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THE ROLE OF BANKS' INNOVATIVENESS IN BUILDING SUSTAINABLE EFFICIENCY: THE CASE OF POLAND*

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Abstract. New technology has already influenced almost all aspect of human life. Innovativeness is considered as one of the most important requirements for both companies and employees. Even such traditional entities like banks should develop their propensity and ability to incorporate changes in business practices through the creation and adoption of new ideas, solutions, and technology. Today, as a result of significant changes on banking markets, the innovativeness becomes one of the condition for banks' sustainability. Strong competition increased by a necessity to compete with new market players requires developing new managers and employees' skills as creativity and intrapreneurship. The purpose of the paper is to investigate to what extent bank's innovativeness impacts a bank's efficiency that lead to sustainable market position. It presents banks' innovativeness among other competitive advantage factors, their assessment from the perspective of their potential in the process of building bank's competitive advantage and a correlation between the level of bank's innovativeness and market efficiency. The majority of the innovativeness research concentrate on developed countries and very little is known about developing, transition countries. Moreover, the few of them explore banks as a specific entity. On the banking market, they focus rather on distribution channels or product innovations. To the best authors' knowledge, this is the first attempt to empirically examine the relationship between a bank's innovativeness and market efficiency in a transition banking market in Europe. The paper uses data retrieved from the research survey. The survey's target group consisted of all retail banks operating in Poland defined as banks that offer a broad range of financial services to different segments of individual customers. The research was conducted under the auspices of the Polish Banks Association. The data was collected by two methods – PAPI (personal and pencil interviews) and CAWI (computer assisted web interviews). The questionnaire was applied to executive managers of retail banks operating on Polish banking market and banks' customers. The data used for assessing banks' efficiency were derived from banks' annual reports. The results provide direction for banks' decision makers concerning innovativeness' factors that should be taken into account in the process of building competitive advantage and sustainable market performance.

Keywords: banks' innovativeness; competitive advantage; knowledge-based intangibles; financial technology; banks' efficiency, market performance

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1. Introduction

Financial technology is thought to be one of the most disruptive factors influencing the banking market all over the world. It is an exciting area of change and development with an unclear impact on banking products, service delivery, and banks' sustainable position on banking market at this time (Walker, 2018). Undoubtedly, today the development of bank's sustainable market position, competitiveness and effectiveness is strictly connected with innovativeness (Aghion, Reenen, & Zingales, 2013, Chava, Oettl, Subramanian & Subramanian, 2013, He & Tian, 2013, Bernstein, 2015, Cornaggia, Mao, Tian & Brian, 2015, Siekelova et al. 2017; Belas et al., 2018). Banks have to be able to create systems that implement new technologies and applications, optimise processes of providing banking products and services, develop financial infrastructure and allow them to exchange information about customers and their behaviour in all distribution channels. It brings new challenges for all banks' employees who should develop new skills such as creativity and intrapreneurship. The traditional attitude to bank's management focused on fulfilling safety regulations might not be enough to face new market challenges (Sullivan, 2009). Lowering the entry barriers and the threats of a necessity to compete with technology-oriented market players (FinTech companies) combined with changes in customers' expectations will require basing banks' market strategy and business models on appropriate factors (First Data Corporation, 2010, Williams & Page, 2011, BMO Wealth Institute, 2014). It is especially important as banks play a special role in society (Xu, Naiwen & Ahmad, 2018). They are crucial in financing the economy, settling payments and providing products that allow other entities to develop their financial and market sustainability. The banking market sustainability influences the financial system stability, the sustainable economic growth, as well as the economy as a whole. Thus banks' position in domestic and worldwide economy make building bank's innovativeness enormously important.

The majority of the innovativeness research concentrate on developed countries and very little is known about transition countries. Moreover, the few of them explore banks as a specific entity. On the banking market, they instead focus on distribution channels or product innovations and their adoption (Akhisar, Tunay & Tunay., 2015, Nekrep, 2013, Norden, Buston & Wagner, 2014, Mullan, Bradley & Loane, 2017, Salampasis & Mention, 2018, Priya, Gandhi & Shaikh, 2018). To the best author's knowledge, this is the first attempt to empirically examine the relationship between a bank's innovativeness and market efficiency in a transition banking market in Europe.

