performing loans are used by Pawlowska [2016] to assess the effect of market structure and competition between the EU27 banking sectors on financial stability during the 2004-2012 period.

Another measure is Z-Score. This index is calculated as ROA + EA/s.d. (ROA). In the above formula, ROA means the rate of return on assets, EA is the ratio of equity to assets and s.d. (ROA) is the standard deviation of ROA. Diallo and Al-Mansour [2017] use the Z-score to analyse the relationship between the insurance sector and the financial stability of 26 countries during the 1998-2011 period.

Financial stability can also be measured by the interest rate spread. Such an approach was adopted – e.g., by Hallak [2013], who examined the impact between private sector debt and financial stability.

Due to the lack of one indicator that measures the financial sector's stability, many authors used an array of financial stability variables. For example, Cernohorska [2015] uses the following indicators in her study of the stability of the banking sector in the Czechia and the UK over the 2006-2013 period: interest spread, net interest margin, a ratio of loans to deposits, after-tax profits, a ratio of bank capital to assets, capital adequacy, ROE and ROA.

Some authors construct their own indices of financial stability. Elsayed, Naifar and Nasreen [2022] built a new composite financial stability index based on the following areas and indicators: the banking sector (banking sector beta coefficients derived from the Capital Asset Pricing Model, bank equities return, and bank volatility), the equity market (stock market returns and stock market volatility), the bond market (sovereign spreads) and the foreign exchange market (exchange market pressure index). The cited authors use this index to examine the relationship between monetary policy and financial stability for the Gulf Cooperation Council countries in the years 2006-2020.

Regarding financial development, the typical measures are the private credit-to-GDP ratio or stock market capitalisation as % of GDP [Svirydzenka 2016]. However, due to the shortcomings of the typically-used indices, the cited author compiled its own aggregate indicator of financial development that includes the depth, access and efficiency of both the financial institutions and financial markets. Svirydzenka [2016] consists of many single variables in calculating composite indicators (e.g., private-sector credit to GDP, lending-deposits spread, ROA, ROE and stock market capitalisation to GDP). These single indices can be used as measures of financial sector development. However, the other authors also employ the aggregated indices compiled by Svirydzenka [2016]. For instance, Khan et al. [2022] used these indices to examine the relationship between institutional quality and financial sector development for 85 emerging and developing economies during the 1996-2018 period.

Numerous authors employ a variety of financial sector development indicators to evaluate the reliability of their conclusions. In their study of 45 Sub-Saharan African economies from 1982 to 2018, Yiadom, Mensah and Bokpin [2022] use the financial development (FD) index from the International Monetary Fund FD Index database as well as domestic credit to the private sector, domestic credit provided by the financial sector, broad money M2 and stocks traded (all as a per cent of GDP) as alternative proxies for financial development. Xue [2020] presents three variables that represent the size of financial sector development: private credit by deposit money banks to GDP, bank credit to bank deposits and domestic credit to the private sector of GDP, in addition to four variables that approximate the quality of financial sector development: bank return on equity, bank regulatory capital to risk-weighted assets (capital adequacy ratio), bank non-performing loans to gross loans and bank Z-score. The cited author includes many of these

variables in the regression models to investigate the link between the financial sector development and the growth volatility for 50 countries from 1997 to 2014.

Data

Based on the review of the literature, we have selected the following variables to measure the financial sector stability and development:

1. Non-performing loans (% of total loans) [NPL];
2. Capital adequacy ratio of the banking sector (%) [CAR];
3. Return on equity of the deposit takers (%) [ROE];
4. Domestic credit (% of GDP) [CRED];
5. Broad money M3 (% of GDP) [MONEY].

The aforementioned factors indicate a wide range of financial sector aspects, including loan quality, the financial posture of banks, the size of the financial sector and the nature of monetary policy. We tried to choose variables which include different areas and are not directly mutually correlated.

The identification of turning points of the above financial variables will be confronted with the behaviour of the real economy. Three variables are used to represent the real economy:

1. Growth rate of real GDP (against a corresponding quarter of the previous year) (%) [GDPGR];
2. Real GDP (in million units of national currency at constant 2014 prices) [GDP];
3. Real GDP per capita (in national currency at constant 2014 prices) [GDPPC].

The analysis is based on quarterly data from the first quarter of 2010 to the second quarter of 2022 (in a few cases, data for the second quarter of 2022 is missing; in the case of ROE for Czechia, the time series ends in the third quarter of 2021).

Research methodology

Many methods are available for calculating macroeconomic phenomena's historical and predicted turning points. Some of them consider many factors simultaneously, like the HMM-based indicator [Bernardelli 2022]. Relatively few of these methods have been applied to financial time series. Due to the absence of econometric assumptions, it was decided to employ one of the most ubiquitous approaches in the study, namely the Christiano-Fitzgerald filter with the Bry and Boschan routine. The Christiano-Fitzgerald filter is a finite data approximation to the ideal bandpass filter [Christiano and Fitzgerald 2003]. The Bry-Boschan algorithm finds statistical extrema using censoring rules and phase and cycle-length constraints [Bry and Boschan 1971].

The turning point identification procedure is illustrated based on the variable MONEY for Poland. The raw values of this variable are presented in Figure 1.

The first step is to use Christiano-Fitzgerald asymmetric filter with the following parameters:

- 24 as a minimum period of oscillation for the desired component;
- 144 as a maximum period of oscillation for the desired component;
- drift and unit root in time series assumed.

As a result, we get the cyclical component defined as deviations from the trend – it is illustrated in Figure 2. The next step is using the Bry-Boschan routine of selecting

cyclical turning points – it is illustrated in Figure 3. This procedure has been repeated for each of the eight-time series of each of the nine countries to find the respective turning points of the variables representing the financial sector and the real economy.

