

# Models, evolution & efficiency

## Regulation of financial markets in Russia

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**F**inancial markets play an important role in economies by connecting the demand for capital with its supply and channeling savings in the process of accumulation. The development of financial markets affects the choice of technology, the amount of labor and resources needed to carry out brokerage transactions, the intensity of research and development, and the extent of innovative entrepreneurial activity. All of these factors have impacts on the rate of economic growth. Additional opportunities for investment projects and more effective control provided by financial markets allow for more efficient use of available resources and increase total factor productivity.<sup>1</sup>

Currently, there is a wide set of regulation models for financial markets. Previous research on the development of financial markets<sup>2</sup> confirms the interdependence between the type of regulation model chosen and the historically achieved depth of financial structure as well as national institutional characteristics. An effective regulation model takes these factors into account and under favorable conditions can contribute to economic growth. The consistency between the regulation model and the depth of financial structure is important. The key issue of national financial market regulation is the choice between integrated and multi-sector models of supervisory and regulatory authority.

The World Bank describes the main challenges and differences between prudential supervision and regulation as follows: “A key challenge of

regulation is to better align private incentives with public interest, without taxing or subsidizing private risk taking. Supervision is meant to ensure the implementation of rules and regulations. It needs to harness the power of market discipline and address its limitations.”<sup>3</sup>

In the context of financial recession, the issues of improving prudential supervision and regulation become particularly relevant. These two functions can be separated into two agencies or to be integrated into one, which may be subject to a variety of regulation models and institutional solutions. Some countries chose to create integrated control models, while others established decentralized models. For example, in Australia, the government introduced a so-called Twin Peaks model. According to this approach, two main institutions have power and authority in different spheres. The Australian Prudential Regulation Authority (APRA) is in charge of prudential supervision while the

Australian Securities and Investments Commission (ASIC) acts as a corporate regulator. The Netherlands adopted the same approach and separated regulation and prudential supervision. In Canada, there are a number of departments, and each one of them supervises only one type of financial institution. In Denmark, the United Kingdom, Japan, Norway, etc., there is only one mega-regulator, which has all the prudential and regulation power. Countries like Greece, the Czech Republic, Portugal, and Singapore are moving towards creating similar systems.

### abstract

The paper examines the relationship between the degree of the integration of financial regulation and the level of economic development. The paper is based on a self-constructed dataset, including a Twin Peaks model, and ordered probit models estimations. The main finding is that factors such as population and economy size have negative effects on financial regulation integration, while quality of governance, the size of the non-banking financial market sector and regulatory quality have a positive impact. Post-estimation analysis shows that the new model of supervision and regulation adopted in Russia in 2013 does not take into account the level of institutional investors' development. This increases the risks of excessive administrative pressure on the non-banking financial sector and weakens its competitive environment.

**KEY WORDS:** regulation, prudential supervision, financial market, institutional investors.

This article analyzes the development patterns of regulatory and supervisory systems in financial markets based on a sample of 50 countries, with an emphasis on trends towards consolidation of regulation and supervision. The econometric analysis of the data presented in the paper evaluates how Russia fits the main models of prudential supervision developed in different countries.

After the fall of the Soviet system, the development of financial markets and institutions in Russia coincided with a long decline in economic activity in the 1990s. Since then, the Russian credit system underwent a transition from a centralized to a multi-tiered system while radically changing its structure and strategies of bank monitoring and control. Nevertheless, the problem of treating banking institutions primarily as instruments of resource allocation, which was evident during the 1998 and 2008 crises,<sup>4</sup> has not lost its relevance today.

The Russian stock market still has some institutional problems and is characterized by a lack of independent monitoring of the financial sphere. In 2010–2012, the government undertook some steps towards more rigid market regulation. The Federal Financial Markets Service (the FFMS) raised requirements for professional market participants in terms of the sufficiency of their financial assets to counter manipulation and introduce prudential supervision. Since September 1, 2013, the Central Bank of Russia (the CBR) took over authority from the FFMS to become a mega-regulator of the Russian financial markets. The definition of mega-regulator refers to the integration of the financial system regulation in the hands of one state agency and includes control over both commercial banks and the non-banking financial sector.

