MODELING ECONOMIC GROWTH IN CONTEMPORARY RUSSIA

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MODELING ECONOMIC GROWTH IN CONTEMPORARY RUSSIA

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Chapter 1

Financial Development and Economic Growth in Russia

Konstantin V. Krinichansky and Bruno S. Sergi

Abstract

This chapter examines the effects of financial deepening on the sources of economic growth in Russia. Previous empirical literature based on cross-country studies presented the evidence that in developing countries financial development affects capital accumulation more than productivity growth. We tested this proposition with panel data from 75 regions of Russia's regions between 2008 and 2015 using system generalized method of moments techniques. Our results are not consistent with this proposition: the effect of finance on output growth occurs primarily through productivity; the positive influence of finance on capital accumulation is less significant, which is more typical for developed countries. This outcome can be explained by the fact that structural problems in Russia and developed countries are somewhat similar. More helpful for Russian economy are tools that would help business get a more profound effect from efforts to promote innovation and boost productivity than from increasing investment by expanding credit.

Keywords: Financial systems; economic development; finance-growth nexus; transmission channels; system GMM techniques; Russia's regions

JEL classifications: O16; O47; R58

1.1. Introduction

This chapter presents the results of the study of Russia's contemporary economic growth and economic aptitude. It follows several studies developing lines of research that deals with economic growth in Russia (Akindinova, Chekina, & Yarkin, 2017; Drobyshevsky, Idrisov, Kaukin, Pavlov, & Sinelnikov-Murylev, 2018; Ivanter, 2018;

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Mau, 2018; Sergi, 2003, 2004, 2018; Voskoboynikov, 2017) and the role of the financial sector in Russia (Danilov & Pivovarov, 2018; Mamonov et al., 2018; Ono, 2017; Stolbov et al., 2018). Unlike previous literature, this study is more focused on financial development as a factor that presumably affects the growth of the Russian economy, exploring the channels through which finances may affect economic growth (Barnett & Sergi, 2018). The works most closely related to our analysis are Beck, Levine, and Loayza (2000) and Rioja and Valev (2004) as these works precisely aim to estimate the effect of financial development on the sources of economic growth.

Considering the dynamics of financial development and its contribution to the development of the Russian economy leads to questionable conclusions. According to World Economic Forum, Russia in 2007−2017 improved its rank in the Global Competitiveness Index (GCI), moving 20 positions up − from 58 to 38.[1] This result has been the best among the BRIICS nations (see Table 1.1). Meanwhile, on Financial Market Development indicator − that is individual component including in the GCI calculation − Russia improved its rank by only two positions over the same period (see Table 1.2). This is a median among the BRIICS countries. However, the comparison of the dynamics of Russia by this indicator with China as a lead nation is depressing, because China improved its development of the financial market rank by 70 positions.

Can financial development be a more reliable companion of economic growth? This study's research task consists of a more in-depth explication of the arrangements linking finance and growth, to put it more precisely, in understanding the transmission channels of this link.

To complete the assigned task, we use a regional-level dataset. We have collected a panel covering 75 regions of Russia for 2008−2015. Unfortunately, it was impossible to acquire the most recent statistics which is desirable for us, because of delays to data access approval. For example, the National Statistical Office of the Russian Federation frequently discloses the regional GDP data with a two-year delay. The *bank loans to regional GDP ratio* is the most appropriate measure for our analysis due to the high role of bank loans as a source of external financing in the Russian regions,[2] as well as due to the poor quality of other statistical information relating to the activity of other financial sectors' segments in these regions (Sergi, 2004, 2018).

1.2. Finance and the Channels to Economic Growth

The literature that studies the relationship between finance with growth is very extensive. We concentrate our attention on the recent literature and the issues discussed in it.

[1]Retrieved from https://www.weforum.org/reports/the-global-competitiveness-report-2017-2018.

[2]During the period under review, total bank loans in Russia (as the average annual value) equal about 7.5 times the amount of money that business got for the fixed capital investment through other funding channels − both bonds and shares issues.

Table 1.1. The Ranks' Dynamics of BRIICS Countries by Global Competitiveness Index, 2007–2017.

Year	Country					
	Brazil	**China**	**India**	**Indonesia**	**Russia**	**South Africa**
2007	72	34	48	54	58	44
2008	64	30	50	55	51	45
2009	56	29	49	54	63	45
2010	58	27	51	44	63	54
2011	53	26	56	46	66	50
2012	48	29	59	50	67	52
2013	56	29	60	38	64	53
2014	57	28	71	34	53	56
2015	75	28	55	37	45	49
2016	81	28	39	41	43	47
2017	80	27	40	36	38	61
Rank change	−8	7	8	18	20	−17

Source: The Global Competitiveness Index Historical Dataset, World Economic Forum.

