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Impact of the Fintech sector on the level of competition in the Polish banking sector

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Abstract

The aim of this paper is to investigate the impact of Fintech on the level of competition in the Polish banking sector. Despite the growing number of studies on the development of the Fintech sector, there is still a lack of specific research on how the above changes affect competition levels and how to properly measure this phenomenon. Most of the measures of competition (concentration indicators, Lerner index, Boon index, H statistics) allow measuring the level of competition on the market for all banking products, while the level of competition in individual market segments may be varied. The aim of the article is to analyze the level of concentration and competition in the Polish banking sector. In addition, an attempt was made to isolate the channels of the impact of new Fintech technologies on the level of competition on the financial market. The empirical results of measuring competition in the Polish banking sector presented in the article concern both the period from before the crisis in 2008. as well as the modern period. In addition to traditional concentration indicators, the following measurement methods were used to measure the structure of the competition market: H statistics. However, the article tried to show that despite the increase in concentration and the emergence of larger and larger banks, the development of new technologies does not cause a decrease in competition.

Keywords: competition, concentration, mergers and acquisitions, market structure, Fintech.

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Introduction

The recent global financial crisis has revived interest in the issue of competition among banks – in both its assessment as well as its determinants.[4] Changes in competition in the banking sector take place mainly through two channels: transformations in the market structure, thought mergers and acquisitions and technological changes, and the financial regulation channel. The former result in changes in concentration, while the latter leads to, among others, reducing or increasing entry barriers to a given market and to changing the product range. The transformations observed in the banking market influenced the level of competition in two ways. While mergers and acquisitions enhanced concentration, which in turn weakened competition, deregulation and liberalization of financial markets undermined entry and exit barriers, which resulted in increased competition. The objective of numerous studies is to find an answer to the question whether, despite the process of consolidation and the emergence of ever-larger banks, competition is growing due to the development of new technologies and new banking products (see Pawłowska 2014). The subject of the research is also the impact of the implementation of prudential regulations resulting from Basel III in response to the financial crisis of 2008 on the level of competition.[5]

One should recognize the importance of the distinction between the concept of competition in terms of competition between banks and the concept of the competitiveness of banks. Competition concerns the structure of the entire market in which the entity operates, in contrast to competitiveness, which is associated with the characteristics of individual entities in this market. Competitiveness can also be understood as an ability to achieve long-term and sustainable growth by maintaining high efficiency. In order to measure competition in the banking sector, the production function adapted to banking technology is used, while efficiency indicators (e.g. Pawłowska, 2014; Bikker and Spierdijk 2017) are often employed to analyse competitiveness.

Despite the growing number of studies on the development of the Fintech sector, there is still a lack of specific research on how the above changes affect competition levels and

[4] L. Laeven, , L. Ratnovski, H. Tong, *Bank size, capital, and systemic risk: Some international evidence,* “Journal of Banking & Finance” 2016, Vol. 69, pp. 25–34.
[5] A. Leroy, Y. Lucotte, *Is there a competition-stability trade-off in European banking?* “Journal of International Financial Markets, Institutions and Money” January 2017, Vol. 46, pp. 199–215.

how to properly measure this phenomenon. Most of the measures of competition (concentration indicators, Lerner index, Boon index, H statistics) allow measuring the level of competition on the market for all banking products, while the level of competition in individual market segments may be varied. The aim of the article is to analyze the level of concentration and competition in the Polish banking sector. In addition, an attempt was made to isolate the channels of the impact of new Fintech technologies on the level of competition on the financial market. The empirical results of measuring competition in the Polish banking sector presented in the article concern both the period from before the crisis in 2008. as well as the modern period. In addition to traditional concentration indicators, the following measurement methods were used to measure the structure of the competition market: H statistics, Lerner index and the Boon method. However, the article tried to show that despite the increase in concentration and the emergence of larger and larger banks, the development of new technologies does not cause a decrease in competition.

