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The Impact of the Tightening of Banking Regulatory Requirements on the Profitability and Concentration of the Banking Sector in the European Union

Summary

The stability of banking systems is a fundamental requirement for any national economy. Instability in the banking system and the consequent possible bank failures pose a threat to the functioning of the whole economy through a chain of infection. The crisis of 2008-2009 also highlighted the vulnerability of banking systems, creating the need for stricter capital and liquidity requirements for banks. Tightening the rules could also carry the risk of "over-regulation" in mega-markets, which might also worsen the profitability of financial institutions. The study examines the changes in the profitability of the banking system of the European Union and Hungary over the period between 2008 and 2019, as well as the impact of the tightening regulations on the ratio of non-performing loans.

Journal of Economic Literature (JEL) codes: G21, G28, H12
Keywords: banking regulation, profitability, non-performingloans

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Introduction

The justification for the tightening of capital and liquidity requirements for the credit institutions sector, which has been very common of the past decade(s), cannot be questioned. However, the questions arises as to how the increasingly stringent requirements affect the functioning of the credit institution system, or what extent they affect the sector's ability to generate income and whether they cause any noticeable changes in the concentration of the credit institution sector? In our study, we have examined, mainly based on the European Central Bank database, that the current level of regulation can be considered as an "over-regulation", so it is not significantly reducing the profitability of credit institutions and to what extent the changes in capital requirements have triggered the processes of increasing concentration within the sector. We have extended our research to the countries of the European Union and we have also examined the situation in Hungary in relation to certain aspects of the research. We have analysed the extent to which the phenomena in Hungary are in line with trends in the European Union level. Our research covers the period between 2008 and 2019. In some cases, we analysed the extent to which the situation of credit institutions has changed in 2019 compared to the "crisis year" of 2008, while in the other cases we attempted to identify trends that emerged during the period under review. In some cases, we also refer to the pandemic period of 2020.

Literature Background

Regulation of banks is always essentially a bargaining process between the state and the credit institutions. The stabilty in the operation of the financial sector and the avoidance of bank failures are in the interests of the national economy and society. One specific feature of banking systems is that, although they are surrounded by a safety net (strict licensing conditions, specific legal and regulatory environment, inter-bank institutions, effective internal decision-making and control systems), bankruptcy of the banks cannot be ruled out and from a bankruptcy - in the worst case - can even start a contagion chain (Széles–Baranyi, 2016).

Because of their prominent role in the national economy, it is important that banks are subject not only to rules, but to much stricter rules than a traditional business. The rules are also determined by the history and culture of the country concerned. Banking rules are completely different in the United States and the European countries. In the US, the separation of commercial banking and investment banking was already made in 1933 in the Glass- Steagall law (Pál, 2009), however in Europe there is no such regulation. In the topic of banking deregulation, the Gramm – Leach – Bliley law was adopted in 1999, which allowed the concentration of banking players. As a restult of this, universal banking giants emerged, which carried increased risk. This regulation also played a role in the crisis of 2008-2009. It is no coincidence that in 2010, legislation was enacted, known in the jargon as the Dodd-Frank Act, which demands stricter prudential supervision.

By the review of the literature suggests that a distinction can be made between a narrower

and a wider definition of banking regulation. while the wider form of regulation also takes into account other factors that determine the functioning of banks, such as financial rescue, the state's lender of last resort (LoLR) function or the deposit insurance (Erdős–Mérő, 2010).

It can be observed that the former risk-based regulation has nowadays become rule-based and has been complemented by the regulation of systemic risks (Mérő, 2018). Banking regulation can be further divided into two big groups, micro-prudential and macro- prudential regulation. Micro-prudential regulation is responsible for the proper functioning of institutions in the sector at national level, while macro-prudential regulation focuses on the whole banking system. According to Baker (2013), prior to the 2008 crisis, regulation was only applied to individual institutions and not to the whole system, so the macro-prudential level was missing. Financial stability was taken for granted in the system; as a result, regulation did not include requirements for differential conditionality.

The 2008-2009 crisis led to the conclusion that the existing regulations were not able to keep up with the changes in the banking system, and that the banking system, which was considered safe and stable until then, suffered huge losses despite the rules. The capital requirement in relation to the risks assumed can be assessed on the basis of capital adequacy, so among the prudential regulations, the examination of this is very important.