What is the transmission mechanism from financial intermediation (in our case, banking intermediation) to economic growth? The finance and growth literature addresses two or three main channels of such transmissions – the physical capital accumulation channel, the total factor productivity (TFP) growth one, and (more rarely) the private saving channel (Figure 1.1).

1.2.1. The Physical Capital Accumulation Channel

Capital accumulation depends on the uninterrupted transformation of savings into investment. However, as an example, information asymmetry hinders that transformation. The elaboration of an agreement between a borrower and a lender, covering all future states of the world and ensuring the incentive compatibility conditions for the counterparties, is impossible. This causes high transaction cost which can dramatically reduce the number and the values of contracts concluded. An economy gets only a suboptimal solution by the criterion of allocative efficiency (Adekola & Sergi, 2007).

The financial sector as a systemic phenomenon lowers this transaction cost. As a result, the financial sector deepening and the development of its structure can positively affect the transformation of savings into investment, the capital accumulation, and, through this, promote growth.

As Levine (1997) shows, theoretical chapters contain two explanations of how capital accumulation affects long-term growth with the participation of the financial system. A class of growth models allows that a financial system affects steady-state

Table 1.2. The Ranks' Dynamics of BRIICS Countries by Financial Market Development Series, 2007–2017.

Year	Country					
	Brazil	China	India	Indonesia	Russia	South Africa
2007	73	118	37	50	109	25
2008	64	109	34	57	112	24
2009	51	81	16	61	119	5
2010	50	57	17	62	125	9
2011	43	48	21	69	127	4
2012	46	54	21	70	130	3
2013	50	54	19	60	121	3
2014	53	54	51	42	110	7
2015	58	54	53	49	95	12
2016	93	56	38	42	108	11
2017	92	48	42	37	107	44
Rank change	−19	70	−5	13	2	−19

Source: The Global Competitiveness Index Historical Dataset, World Economic Forum.

growth by influencing the rate of capital formation either by altering the savings rate or by reallocating savings among different capital producing technologies.

At the same time, a review of empirical studies reveals that the accumulation of physical capital cannot be considered an undeniable and reliable source of long-term growth. This is shown in both the growth accounting literature (Jorgenson, Kyoji, & Timme, 2016) and finance–growth nexus one (Beck et al., 2000; Levine & Zervos, 1998). Wachtel (2003) reminds that growth rates among countries with similar investment ratios vary substantially. Some countries have high rates of investment and savings but settle for poor growth experience. Significant results were obtained by Beck et al. (2000) who have demonstrated that the link between financial intermediary development and physical capital accumulation is not robust. Out of the four measures of financial intermediary development, only one, namely, Private Credit, exhibited a strong, positive, and unbiased link with capital growth. Such findings forced researchers to look for an explanation of the finance-related sources of growth not in too narrowly on aggregate savings, but in factors that increase the efficiency of resource allocation decisions and foster productivity growth.

1.2.2. The Total Factor Productivity Growth Channel

The TFP increases when resources are available to those who can use them most efficiently. The problem of asymmetric information is also relevant here, as well as the features of the relationship between the parties (such as board members and shareholders) which are commonly called the agency problem. Let's recall

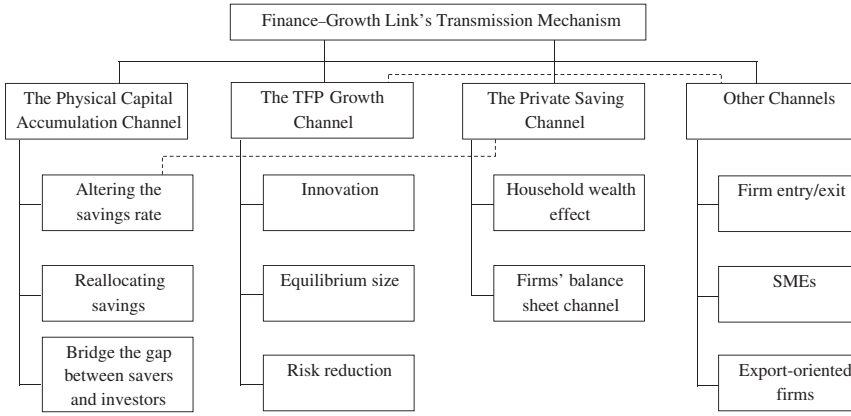

Figure 1.1. A Synopsis of the Finance–Growth Link's Transmission Mechanism. *Source*: Flowchart designed by the authors.