Nowadays, we are observing the ongoing revolution of the financial world. New business models based on financial innovations (FinTech) change the way of meeting consumer needs in the area of financial services. The existing institutions must propose new solutions in order to preserve their competitive position on the market. New technology entities are often startups that seek sources of financing. Government policy favours their development. However, creating the right business model requires learning about, among others, the needs of the consumer.

1. Measuring bank competition

There are two major schools of thought in the methodology of assessing competition among banks: the structural approach and the non-structural approach. The structural approach is based on the more conventional views of the relation between competition and market structure, and embraces the structure-conduct-performance paradigm (SCP) and the efficiency hypothesis, as well as a number of formal approaches. The two most common non-formal structural approaches measure the impact of concentration on competition (Reid, 1987, Scherer and Ross, 1990). The SCP paradigm (relates structure and conduct to performance) would suggest that more concentrated markets tend to be more collusive. The efficiency hypothesis, developed by Demsetz (1973) and Peltzman (1977) offers a competing explanation of the relation between market structure and performance. This theory states that if banks enjoy a higher degree of efficiency than their competitors, they can: increase shareholder value or will gain market share by reducing prices. Both in the SCP and in the ESH models, measures of the concentration level (i.e. CRk[6] and Herfindahl-Hirschman indexes – HHI[7]) are used to measure competition between banks (Bikker 2004, p. 63).

In reaction to the theoretical and empirical deficiencies of structural models[8], **non-structural** models of competitive behavior have been developed based on the new competition theory: the Iwata model (1974), the Bresnahan model (1982), the Lau model (1982), and the Panzar and Rosse (1987) approach, the Lerner index but also the so-called Boone index, proposed by Boone (2000), which is based on the ESH hypothesis.

However, in addition to the above-mentioned measures of competition, the measures of concentration (CRk indicators and Herfindahl-Hirschman indexes) are still widely used to measure competition in the banking sector, due to the ease of their estimation.

2. Competition versus concertation and new technology: literature review

A significant issue regarding the banking sector, widely described in the literature, is the relationship between the consolidation of the banking system and competition. However, the general relationship indicating that a greater market share determines greater market power and less competition is not obvious, and many authors note that the intensity of competition may, however, be different for markets with the same level of concentration.

Referring to empirical analyses of the relationship between concentration growth and competition, many papers state that there are no clear links in the banking sectors of developed economies between the increase in the system concentration and the level of its competition (Claessens and Laeven 2004, Hempell 2002). Regulations that reduce the freedom to provide services turn out to be more relevant.

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[6] CR_k denotes the market share of the largest banks in: gross loans, net assets, and asset deposits.

[7] The Herfindahl-Hirschman index (HHI) is calculated as the sum of squares in the market share of individual commercial banks (e.g. in net assets). The index reaches values from 0 to 1 and the higher the index value, the greater the concentration of the market.

[8] Hempell (2002, p. 9).

Gelos and Roldos (2002), analyzing the level of competition in transition economies, have come to similar conclusions and found that despite the decline in the number of banks in the analyzed period, the level of competition did not decrease because the effects related to consolidation in the analyzed countries (including Poland) were neutralized by the possibility of foreign banks' entry, which was due to low entry barriers. Similar conclusions about the Polish banking sector have been reached by, among others, Yildirim and Philippatos (2007) or Pawłowska (2014).

Crucial determinants of the competition, apart from changes in concentration, are also developments in the ownership structure and regulatory changes (see e.g. Cetorelli 2004, La Porta et al. 2000). However, the authors of many papers that emerged after the financial crisis claim that the type of property does not affect decisions taken by banks and does not determine the level of competition (e.g. World Bank Report 2013). In the long run, however, the state plays a significant role, especially in ensuring financial supervision, facilitating healthy competition through appropriate regulatory policy and through strengthening the financial infrastructure.