The purpose of the paper is to investigate the contribution of the bank's innovativeness to bank's efficiency that is the foundation for sustainable market position and performance. Achieving the purpose of the paper requires answering the following research questions:

- RQ1: What is the importance of a particular bank's competitive advantage factors from the perspective of building sustainable market position?
- RQ2: Does a bank's innovativeness influence its sustainable efficiency?

The paper uses a two-fold methodology. The range of assets influencing a bank's competitive advantage and market performance was prepared as a result of a literature review. Then they were verified by empirical research. The strategic assets' structure was verified using a principal axis factor analysis. Afterwards, the impact of verified assets' groups on banks' efficiency was examined.

The remainder of this paper is structured as follows: the first section presents the literature review concerning innovativeness among other bank's competitive advantage factor and their role in bank's sustainable development, the second section considers the competition on the Polish banking market, the third section shows the empirical results concerning banks' innovativeness and efficiency. The paper concludes with the summary evidence of the study and its limitations.

2. Bank's innovativeness as competitive advantage factor

Today as never before banks market environment has a crucial impact on banks' business decisions. Many factors make gaining competitive advantage more and more difficult. Among them, the most important is new technology. Its continuously increasing complexity and the development of information and communication's techniques has resulted in a social revolution that has changed customer behaviour and expectations concerning banking services. The technology development has a profound effect on retail banking services all over the world. The primary motivation for using modern technology has been to reduce costs (Delafrooz, Taleghani & Taghineghad, 2013, Persson 2013), increase efficiency, speed, and control of customer-bank interactions (Honebein & Cammarono, 2006). The contemporary motivation is to add value to the overall customer experience (Blount, 2010). In recent years, the technological landscape has been additionally enriched by social media development that has influenced markets, companies, institutions and customers' behaviour and expectations (Kaplan & Heinlein, 2010, Hanna, Rohm & Crittenden, 2011, Papagiannidis & Bourlakis, 2015, Durkin, Mulholland & McCartan, 2015).

Obtaining a sustainable competitive advantage requires developing the bank's innovativeness. The banks' innovativeness is an organisation's propensity and capability to rapidly incorporate change in business practices through creation and/or adoption of new ideas, that decrease costs, reduce risks, and improve product what results in adding value in the form of increased competitiveness and sustainability (Frame & White, 2002, Guimaraes, Brandon & Guimaraes, 2009). It is an aspect of organisational culture that reflects the internal receptivity to new ideas and innovations (Hult, Hurley & Knight, 2004, Menguc & Auh, 2006, Tsai & Yang, 2013). A firm oriented toward innovation makes individuals, teams and management more open to ideas generation, creative, risk-taking and entrepreneurial (Zhou & Wu, 2010; Laužikas & Mokšeckienė, 2013). Following resource-based view (RBV) bank's innovativeness is one of internal resources and capabilities that, if matched appropriately with to environmental opportunities, help organisations to gain sustainable competitive advantage. The basic assumption of RBV is that resources and capabilities are heterogeneous across firms, and the firms that have superior resources gain sustainable competitive advantage (Hamel & Prahalad, 1990, Barney, 1991, Peteraf, 1993, Acur & Bitici, 2004, Cheng, Lin, Hsiao & Lin., 2010, Zubac, Hubbard & Johnson, 2010). Innovation capability includes strategic capability, product development capability, and technological capability (Vicente, Abrantes & Teixeira, 2015). It requires adequate leadership style, efficient customer knowledge management, and proper investment in technology implementation. Thus such a capability results from the efficient management of a bank's strategic resources and concurrently influences the strategic resources (Figure 1).