**TO EVALUATE THE CONSISTENCY** of government decisions with the current economic situation, we investigated first patterns of the development of regulation and supervision systems in the financial markets by using a data sample of 50 countries. Our primary attention was focused on trends in integration of regulation and supervision. Based on the analysis of regulatory structures in our sample of countries, we composed a data set that included 18 macroeconomic and financial indicators. In this paper, we used ordered probit regression to estimate and explain the main relationships and hypotheses from previous studies. This analysis allowed us to determine the impact of the main factors on the choice of the degree of integration of financial market regulation. The results obtained showed a strong link between almost all selected factors and revealed their degree of impact. This made it possible to construct an estimated formula to define a suitable degree of integration of financial market regulation.

The next step of our analysis included an assessment of the comparability of the chosen regulative regime in Russia with six degrees of supervision integration. Based on post-estimation procedures after the regression estimation, we constructed a series in accordance with the proposed World Bank classifications of financial market regulation, which represented the predicted probability of each category. The calculations show that the new model of rigid integration of the system of prudential supervision and regulation controlled by the CBR does not fully take into account the level of development of institutional investors.

It also increases the risks of excessive administrative pressure on non-banking financial institutions and weakens competition in the financial sector. Solving these problems requires an active effort on the part of government agencies and financial market participants.

The paper is structured as follows. Section 2 provides a further description of the role of financial market regulation along with institutional challenges relating to financial markets and current trends in their regulation. Section 3 describes data and methodology. Section 4 presents the main empirical results, and section 5 provides the main conclusions of the study.

## **The role of financial market regulation**

### **Institutional challenges relating to financial markets**

The existence of a correlation between economic growth and financial market development was first observed by studies in long-term economic historical trends.<sup>5</sup> Since the 1980s, a number of theoretical models were developed which combined endogenous factors of economic growth with endogenous development of financial markets.<sup>6</sup> Later, some representatives of mainstream financial economics concluded that financial development was the cause for improved business conduct and accelerated economic growth.<sup>7</sup>

Analysis of the relationship between financial system complexity and implementation of the competitive market principle indicates a strong positive correlation between these factors and the development of the commodity markets. Additionally, financial intermediaries play an important role in monitoring and overcoming information asymmetries.<sup>8</sup> The links between cross-country differences in financial market risks and economic growth has also been studied in works of R. La Porta, F. Lopez-de-Silanes, R. Vishny, and A. Shleifer.<sup>9</sup> More recent studies investigated the relationship between company financing and levels of investor protection,<sup>10</sup> and the interdependence between national stock market volatility, the level of investor protection and securities market development.<sup>11</sup>

**SOME AUTHORS WHO** studied developing and transition economies concluded that the theoretical model of financial economics, in which financial markets facilitate the transition to a more efficient allocation of resources, is not always consistent with the evidence presented on misbehavior, asset stripping, violation of minority shareholders rights and corruption. If the financial system simply attracts resources and transfers them to financially and politically connected individuals, it creates barriers to economic growth and affects the implementation of business initiatives.<sup>12</sup> Thus, the impact of the financial system on economic growth is not always positive. The financial market also requires appropriate micro-economic conditions, such as a "contract culture", enforcement of property and contract rights, the development of financial institutions with long-term goals, and transparency.<sup>13</sup>

The assessment of the financial depth of the Russian economy by a set of key indicators (representing the international standard for national financial systems) shows that the financial

depth is insufficient and even inadequate with exceptionally high risks and exposure to shocks in the international market.<sup>14</sup> The chronic imbalances are currently characteristic for the Russian financial market as well.<sup>15</sup> The main imbalance in its development lies between the impact of global investment booms, when the market has an optimistic view concerning the prospects of the Russian economy, and underlying fundamentals that provide rather negative estimates. Despite these contradictions, the transition to a state-capitalist economic model in the 2000s contributed to market growth and attracted investments. Capital repatriation into Russia became an essential component of the investment boom, though such factors as underdevelopment of the institutional environment, high risks, and weak property rights protection impeded an effective reallocation of resources. Investments in state-owned companies became a source of virtually guaranteed returns to investors since the state provided these companies with financial, regulatory and political support. This model of the financial market growth is speculative; it is not associated with significant capital investments in production and is only possible under the condition of capital inflows into emerging markets. It brings about revenues for large companies due to increasing prices and redistribution of available assets.

Most of the Russian stock market's institutional problems have not yet been solved. The basis for the growth of the financial market including sources of liquidity is very fragile. The largest public corporations increase capitalization by acquisitions of new assets; therefore the process is not accompanied by increasing efficiency. Large corporations have been rendered into elements of public policy; their decisions have been less predictable and depend on inner conflicts of interest. There is a lack of independent monitoring of the financial system's efficiency by investors and civil society. All this increases the risk of systemic crises in the financial market.