It should be noted that empirical studies on the direction of changes in the level of competition over time in the EU generally have shown increased competition before the crisis despite increased concentration in the banking sectors of Central and Eastern Europe (see, e.g. Pawłowska 2014, Clerides et al. 2013, Miklaszewska et al. 2013). The results regarding the eurozone are already ambiguous (see Bikker et al. 2012, Weill 2013, Bikker and Spierdijk 2017).

The modern world is watching a progressive revolution in the financial sector. Entities creating new business models based on financial innovations (FinTech) (including technology based on distributed ledger or artificial intelligence) completely redefine the way consumers meet their financial needs. In the era of a dynamically changing world, the young generation of consumers is receptive and open to digitization, freely using innovative solutions with electronic channels that allow remote access to financial services (internet, mobile devices).

FinTech is a sector consisting of companies that base their activities (business model) on technologies and ICT solutions, creating services to meet the needs of financial services for clients (technological financial innovations) in a more effective and friendly way, especially for the new generation of clients.

The FinTech sector includes, among others supervised entities (e.g. banks, payment institutions, insurance companies, investment companies) using innovative technological solutions and non-supervised entities (often startups just starting their activities using innovative tools or using an innovative business model) even outside the financial sector, for financial entities.

Traditional institutions must introduce new solutions aimed at maintaining their competitive position on the market. Technological financial innovation is a key factor in the transformation of the financial sector around the world. Innovation is becoming one of the main ways to create a competitive advantage on the financial market by creating new distribution channels for financial products and services, expanding the range of operations and improving the quality of services provided.

The dynamic development of the FinTech sector is a significant challenge for the authorities supervising the financial market, central banks as well as regulators who are responsible for creating the right laws in the digital economy. Due to the openness of economies and the financial system, new standards defining the requirements which innovative products, services and business models are subject to, must be shaped in the spirit of international consensus. There are many solutions on the market that go beyond the traditionally understood categories of financial products or services.

According to statements of government representatives, Poland intends to be actively involved in promoting the development of the financial innovation market (FinTech) and is interested in joining in the competition for the name of one of the key FinTech hubs in Europe and a leader in the region of Central and Eastern Europe. It should also be emphasized that the banking sector in Poland stands out, compared to other countries of the region and some major EU countries, in innovation and is determined, on the basis of services market research, as modern and inspiring for others. Cooperation between banks operating in Poland and entities from the FinTech industry is also noticeable.

3. Changes in the structure of the Polish banking sector

Before the financial crisis, the structure of the Polish banking system was largely shaped by the earlier privatization policy focused on attracting foreign investors. Hence, one could observe an increase in foreign capital and an increase in concentration due to, among others, intensification of the merger and acquisition process on the global scale and the emergence of the euro area. The financial crisis triggered another wave of cross-border mergers and acquisitions, which was also reflected in the Polish banking system due to the situation of mother banks (see Schoenmaker 2010).

As a result, for the first time since 1999, the share of domestic investors in assets of the banking sector was higher than the share of foreign investors (at the end of 2017 it amounted to 54.5%).[9] In 2017, the largest shareholder in the Polish banking sector were German investors. While analysing the volatility of CR5 concentration indicators in the Polish banking sector, one may observe that for the periods 1998–2001 and 2011–2016 these indicators show an increasing trend. The increase in concentration ratios was fuelled by mergers and acquisitions carried out by large banks The drop in concentration ratios was caused by a slowdown in the consolidation process and slower development of large banks. In 2017, the share of 5 largest banks in the assets of non-financial sector decreased slightly and at the end of 2017 amounted to 47.1%. It seems noteworthy that the values of concentration ratios for assets place the Polish banking sector in the 21st position, well below the EU average (62%). However, this state of affairs may change due to an increasing intensity of mergers and acquisitions.