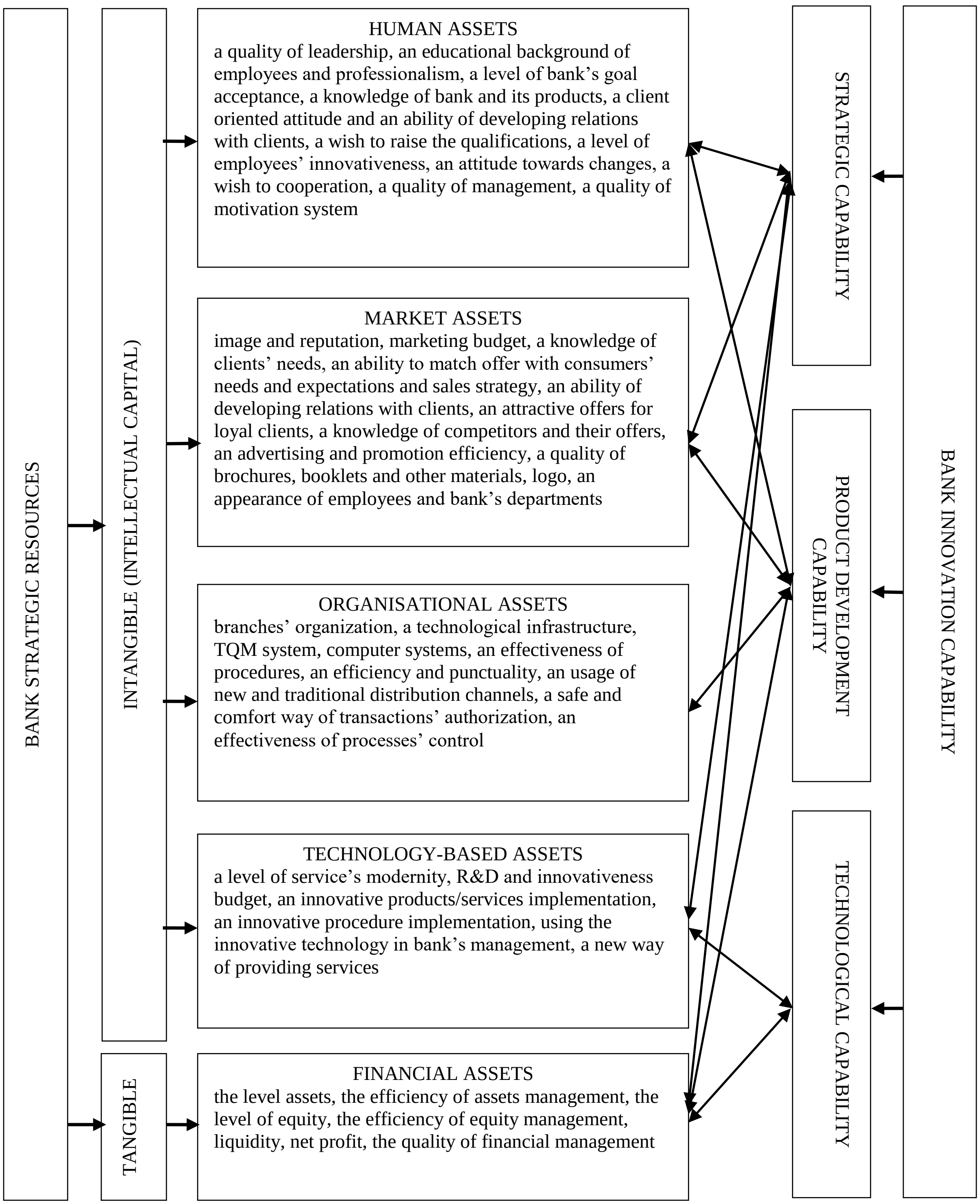

Fig. 1. The relations between bank's strategic resources and innovation capability.
Source: Author's work.

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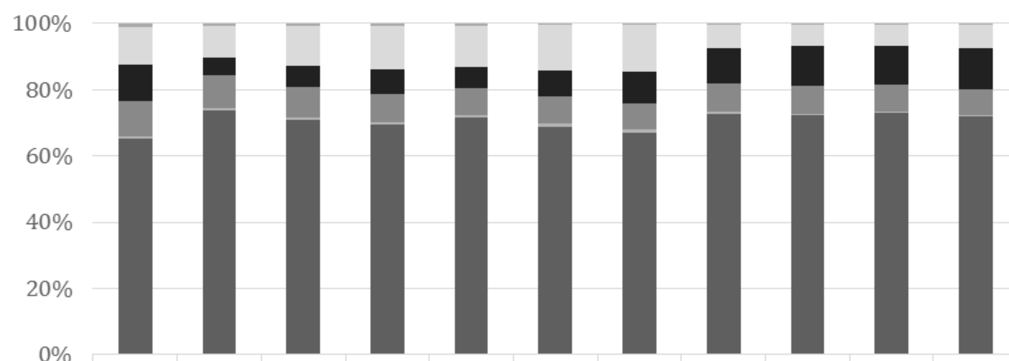
The basic nature of the banking business is knowledge intensive (Mavridis, 2005). The market success to a large extent depends on employees qualifications, engagement, motivation, innovativeness and intrapreneurship. From that perspective, the most important asset category is human capital. Human capital also influences the efficiency of market capital's usage, especially the reputation, long-term relationship with customers and their trust. Concurrently, meeting customers' expectations regarding speed, flexibility, access to banking services and usage convenience, is impossible today without organisational capital. Additionally, during the last few decades, as a result of fast technology development, many financial innovations have been implemented and have become a source of competitive advantage.