The accumulated experience in the development of financial markets and special aspects of the market economy in a number of developed and emerging economies suggest that the national model of financial market regulation begins to correspond to the economic growth goal after the introduction of new institutional rules. The consistency between the regulation model and the depth of financial structure is important. In particular, this applies to the key issue of national financial market regulation, which focuses on the choice between integrated and multi-sector models of supervisory and regulatory authority.

### Current trends in prudential supervision and regulation

The major components of regulation, supervision and monitoring of modern financial markets traditionally include:

- judicial and legal authorities that ensure enforcement of property rights, contractual rights, and obligations;
- supervisors and a Commission for the Securities Market;
- systems of independent and effective auditor control;
- private analytical firms and rating agencies;
- independent professional organizations that set standards and norms of behavior in their respective fields.

**Table 1: Classification by the degree of integration of prudential and conduct-of-business supervision**

Prudential supervision structure	Supervision index	Conduct-of-business supervisory structure	Regulation index
Sectoral supervision with banking and non-banking supervision in an agency other than the central bank	1	No business conduct supervision <sup>a</sup>	1
Sectoral supervision with banking supervision in the central bank and non-banking supervision in an agency other than the central bank	2	Separate institution(s) for business conduct supervision other than the prudential supervision agency <sup>b</sup>	2
Partial integration, where financial sectors are supervised by the agencies outside of the central bank	3	Sectoral supervision <sup>c</sup>	3
Partial integration, where financial sectors are supervised by the central bank	4	Business conduct supervision is held by the agency, which acts as an integrated supervisor	4
Financial Supervisory Authority – integration of prudential supervision into an agency outside the central bank	5	Twin Peaks model – one integrated agency for regulation along with a separate integrated agency for prudential supervision	5
Integration of prudential supervision into the central bank	6		

Notes: This classification excludes prudential supervision and conduct-of-business regulation of pension funds. <sup>a</sup> Assumes the absence of an agency with regulation authority including competition maintenance and consumer rights protection, in particular for the banking sector. Some stock and insurance market authorities may still exercise certain regulatory functions. <sup>b</sup> Partial market regulation, when there is an organization with financial consumers protection authority, including customers of banks. <sup>c</sup> A separate prudential supervision agency exists for each financial sector and is also authorized to perform a regulatory function.

Source: World Bank, 2013.

Financial regulation includes prudential supervision and conduct of business regulation. The former provides reliability and stability for financial institutions and reduces systemic risks, while the latter ensures an appropriate level of performance in competitive markets and protects financial consumers' rights. Prudential supervision monitors the behavior of individual firms and enforces legislation. Prudential supervision has four main components and includes licensing of new financial institutions,

on-going monitoring of the sound conduct of business by financial institutions (asset quality, capital adequacy, liquidity, management, internal control, etc.); sanctioning or imposing penalties in case of non-compliance with the law, fraud or other types of wrongdoing; performing the role of the lender of last resort such as provision of deposit insurance guarantees, and insolvency proceedings.

The conduct of business regulation concerns the process of rule-making and the legislation underlying the supervisory framework. The main focus of the conduct of business regulation lies on the activities of financial institutions, their market behavior and how they conduct business with their customers. This type of regulation deals with rule setting on appropriate behavior and monitoring its implementation.

