DOI: https://doi.org/10.17323/j.jcfr.2073-0438.17.1.2023.44-53
JEL classification: G17, G32, O32, O33

Impact of Intangible Assets on Bank Performance in Emerging Capital Markets: Evidence from Russia

Andrey Egorov
Research Instructor, National Research University Higher School of Economics, St. Petersburg, Russia, andreyjegorov13@gmail.com, ORCID

Abstract

The article examines the impact of innovations on the performance of commercial banks. The size of intangible assets is used as a proxy for innovation, since most innovations in the banking sector, unlike those in industry, are intangible and include licenses, software, employees' knowledge and experience, corporate culture, etc. Most researchers agree that an increase in efficiency and performance of financial companies is mainly underpinned by intangible assets, especially their unobservable part. The purpose of the study is to identify the relationship between innovation and financial performance of banks. Thirteen largest systemically important Russian banks of various forms of ownership in 2011–2020 were considered in the course of the research. This choice stems from the fact that these banks account for over 2/3 of the entire banking system in terms of assets, and have their own specifics compared to other banks both within Russia and in the world. This study is limited by the fact that only large Russian banks were considered, while the specifics of medium and small banks, which have significantly fewer opportunities and are ready to take on higher risks, were not assessed. The scientific novelty lies in the fact that intangible assets are reflected in the work by a quantitative change used to assess the innovative activity of banks, for which an suitable approach is proposed. The results of empirical analysis demonstrate that the growth of intangible assets allows banks to increase the volume of both interest and commission income and slow down the rise of expenses, thereby ensuring profit growth. In turn, this stimulates increased liabilities, however, due to regulatory requirements, the share of equity remains almost unchanged at about 10% of the asset value. This trend indicates that even smaller banks can compete with larger ones by implementing innovation and building intangible assets.

Keywords: intangibles, innovation, financial efficiency, stability, intellectual capital

For citation: Egorov, A. Impact of Intangible Assets on Bank Performance in Emerging Capital Markets: Evidence from Russia. *Journal of Corporate Finance Research*. 2023;17(1): 44-53. https://doi.org/ 10.17323/j.jcfr.2073-0438.17.1.2023.44-53

Evaluation of Influence of Innovation on Banks' Financial Performance

Introduction

The ability of commercial banks to fulfill their obligations in full and in due time has always been and will be an important issue for managers and shareholders of a company, as well as for creditors and regulators. A country's social and economic development may have an adverse impact on the resilience of commercial banks, which are not ready for new conditions. Special features of the institutional structure have a significant impact on such development. Development of the technological base, which serves as the fundamental social variable, influences social practices and behavior standards in the society and promotes institutional changes.

Today, the rapid growth of information technology is transforming the rules of the game, and commercial banks have to adapt to them quickly. They have to transform all areas of their activity, create new products, implement new forms of communication with partners and clients, speed up information collection and processing, etc. On the one hand, it results in a growing role of intangible assets and provides additional revenue, and, on the other hand, it requires serious expenditures and additional financing. As users of financial technology, banks apply economic and statistical models to create and assess new securities, to evaluate and distribute revenues, to make decisions concerning asset portfolio management on the basis of current and historic data. Financial engineering is used to create new derivative financial instruments, credit and market risk models, which are applied in order to improve portfolio management and assess loan applications. Financial information technology is used to collect, process and distribute data, as well as to develop economic and statistical models. However, it is rather difficult to assess these innovations and formulate the relationship between them and the performance and resilience indicators of the banks which implement them, in quantitative and numerical form. In the banking sector, intangible assets are the key innovation indicator, and their size characterizes the level of activity in this sphere.

In the first section, we present a literature review. On its basis we define the role of intangible assets in the procedure of innovation implementation and consider the methods of assessing the scale of intangible assets as a variable of innovation activity. We showed that the intangible component creates the innovation potential, without which the development of companies in any sector of the economy is impossible, especially in the financial sector.

Based on these methods, in the second section we offer a quantitative method of evaluating innovation using the intangible assets variable. Using this method, we analyze the influence of innovation on banks' financial performance. It is demonstrated that within 10 years the growth of the intangible assets volume resulted in an increased demand for banking products and services, thus driving the growth of interest and commission income, as well as the increase of bank assets.