Nowadays, banks are allowed to underwrite insurance, while other financial entities are given a possibility to offer some financial products that have been traditionally provided by retail banks (Nejad & Estelami, 2012). The emerge of crowd-funding business models, and the introduction of payment services by companies originating from other sectors have contributed to the alteration of the landscape of the banking industry.

All these developments make banks to rethink their market strategy and business models basing them on the resources which are of strategic importance from the perspective of their ability to create bank's competitiveness and sustainable market performance.

3. The competition on Polish banking market

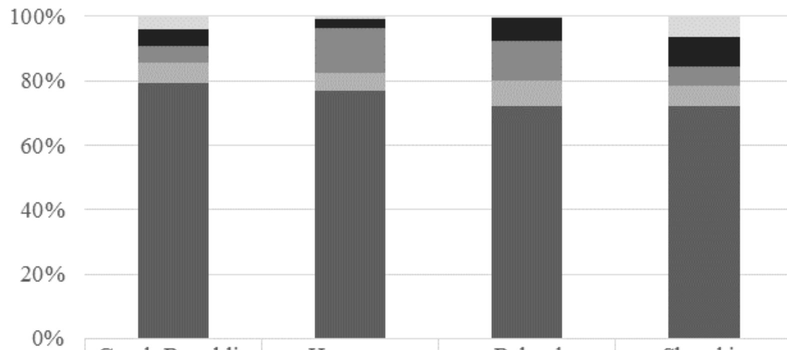
The banking market plays a significant role in the Polish financial sector. Although the assets of the non-bank financial institution have been systematically growing, the dominant share of the banking sector's assets in the assets of all financial entities remain stable. During the last decade, it has been ranging between 65.3 and 73.0 per cent (Figure 2).



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Brokerage Houses	1,0	0,6	0,7	0,6	0,6	0,5	0,4	0,4	0,3	0,3	0,3
Open Pension Funds	11,5	9,8	12,0	13,3	12,4	13,8	14,3	7,1	6,4	6,6	7,3
Invest Funds	11,1	5,4	6,4	7,3	6,5	7,7	9,3	10,5	12,3	11,7	12,2
Insurance Companies	10,5	9,8	9,3	8,7	8,1	8,3	8,0	8,5	8,2	7,9	8,0
Credit Unions	0,6	0,7	0,8	0,8	0,9	0,9	0,9	0,7	0,6	0,5	0,4
Banks	65,3	73,7	70,9	69,4	71,6	68,9	67,1	72,9	72,2	73,0	72,2

Fig. 2. The structure of Polish financial sector's assets.
Source: NBP, 2007-2017.

Taking into account the assets' structure, the Polish market is representative for the Middle-East European financial sector (Figure 3) and for most countries in European Union where banking market is the crucial segment of the financial market and banks as financial intermediaries have key functions in the domestic economy.



	Czech Republic	Hungary	Poland	Slovakia
Other	4,0	0,7	0,3	6,5
Pension Funds	5,0	2,9	7,3	8,9
Invest Funds	5,5	13,9	12,2	6,1
Insurance Companies	6,1	5,8	8,0	6,4
Banks and Credit Unions	79,4	76,7	72,2	72,1

Fig. 3. The structure of Middle-East financial sectors' assets.
Source: NBP, 2017.