The central role of capital in financial regulation can be supported by the following main arguments:

- The right amount of capital reduces the risk that fluctuations in the bank's profitability will lead to a bankruptcy.
- In case of financial problems, capital is the first line of defence to absorb the shock, thus reducing the additional costs for other stakeholders.
- Prudential requirements make bank owners more cautious, as they require proportionately more capital from them if they take on more risk.
- Capital rules contribute to the development of risk-proportionate pricing and help to develop an appropriate risk-taking strategy.

Nowadays financial regulation was laid down in the Basel III package of measures by the Basel Committee on Banking Supervision, established in 1974 by the heads of the G10 central banks. The Commission's first task was to develop the basics and examination methods for an early-warning system to forecast credit institutions bankruptcy, but since then its remit has become much wider. One of the Commission's priorities is to promote international cooperation between banking supervisors. The current active Basel III package contains new global regulatory standards and an implementation plan for these standards on bank capital adequacy and liquidity. The previous regulatory "package", Basel II - which entered into force in 2004 - was only in force for a short period after its introduction. The crisis of 2008 created a situation that call for a rethink of the previous regulation (Andres, 2018).

In 2010, the decision was taken to create the Basel III Capital Accord, which aimed to establish new rules at the micro level, but mostly at the previously incomplete macro-prudential level. Currently, the regulation of capital requirement for banks is composed of three pillars:

- minimum regulatory capital requirement: meeting the minimum required levels of own funds,
- additional capital requirement: the amount of capital set by the bank and the supervisory authority,
- additional capital buffers: capital surplus that can be used in case of unexpected events (Kovács–Marsi, 2018).

The last additions to the Basel III regulatory package were made in December 2017, mainly due to the tightening of capital requirements and the standardisation of rules (Seregdi, 2019). The final set of proposals is often referred to as Basel IV, due to the multiple changes made to it. With the introduction of the new rules, it was predicted that economic growth and loan placement would initially decrease, but the losses thus implied would still be less than the economic and social impact of a bankruptcy.

According to the analysis of Demirgüç-Kunt and Huizinga (2010), in 2008 there were 30 banking groups operating in 19 different countries around the world with sources exceeding half of the GDP of the country in which they were based. The issue of moral hazard arises for these institutions, they have to know the magnitude of the risk they are taking, yet they continue to increase their investments and they are bailed out by the state if in case of problems that appear.

However, in the case of the bankruptcy of the 30 systemic risk banking groups included in the 2008 report, countries would not have been able to provide a bailout, as the economic weight of the institutions was greater than the influence of the state. For this reason, the too big to fail (TBTF) principle has now been replaced by the too big to save (TBTS) principle, so some banks have now reached a size that is too big to save (Mérő, 2012).

The Basel Committee on Banking Supervision has also developed an indicator-based approach, which including both quantitative and qualitative criteria, to identify banks that are systemically important for the global economy from systemic risk perspective (BCBS, 2011). As banks grow in size, they are becoming more spatially concentrated. Among the 20 largest banks, eight were based in Asia (China and Japan), eight in Europe and four in the US. Among the European banks, four were French, two British, one German and one Spanish. Banco Santander in Spain had assets exceeding 100% of Spanish GDP, but 7 banks had assets exceeding 50% of GDP. Tóth and Zéman (2017) argue that determining the degree of concentration in the banking system is important because the timely identification of a monopoly situation reduces the likelihood of negative effects, helps new entrants to decide to enter the market and allows players on the market to determine competition.

Ten years of significant regulatory reforms following the global financial crisis have helped to ensure that the financial system was well prepared to withstand the shocks caused by the COVID-19 pandemic. Many of the measures announced by the ECB following the outbreak of the coronavirus were aimed at mitigating the negative impact of the pandemic shock on the stability of the financial system and the real economy. Thus, several national authorities decided to release part of the capital buffers accumulated in previous years.

Results

Profitability trends in the European Union banking system

As we mentioned earlier, the tightening of regulation has also made it obligatory to comply with higher capital requirements and to achieve adequate liquidity levels in the EU banking system. We have assumed that an increase in the share of assets with lower return-generating capacity but higher liquidity, combined with tightening capital requirements, will only allow for lower profitability within the EU banking system (Lentner–Nagy, 2020). Our assumption is based on that the mandatory and applicable capital requirements have helped banks to operate more safely, while at the same time the higher capital reserve and liquidity insurance requirements have contributed to decrease in profitability.