Results

The analysis results are presented in Tables 1-2 and Figures 4-12. The tables show the turning points (peaks and troughs) for the individual countries for the financial sector variables (Table 1) and real variables (Table 2). In the tables, '03' indicates the first quarter, '06' the second quarter, '09' the third quarter and '12' the fourth quarter. The figures show the time distribution of turning points, making them easy to interpret in terms of cycle synchronisation. We will also make reference to the graphical behaviour of a particular time series – as shown, for example, in Figure 3 – when evaluating the result (the figures of this type are not presented in the article for the sake of conciseness).

The data presented in Table 1 indicates that the number and chronology of turning points in the financial sector variables were different across the countries and the variables. The countries usually recorded two to four turning points in the financial variables. However, the situation when one or five turning points were identified also occurs.

Before interpreting the results, it is worth noting that in most variables and countries, the first peak was already observed in the first quarter included in the analysis (03/2010). Such a peak has rather a statistical character and indicates that the value of the variable was falling after this time. In other words, a given variable was in a downward phase at the beginning of the analysed period.

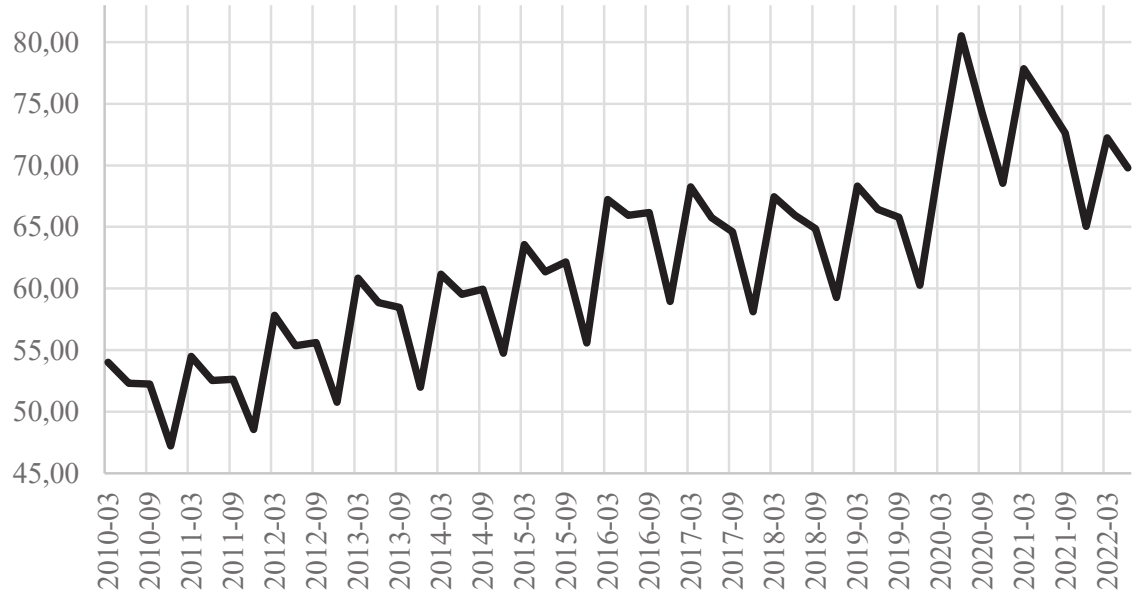

Figure 1. The ratio of broad money to GDP for Poland (MONEY variable)
Source: Own calculations.