Literature Review

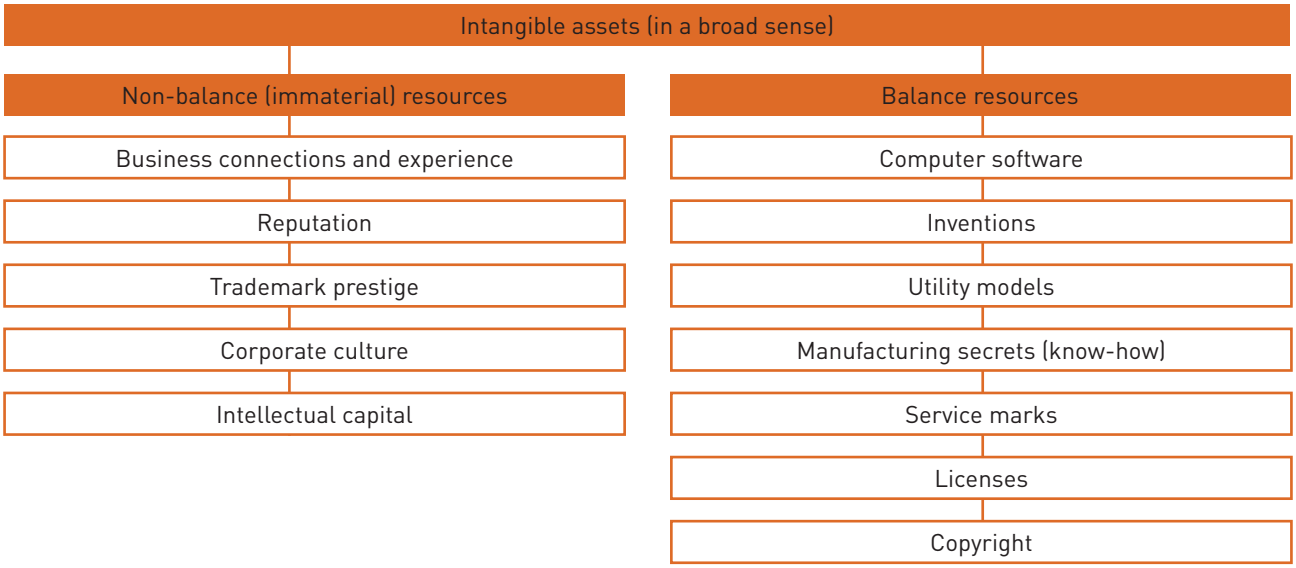
Intangible assets differ completely from fixed assets in their dynamics and risk profile. For this reason, it is an intricate problem to assess the companies that produce them. M.G. Marrano, J. Haskel and G. Wallis describe the distinctive characteristics of intangible assets, including their side effects [1]. For example, the extensive driver network is an advantage of the Uber business model, but it is not unusual for an Uber driver to work simultaneously for other companies. The authors also describe the scaled nature of these assets, and how after the initial expenses for the first unit, products may be replicated infinitely at practically no cost. Obtaining reliable indicators of an intangible asset's value is a problem for investors because R&D efforts are entered in accounting records only as expenditures. This, in turn, has a negative impact on revenue forecasts, which may conceal the innovation areas and discourage public companies from investing in R&D. Other intangible assets such as patents and brand value may also be absent from financial statements. Finally, intangible assets have marginal value, which is often low, and are easily scalable to the benefit of the business.

It is necessary to review accounting indicators in order to develop the best approach to defining modern innovators and finance innovation. This allows to focus on understanding the long-term value of intangible and strategic assets [2]. Fixed assets may comprise the premises and equipment essential for manufacturing and delivery. One may evaluate these assets to provide an accurate description of their value. These fixed assets may be bought and sold, borrowed and used in order to support other financial instruments. However, intangible assets are more important for the innovative development of a bank (Figure 1).

Intangible assets are of non-physical and nonmonetary nature. They are difficult to measure quantitively or are disguised as cash, but some intangible assets may be used to raise funds. Consequently, they should be protected. Intangible assets are the assets whose economic influence depends on a complex decision-making procedure. Based on this procedure, companies decide whether to invest in such assets. This supposition adds intangible assets to the analysis of increase in productivity at both the macro- and micro-levels. However, this starting point is ignored both in theoretical and empirical studies of innovation, where intangible assets are usually considered fragmentarily and their strategic prerequisites are ignored. Many studies, i.e., the one by S. Montresor and A. Vezzani, consider intangible assets as simple "resources," which, along with other fixed assets, allow companies to manufacture more physical products (or make a product of higher value) within a "standard" production function structure or make new inventions within the so-called "knowledge

production function" [3]. Here the most important aspect is the scientific content of intangible assets. The emphasis is exclusively on the way in which firms accumulate such knowledge with time and how they manage, after deduction of depreciation and obsoletion, to accrue intangible capital, which H. Lööf and A. Heshmati in innovation economics consider a synonym for "knowledge capital" [4].

Figure 1. Bank's intangible assets



Source: Regulation of the Bank of Russia of 27.02.2017 No. 579-P.

Many authors pursue different approaches to evaluation of intangible assets, which may conventionally be subdivided into: 1) accounting and 2) economic types.

The accounting approach is based on the fact that an intangible asset should be identifiable, separable and created as a result of contractual or other legal rights. Such assets may be licensed, transferred for use, sold, etc. They may comprise trademarks, patents, software, copyright etc. At the same time, the value of an intangible asset is defined by adding together the expenses incurred directly by the purchase and development of this asset. In addition, the expenses for intangible assets are included in their value only if there is a possibility that they will generate profit in the future and that there is a reliable system for evaluating this asset. This provision is entrenched, for example, in IFRS (IAS) 38 Intangible Assets, in accordance with which the value of intangible assets is determined on companies' accounting balance sheet in many countries across the globe. A similar provision is stated in US GAAP standards (Topic 350 and 985). This approach allows to evaluate rather precisely the observed volume of intangible assets, i.e., the assets that have been recorded in the statements and, if necessary, may be sold, bought or transferred for use. Such approach allows to compare volumes of intangible assets on the balance sheet of joint-stock companies, as well as companies with other forms of ownership. However, the accounting method does not allow to evaluate those intangible assets that are difficult to record by means of a simple acknowledgement of expenses.

Investment in intangible assets provides companies with knowledge that may be used as the basis for the transformation of business processes and implementation of innovation in order to manufacture products and services that are more convenient and attractive for consumers, thus exerting a positive influence on company reputation [5].