In order to improve their competitive position, banks operating in Poland are continuing their efforts to increase efficiency through optimization of their employment and sales network. This process is enhanced by acquisitions and mergers as well as the development of electronic banking. It is worth highlighting that commercial banks in Poland, despite rising costs, still achieve high financial results. In 2017, the net financial performance of the banking sector was slightly lower than in 2016, but there was an increase in interest income, with a simultaneous decrease in interest expenses. The observed changes translated into an improvement in the interest margin (from 2.29 in 2016 to 2.44 in 2017), but the remaining basic performance measures slightly

[9] Cf. KNF (Polish Financial Supervision Authority), *Information about banks' situation in 2017*, Warszawa 2018.

deteriorated. In particular, the cost index increased (from 55.97 to 56.36) whereas ROA (from 0.84 to 0.78) and ROE (from 7.76 to 7.07) recorded a fall.

The Polish banking sector is characterized by a moderate increase in the scale of operations. In 2017, the relation of the balance sheet total to GDP amounted to approx. 90%. The main areas of growth on the asset side are loans to the non-financial sector and debt instruments.

The financial crisis brought about a number of regulatory measures in particular related to the introduction of uniform regulations for the banking sector in the whole EU, including Poland (CRD IV package).[10] In addition, in the banking sector a directive was implemented for retail banks to standardize the payment services market of the Payment Services Directive (PSD2),[11] and for the investment banks and asset managers, the Markets in Financial Instruments Directive (MiFID2)[12] was implemented, which is the basis of the EU regulation aimed at improving the competitiveness of EU financial markets and protecting investors by creating a single market for investment services and activities as well as ensuring a high level of their harmonization.

Technological changes in the Polish banking industry

The resent years saw the development of electronic technology which has an impact on changes in the Polish banking industry. Advances in information technologies have transformed banking practices and products. The Internet has created a world of new challenges and threats in banking services and sales potential. Electronic banking became an additional distribution channel of products and services. Furthermore,

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10 The EU has already introduced: Directive 2013/36/EU of the European Parliament and of the Council of 26 June 2013 on the conditions for the admission of credit institutions to operations and prudential supervision of credit institutions and investment firms, amending Directive 2002/87/EC and repealing Directives 2006/48/EC and 2006/49/EC and Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms, amending Regulation (EU) No. 648/2012.

11 Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, (Payment Services Directive 2).

12 *Markets in Financial Instruments Directive II*, Directive 2014/65/EU of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Directive 2002/92/EC and Directive 2011/61/EU

electronic money became an important element of electronic banking. This category relates to settlement instruments such as payment cards and electronic access channels. In consequence, new markets emerged that did not require direct confrontation of parties to transactions, using network connections instead. These services enable customers to access their bank accounts electronically, via computer or telephone. The customers take a growing interest in telephone banking, which includes account services and the purchase of banking products through the phone, as well as in mobile banking, which combines telephone banking with Internet banking, with the use of access to the Internet via the WAP protocol. Via ATMs[13], the customer may have access to the following banking services: cash deposits and withdrawals, placing deposits, checking the account balance and the account history.

In the last years, Internet banking is one of the fastest growing commercial applications of the Internet. In the Polish banking industry, the banks offering Internet services can be divided into two groups: the physically existing banks with a network of traditional branches, which additionally create solutions based on Web pages and thus provide services via the Internet, and exclusively Internet banks[14].

The offering of virtual banks includes attractive terms and conditions of bank accounts, such as free of charge account maintenance, free payment cards, free bank transfers, and free of charge ATM services. Moreover, the interest rates on funds on current accounts are higher than in traditional banks[15].

To sum up, Technical solutions have also become one of the important internal factors enabling banks to streamline their management system, improve work quality and create new distribution channels. Appropriate use of the new technologies enabled banks to rise their competitiveness what in consequence enhanced the level of competition in the banking industry.

In the conditions of an open market and relatively strong competition, Polish banks have used the “retirement pension”. In its development, the Polish banking sector quickly switched to the use of modern IT solutions in banking, which resulted in the

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[13] Nicoletti B., The Future of FinTech: Integrating Finance and Technology in Financial Services, Palgrave, 2017, pp. 14-15.
[14] See also: National Bank of Poland, *Financial System Development Reports*, Warsaw, 2005.
[15] Ibidem.

elimination of traditional forms of operation (e.g. checks have never been accepted on a large scale). Poland is a leader in the region and ranks 14th in the E-Participation Index ranking prepared by the UN, which means relatively high use of ICT in everyday life.