The profitability of banks - like other economic organisations - is influenced by a number of external and internal factors, such as the economic environment, government regulators, owners expectations of returns, economic activity, etc. (Fenyves et al., 2020). Of course, the ability of financial institutions to generate income is also influenced by a number of specific factors, including the financial institutions willingness of taking risks or the quality of their customers.

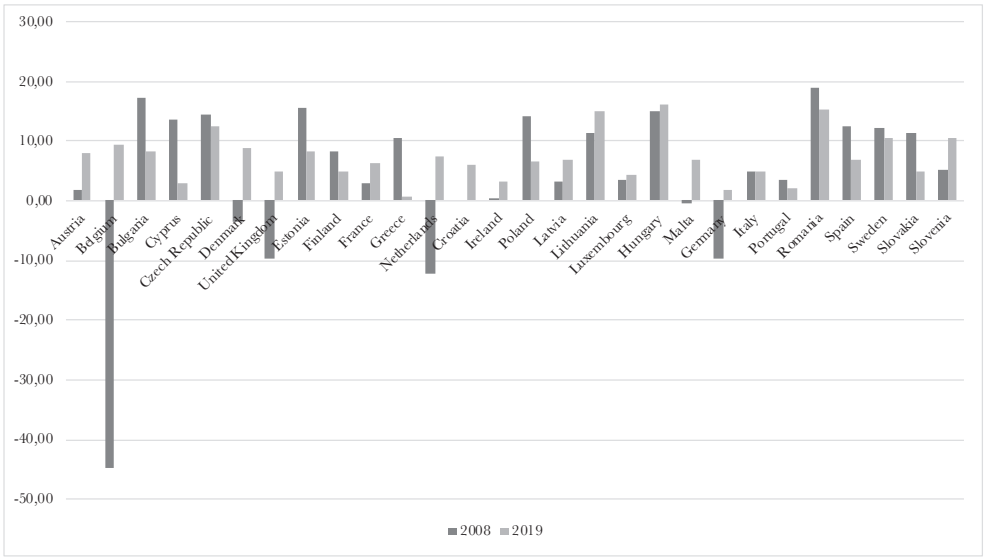
Profitability shows the ability of business organisations to generate income, essentially what result they can achieve with the available assets (Fenyves et al., 2019). Financial institutions can be considered as specialised businesses. In order to ensure that bank owners do not only focus on their own profit needs but also put the interests of depositors before their own interests, it is important to strictly regulate bank profitability, which can prevent excessive risk taking, and through prudent bank operations, keep customers' deposits safe.

In the first part of our research, we tried to support our hypothesis by analysing profitability indicators since the 2008-2009 crisis. The analysis was based on the statistical database of the European Central Bank and the analyses of the European Banking Federation.

Examination of return on equity

There are a number of indicators available to measure profitability, what they have in common is that they relate a certain category of results to a projection base (Becsky-Nagy–Fazekas, 2021). One of the most commonly used profitability ratio is the return on equity (RoE), which compares the bank's profit after taxation to its equity. The higher its value, using a unit of equity, the financial institution has generated more profit after tax. High profitability indicates that banks are in a favourable position to increase their capital buffer in the near future through retained earnings. Figure 1 shows the average values for each EU Member State, based on 2008 and 2019 data.

Figure 1: Average values of the RoE -Indicator in the EU Member States in 2008 and 2019 (%)