The economic approach is, in the first instance, an approach focused on unobservable intangible assets that are not recorded on the balance sheet, but play an equally important role as those that are. The most significant unobservable asset is intellectual capital. In the opinion of many researchers [6; 7], precisely this component of intangible assets makes a significant contribution to creation of value. Such companies as Google or Apple are global leaders due to their intellectual capital. Therefore, an increasing number of researchers are paying attention to this unobservable form of assets [8; 9]. At the same time, intangible assets (both observable and unobservable) are not intrinsically a competitive advantage of a firm. In order to have a competitive advantage, a company has to properly use its intellectual capital, maximizing company value. In this case, the correct use is not a comprehensive methodology, but a series of management decisions unique for each company which, taking random variables into consideration, result in a local win over competitors. Intellectual capital is an important corporate asset because conventional methods of measuring efficiency are unable to present intangible aspects of corporate activity [10].

It should be noted that T.A. Garanina separates the notions of "intangible assets" and "intellectual capital" [11]. In her opinion, these two notions are equal in value, but intellectual capital is considered in terms of creation of value, while intangible assets are examined in terms of distribution, similarly to the division of the balance sheet into assets and liabilities. I. Caddy [12], M.G. Harvey and R.F.

Lusch [13] take a different view. They introduce the term of "intangible liabilities," which have negative consequences for the company (defective goods, hazardous employment, low-quality management, share price manipulations, race discrimination etc.). This term is expressed as the following equation:

$$\text{Assets}_{\text{intangible}} = \text{Liabilities}_{\text{intangible}} + \text{Capital}_{\text{intellectual.}} \quad (1)$$

The differences in approaches lead to a relative difficulty of comparing the results obtained in papers of various researchers. However, it is fair to assume that the majority of authors do not deny the significance of intangible assets, and intellectual capital in particular, however, each author has their own opinion concerning their structure. Thus, we may divide intangible assets into two components: internal (patents, licenses etc.) and external (trademarks, client relations etc.). On the other hand, R. Petty and J. Guthrie [9] consider intangible assets in terms of supply chains and distribution channels (organizational capital), and human capital, which comprises employees. suppliers and customers. L. Edvinsson and M.S. Malone [14], J. Roos et al. [15] hold a similar opinion. E.R. Baiburina and I.V. Ivashkovskaya in their paper point to the growing role of quality in a company's relationships with its contractors and the network mechanisms of business conduct based on this factor, as well as on the fact that business relations are an element of long-term stability [16]. Human, organizational (including innovation and process), client and network capital are determined on the basis of this concept. N. Feruleva and I. Ivashkovskaya have singled out and systematized the indicators related to intellectual capital and have found out that indicators of this capital are still poorly studied and deserve a more careful assessment [17]. There are also numerous other versions: A. Brooking [8] defines human, market and infrastructure capital; T. Günther subdivides the capital structure into internal and external elements and points to a great role of employee competence [18]. A.N. Kozyrev singles out human, organizational and client capital [19].

There are many approaches, but we generally distinguish three components of intellectual capital: human (employee competence), relational (external, client, social, market) and organizational (structural, internal, infrastructure). In the opinion of T.A. Garanina, classifications that have more than three intellectual capital components actually just parcel out individual elements from the above-mentioned three or leave out the components indicated by other authors [11]. According to D.L. Volkov and T.A. Garanina, human capital does not merely comprise knowledge, skills and experience. It is also the ability to derive benefit from these features [20]. Relational capital does not only encompass the relationships with external environment. It is also the ability to derive benefits from these relationships. In its turn, structural capital is the ability to benefit from intellectual property items and infrastructure assets (corporate culture, management structure etc.).

The scope of intangible assets was assessed differently by various authors. The main viewpoints are as follows:

1) in order to assess human capital, we used indicators of personnel expenses and personnel productivity;

2) in order to assess relational capital, we used indicators of income and business expenses (including advertising, packing costs, etc.);

3) in order to assess organizational (structural) capital, we used the ratio of expenses to revenue, the capital-output ratio, etc.

Apart from that, intangible assets can also be evaluated through the difference between the market and balance-sheet values of the company or their ratio (for example, Tobin's Q ratio [21]). This technique proceeds from the assumption that investors conduct a comprehensive analysis of corporate activity and buy shares at a price that they consider justified. If a company develops and has a high potential, investors will actively buy its shares, leading to a share price growth. Otherwise, investors will be wary about the company, and as a result, the share price may be even lower than the book value of assets and (or) equity. However, this technique has its flaws. First, it is easy to define the market value of joint-stock companies, but there are quite a few other forms of ownership, where the accurate price may only be determined at the date of sale. Second, investors may show a lack of judgment or act in a chaotic manner because each investor has his/her own opinion and investment strategy. Divergent strategies of different investors that hold small shares of the market create the random walk effect, when the asset price grows not only because of rational reasons related directly to the company, but due to a large range of causes (from a local manager's dismissal to the government's foreign policy) that may be completely unrelated to the specific company [22; 23].

Summarizing the above, we may note that at present the procedure of implementing innovation is related directly to intangible assets. This is contingent upon the following: on the one hand, intellectual capital creates the conditions for struggling against conservatism and accepting innovations, on the other hand, current innovations, especially in the banking sphere, take the form of non-material assets (software, risk assessment techniques, business culture, etc.). There is currently no clear definition of intangible assets that would take all aspects into consideration, hence, there are no universal techniques for the valuation of such assets. However, there is no doubt that this is an asset that creates innovation potential, without which development is impossible in any economic sector.