The Polish banking market consists of commercial banks, credit institutions and co-operative banks. The competition in all segments has appeared in the 90. last century, but the history of the banking sector is dated on the 15th century when the first banking houses were established. Despite the turbulent history and the loss of independence the first issuing bank, called the Polish Bank, stated the activity in 1828. Some banks established at that time are still operating on the Polish banking market. Bank Handlowy, the first commercial bank in Poland, has been operating for a continuous period till now. The other banks, as PKO Bank Polski and PeKaO SA, stopped their activity during the Nazi German occupation and re-established market activity after the Second World War. A centrally planned economy was not conducive to the development of competition and did not require customer-oriented strategy. The bank's market behaviour started to change in 1989 after introducing the new Act of Banking that enabled the establishment of non-state banks in Poland. The market response was immediate. By the end of 1992, there were 54 domestic banks. Since then the process of mergers and acquisitions has become the essential methods for gaining a more significant market share, as well as restructuring some of them. Poland`s entrance to the European Union also resulted in cross-border consolidation (Klimontowicz, 2016). Mergers and acquisitions influence not only the number of banks and the sector's ownership structure but also impact the level of market concentration.

The most frequently used measures of banking market concentration are Herfindahl-Hirschman index (HHI) and concentration ratio (CR5). They are also considered to be an indicator of the level of market competition. Table 1 presents the selected Polish banking market data.

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Table 1. The structural characteristic of Polish banking market

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Number of banks											
commercial banks	47	49	49	49	47	45	41	38	38	37	35
co-operative banks	581	579	576	576	574	572	571	565	561	560	555
credit institutions	14	18	18	21	21	25	28	28	27	26	28
Banking distribution network											
branches	4 073	4 511	6 507	6 933	7 092	7 534	7 336	7 352	7 230	7 137	6 642
subsidiaries and agencies	5 217	5 789	7 290	7 246	6 802	4 876	5 019	4 872	4 660	4 135	3 815
Number of employees (in thousands)											
	167,2	181,3	175,2	176,9	176,7	175,1	174,3	172,7	170,9	169,3	164,4
Market concentration											
HHI	0,640	0,562	0,574	0,559	0,563	0,568	0,586	0,656	0,670	0,659	0,648
CR5	46,6	44,2	44,2	43,9	44,3	45,0	46,01	48,5	48,8	48,5	47,9

Source: NBP, UKNF 2007-2017

The level of HHI and CR5 ratios shows that the concentration of Polish banking market is relatively low. It is one of the lowest in Europe (Poland is 22nd in Europe) and significantly lower of European Union and Eurozone average (NBP, 2018). The low HHI index and the relatively low market share of big banks enhance the market competition.

Many factors have influenced the intense competition in the Polish banking market. Today, in post-crisis reality it is quite difficult to point out the most important of them (Pawłowska, 2010). The level of competition influence both banks' innovativeness and sustainable market performance (Anning-Dorson, Nyamekye & Odoom, 2017). Banks have already noticed new market players. Most of them do not treat them as crucial rivals, whereas in many worlds markets they are thought to be the biggest threat that may change banks' sustainable market position and the banking market structure (Worthington, 2011).

4. Bank's innovativeness and sustainable market performance

4.1. Research methodology

Bank's innovativeness is strictly connected with its strategic assets. As a category, it results from strategic capacity, product development capacity and technological capacity. The broad range of possible assets that might be the foundation for creating those capacities in the context of gaining competitive advantage and sustainable market performance led to the question what strategic assets have the crucial importance on contemporary banking market in Poland.

The list of potential factors (strategic resources) that influence banks' sustainable competitive advantage and market position was prepared on the basis of a literature review. Then they were verified by empirical research. The research was conducted under the auspices of the Polish Banks Association. The survey's target group consisted of all retail banks operating in Poland defined as banks that offer a broad range of financial services to different segments of individual customers and fulfil all their financial needs and expectation. The questionnaire

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was applied to executive managers of retail banks operating on the Polish banking market. 57 statements in the questionnaire were chosen to examine the significance of particular factors. A seven-point Likert scale from 1 to 7 was used in the research. The importance was graded from 1 which meant that the item is not essential at all to 7 which meant the enormous influence. Reliability analysis for competitive advantage components, measured with Cronbach's alpha, ranged between 0,81 and 0,90 for each construct what confirmed adequate reliability levels for all of the scores. The assets of banks which responded to the questionnaire correspond to 79.5 per cent assets of all retail banks operating in Poland. Two methods collected the data – PAPI (personal and pencil interviews) and CAWI (computer assisted web interviews).