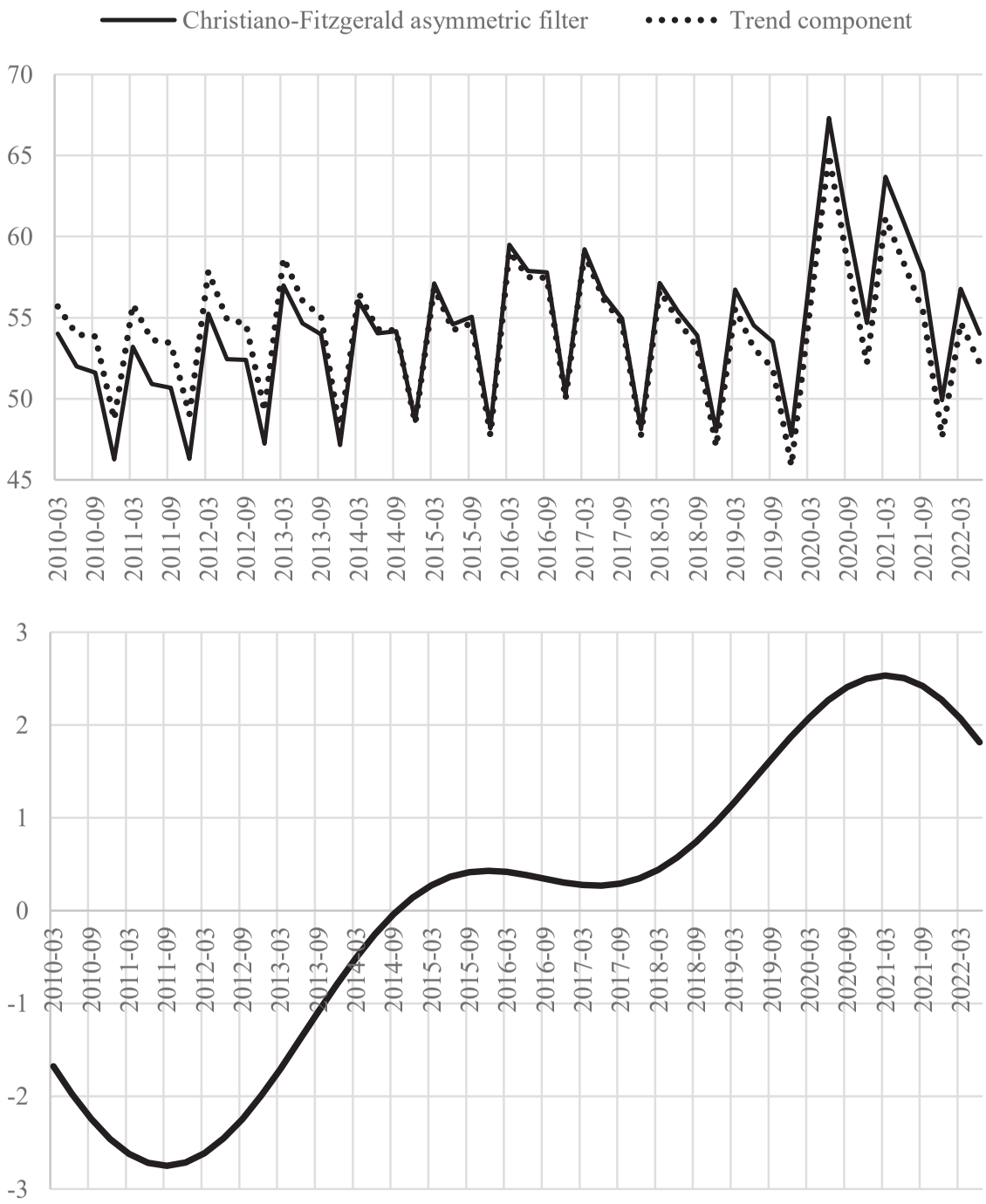

Figure 2. The Christiano-Fitzgerald asymmetric filter (upper panel) and the cyclical component (bottom panel) of the variable MONEY for Poland
Source: Own calculations.

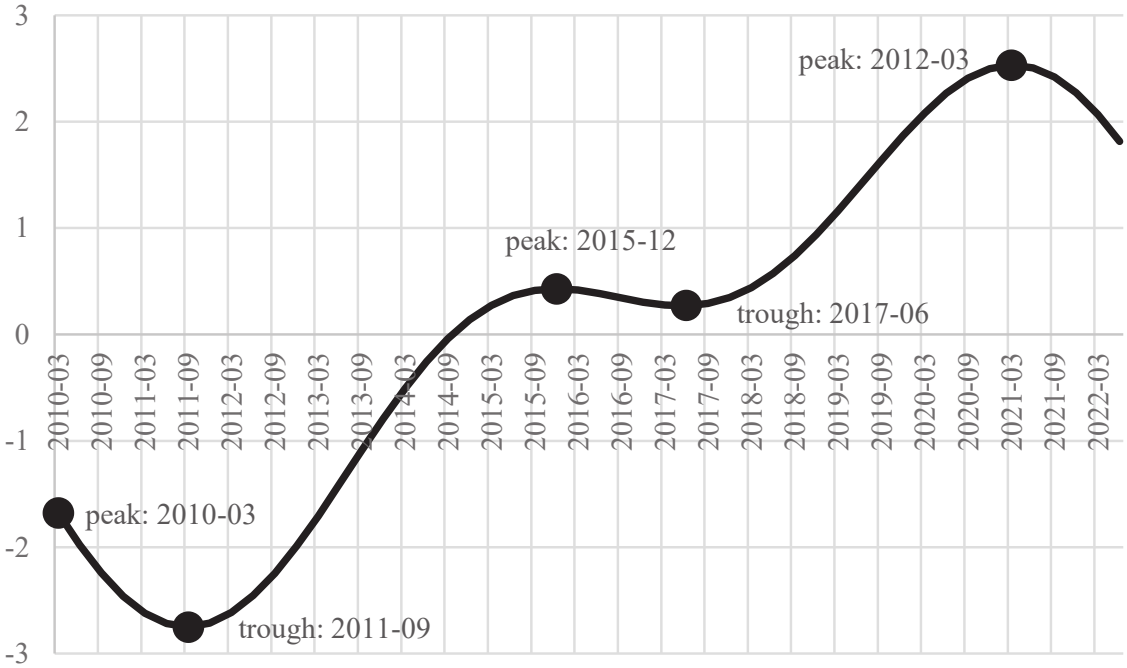

Figure 3. Turning points of the variable MONEY for Poland
Source: Own calculations.

Table 1. Timing of turning points (peaks and troughs) of the financial variables

Turning point	Albania	Czechia	Hungary	Poland	Romania	Serbia	Turkey	Brazil	Canada
Non-performing loans (% of total loans) [NPL]									
Peak	06.2014	12.2014	12.2013	06.2013	03.2014	03.2015	03.2010	03.2010	03.2010
Trough		03.2020	06.2019	06.2017	03.2019	03.2020	03.2013	06.2013	03.2014
Peak				03.2020			06.2020	09.2017	12.2021
Trough								09.2021	
Peak									
Capital adequacy ratio of the banking sector (%) [CAR]									
Peak	03.2010	06.2013	03.2010	03.2010	03.2010	03.2010	03.2010	03.2010	03.2011
Trough	06.2010	03.2017	06.2010	06.2013	06.2012	09.2012	12.2014	12.2013	09.2016
Peak	03.2013	06.2021	06.2015	06.2019	12.2020	03.2019		03.2019	
Trough	12.2016								
Peak	12.2020								
Return on equity of the deposit takers (%) [ROE]									
Peak	12.2010	03.2010	03.2010	09.2012	03.2010	03.2010	03.2010	03.2010	09.2011
Trough	12.2011	12.2013	09.2013	09.2021	03.2013	06.2014	03.2014	03.2015	12.2019
Peak	06.2017	06.2018	09.2018		09.2017	06.2018	06.2016	09.2020	
Trough					06.2021		09.2019		
Peak									
Domestic credit (% of GDP) [CRED]									
Peak	03.2010	06.2014	03.2010	03.2010	03.2010	03.2012	03.2010	03.2010	03.2010
Trough	09.2010	09.2018	12.2015	12.2010	03.2012	03.2016	06.2011	12.2011	12.2012
Peak	03.2014			09.2018	12.2013	03.2020	09.2019	03.2016	06.2020
Trough	03.2018				09.2017			09.2016	
Peak								03.2021	
Broad money M3 (% of GDP) [MONEY]									
Peak	03.2010	03.2010	03.2010	03.2010	03.2010	03.2010	03.2010	03.2010	03.2010
Trough	09.2010	06.2012	06.2016	09.2011	09.2012	09.2012	12.2011	06.2013	12.2012
Peak	09.2014	06.2021		12.2015		09.2015	09.2020	09.2020	09.2014
Trough	12.2018			06.2017		03.2016			09.2016
Peak				03.2021		09.2021			09.2021

Source: Own calculations.