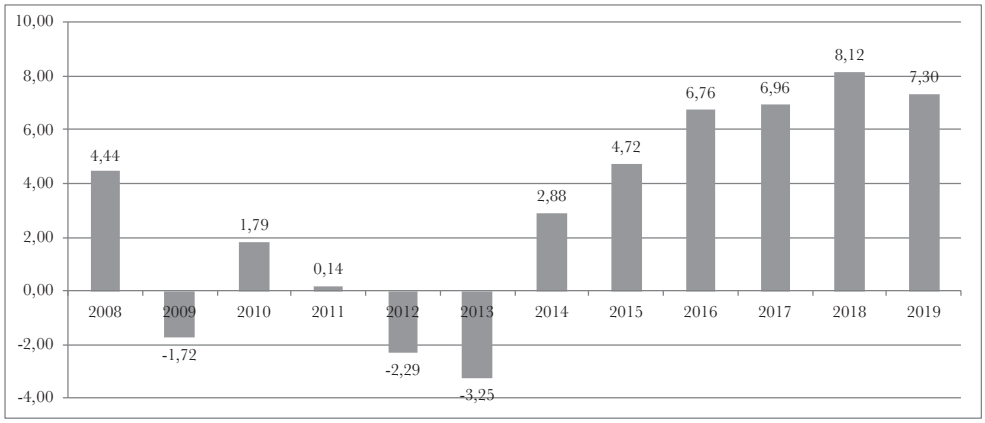


Source: own editing based on the European Central Bank statistical database

Among EU member states, Hungary had the highest RoE in 2019 at 16%, followed by Romania (15.20%), Lithuania (15.10%), the Czech Republic (12.50%) and Sweden (10.60%). The average RoE of the Hungarian banking system in 2019 was already above the pre-crisis 2008¬2009 level, which was still quite high. The Cypriot banking system suffered the largest average loss of equity over the period 2008-2019, in 2012 (-100.83%), due to the significant exposure of its banking system to Greece and the crisis in the Greek banking system that also affected the island's economy. This negative event continues to have an impact on both countries to this day, to the extent that Greece was the only country with a negative RoE in 2018 (-0.36%), but in 2019 there was no longer a county like this. So in 2019, there were six EU countries with a RoE above 10%. Over the period we have examined, there are seven EU countries whose banking system has had a positive RoE in each year (Bulgaria, Czech Republic, Finland, Poland, Luxembourg, Sweden and Slovakia). The data show that the banking system in Western European countries was hit by the crisis in 2008 and 2009, while the impact in Central and Eastern European countries was felt only afterwards. The crisis had the greatest negative impact on the profitability of the banking systems in the Baltic States (Estonia, Latvia and Lithuania) and Ireland.

Figure 2 illustrates the average RoE values calculated from EU Member State data in the examined period. After the lowest point in 2013, the indicator increased despite the subsequent introduction of the Basel III capital rules.

Figure 2: Average value of the RoE Indicator in the European Union 2008- 2019 (%)

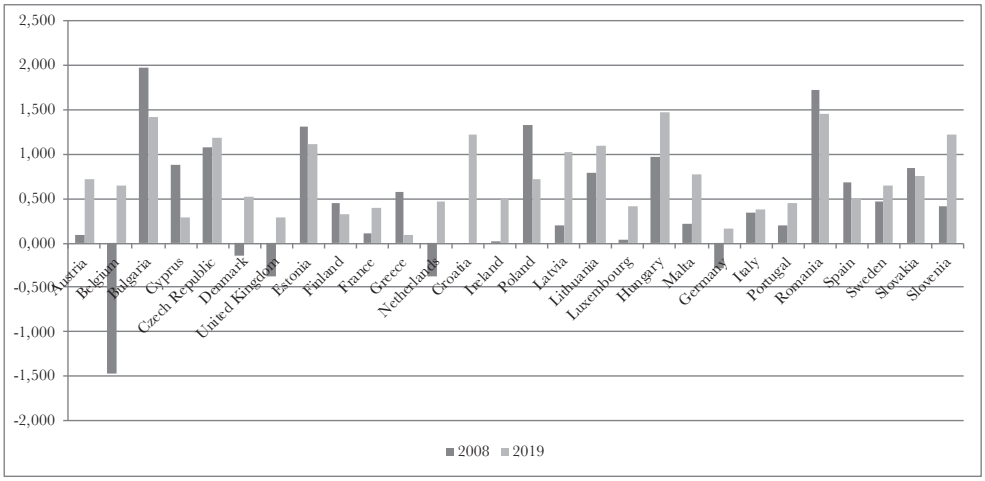


Source: own editing and calculation based on the European Central Bank's statistical database

Examination of return on assets

The Return on Assets (RoA) indicator compares the bank's profit after taxation to the total average value of assets. It shows how much profit a financial institution can generate with the available assets.

Figure 3: Average values of the RoA Indicator in the EU Member States in 2008 and 2019 (%)



Source: own editing based on the European Central Bank statistical database

Figure 3 illustrates that although the indicator has improved over the past period, the sector is still characterised by a relatively low level of profitability. This reflects the combined

effect of a number of factors, such as the increase in bank balance sheet totals and the accumulation of capital and liquidity reserves, which have the effect of reducing the return on assets indicator of financial institutions.