The list of factors was verified using a principal axis factor analysis with varimax rotation. The Principal Axis Factor Analysis (PAF) implemented in HDMD package in R environment was applied (McFerrin, 2015) that is similar to principal components and may be done with a reduced matrix where the diagonals are the commonalities (Revelle, 2015). The principal axis method of factor analysis allows estimating commonalities by iteratively updating the diagonal of the correlation matrix and solving the eigenvector decomposition (McFerrin, 2015).

Due to a particular role in the economy banks' market activity is influenced by many factors of a political, legal, economic, sociological, and technological nature. To examine the relationships between competitive advantage factors and banks' efficiency a multivariate regression analysis was conducted. The efficiency was measured by return on assets (ROA) and return on equity (ROE) indexes. Those indexes are commonly used in industry (Subramanian & Nilakanta, 1996) and service research (Akhisar, Tunay & Tunay., 2015; Xu, Naiwen & Ahmad, 2018). The data were derived from banks' annual reports dated from 2012 till 2016. The relationship between factors which constitute banks' innovation capability and their efficiency were analysed using a regression model.

4.2. Results

The theoretical construct combining banks' strategic resources and innovation capability was the foundation for the list of strategic factors that potentially influence banks' sustainable competitive advantage and market position. The list consisted of 57 statements referring to human, market, organisational, technology-based and financial aspect of banking activity and its innovation capability. The factor analysis resulted in the identification of four dimensions of factors that correspond to strategic assets and banks' innovation capability.

The first dimension has loadings from all factors related to the bank's product development and technological capacity and includes items allowing a bank to serve the right products in the right place and at the right time. It incorporates the factors influencing both the product (service) and the process innovations.

The second dimension represents the strategic capability factors. It is worth to stress that the most significant factors are connected with the quality of leadership and management. These and other factors influence the organisational culture and employees' work conditions.

All the analysed factors representing financial aspects of banks' market activity had noticeably high loadings on the third dimension. From the perspective of the bank's innovativeness and sustainability, they are the source of financing the process of implementing the innovations and the foundation for sustainability.

The analysis of the last dimension's factors leads to the conclusion that banks' competitive advantage and sustainable market position is strictly connected with employees' knowledge, experience, progressive attitude and their intrapreneurship.

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The pattern matrix of the empirical strategic resources' item is shown in Table 2. Only items with a factor loading at least 0.60 were considered. Factor loadings of less than 0.6 have been deleted. Four factors of presented items account for 79% of the variance, with factor 1 which explains 24% of the total variance. The verified structure of banks' strategic resources includes 38 items. Reliability test on the factor groupings confirms good results achieved.

Table 2. The pattern matrix for banks' innovation capability

Factors	**Product development & technological capability (PD&TC)**	**Strategic capability (SC)**	**Financial capability (FC)**	**Human resources capability (HRC)**
The level and efficiency of assets.			0.77	
The level and efficiency of equity.			0.89	
The sources of funding.			0.94	
Net profit.			0.87	
Liquidity/			0.82	
The quality of financial management.			0.80	
The level of service modernity.	0.89			
The implementation of innovative products.	0.78			
The implementation of innovative procedures.	0.80			
Using technology in bank's management.	0.79			
The quality of leadership.		0.88		
The number of employees.	0.66			
Educational level of employees.				0.63
Professionalism.				
The employees' identification with bank's objectives.				0.88
The level of knowledge regarding a bank and its offer.				
Customer-oriented attitude.				0.78
The ability to develop long-term relations with clients.				0.77
The willingness to self-development.				0.75
The level of employees' innovativeness.				0.68
The will to cooperation and knowledge sharing.		0.76		
The quality of executive management.		0.94		
The quality of mid-level management.		0.97		
The level of managers' acceptance.		0.95		
The quality of motivation system.		0.84		
The number of branches.	0.60			
The number of ATMs.	0.77			
The branches' organisation and working hours.				0.88
Employees' equipment.		0.73		
Internal IT systems and procedures.				
The level of quality management.				
The effectiveness of procedures.		0.69		
User-friendly procedures.		0.68		
Efficiency and timeliness of services	0.78			
The usage of traditional distribution channels.	0.93			
The usage of modern distribution channels.	0.91			
The safe and comfortable way of transactions' authorisation.	0.89			
The effectiveness of internal control.				
The knowledge of clients' needs.		0.74		
Matching products to clients' needs.				