Table 2. Timing of turning points (peaks and troughs) of the real variables

Turning point	Albania	Czechia	Hungary	Poland	Romania	Serbia	Turkey	Brazil	Canada
Growth rate of real GDP (against a corresponding quarter of the previous year) (%) [GDPGR]									
Peak	03.2010	03.2010	03.2010	03.2010	09.2015	06.2010	09.2010	03.2010	03.2011
Trough	09.2013	12.2012	09.2012	09.2013	03.2021	03.2014	12.2018	03.2015	06.2015
Peak	06.2016	09.2016	03.2016	12.2016		03.2018			12.2015
Trough	12.2019	09.2020	06.2020	09.2020		03.2021			06.2020
Peak									
Real GDP (in million units of national currency at constant 2014 prices) [GDP]									
Peak	03.2012	12.2010	12.2010	09.2011	03.2012	06.2011	12.2012	03.2013	09.2012
Trough	09.2015	09.2014	03.2015	06.2015	09.2015	06.2016	03.2021	03.2019	09.2015
Peak	12.2018	03.2018	12.2017	06.2019	09.2018				09.2017
Trough		12.2021	03.2021						
Peak									
Real GDP per capita (in national currency at constant 2014 prices) [GDPPC]									
Peak	12.2011	12.2010	12.2010	06.2011	12.2011	06.2011	03.2013	12.2012	09.2012
Trough	09.2015	09.2014	03.2015	06.2015	06.2015	06.2016	06.2021	09.2018	12.2021
Peak	03.2019	12.2017	12.2017	06.2019	09.2018				
Trough		09.2021	03.2021						
Peak									

Source: Own calculations.

Regarding non-performing loans, we can distinguish two countries with similar in-group variation but different cross-sectional differentiation. The first group includes the European countries apart from Turkey (i.e., Albania, Czechia, Hungary, Poland, Romania and Serbia). In this group, the volume of non-performing loans steadily rose starting from 2010, reaching a peak around 2013-2015. The global and Euro area crises, which impeded many European economies and impaired the credit position of many enterprises and people, were to blame for this behaviour. The data clearly shows an upward tendency in non-performing loans until a peak in the mid-2010s. After this peak, the volume of non-performing loans in these six European countries revealed a contractionary period with different behaviour around the COVID-19 pandemic. Apart from Albania and Poland, all four of these nations showed a trough before or around the onset of the pandemic, following which non-performing loans began to grow until the end of the study period. The trough was not found in Albania, and a downward phase also occurred during the pandemic. In contrast, Poland recorded an additional peak in the first quarter of 2020, meaning that during the pandemic era, the volume of non-performing loans in Poland was in a contractionary phase. On the other hand, two non-European countries (Canada and Brazil) – as well as Turkey – behaved differently. In the period's first years, non-performing loans decreased – achieving a downturn in 2013 or 2014 – followed by a shorter or longer upward tendency.

Regarding the capital adequacy ratio, we can also distinguish some common trends. Albania and Czechia behaved very similarly in terms of capital adequacy ratio (the first two turning points evidenced in 2010 for Albania can be neglected as confirmed by the graphical analysis). Albania and Czechia increased capital adequacy in the banking sector until 2013, followed by a downward tendency until the end of 2016 and early 2017, as well as a peak in the period of the coronavirus pandemic. Poland, Romania, Serbia and Brazil can also be classified as similar countries with the reverse behaviour of CAR (a trough in 2012 and 2013, and a peak in 2019 and 2020).

Poland may be treated as akin to Canada in terms of return on equity. Both countries started the second decade of the twenty-first century with an upward tendency

in ROE and a peak in 2011 and 2012. Afterwards, they recorded a long downward phase with a trough in 2021 (Poland) and 2019 (Canada). The remaining countries (except Albania) noticed at least three turning points with a decreasing behaviour of ROE from the beginning of the analysed period until around the mid-2010s.

Poland shares a high degree of resemblance with Turkey and two non-European nations – Brazil and Canada – based on the distribution of domestic credit turning points. In these countries, a trough had already emerged in 2010-2012, followed by a long expansionary period until the peak in 2018 or later (the two turning points occurring in Brazil in 2016 cancelled out and could be omitted). In Albania and Czechia, the path of credit expansion showed similar mutual fluctuations, with an evident peak in 2014 and a trough in 2018. Hungary and Romania recorded a downward trend until 2015 and 2017, when a deep trough was noted (turning points in Romania in 2012 and 2013 are negligible).

Regarding the monetisation rate (i.e., the ratio of broad money to GDP), the time series clearly shows that all the countries except Albania noticed an upward phase in this variable many years before the pandemic outbreak and at least at the beginning of the pandemic period. Czechia, Poland, Serbia, Turkey, Brazil and Canada evidenced a peak in 2020, 2021 and 2022; meanwhile, a former trough was recorded many years earlier. Hungary and Romania noticed similar behaviour except that the peak has not been recently identified. Such outcomes indicate that the expansionary phase in the monetisation rate was very long, covering at least many months of the COVID-19 pandemic. The results were caused, among other things, by highly expansionary monetary policy in the last years, fuelled by the aid programs implemented by many governments during the pandemic period. As a result, the money supply growth rate exceeded the GDP growth rate, leading to an increase of the monetisation ratio trend above.