Model and Data

In order to analyze the influence of intangible assets on the banking business, we collected data about 13 systemically important Russian banks over 10 years (2011–2020). The list of systemically important banks was compiled by the Central Bank of Russia, and as at the beginning of 2022 comprised 13 most influential banks, whose assets amount to about 80% of the value of all the assets in the Russian banking sector. This list comprises six government-owned banks (Sberbank, VTB, Gazprombank, Otkrytie, Russian

Agricultural Bank (Rosselkhozbank), Promsvyazbank), four private banks (Alfa-bank, MCB, Sovcombank, Tinkoff bank) and three foreign-owned banks (UniCredit bank, Raiffeisenbank, Rosbank). These banks cover the major part of the banking sector, have different forms of ownership and efficiency levels. We took intangible assets (intangible assets) and unobservable intangible assets (intangibles) as the indicators of the innovation variable.

According to the Regulation of the bank of Russia dated 27.02.2017 No. 579-P On the Chart of Accounts for Bookkeeping for Lending Institutions and the Manner of its Application, intangible assets are posted at account 60901 Intangible Assets. This category comprises the property with no material form, but which may be identified clearly (software, patents etc.). The value of intangible assets was taken as at the beginning of the year and value of dependent variables – as at the end of the year. This allowed to evaluate the general impact of implementing innovation on the banking business indicators over the year.

Unobservable intangible assets (intangibles) are rather difficult to assess because they are not clearly recorded in reports. Besides, the banking business, unlike other types of activity, has its specific features. Banks have almost no production facilities, since the main production factor in any bank is capital, which determines the scope of economic activity. A bank also has to fulfill the rather strict requirements of the Central Bank, which significantly limit its activity. Bank product prices depend greatly on the Central Bank rate, while an increase in the price is possible only if the assumed risks increase. However, capital utilization efficiency varies among banks. This difference exists because each individual bank strives to optimize its expenses and structure, to create corporate culture, assess risks more accurately etc. Some banks manage to do so successfully, while others fail. The results depend on the size of intellectual capital and the share of intangible liabilities.

Table 1. Assets of 13 of Russian systemically important banks, RUB bn.

Year	Sberbank	VTB	GPB	Alfa-bank	Tinkoff	Rosselkhoz-bank	UniCredit	Sovcombank	MCB	Rosbank	Ppromsvyaz-bank	Otkrytie	Raiffeisen-bank
2020	32 980	16 354	7237	4580	810	3820	1270	1454	2909	1369		2600	1452
2019	27 584	13 815	6326	3635	555	3218	1214	1155	2435	1205	1940	2330	1274
2018	26 900	13 642	6152	3216	378	3338	1358	965	2136	1082	1257	1393	1115
2017	23 159	9631	5268	2496	268	3078	1178	666	1830	924	994	1767	838
2016	21 721	9429	4749	2247	172	2679	1148	531	1383	758	1252	2678	753
2015	22 707	9395	4953	2059	140	2511	1375	506	1186	861	1218	2966	851
2014	21 747	8295	4636	2157	113	2067	1344	207	572	941	1061	2716	866
2013	16 275	5268	3565	1477	105	1816	904	124	446	689	736	935	694
2012	13 582	4313	2767	1307	73	1578	871	92	310	650	686	636	614
2011	10 419	4172	2398	923	31	1384	878	56	229	599	561	454	572

Source: Author's calculations based on the data provided by the Bank of Russia.

Sberbank is the largest bank in the sample of 13 systemically important banks. Its assets as at the end of 2020 exceeded RUB 32 tn. which is 40 times greater than Tinkoff's assets (Table 1). At the same time, Sberbank grew 3.2 times in 10 years, while Tinkoff grew 26.1-fold.

Table 2. Revenue of 13 Russian systemically important banks, RUB bn.

Year	Sberbank	VTB	GPB	Alfa-bank	Tinkoff	Rosselkhozbank	Rosselkhozbank	UniCredit	Sovcombank	MCB	Ppromsvyazbank	Otkrytie	Raiffeisenbank
2020	2928	1127	452	392	186	261	77	147	169	97		188	115
2019	2884	1166	446	364	149	275	97	118	162	96	149	183	127
2018	2608	1062	411	309	113	266	94	81	154	81	116	143	109
2017	2454	705	400	271	89	278	87	69	137	69	130	206	93
2016	2440	751	419	245	66	290	100	57	124	72	129	202	88
2015	2289	658	403	234	56	242	98	47	99	80	121	200	87
2014	1903	440	296	197	49	189	77	28	65	81	94	105	75
2013	1528	319	236	161	42	170	60	20	48	71	79	74	67
2012	1254	246	194	119	24	151	54	13	32	64	71	48	52
2011	972	212	141	92	11	125	49	9	24	57	60	37	50

Source: Author's calculations based on the data provided by the Bank of Russia.

It should be noted that Sberbank surpasses Tinkoff just 15.7 times in terms of revenue. Also, over the 10 years, Sberbank's revenue has increased three-fold, while Tinkoff's revenue grew 16.9-fold (Table 2).

In the sample of 13 banks over 10 years, Otkrytie showed the worst income/assets ratio in 2014, which amounted to 0.039 or 3.9% (=105/2716).

$$Intangibles = \frac{Income}{0,039} - Assets. \quad (2)$$

We presume that 3.9% of earning power in this sample within this period is the level that may be achieved without significant investment in financial innovation. Based on this earning power, we recalculated the assets required for all banks for all periods to get the revenue indicated in reports. In other words, if a bank has RUB 100 of assets, does not invest in innovation and does not increase the volume of intangible assets, it will get RUB 3.9 in income by the end of the year.