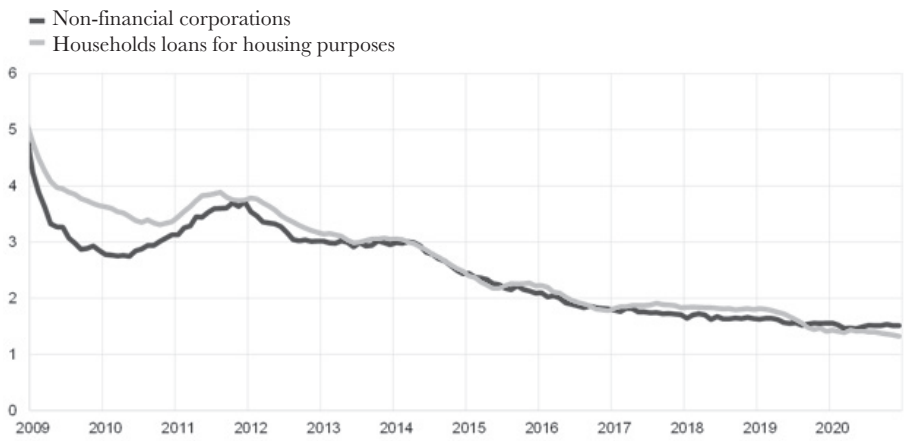
Looking at the RoA data of the member states, it can be seen that, following the 2008 crisis, the indicator fell in all twenty-seven member states at that time. The most significant negative changes were observed in Cyprus, Estonia, Latvia, Lithuania, Belgium, Slovenia, Spain and Cyprus. In 2019, the value of the indicator was positive in all countries. However, only Estonia recorded RoA values above 3 percent and 2 percent in a given year (3.14 in 2011 and 2.01 in 2012), while the other countries did not reach a value of 2.0 in any of the years of the examined period.

Looking ahead, the profitability of the credit sector is expected to decline in the short term in many countries - in no small part due to the introduction of credit moratoriums - and this phenomenon is already visible for 2020.

Most countries in the European Union have introduced some form of payment moratorium. The exceptions include the Nordic countries of Northern Europe (Sweden, Finland, and Denmark), where no moratorium was introduced at all, the United Kingdom, Ireland and Iceland only 3-6 months, and most of the countries of Central and Eastern Europe 6-9 months the length of the moratorium. Hungary was one of the first countries to introduce a moratorium, and no EU country has currently introduced a longer moratorium than the one in Hungary.

Of course, the expected decline in profitability is also influenced by the fact that credit interest rates have fallen to historic lows. This has allowed the banking system to provide supportive financing conditions for businesses and households. By the end of 2020, the interest rate on loans to households for housing purposes will have fallen to 1.32 percent and the interest rate on loans to non-financial corporations to 1.46 percent (Figure 4).

Figure 4: The Changes of Average Credit Interest Rates in the Euro Area Countries



Source: European Central Bank

Concentration processes in the EU and Hungarian banking systems

According to Gál (2010), the process of concentration is a spatially interpretable concept whereby the number of independent financial institutions is reduced by the acquisition of banks located in geographically common markets, and as a result there are fewer and fewer players in the market. In statistical terms, concentration is defined as the phenomenon where the multitude's determinant part of the total sum of value concentrated in a few units of the multitude (Baranyi et al., 2018). An analysis of the degree of concentration in the banking system is necessary to ensure the prudent functioning of the system.