The ability to develop long-term relations with customers.				0.65
Interesting proposals for customers.				
The understanding of competitors.			0.78	
Brand value			0.73	
Branches' appearance.				0.68
% of explained variance	24	22	18	16
Cumulative % of explained variance	24	46	63	79

Source: Author's work.

The relationship between factors which constitute banks' innovation capability and their efficiency were analysed using a regression model. The following equations show regression models:

Model 1: ROE= β_0+ β_1 (PD&TC)+ β_2 (SC)+ β_3 (FC)+ β_4 (HRC)+e

Model 2: ROA= β_0+ β_1 (PD&TC)+ β_2 (SC)+ β_3 (FC)+ β_4 (HRC)+e

Models were estimated for ROE and ROA from 2012 till 2016. Table 3 presents the regression results only for 2013 as any significant positive relation has been observed in the subsequent years.

Table 3. Regression results

	Model 1	**Model 2**
Intercept	10,940*** (10,30580)	1,112 (5,236)
PD&TC	0,493 (0,443)	-0,026 (-0,117)
SC	2,938** (2,639)	0,346 (1,553)
FC	3,684** (3,309)	-0,230 (-1,034)
HRC	1,381 (1,241)	0,329 (1,477)
Adjusted. R^2	0,610	0,143
F-value	4,914	1,420
Significance	0,0421	0,333

Notes: ***, **, and * denote statistical significance at the 1, 5, and 10 per cent levels respectively. The figures in the parentheses are the t-statistics.

Source: Author's work.

The results of the regression analysis show that there was a significant positive correlation between banks' innovation capability based on strategic capability and financial capability and their efficiency measured by ROE. Concurrently, there is no a significant correlation between any innovativeness' dimension and the efficiency of assets' management measured by ROA.

Discussion and conclusions

During the last few decades, the Polish banking market has changed remarkably. Opening the market for foreign investors has increased the number of bank and credit institutions. The assets of the Polish banking market has been systematically growing and has become one of the most competitive markets in Europe. Although the new market player has already entered the banking market, banks remain the most crucial market player with over 70 per cent of market assets share. Such a situation correspond to other banking markets in Europe. The market condition has made banks to search for factors enabling them gaining competitive advantage.

The factors analysis proved that in contemporary economy banks should base building competitive advantage and sustainability on those strategic resources that are strictly connected with their innovation capability. Among them, the most important are those that allow a bank to improve products, services and processes. The findings are relevant to Shih (2008) who recognised the importance of innovations and IT. The results correspond with some previous research conducted on the banking market and others markets that showed the dominance of human capital and employees incentives (Blazevic & Lievens, 2004, Jong & Hartog, 2007, Curado, 2008, Liao, Chen, Hu, Chung & Liu, 2017, Davydenko et al, 2017; Atkočiūnienė, Praspaliauskytė, 2018; Waheed, Kabiru & Umair, 2018) and the impact of strategic management on the ability to create long-term relationship with customers and value creation (Kianto, Andreeva & Pavlov, 2013). Such an ability is the heart of open and user-driven innovation approaches (Hoffmann & Prause, 2015).

The regression analysis proved the importance of strategic capability for the bank's efficiency of equity management. The second factor that impacts the bank's efficiency includes financial parameters as the level of equity, the level of assets, profits and liquidity. The results gave no evidence for a direct correlation between any of competitive advantage factors and the efficiency of asset management. They correspond to the research conducted by Nekrep (2013) that did not prove the influence of a bank's internal innovation capability on their market performance.

The results provide that building innovation capability is strictly connected with organisational culture and require specific leadership encouraging employees to be creative, entrepreneurial and motivated to create long-term relations with customers. Concurrently, the findings indirectly proved the complex character of factors influencing banks' market performance and show that it is difficult to extract particular factors influencing banks' sustainable market efficiency. It may be an inspiration for further research aimed to build a model taking into account both external and internal factors influencing banks' sustainable market efficiency and performance.

The practical implication of the finding is the recommendation for banks' decision makers to base their market strategies only on factors that help to gain a long-term sustainable competitive advantage, market performance and efficiency. As those factors are related to fulfilling customers' needs and expectations, such a market attitude will also be beneficial for society and economy.

As many factors influence the bank market performance, the scope of the research might be its limitation. Although the Polish banking market is one of the most competitive and stable banking markets in Europe, the results cannot be directly extrapolated to other banking markets.

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