Schumpeter's idea (1934) regarding the role of banks in mitigating informational problems and identifying promising borrowers. At present, a vast theoretical literature shows that financial intermediaries, when accumulating special knowledge for the assessment and monitoring of borrowers and investment projects, acquire a comparative advantage which helps them to solve the problem of asymmetric information between the borrowers and the lenders.

At the same time, another part of the financial sector – stock and financial derivatives markets – increases the effectiveness of economic decision-making under uncertainty. According to M. Theil, "the larger the number of participants with an independent opinion on the determinants of future developments, the more likely the aggregate view is reflecting the true probability distribution" (Thiel, 2001, p. 29). Thus, when capital markets direct financial flows, the information asymmetry problem can be moderated, and the required investment in risky projects is provided. The nation's prosperity increases due to achieving and maintaining high allocative efficiency, and the country achieves more rapid rates of economic growth.

Although the TFP channel is often understood to a full extent, strictly speaking, its work consists in deepening of the financial systems that favorably affect aggregate economic performance through innovation, equilibrium size, and risk mitigation[3] (see Figure 1.1). Let's consider the weighty evidence given in the literature for each of these three lines separately.

Paying tribute to the current theory of endogenous economic growth, first, one should pay attention to the arguments that financial development leads to an increase in the innovative activity of companies. Many papers contain such arguments. So,

[3]There are some alternative decomposition approaches for the total factor productivity growth channel in the literature. It has often been claimed that financial development might raise the TFP by (1) the selection of the most profitable investment projects, (2) the provision of liquidity, and (3) the allocation of risks (Thiel, 2001).

for example, Ayyagari, Demirgüç-Kunt, and Maksimovic (2007) have analyzed the responses of about 17,000 firms in 47 countries to the questions on enterprise innovation. Taking an average of each firm's responses, the authors have collected a range of country- and firm-level variables likely to be correlated with firm innovation, as well as information about the structure of firm's financing. They have found that the firms' use of external financing is associated with more innovation.

Another way to show the performance of the TFP channel is to demonstrate that developed financial sectors contribute to the more efficient cross-sectoral reallocation of capital. Such evidence is presented by Wurgler (2000). He used industry-level study on 65 countries and argued that if the country has an advanced financial system, its investment increases in growing industries and decreases in declining industries. Undeveloped financial systems cannot manage to do it. Similarly, Fisman and Love (2007), using the industry characteristics for each of 37 industries in 42 countries, found that industries with good global growth opportunities grow more rapidly in countries with high-developed financial markets. In turn, Ciccone and Papaioannou (2010) built cross-industry cross-country models, controlled 1,607 country-industry observations, and concluded that financial development of a country facilitates the reallocation of capital from declining sectors to sectors with excellent investment opportunities. Marconi and Upper (2017), using a panel of 26 industrial sectors in six countries at different levels of development, found that more developed financial systems allocate capital investment more efficiently than less developed ones. If the financial activity is low, faster capital accumulation more likely leads to worsening of allocative efficiency. This effect cancels for the countries with well-developed financial systems. Additionally, the authors justify that industries with high R&D expenditures or high capital investment benefit most from financial development.

As for the equilibrium size of firms, the literature pointed out that financial markets contribute to firms' reaching optimal size because they give the opportunity to use a more efficient legal form of enterprises such as incorporated enterprises with widely spread ownership. We also know that financing constraints lead to a considerable reduction in firm growth in terms of firm sales (Beck, Demirguc-Kunt, & Maksimovic, 2005)[4] or value added (Klapper, Laeven, & Rajan, 2006).[5] Eliminating external financial constraints, which is associated with financial development, allows firms to grow and to achieve a larger equilibrium size.

The issue concerning risk reduction as an inherent part of financial development is closely related to the equilibrium firm size problem mentioned above. Firms can safely acquire a more efficient productive asset portfolio where the infrastructures of finance

[4]Using data on the largest industrial firms for 44 countries, the authors provided empirical evidence that firms are larger in countries with more developed financial institutions, more effective legal systems and less corruption. Firm size increases with financial institution and stock market development.

[5]Using Amadeus firm-level data on more than 3 million firms established in European countries with advanced and transition economies, Klapper et al. (2006) computed the entry rate for firms from different sectors and thus investigated the effect of entry and other regulations on the degree of new firm entry and firm growth.

are in place. More generally, financial systems development is accompanied by designing arrangements to ease risk management. Levine (1997) says that financial markets and institutions make trading, hedging, and pooling of risk easier. Specifically, Diamond and Dybvig (1983) modeled the emergence of financial markets in response to liquidity risk, and Levine (1991) examined how financial markets affect economic growth. Liquidity risk creates incentives for investing in the liquid, low-return projects – however, the emergence of financial intermediary overs this problem.