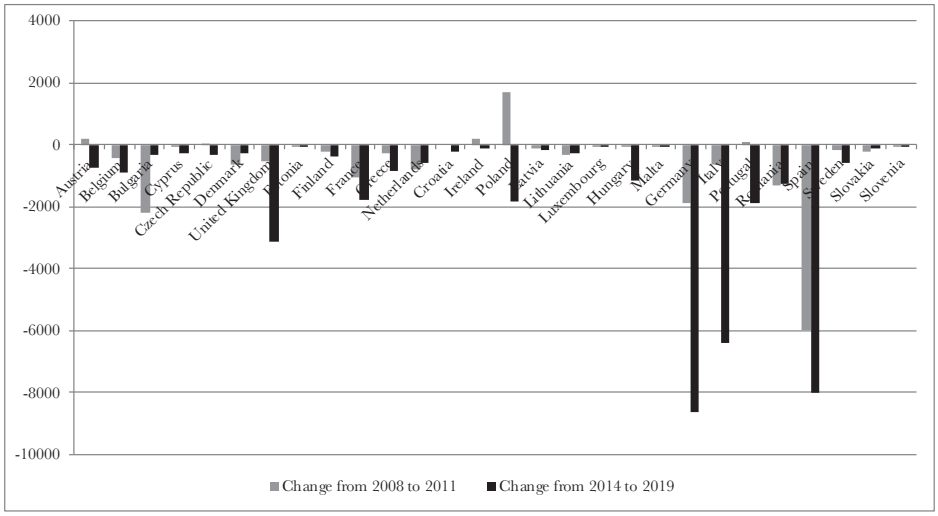
We assume that, the effect of the tightening of banking regulation make increase in concentration processes within the banking systems of EU Member States, as some institutions in the banking systems were unable to meet the higher capital requirements. Statistical methods were used to verify or reject our assumption.

To measure the concentration of the banking system is a suitable tool to analyze the changing of the number of credit institutions, the Herfindhal-Hirschmann Index (HHI) or the concentration ratio (Illés et al., 2017). We use these indicators to examine changes in the concentration of the EU and domestic banking system.

Changes in the number of credit institutions

The number of credit institutions in the EU countries has been steadily declining since 2008. At the same time, the number of bank branches has also started to fall dramatically. This process has been significantly influenced by the spread of digitalisation processes within the sector.

Figure 5: Change in the Number of Bank Branches in the EU Member States, 2008-2011 and 2014-2019



Source: Own editing, based on the European Central Bank statistical database

Figure 5 illustrates the change in the number of bank branches in the EU member states over two periods. In the four years between 2008 and 2011, the number of branches decreased by total 8,672, with the largest decrease in Spain (-5,962 pieces). At that time, there were still countries (Austria, Czech Republic, Ireland, Poland and Portugal) where the number of branches increased slightly, but overall the trend in the following years was similar to the previous one. From 2014 to 2019, the number of branches decreased by 30,501. The largest decreases were also observed in Spain (-7,995 pieces) and Germany (-8,644 pieces). It can therefore be concluded that the decline in the number of bank branches has been much more strongly influenced by the spread of digitalisation than by the financial crisis. It is also interesting to note that the rate of decline in the number of bank branches slowed down towards the end of the period under review, with several countries (Denmark, Latvia, Slovakia and Slovenia) seeing a stagnation in the number of bank branches and some (UK, Estonia, Portugal, Romania and Sweden) even seeing an increase in 2019 compared to 2018.

In the Euro Area, a further decline was observed in 2020 due to continued changes in community business models. The number of branches in the Euro Area fell from 186,000 in 2008 to 118,600 in 2020. The number of branches decrease particularly sharply in Latvia (-85.6%), Netherlands (-72.5%) and Estonia (-71.2%).

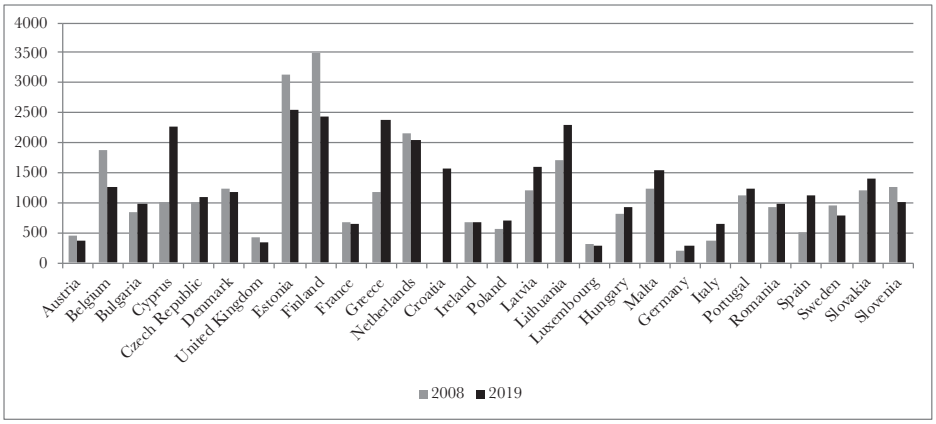
Examination of the Herfindhal-Hirschmann index