The identification of turning points for real variables (GDP growth, GDP volume and GDP per capita) leads to the following four conclusions. Firstly, the trough was evidenced in about half cases in 2020 and 2021. It was caused by the recession and slowdown that took place during the COVID-19 pandemic. Even if the trough was not formally identified in many other cases, the countries revealed a downward phase in GDP path during 2020-2022, meaning a downturn could soon be found. Secondly, before the beginning of the pandemic, many countries noticed a peak in economic growth. The peak revealed the good economic condition of the analysed countries in the second half of the second decade of the twenty-first century. Thirdly, the turning points identified for GDP and GDP per capita volume are very similar. Fourthly, turning points for the GDP growth rate usually occur earlier than the turning points for both variables measuring the level of GDP.

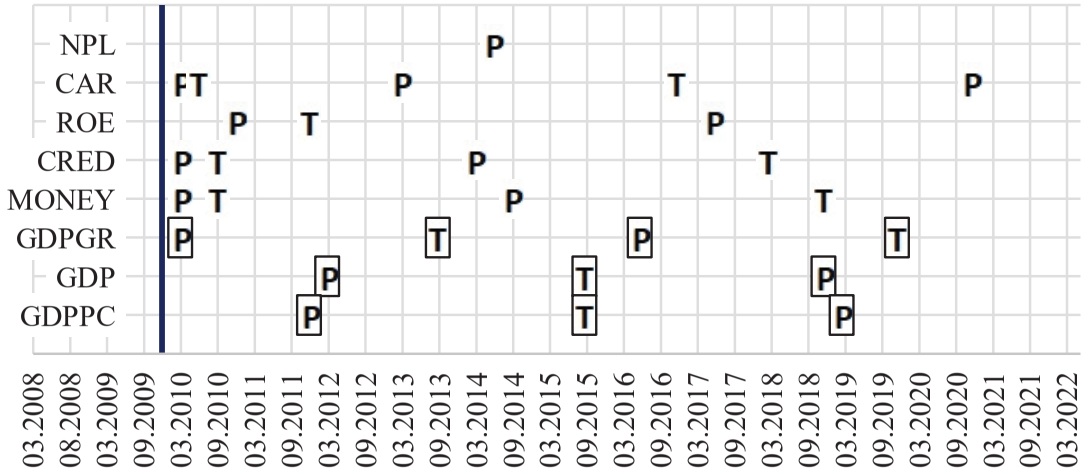

Figure 4. Turning points: peaks (P) and troughs (T) of the financial and real variables for Albania
Source: Own calculations.

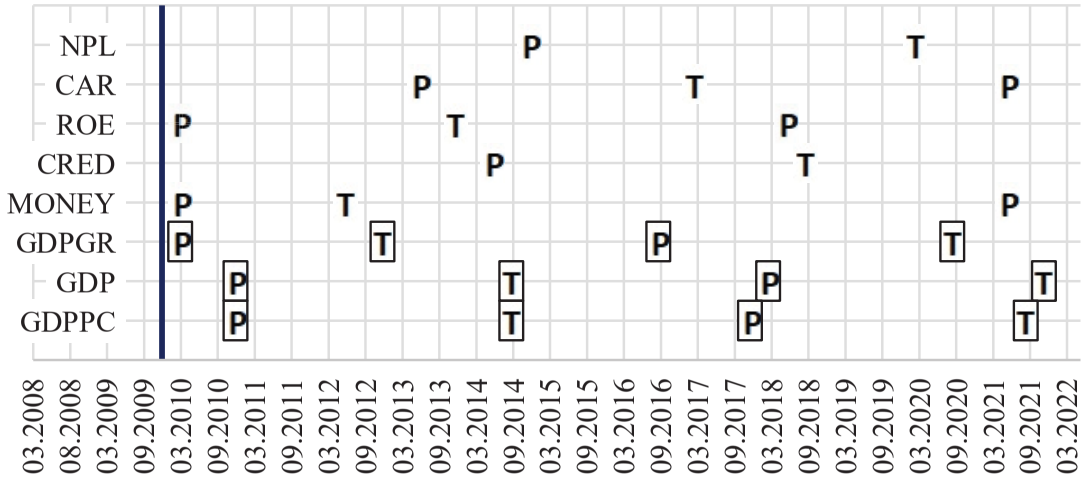

Figure 5. Turning points: peaks (P) and troughs (T) of the financial and real variables for Czechia
Source: Own calculations.

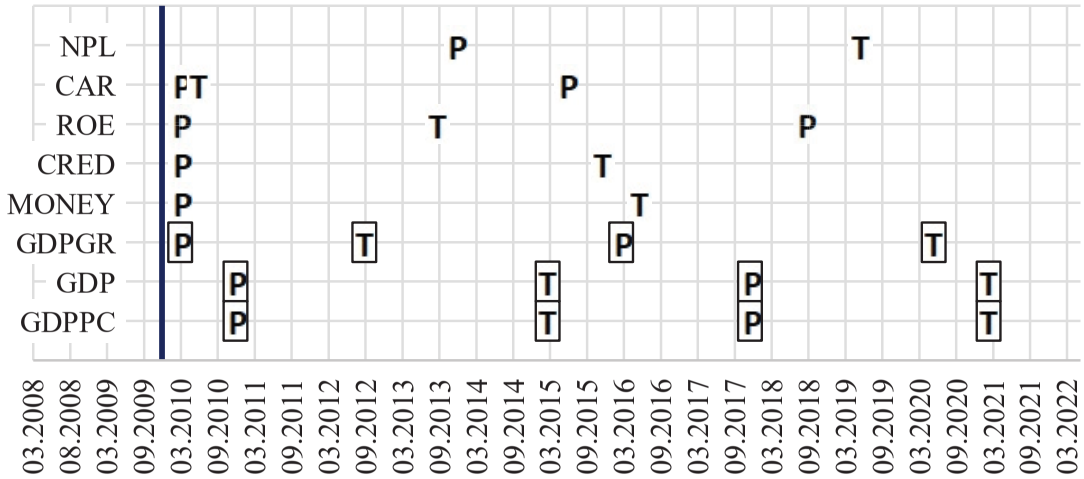

Figure 6. Turning points: peaks (P) and troughs (T) of the financial and real variables for Hungary
Source: Own calculations.