Banks quickly absorb innovative solutions in the field of banking and payment services and introduce them to the offer for customers. In Poland, the vast majority of solutions for banks are created on their own or made available by large IT suppliers on individual orders.

The effect of banks' cooperation with FinTech are innovative solutions recently introduced in Poland: smartphone payments (e.g. BLIK), proximity cards, authorization of banking transactions by fingerprint, voice account login, biometric ATMs, mobile ATM / cash deposit machine, ATM loan, card payment with display, card with dynamic CVC code, mobile ATM, mobile transfer, leasing per kilometers, collision, comprehensive and third party insurance per kilometers and others.

On the Polish market, the main categories of services provided by FinTech companies include (in terms of the number of entities): financial platforms (25%), crowdfunding / P2P Lending (13%), Digital & Mobile Payments (13%), Big Data / Analytics / Machine Learning (13%), Personal Finance Management (6%), virtual "currencies" (6%) and 25% of others, including AISP, insurtech (technological solutions in insurance) / P2P insurance or sales automation. In the category of FinTech sector financial platforms, non-bank loan providers dominate in terms of the number of entities (i.a. Vivus.pl, Wandoo). The second most important service segment is online currency exchange (i.a. Walutomat.pl, Cinkciarz.pl), as well as mobile banking solutions (i.a. IKO, Pekao24), and credit consulting in the form of comparing offers available on the market (i.a. Rankin, Totalmoney). In addition, at least 30 crowdfunding platforms (i.a. Siepomaga.pl, Zrzutka.pl, Pomagam.pl) operate in Poland, including donation platforms or rewards-based platforms. It is estimated that annually projects worth PLN 507 million are financed through non-share crowdfunding platforms in Poland. Due to the small scale of operations, there is no public register of FinTech platforms and public authorities do not collect data on their activities.

In the PayTech area, particular attention should be paid to the development of contactless, mobile and internet payments in Poland. According to information published by the National Bank of Poland, at the end of the third quarter of 2018, there were approximately 33.5 million cards with contactless function in circulation on the Polish market, which represents 82.8% of the total payment card market. The number of other contactless payment instruments based on payment cards, such as payment gadgets, stickers and cards installed in the phone, reached the level of 34.768 million units at the end of September 2018., i.e. during the third quarter of 2018 increased by 760 thousand (increase by 2%). The saturation of the market with contactless cards is accompanied by the development of the terminal network with their support function (99.2%), which creates favorable conditions for the development of mobile contactless payments, e.g. with a smartphone equipped with the NFC (near-field communication) function. In addition, Poland has become the European cradle of HCE (host card emulation) technology implementations - payments via a virtual card e.g. on the phone, and at the end of 2016 Android Pay began its operation in Poland.

The development of mobile and online payment channels is possible thanks to the cooperation of the FinTech sector with banks. Companies such as the National Clearing House (KIR), Blue Media and PayU are precursors of innovative payment technologies (classified as FinTech) in the payment sector, creating an offer of instant transfers, pay-by-link transactions for Polish clients (automatic completion of the transfer form and simple transaction authorization) or electronic wallets (electronic wallet equivalent used to execute transactions in e-commerce). They made it possible to generate new income for banks, which allowed for a rather early level of development of electronic banking indicating the profitable nature of this channel and justified further investments in its promotion and functional development. In turn, the Blik mobile payment system, whose operator is the Polish Payment Standard, is an example of an interbank initiative aimed at systemically creating financial innovation across the entire sector.

In addition, KIR successfully conducts, along with banks, implementation tests of a prototype platform for a durable data medium based on a generally available blockchain technology solution. This is also the way in which the solution of the Polish company Billon works, based on which five Polish banks have already published their documents (including regulations, price lists) for customers in a way that guarantees the inability to interfere with the content of correspondence.