The HHI index is the sum of squares of the market shares of companies, typically expressed as a percentage, ranging from 0 to 10,000. When the index is close to zero, there are many companies in the market with a low individual market share, and competition prevails. However, in the case of a high value, there are few players in the market, high levels of convention and, as a result, the risk can increased in the sector. According to the European Central Bank's guidelines, an HHI below 1,000 is low, between 1,000 and 1,800 is moderate, and above 1,800 is meaning highly concentrated (ECB, 2015).

The European Central Bank's database uses the total assets of a country's banking system as the basis for calculating the Herfindhal-Hirschmann index. It is calculated by comparing the assets of the banks in each Member State with the total banking assets of the European Union and then squaring this sum to obtain the concentration value.

Figure 6 shows that there are significant differences between the HHI values of the member states. The countries with the highest values in the period of 2008-2019 are Estonia (2.545), Finland (2.420), Greece (2.382), Lithuania (2.289), Cyprus (2.276) and the Netherlands (2.039) - (values in brackets refer to 2019), which means that these countries are highly concentrated. In 2019, these countries accounted for 40% of the EU HHI value. Germany and Luxembourg (277-277) had the lowest concentration values over the considered period.

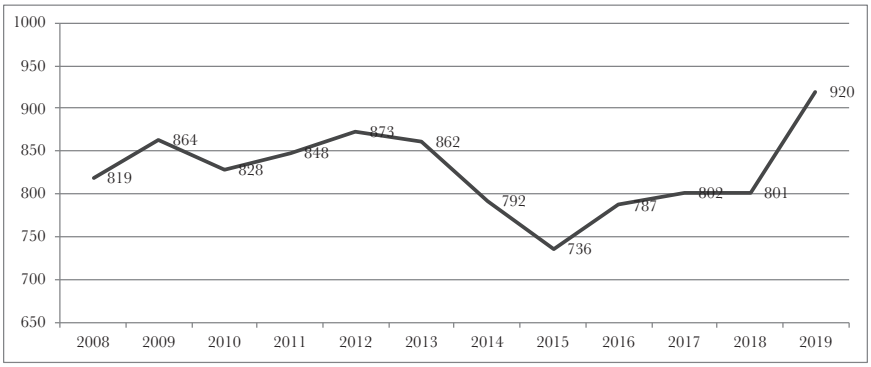
Figure 6: Average Herfindhal-Hirschmann Index Based on the Total Bank Assets in the EU Member States in 2008 and 2019



Source: Own editing, based on the European Central Bank statistical database

Overall, the value of the index tended to increase in most EU member states over the period (e.g. Cyprus, Greece, Latvia, Poland, Portugal, and Slovakia), but the opposite trend was observed in several countries (most strongly in Belgium, Estonia and Finland). High concentrations above the HHI of 1,800 - as mentioned above - are found in the banking systems of Estonia, Finland, Greece, the Netherlands and Lithuania. It is not possible to identify geographic regions with the same type of phenomena, for example, while Finland has a high concentration, Denmark has a medium concentration, Sweden has a low concentration and similar phenomena can be observed in other geographic regions. Our country is in the middle of the range with a low concentration value of around 900. The change in the average HHI index of the Hungarian banking system is illustrated in Figure 7.

Figure 7: The Average HHI Values Based on the Calculation of the Total Banking Assets of the Hungarian Banking System, 2008-2019