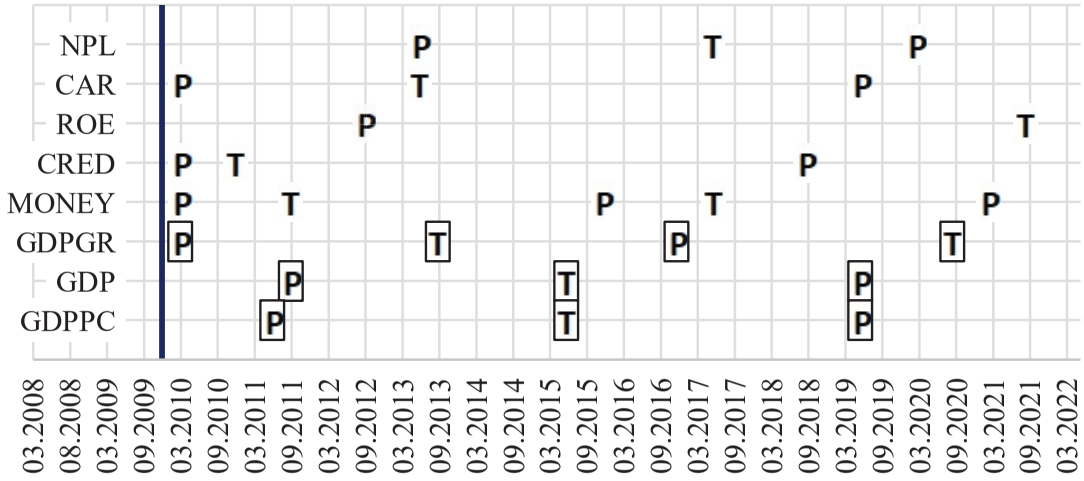

Figure 7. Turning points: peaks (P) and troughs (T) of the financial and real variables for Poland
Source: Own calculations

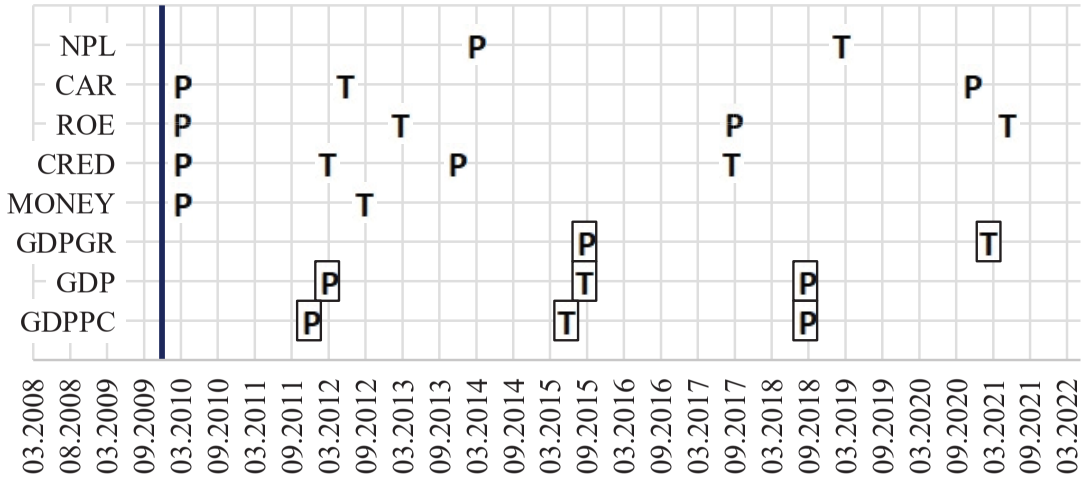

Figure 8. Turning points: peaks (P) and troughs (T) of the financial and real variables for Romania
Source: Own calculations.

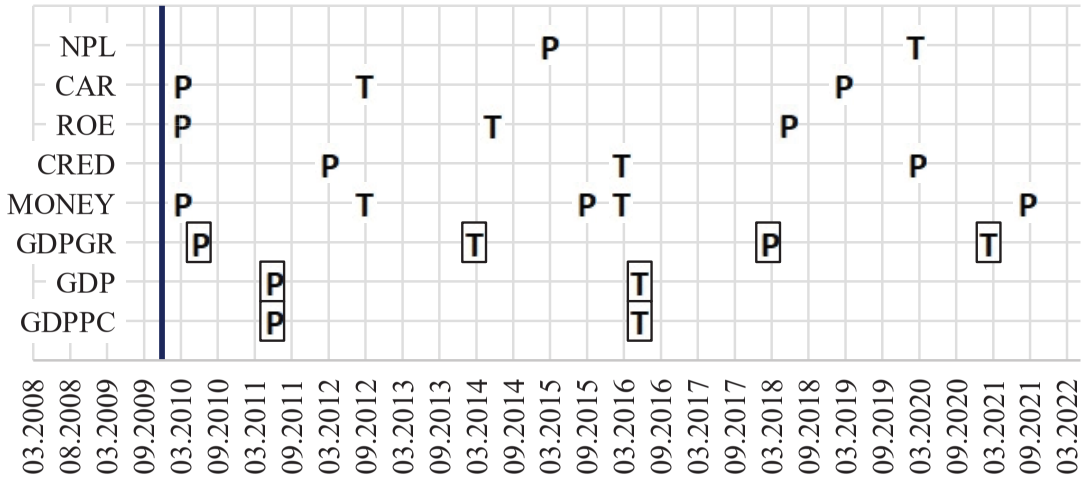

Figure 9. Turning points: peaks (P) and troughs (T) of the financial and real variables for Serbia
Source: Own calculations.