An interesting application of blockchain technology called eVoting is also implemented by the the Central Securities Depository of Poland S.A. (KDPW S.A.) for capital markets in cooperation with IBM. This solution is aimed at increasing investor involvement in voting on resolutions of general shareholders' meetings. In particular, it should provide KDPW S.A. and other capital market participants, such as public companies as well as banks and brokerage houses, access to information on exercise of voting rights in real time (or close to real), and provide access to reliable results of correspondence voting.

In Poland, platforms have also been created for exchanging virtual "currencies" (bitcoins and litecoins) for traditional currencies. There are websites offering social loan or microcredit services in bitcoin.

5. Legal regulations in Poland - current state and perspectives

A significant part of the FinTech sector's activity is not covered by the regulation, although general civil law, anti-money laundering and payment services regulations apply to the majority of services. Despite the lack of specific sectoral regulations, FinTech entities compete with regulated sectors / entities, which is extremely cost-intensive for newly established entities (e.g. license requirements). Nevertheless, FinTech activities in the financial sector generate risk and may require the creation of regulations addressing risk and allowing supervision of their activities.

In this respect, the National Bank of Poland monitors the development of the FinTech market in Poland, in accordance with its scope of competence. The dynamic development of FinTech presents challenges in the main areas of activity of the National Bank of Poland, in particular in the field of activities for the stability of the national financial system, and above all, the development of the payment system in Poland. In addition, the National Bank of Poland participates in the process of supervising acquiring activities in the scope of giving opinions to the Polish Financial Supervision Authority on the applications of domestic payment institutions providing the acquiring service, including FinTech entities.

At present, the leading competence role in creating and developing the regulatory and supervisory ecosystem in Poland is played by the Polish Financial Supervision Authority (UKNF), which appointed and coordinated the work of the Special Task Force for Financial Innovation in Poland (FinTech). Published at the end of 2017, the team's work report presents the identified barriers to the development of the FinTech sector in Poland, the actions taken by the team to remove them, and proposals for solutions and recommended further actions on the side of competent authorities and entities that will contribute to creation of a friendly regulatory and supervisory environment for the development of the financial innovation sector in Poland.

In addition, the UKNF’s FinTech Department was established at the beginning of 2018. The task of the new department is to develop supervisory positions, conduct dialogue with entities in this sector, and develop the UKNF subpage in the field of financial innovation. It also conducts analytical activities and monitors changes in the regulatory and legal sphere, just like the NBP Financial Innovation Department created on June 1, 2018.

The way FinTech entities are regulated depends on the type, scale and location of their business. The division of financial sector entities in Poland is made in accordance with EU regulations (PSD2), taking into account national exceptions when they are allowed (so-called national options). There is also a group of entities that are not regulated, except for standard business registration. In line with the division of FinTech entities, one can distinguish banks / other credit institutions and technology companies often just starting a business. Another division takes into account the categories of payment institutions and electronic money institutions. Some start-ups received a payment institution license. Both banks / credit institutions and payment institutions are licensed. However, not all FinTech entities are regulated because they operate in areas where a license is not required (e.g. machine service providers for banks in the field of machine learning, API or currency exchange platforms). A separate group of entities potentially related to FinTech services deals with virtual "currencies" or more broadly - cryptographic resources. Currently, this group is regulated in Poland, and virtual “currency” exchange transactions and trustee portfolio services are subject to anti-money laundering regulations (in accordance with the Act of 1 March 2018 on anti-money laundering and terrorist financing).

The payment services market in Poland is regulated mainly through the Act on Payment Services, amended to implement PSD2. The category of small payment institutions (SPI) has been implemented, which are exempted from the licensing requirements for the provision of payment services (in accordance with Article 32 of PSD2) and obliged only to register their activity in the UKNF. They can provide all payment services except payment initiation services and account information services (points 1-6 of Annex I of PSD2). The geographical scope of SPI's operations is limited to Poland, and the total value of payment transactions carried out by SPI, including all agents for which it is fully responsible, does not exceed the limit of EUR 1,500,000.