At the same time, an innovative bank will get RUB 15 of revenue over the same period of time. In order to obtain such revenue without innovation, the bank would have needed approximately RUB 385 of assets, but it has only RUB 100 on the books. It means that RUB 285 of assets (=385 – 100) are unobservable intangible assets (intangibles).

Among the 13 largest banks in 10 years, Sberbank had the greatest volume of unobservable intangible assets in 2019 (RUB 47 tn. or about 129% of its asset value), while VTB (the second bank in Russia in terms of the total value of assets), had intangible assets exceeding 100% only in 2015 (Table 3). At the same time, in terms of the share, Tinkoff had about 1021% of the total asset value of such intangible assets (RUB 1152 bn.) in 2014.

Table 3. Intangible assets of 13 Russian systemically important banks recalculated using the basic earning ratio, RUB bn.

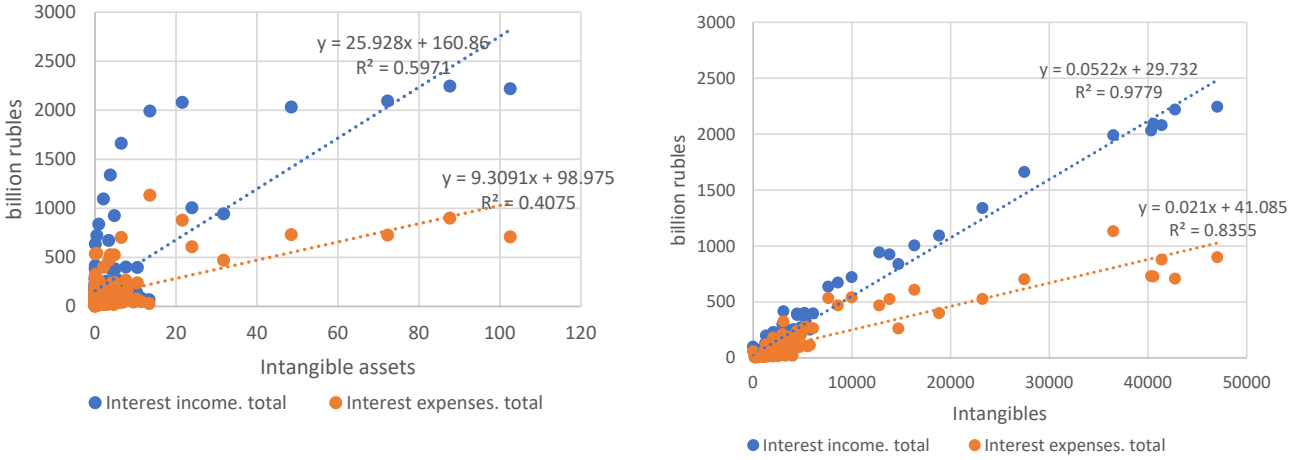
Year	Sberbank	VTB	GPB	Alfa-bank	Tinkoff	Rosselkhozbank	UniCredit	Sovcombank	MCB	Ppromsvyazbank	Otkrytie	Raiffeisenbank	UniCredit
2020	42 748	12 789	4460	5557	3998	2936	713	2352	1460	1152		2252	1531
2019	47 023	16 347	5210	5767	3303	3893	1293	1892	1766	1283	1914	2392	1999

Year	Sberbank	VTB	GPB	Alfa-bank	Tinkoff	Rosselkhozbank	UniCredit	Sovcombank	MCB	Ppromsvyazbank	Otkrytie	Raiffeisenbank	UniCredit
2018	40 556	13 830	4466	4782	2552	3548	1086	1140	1852	1014	1748	2302	1699
2017	40 324	8602	5086	4509	2021	4125	1080	1108	1711	865	2360	3556	1573
2016	41 402	9999	6094	4083	1540	4814	1444	936	1832	1094	2075	2553	1532
2015	36 487	7615	5481	4004	1304	3749	1165	712	1380	1202	1921	2209	1399
2014	27 476	3083	3021	2936	1152	2808	650	519	1120	1143	1374	0	1079
2013	23 245	2986	2532	2679	975	2589	645	387	785	1155	1298	968	1028
2012	18 851	2050	2241	1768	542	2332	528	249	524	1004	1138	601	731
2011	14 727	1307	1239	1443	262	1861	401	166	392	883	988	503	713

Source: Author's calculations based on the data provided by the Bank of Russia.

As for intangible assets, Sberbank is also the leader, since it has more financial opportunities. However, the gap between Sberbank and Tinkoff is just 10.7 times. This can be explained by the fact that Tinkoff's decisions are more innovative, which allows it to develop more rapidly and compete with larger banks. Figure 2 shows the dependence of interest income and expenses on intangible assets over one year. As we see in the diagram, the growth of intangible assets facilitates an increase in interest income. So, the growth of balance-sheet intangible assets by RUB 1 results in an increase of interest income by RUB 25.9, while the growth of unobservable intangible assets by RUB 1 leads to an increase by RUB 0.08. However, the correlation with balance-sheet intangible assets is rather low.