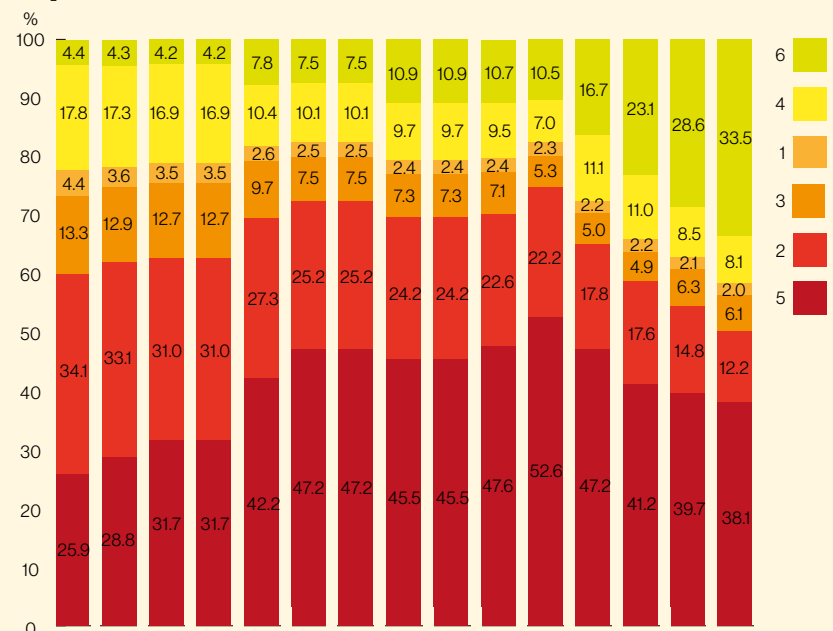
Financial regulation should be used to maintain a balance between prudential supervision and conduct-of-business supervision. Excessive strengthening of the former may undermine competition. On the other hand, weakening regulation can jeopardize the stability of financial institutions. Excessive prudential requirements usually lead to the shift of institutional investors' focus towards short-term strategies.<sup>16</sup> This can take effect in reduction of the asset holding period, increase in the turnover of investment portfolios, reduction of investment in less liquid and riskier assets, such as venture capital and infrastructure, and can lead to herd behavior among investors. In 2013, the EU Green Paper for Long-term financing of the European economy observed the importance of monitoring prudential reforms to minimize the negative consequences for long-term investment.<sup>17</sup> In particular, the system of regulation and supervision should maintain competition between banks and institutional investors.

The World Bank divides the systems of prudential supervision into six categories and regulation systems into five based on their level of integration. For further calculations, we arranged these categories according to increasing degrees of integration. Each category was assigned a corresponding number that increases along with the degree of integration. This mapping process is illustrated in Table 1.

**WE CONSTRUCTED A DATASET** for 50 countries. The relatively small sample size is explained by missing data for some countries. Previously, the World Bank had conducted a survey on prudential supervision and conduct of business integration up to 2010. We complemented the World Bank dataset with our own statistical calculations for the period between 2011 and 2013. The sample was maximally diversified to include both developing and developed countries.

Figure 1 illustrates the data on prudential supervision classifi-

**Figure 1: Countries with six regimes for prudential supervision in 1999–2013 (in %)**



Sources: World Bank dataset, authors' calculations. Numbers in the legend indicate the model of prudential supervision according to the classification in Table 1.

cation for 50 countries between 1999 and 2013. Before the 2008 crisis, the number of countries with more integrated models of prudential supervision was increasing. The proportion of countries with fully integrated supervision under the control of respective central banks (group no. 6 in the classification) increased from 4.4% in 1999 to 10.7% in 2008. The proportion with integration outside the central bank control (group no. 5) increased from 25.9% to 47.6% respectively. After the crisis, the group no. 6 continued to grow, reaching 33.5% in 2013, and the group no. 5 decreased to 38.1%. Therefore, the crisis has not resulted in a rejection of integrated prudential supervision. Nevertheless, in many countries, the opinion that central banks are, in general, better prepared for integration than other agencies became prevalent.

**FIGURE 2 ILLUSTRATES** that before the crisis, the number of countries with integrated prudential supervision regimes (group 4) grew more quickly. The group 4 countries increased from 10.7% in 1999 to 32.7% in 2008. Countries with integrated business conduct and supervision formed the largest group in the sample of 50 countries. During the same period, the proportion of countries applying the Twin Peaks approach (group 5) grew at a moderate pace, from 6.7% in 1999 to 9.1% in 2008. In 2008, Australia and the Netherlands were the only countries applying the Twin Peaks model.

After the 2008 crisis, significant changes took place regarding regulation. The proportion of countries using the Twin Peaks approach grew to 22.9% by 2013. Growth of group 4 slowed