6. Results of assessing the level of competition in the Polish banking sector

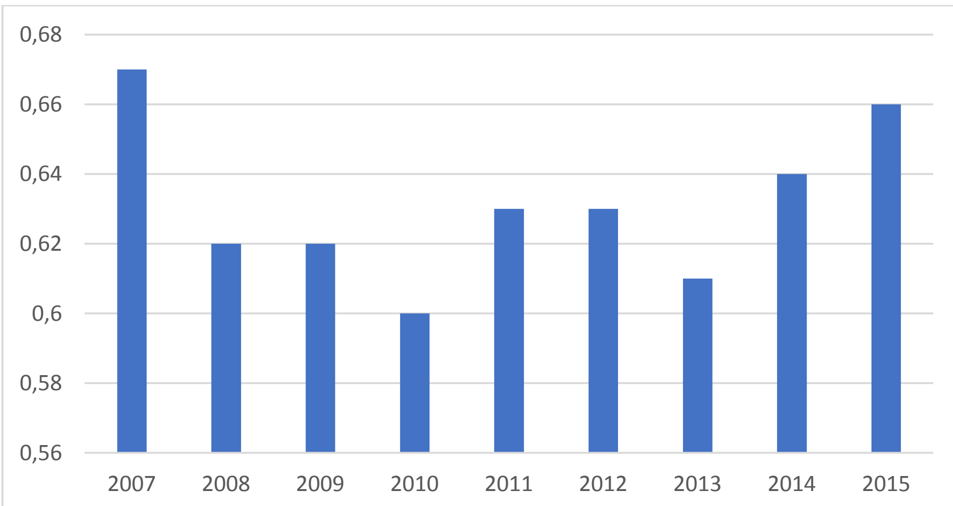
Upon analysis of the level of competition in the Polish banking sector, one may identify specific determinants that affected its impact, such as: ownership transformations in the 1990s, increased concentration due to increased mergers and acquisitions caused by the emergence of the euro area, Poland's accession to the EU and related regulatory changes, progress in information technology and, finally, product innovations in the financial sector. After 2008, the main determinant of competition in the Polish banking sector proved to be external factors caused by the global crisis, followed by the debt crisis in the countries of the euro area as well as regulatory amendments that appeared in response to it. Apart from the institutional changes, modifications to prudential regulations or modern technologies, the level of competition in the Polish banking sector was also influenced by the situation in the real sphere in line with the business cycle.

It is worth highlighting that the presented measures of the level of competition after the financial crisis point to different directions of competition development. On the one hand, the values of the Lerner index demonstrate a decrease in competition after 2009. On the other hand, the values of H statistics indicate a drop in competition after 2009, and yet another slight increase in the level of competition after 2014. The results of the CR5 concentration, however, indicate an increase in market power after 2009.

One should bear in mind that the level of competition in the euro area is much higher than in Poland, as indicated by both the Lerner and the Boone indices as well as the H statistics.

On the basis of the analysis of various measures of levels of competition, it can be stated that after 2009, the market power of the banks operating in Poland has increased. Moreover, the analysis of the values of competition and concentration measures shows that the level of competition in the Polish banking sector may decrease due to further mergers, which helped to prove the thesis that since 2009 the market power of the banks in Poland has increased.

Figure 1. H- statistic



Sourece: Federal Reserve Economic Data, see. Pawłowska (2014), pp. 142-147.

Traditional banks feel competition from FinTech entities, which is why they are starting to increase investment in new technologies - Spanish Banco Santander announced in 2019 that it will allocate 20 billion euros in the next four years for digital transformation and information technologies, and in 2019 JP Morgan will spend for IT development USD 11.4 billion, Bank of America USD 10 billion, and Wells Fargo USD 9 billion.