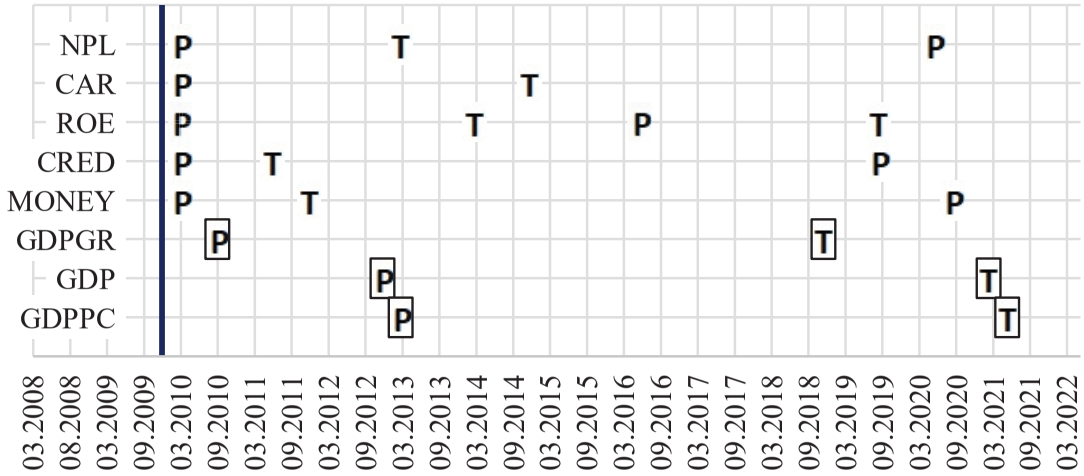

Figure 10. Turning points: peaks (P) and troughs (T) of the financial and real variables for Turkey
Source: Own calculations.

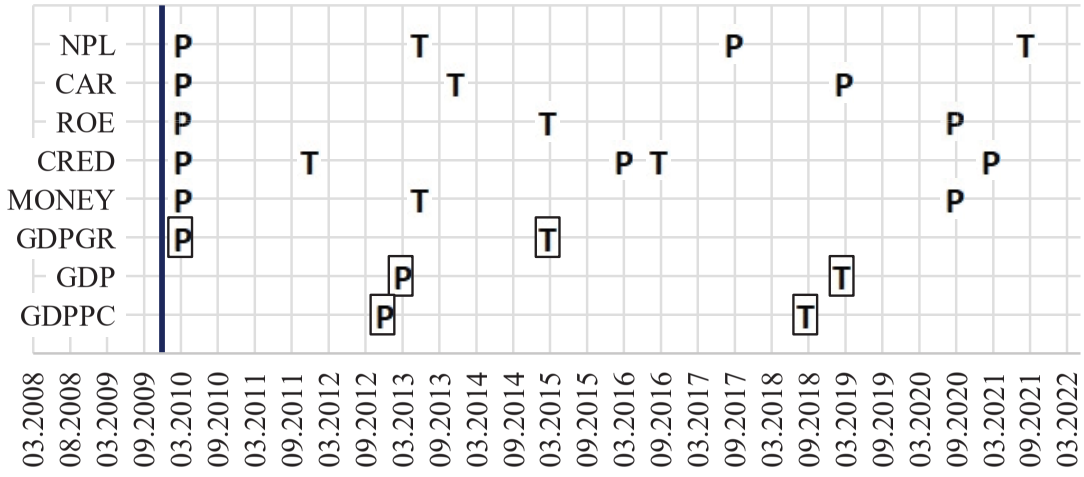

Figure 11. Turning points: peaks (P) and troughs (T) of the financial and real variables for Brazil
Source: Own calculations.

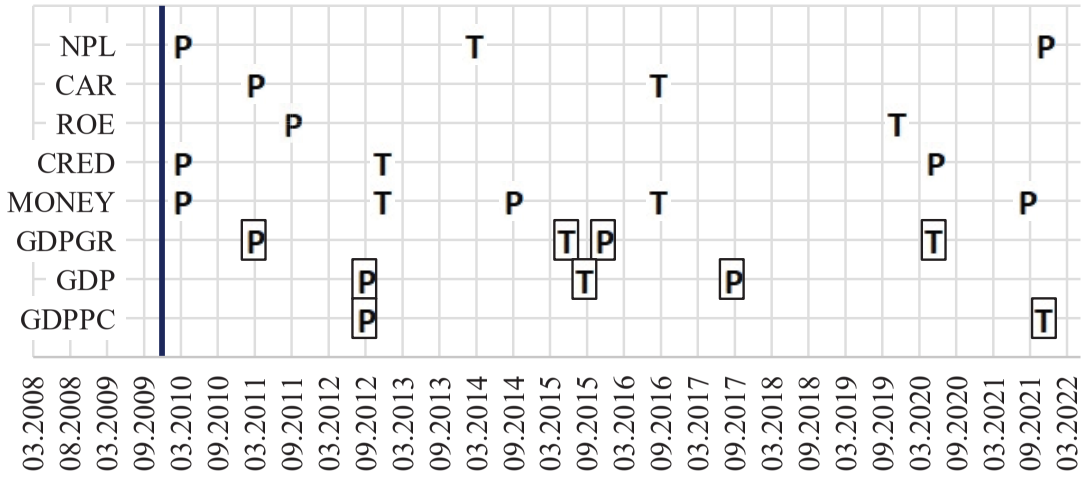

Figure 12. Turning points: peaks (P) and troughs (T) of the financial and real variables for Canada
Source: Own calculations.

Comparing the distribution of turning points for individual financial variables to that of real variables allows us to conclude that the financial sector behaved differently from the real sector. There is no similarity in the distribution of turning points across the single financial variables within a given country as well as between the financial and real variables. The length of the cycles for the individual financial variables differs across the countries. Moreover, for some countries, a given financial variable may behave pro-cyclically, whereas a countercyclical or acyclical path may be observed for another country.

These outcomes suggest that financial variables do not behave similarly. From the point of view of the whole sector, this behaviour indicates high instability in the financial sector. The coverage of the individual financial variables is largely differentiated and not mutually synchronised. Therefore, a full assessment of the financial system's stability should not focus on a single financial variable because such a narrow approach would omit many other aspects of financial sector development.