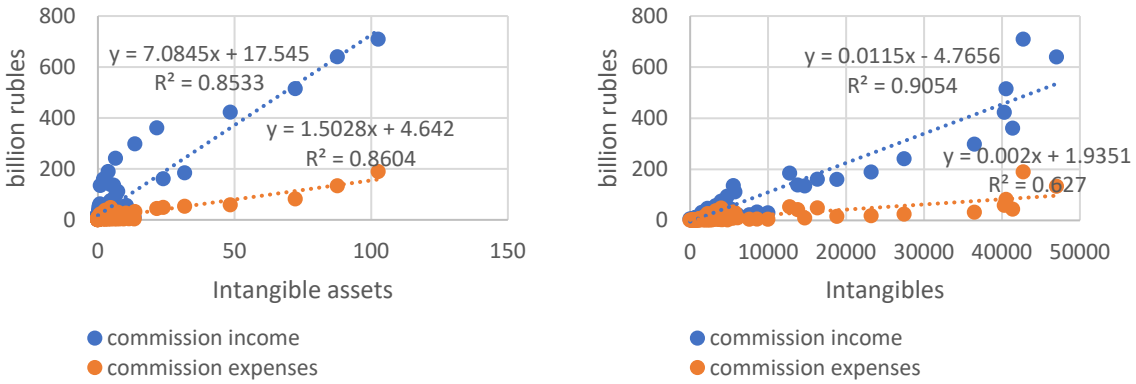
Figure 2. Dependence of interest income and expenses on intangible assets over one year, RUB bn.



Source: Author's calculations based on the data provided by the Bank of Russia.

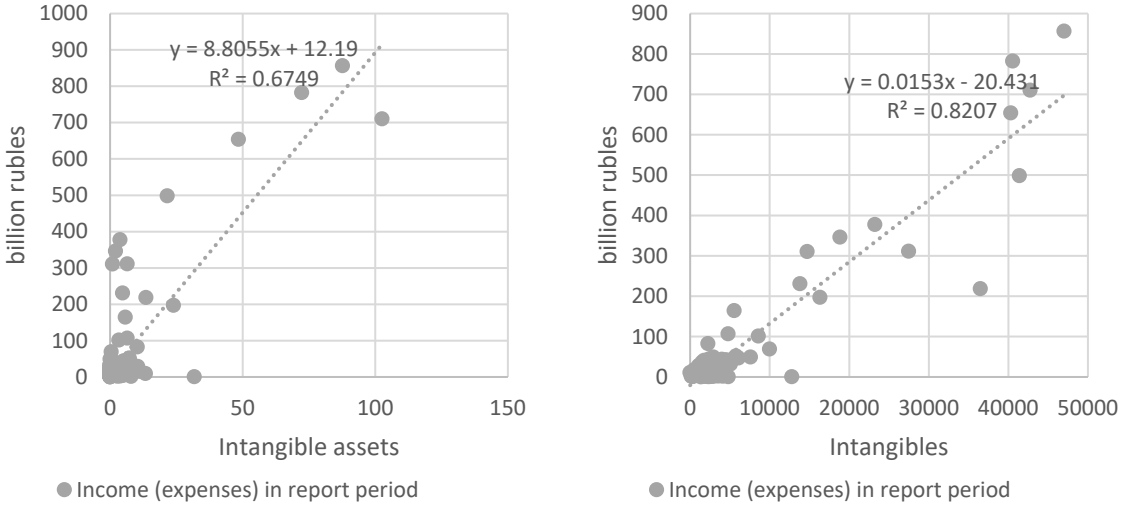
As we see in Figure 3, the growth of intangible assets facilitates an increase in commission income. Thus, a rise in balance-sheet intangible assets by RUB 1 leads to a growth of commission income by RUB 7, while an increase in unobservable intangible assets by RUB 1 – to a growth by RUB 0.01. At the same time, the correlation with balance-sheet intangible assets is rather high.

Figure 3. Dependence of commission income and expenses over a year on intangible assets, RUB bn.



Source: Author's calculations based on the data provided by the Bank of Russia.

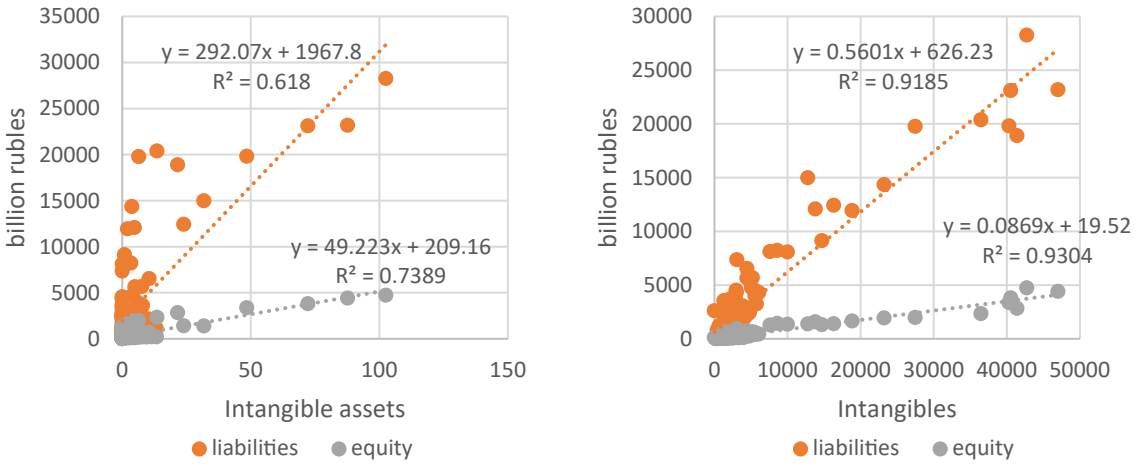
Figure 4. Dependence of income on intangible assets over one year, RUB bn.