Moreover, liquid stock markets provide the drop of market transaction costs. As a result, more investment occurs in the illiquid, high-return projects. Thus, the higher stock market liquidity induces faster long-run growth.

However, when authors analyze in more detail the mechanism of the impact of finance on growth or consider the finance-related sources of growth, their reasoning turns out to be broader. Often, the starting point of the analysis is the understanding that the financial sector development contributes to better access to external finance (or, on the assumption of the opposite, to breaking down of external financing barriers).

It is more difficult for some categories of firms – the small and the new ones – to obtain external finance than other categories. For a large body of the literature, the development of financial systems and expanding access to external finance favor the entrepreneurship and business development. Beck et al. (2005) and Beck and Demirguc-Kunt (2006) find that firms undoubtedly face serious difficulties when accessing finance. If we consider large firms, on average, financing obstacles reduce firms' growth by six percentage points, but as for small firms, this firm growth reduction amounts to 10 percentage points. Carbó-Valverde, Rodríguez-Fernández, and Udell (2016) show that small and medium enterprises' (SMEs) financing constraints concern both bank loans and their alternative trade credit. They also find significant evidence that SMEs' sector funding can suffer much during the crisis. At the same time, both cross-country and case study evidence show how access to and use of credit can alleviate the financing constraints.

Firm entry spurred by the development of the financial system can directly affect economic growth. It can also affect growth through the productivity effect. Indeed, new firms provide competitive pressure and contribute to innovation diffusion, since they often introduce innovative manufacturing technology or new products. Financial systems can also successfully regulate firm exit. This can affect growth too, because the economy benefits when stagnant incumbent firms leave markets, resources are released, relevant factors become available, and prices become fairer.

Also, a well-developed financial system creates conditions for the development of sectors in which firms generally rely more on external finance (including export-oriented firms). It also boosts potential output both through extensive growth and via the productivity channel. Chaney (2005), Manova (2013), and other early empirical researches on the impact of financial factors on firm exports showed the significant role of lack of access to finance in firms' decision to export. Other studies argued that access to finance is more critical for firms in industries that are more dependent on external finance (Alvarez & López, 2014). A recent paper by Kumarasamy and Singh (2018) based on the analysis of around 54,000 firms in 16 Asia Pacific countries found that greater financial sector development translates into a higher likelihood of firms entering the export market.

Finally, we should review some papers that consider two separate channels of transmission of finance development to economic growth without splitting them. So, Beck et al. (2000) were the first authors who carried out an empirical test of the relationship between financial and economic development with the addition of variables which control these transmission channels' operations. The scholars found an economically significant and statistically significant relationship between financial intermediation development and TFP growth. The link between financial intermediation development and physical capital accumulation, as well as the private saving rate, turned out to be less robust. The similar finding that finance has its influence through productivity gains rather than through an increase in the volume of capital investment is obtained by Love (2003).

Rioja and Valev (2004), based on these results, as well as the findings of (Acemoglu, Aghion, & Zilibotti, 2002), tested the following hypothesis: the impact of finance on the sources of growth varies in countries at different stages of development. The authors showed that financial indicators denote a robust positive impact of financial development on the growth of overall factor productivity, particularly in more developed countries (with medium and unusually high income per capita). In less developed countries, the effect of the financial sector on output growth is mainly due to capital accumulation, not productivity.

1.3. Data, Methodology, and Model Specification

Let's accept these results as a working hypothesis for the subsequent empirical testing of the transmission channels, with whose help financial development can spur economic growth, using the case of Russian regions. We will carry out our study using the Russian regions' level data. We have collected a panel covering 75 regions of Russia for the period of 2008 − 2015. The data employed in this study are taken from the database of the Federal State Statistics Service (Rosstat)[6] and the database of Bank of Russia (see website's section named "Regions. Analytical System of Economy Activities")[7]. Table 1.3 presents observations by region. Tables 1.4 and 1.5 give summary statistics and correlations.

We use the only financial variable based on the total commercial bank credit as a measure of financial deepening. First, this is because Russia's governmental statistics agency does not distribute some of the regional-level information relating to financial sectors activity we are interested in. For instance, it would be necessary to assess the impact of the bond market development on the economy of the federal subjects of Russia, but neither Rosstat nor Bank of Russia provides data on how the Russian regions' residents issue bonds to raise money. We come across a similar difficulty when trying to see the data covering the insurance industry, factoring, and leasing.

[6]Retrieved from http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/accounts.
[7]Retrieved from http://www.cbr.ru/eng/region/olap.