Our results suggest that the presented analysis has confirmed both research hypotheses. Moreover, the financial sector's high instability means that the financial sector's future situation is highly unpredictable. Regardless of the current situation of the real economy, numerous future development trajectories can be anticipated because of differences in cycle length and behaviour relative to the real economy.

Conclusions

This study assessed the financial sector's stability in seven European countries (Albania, Czechia, Hungary, Poland, Romania, Serbia and Turkey) and two non-European ones (Brazil and Canada). The research hypotheses are verified based on the identification of turning points (peaks and troughs) in the process of the financial sector development, with a broad range of variables measuring the financial sector. We also compare the financial sector's stability with the stability of the real economy based on turning points distribution.

As the result of the analysis, we identified peaks and troughs for five financial variables: non-performing loans, capital adequacy ratio of the banking sector, return on equity, domestic credit (% of GDP) and broad money (% of GDP), as well as three variables representing domestic output: GDP growth, GDP volume and GDP per capita. The distribution of turning points is presented in Figures 4-12.

The behaviour of the financial sector exhibited significant differences compared to the development of the real sector. It isn't easy to find substantial similarities between the distribution of turning points across the single financial variables within a given country and between the financial and real variables. Among the financial variables, we can find those that behave procyclically with output, those that exhibit a countercyclical behaviour and those with an acyclical path of change. Moreover, the length of the cycles of financial variables is different. Therefore, a comprehensive evaluation of the stability of the financial system should not be centred on a single financial indicator since this would exclude many other facets of the evolution of the financial sector. From the point of view of the whole sector, our outcomes indicate that the financial sector reveals a high degree of instability. Hence, it is challenging to predict the future development paths of the financial variables.

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References

Bernardelli M. (2022), Automatic identification of turning points with HMM-based indicator. [In:] S. Bialowas (ed.). Economic Tendency Surveys and Economic Policy – Measuring Output Gaps and Growth Potentials. Poznań University of Economics and Business Press, Poznań, pp. 39-55, https://www.doi.org/10.18559/978-83-8211-129-3/3

Bry G., Boschan C. (1971), Programmed selection of cyclical turning points. [In:] G. Bry, C. Boschan (eds). Cyclical analysis of time series: Selected procedures and computer programs, National Bureau of Economic Research (NBER), Cambridge, pp. 7-63.

Cernohorska L. (2015), Impact of Financial Crisis on the Stability Banking Sectors in the Czech Republic and Great Britain, Procedia Economics and Finance, 26, 234-241, https://www.doi.org/S2212-5671(15)00824-2

Christiano L., Fitzgerald T.J. (2003), The band pass filter, International Economic Review, 44, 435--465, https://www.doi.org/10.1111/1468-2354.t01-1-00076

Diallo B., Al-Mansour A. (2017), Shadow banking, insurance and financial sector stability, Research in International Business and Finance, 42, 224-232, https://doi.org/10.1016/j.ribaf.2017.04.024

Elsayed A.H., Naifar N., Nasreen S. (2022), Financial stability and monetary policy reaction: Evidence from the GCC countries, Quarterly Review of Economics and Finance, https://www.doi.org/10.1016/j.qref.2022.03.003

Hallak I. (2013), Private sector share of external debt and financial stability: Evidence from bank loans, Journal of International Money and Finance, 32, 17-41, https://www.doi.org/10.1016/j.jimonfin.2012.02.017

Khan M.A., Gu L., Khan M.A., Bhatti M.I. (2022), Institutional Perspective of Financial Sector Development: A Multidimensional Assessment, Economic Systems, 101041, https://www.doi.org/10.1016/j.ecosys.2022.101041

Pawlowska M. (2016), Does the size and market structure of the banking sector have an effect on the financial stability of the European Union?, Journal of Economic Asymmetries, 14(A), 112-127, https://www.doi.org/10.1016/j.jeca.2016.07.009

Svirydzenka K. (2016), Introducing a New Broad-based Index of Financial Development, IMF Working Paper, no. WP/16/5, International Monetary Fund, Washington.

Xue W.-J. (2020), Financial sector development and growth volatility: An international study, International Review of Economics & Finance, 70, 67-88, https://www.doi.org/10.1016/j.iref.2020.06.025

Yiadom E.B., Mensah L., Bokpin G.A. (2022), Environmental Risk and Foreign Direct Investment: the role of Financial Sector Development, Environmental Challenges, 9, https://www.doi.org/10.1016/j.envc.2022.100611

Porównanie sektora finansowego i wyników makroekonomicznych na podstawie analizy punktów zwrotnych

STRESZCZENIE
Celem artykułu jest ocena stabilności sektora finansowego w porównaniu ze stabilnością realnej gospodarki. Analiza opiera się na identyfikacji punktów zwrotnych („szczytów i dołków") w procesie rozwoju sektora finansowego. System finansowy jest reprezentowany przez pięć zmiennych finansowych: kredyty zagrożone, współczynnik wypłacalności sektora bankowego, stopa zwrotu z kapitału własnego, kredyt krajowy (% PKB) i podaż szerokiego pieniądza (% PKB). Analiza porównuje również punkty zwrotne zmiennych finansowych i zmiennych dotyczących realnej sfery gospodarki. Badanie obejmuje siedem krajów europejskich i dwa pozaeuropejskie oraz lata 2010-2022. Wyniki wskazują, że zachowanie sektora finansowego różniło się od zachowania sektora realnego. Nie ma podobieństwa w rozkładzie punktów zwrotnych między pojedynczymi zmiennymi finansowymi w danym kraju oraz między zmiennymi finansowymi a realnymi. Zmienne finansowe mogą zachowywać się procyklicznie, antycyklicznie lub acyklicznie w porównaniu z PKB.

Słowa kluczowe: stabilność gospodarki, sektor finansowy, punkty zwrotne, szczyt, dołek