Source: Author's calculations based on the data provided by the Bank of Russia.

Due to the fact that income is more sensitive than expenses to the growth of intangible assets, the banks' profit has a positive slope as intangible assets grow (Figure 4). This is achieved by means of spending optimization, cutting down the number of offices and employees and expansion of digital solutions.

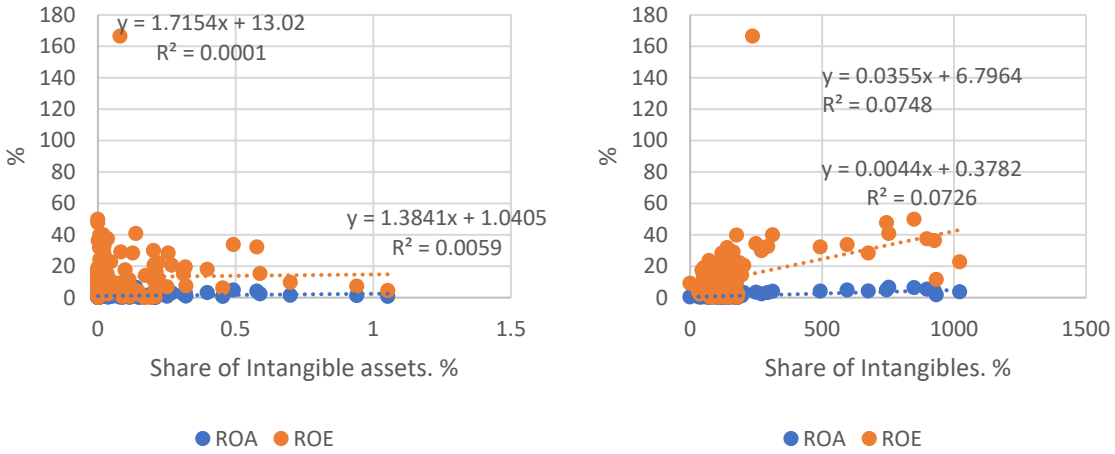
Figure 5. Dependence of liabilities and equity as at the end of the year on intangible assets, RUB bn.



Source: Author's calculations based on the data provided by the Bank of Russia.

An increase in income due to intangible assets requires additional funds for development, which entails a growth of a bank's liabilities. However, in terms of the share, banks' equity was on average approximately 10% and experienced only a marginal decrease (Figure 5).

Figure 6. Dependence of ROE and ROA on the share of intangible assets



Source: Author's calculations based on the data provided by the Bank of Russia.

As long as innovation allows to reduce the share of expenses, while the share of income grows, Figure 6 shows a positive slope of both ROE and ROA. It is due to the fact that innovation allows to find more solvent customers, to evaluate the borrower's risk level more accurately, as well as to decrease costs by reducing the number of bank departments and downsizing. However, the return on equity does not exceed 20% for the majority of companies because the Central Bank significantly limits banking sector activity, and banks cannot assume higher risks.

Discussion of Results

In this research we have analyzed 13 banks over 10 years (2011–2020). These banks were selected because they hold over 2/3 of assets of Russia's entire banking system. Such banks have their own specifics in comparison to other banks, both in Russia and abroad. The present research is limited by the fact that we have considered only large Russian banks and have not analyzed the specifics of medium and small banks, of which there are approximately 400 in Russia, which are less regulated by the Central Bank and willing to assume higher risks. We used the "intangible assets" indicator as the innovation variable. At the same time, intangible assets were divided into balance-sheet assets (intangible assets) and unobservable ones (intangibles).

The balance-sheet intangible assets have a significant influence on banks' operations; however, the correlation was low in the majority of models. It is due to the fact that this indicator does not take into consideration the assets that are difficult to identify. On the other hand, unobservable assets had higher correlation with the indicators of banks' business activity. Generally, we assumed that the growth of intangible assets has a positive impact on the increase of both interest income and commission income. At the same time, intangible assets allow to increase income quicker than expenses. Due to this fact, banks with large intangible assets had higher revenue. Growth in income requires additional funds for development, thus driving the growth of a bank's liabilities, however, the share of liabilities remains almost unchanged at the 90% level. It should also be noted that an inverse dependence is possible, whereby larger companies have more opportunities for the implementation of bigger volumes of intangible assets. However, according to statistics, out of Russia's 13 largest banks over 10 years (2011–2020), Sberbank had the largest amount of unobservable intangible assets in 2019 (RUB 47 tn. or about 129% of the asset value), while VTB (the second bank in Russia in terms of the total asset value) had intangible assets exceeding 100% only in 2015. At the same time, Tinkoff in 2014 had about 1021% of the total asset value in such intangible assets (RUB 1152 bn.). It means that relatively small innovative banks may compete with larger traditional banks, which invest a smaller relative share in intangible assets.

Conclusion

Intangible assets are an important factor of commercial banks' development. Growth of intangible assets is indicative of banks' innovative development and produces a positive impact on their business activity. Many researchers point out that without investing in intangible assets, it is impossible to achieve an increase in productivity and, hence, in the earning power of business activity. In this connection, the greatest influence is exerted not by intangible assets that are recorded in the companies' balance sheets (patents, licenses, software etc.), but by unobservable assets (corporate culture, reputation, knowledge, experience, etc.). However, there are still no clear descriptions of these assets or comprehensive techniques for their evaluation.