On the other hand, in the FinTech sector there are more and more initiatives of the private sector type “neobank”, which get large financing from investors. These are projects to create banks in the FinTech trend and philosophy. For example, the Australian mobile project volt bank obtained a limited banking license (Restricted Authorized Deposit-taking Institution, RADI) in May 2018, obtaining AUD 2.7 million funding. A similar development model was adopted by another entity on the Australian market -

Xinja Bank, which until December 2018 as part of crowdfundig accumulated the necessary financial resources (AUD 2.7 million) to start a limited activity. Funding on a larger scale is more difficult to obtain, because, apart from positive media overtones, these initiatives carry a high risk and face significant profitability problems in the initial period of their development. Let this be demonstrated by the sale of a new generation bank project - Virgin Money, owned by Richard Branson. In turn, Monzo, a British neobank licensed for a year, and operating for two years, in 2017 increased its loss from 7 million to 33 million pounds. The financial statements for 2018 (tax year ending in February 2019) are not yet available, although since the last year the number of actively using the bank's services has already reached almost 3 million customers, i.e. more than three times more in 2017.

Conclusion

The level of competition in the Polish banking sector was influenced by a variety of factors, including both the changes in the external environment as well as actions taken by the banks themselves in response to emerging threats and opportunities. The analysis of concentration ratios and competition measures has shown that as a result of the consolidation process, the level of competition in the Polish banking sector is declining. Moreover, it has been pointed out that despite the generally favourable situation, the regulatory requirements observed in recent years are a significant challenge for banks in order to maintain their competitive position on the market.

On the one hand, the consolidation of the Polish banking sector may cause an increase in market power and the ability to compete for Polish banks on the global market. On the other hand, however, it may lead to the monopolisation of the domestic market. It should be noted, though, that the presented measures estimate the level of competition on the market for all banking products, while the level of competition in individual market segments may prove different. Moreover, the question that remains open is what level of competition in the Polish banking sector will ensure long-term economic growth and how to reconcile pressure on short-term profits with long-term economic development strategies.

Market activity in times of turbulent socio-economic reality is becoming a big challenge for mature enterprises. The development of new technologies is both an opportunity giving the chance to expand, reduce the cost of doing business, as well as develop new market niches. On the other hand, companies with an established position must constantly learn to function in new realities, and failure to notice the growing trend and marginalization of the potential of new solutions may have adverse consequences from the organization's point of view.

Reducing legal uncertainty for entities from the FinTech industry in Poland will be an opportunity for the development of safe and effective solutions offered by these entities. It is expected that this will be possible through the implementation of PSD2 regulations into the national legal system (including the implementation of API applications), development of infrastructure and quality of telecommunications services, elimination of regulatory and supervisory barriers in the national legal system, dissemination of e-identity and trust services, testing solutions in Poland before foreign expansion, creating a FinTech hub in Poland, as well as dynamic responses to customer needs.

This article attempts to determine the impact of Fintech sector development on the level of competition in the Polish banking sector. To this end, an attempt was made to isolate the channels of the impact of new Fintech technologies on the level of competition on the market. The analysis of concentration and competition measures shows that after 2009 the market power of banks in Poland increased. Analysis of all presented measures (both concentration indicators and competition measures) has shown that it is difficult to clearly estimate the directions of changes in the level of competition. On the one hand, the consolidation of the Polish banking sector leads to increased concentration and decrease in competition, on the other hand, the Fintech sector stimulates the increase of competition within the banking sector but also the entire financial sector. It should be noted that the impact of the Fintech sector is not easy to estimate on the one hand due to the limitations of the measures of competition and on the other hand due to the lack of comparable data. The next step in the research should be to identify in detail the channels of the Fintech sector's impact on the level of competition allowing for empirical measurement of this phenomenon. Therefore, the current article should be treated as a foundation for further empirical work allowing for proper measurement of the phenomenon, perhaps it requires the construction of new measures.

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