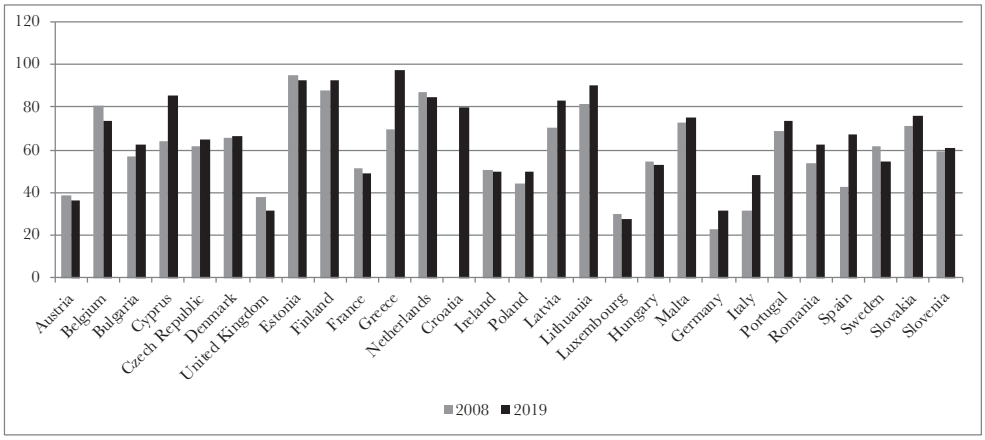


Source: Own editing, based on the European Central Bank statistical database

Concentration ratio test

The concentration ratio shows the market share of the largest banks in the market. Figure 8 shows the share of the five largest banks (CR5) in the EU Member States in 2008 and 2019. This indicator also confirms the findings for the HHI index.

Figure 8: Changes of the Market Shares of the 5 Largest Banks in the Member States in 2008 and 2019 (%)



Source: Own editing, based on the European Central Bank statistical database

In 2019, the highest values were recorded in Greece (97.35%), Estonia (92.95%), Finland (92.95%), Cyprus (86.89%), Lithuania (90.44%), the Netherlands (84.66%) and Finland (81.61%). In these countries, the five largest players covered a significant part of the sector, almost all of it in the case of Greece. Hungary is also in the middle of the range with an average of 52%. Germany and Luxembourg have the lowest values of around 30%. In terms of trends, the weight of the five largest credit institutions in the sector increased over the examined period in the southern countries, Cyprus, Malta, Greece, Italy, Portugal and Lithuania. The market concentration of the Hungarian sector, considering the five and ten largest credit institutions, has changed only slightly between 2008 and 2018. The concentration of the five largest banks has consistently been around 50%. This is illustrated in Figure 9.

As a result of various mergers, banks around the world continued to grow in size after the crisis. The largest bank in the United States, JP Morgan Chase, would have the 8th largest economy in the world if it were a country, ahead of Brazil, Canada or Russia (Andres, 2018). In other words, the growth of banks and the resulting TBTF risk is still present in the market. Nowadays, under the directives introduced by the European Union, the primary objective is to rescue credit institutions from their own resources, so that taxpayers' money is not used to bail out financial institutions in distress or those that are important from a systemic risk perspective. This is also the purpose of the Banking Union's Single Supervisory Mechanism and Single Financial rescue Mechanism, which can be mobilised from EU resources when it is not possible to rescue an institution at national level.

Figure 9: The Concentration of the Hungarian Credit Institutions Sector of the 5 Largest Credit Institutions by the Market Share, 2008-2018 (%)

Source: statistical database of the European Central Bank sdw.ecb.europa.eu

Conclusion

Our analysis shows that - contrary to our preliminary assumptions - the introduction of the Basel III regulatory framework has not led to a drastic decline in profitability in the banking systems of the EU member states. While tightening capital and liquidity requirements have reduced banks' ability to generate income, other effects (mostly a clear improvement in the quality of the loan portfolio and some measures taken at the national level) have been able to compensate for the negative impact of regulatory tightening on profitability in most countries. However, it can be observed that the profitability of banking systems (in particular the return on assets) has remained at a low level over the period under review, with the increase in bank balance sheet totals playing a significant role.

The number of banks and bank branches in the European Union also fell sharply between 2008 and 2019, and this trend was much more pronounced between 2014 and 2019 than during the crisis and in the years immediately after the crisis. The spread of digitalisation has played a greater role in the decline in the number of branches than post-crisis cost-cutting measures. However, it can be noted that in the last years of the examined period, this process has slowed down and, in some countries, has already started to reverse, albeit to a small extent. There is no any consistent trend in the direction of change in the concentration of the banking system. While in the majority of EU member states the degree of concentration in the banking system has increased, in other countries (mainly in northern Europe) the opposite trend can be observed. The banking system in Hungary is characterised by low concentration, and there has been no significant shift in this respect over the examined period. It can therefore be concluded that the banking system in the EU and in Hungary has become somewhat more concentrated following the crisis, but there is a strong differentiation between countries.

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