As analysis of 13 systemically important Russian banks over 10 years (2011–2020) demonstrated that the growth of the volume of intangible assets results in an expansion of demand for banking products and services, which increases interest and commission income and revenue, as well as accumulation of assets. On the other hand, innovation is partly aimed

at the reduction of risks and expenses of business activity, which results in a growth of ROE and ROA. It should be noted that in the banking business a growth in earning power has significant regulatory limitations because higher revenues are directly related to increased risk levels. A growth in demand also makes banks increase the share of liabilities, which may have a negative impact on a bank's future financial resilience, making banks less sensitive to crises.

Acknowledgements

The study was conducted with the support of the Russian Science Foundation (Project No. 23-18-00756).

References

1. Marrano, M. G., J. Haskel, & G. Wallis. (2009). "What Happened to the Knowledge Economy? ICT, Intangible Investment, & Britain's Productivity Record Revisited." Review of Income & Wealth 55 (3): 686–716.10.1111/roiw.2009.55.issue-3
2. Koivisto M. (2018). As the innovation race hots up, how can we value intangible assets? Programme Lead, Economics & Finance, World Economic Forumю URL: https://www.weforum.org/agenda/2018/09/when-we-can-t-quite-put-our-finger-on-it-intangibles-&-finding-better-metrics-for-financing-technological-disruption/
3. Montresor S. & Vezzani A. (2016). Intangible investments & innovation propensity: Evidence from the Innobarometer 2013. Industry & Innovation. Volume 23, 2016 - Issue 4. p.331-352
4. Lööf, H., & A. Heshmati. (2002). "Knowledge Capital & Performance Heterogeneity." International Journal of Production Economics 76 (1): 61–85.10.1016/S0925-5273(01)00147-5
5. Wong, H. Y., & B. Merrilees. 2008. "The Performance Benefits of Being Br&-orientated." Journal of Product & Br& Management 17 (6): 372–383.
6. Hamel G., Prahalad C. K. (1996). Competing in the New Economy: Managing out of Bounds // Strategic Management Journal. Vol. 17. N 3. P. 237-242.
7. Stewart, T.A. (1997). Intellectual Capital: The New Wealth of Organizations. Doubleday/Currency, New York.
8. Brooking A. (1996). Intellectual Capital. London: International Thomson Business Press
9. Petty R., Guthrie J. (2000). Intellectual Capital Literature Overview: Measurement, Reporting and Management // Journal of Intellectual Capital. Vol. 1. N 2. P. 155-176.
10. Khan, A. M. (2018) «An Empirical Study of the Impact of Intellectual Capital on the Financial Performance of Indian IT Sector», Journal of Corporate Finance Research, 12(1), cc. 7-19. doi: 10.17323/j.jcfr.2073-0438.12.1.2018.7-19.
11. Garanina Tatiana A. Intangible Assets and Intellectual Capital: Role in Creation of the Company Value // Vestnik of Saint-Petersburg University. Management. 2010. №2. URL: https://cyberleninka.ru/article/n/nematerialnye-aktivy-i-intellektualnyy-kapital-rol-v-sozdanii-tsennosti-kompanii-1 (reference date: 01.02.2022).
12. Caddy I. (2000). Intellectual Capital: Recognizing Both Assets and Liabilities // Journal of Intellectual Capital. Vol. 1. N 2. P. 129-146.
13. Harvey M. G., Lusch R. F. (1999). Balancing the Intellectual Capital Books: Intangible Liabilities // European Management Journal. Vol. 17. N 1. P. 85-92.
14. Edvinsson L., Malone M. S. (1997). Intellectual Capital: Realizing Your Company's True Value by Finding Its Hidden Brainpower. N. Y.: Harper Business,
15. Roos J., Roos G., Dragonetti N., Edvinsson L. (1997). Intellectual Capital: Navigating the New Business Landscape. London: Macmillan Press Ltd., Stewart T.
16. Baiburina E.R., Ivashkovskaya I.V. Role of Intellectual Capital in Generation of Russian Companies' Value // Vestnik of Financial Academy. 2007. Issue 4. No. 44. P. 53-63.
17. Feruleva N., Ivashkovskaya I. Assessment of intellectual capital influence on corporate value as a field for further investigations in corporate finance //
18. Günther T. (2001). Controlling Intangible Assets under the Framework of Value-Based Management // Kostenrechnungspraxis. Vol. 1. P. 53-62.
19. Kozyrev A.N. Economy of Intellectual Capital: Scholarly Papers. No. 7(R)-2006. SPb: Research and Development Institute of Management of the St. Petersburg State University, 2006.
20. Volkov D.L., Garanina T.A. Intangible Assets: Problems of Composition and Evaluation // Vestnik of Saint-Petersburg University 2007. Series 8. Issue 1. P. 82-105.
21. Lu, Jack (2010). Intangible Assets Valuation by License Market and Stock Market: Cross-Industry Analysis Based on Royalty Rate and Tobin's Q (July 5, 2010). les Nouvelles, June 2011, Available at SSRN: https://ssrn.com/abstract=1646641
22. Dupernex S., (2007). Why might share prices follow a random walk? Student Economic Review, Vol. 21, 2007
23. Durusu-Ciftci D., Serdar Ispir M., Kok D. (2019). Do stock markets follow a random walk? New evidence for an old question. International Review of Economics & Finance. Volume 64, November 2019, Pages 165-175

The article **was submitted** 25.12.2022; **approved after reviewing** 23.01.2023; **accepted for publication** 10.02.2023.