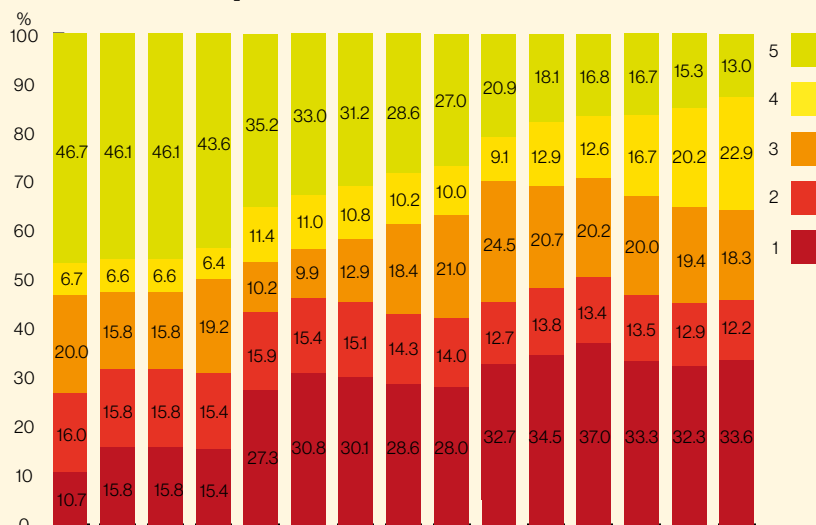
sharply, increasing to only 33.6% in 2013. Along with integrating prudential supervision into central banks, more countries made steps toward adoption of the Twin Peaks approach and transferred control functions to agencies independent from central banks. The aim was to create integrated supervision, which would not impede competition, financial institution development, or comprehensive protection of financial customers' rights. By 2013, countries such as Finland, Belgium, New Zealand and the United Kingdom fully or partially completed the transition to the Twin Peaks approach.

**THE CHOICE OF A PARTICULAR** regulation model and degree of integration is based on several factors of economic development and policy priorities. Melecky and Podpiera<sup>18</sup> investigated the relationship between prudential supervision and regulation models, on the one hand, and on the other, a number of indicators reflecting the development level of economic, political and financial systems in 98 countries from 1999–2010. They attempted to explain the choice of a particular prudential supervision and regulation model using 19 variables for prudential supervision structures and 21 for models of regulation. Their main conclusions were that countries with higher levels of economic development preferred more integrated systems of prudential supervision; improvement of the regulative efficiency usually led to a more integrated model. Melecky and Podpiera also found that the presence of a more sophisticated non-banking financial sector including capital markets and insurance companies resulted in a less integration while a high concentration of the banking system prevented the creation of an effective system of financial market regulation.

Based on the analysis of supervision structures in 102 countries in 2008–2009, another study shows that the unification and centralization of supervision negatively affect economic growth. Integration of macro- and micro-prudential supervision into two independent departments makes it more transparent and balanced.<sup>19</sup> A sample of 140 countries from 1998–2006 showed that the establishment of independent prudential supervision outside the central bank control reduced the share of nonperforming loans in relation to GDP, and such countries are less prone to systemic risk.<sup>20</sup>

The choice of a particular regulative model can affect economic performance in several aspects, including GDP, exports share of GDP, stock market capitalization, etc. The main rationale for choosing a regulation model and degree of regulative integration is to find a model that would correspond to the level of economic and institutional development. In the next section, we will demonstrate that our primary raw data analysis led to the hypothesis that the Russian economy was not ready to adopt a centralized integration model represented by the Central Bank as a financial market mega-regulator.

**Figure 2: Countries with five regimes of conduct-of-business supervision in 1999–2013 (in %)**



Sources: World Bank dataset, authors' calculations. Numbers in the legend indicate the model of conduct-of-business supervision according to the classification in Table 1.

### Data and methodology

In order to determine the effects of selected factors on the probability of choosing a certain degree of prudential supervision and conduct-of-business integration, the authors used an ordinal probit pool model. The model has the following general form:

$$y_{it}^* = X_{it}^T \beta + \epsilon_{it} \tag{1}$$

where:  $t \in [1999, 2013]$  is the time period (year);  $i \in [1, 42] \cup (43, 50]$  – a code for each country except Russia (code 43), which is excluded from regression estimations and used later in analysis;  $\epsilon_{it}$  – unobserved error, which reflects the impact of unaccounted additional factors,  $\beta$  –  $K \times 1$  coefficient vector and  $X_{it}^T = (X_{1,it}, \dots, X_{K,it})$  – row-vector of a matrix of  $K$  explanatory variables.

We used the ordered choice model as a key commonly used instrument for data analysis, in which the main (dependent) variable is discrete, i.e. takes the only limited set of values. In our case  $y_{it}$  has 6 or 5 categories (depending on classification in table 1). The estimation method for all regressions is maximum likelihood.

The estimates of the coefficients  $\beta_i, i=1, \dots, 18$  are interpreted as follows: a positive value indicates an increase in the probability of transitioning (or fitting) into the category with a higher number with an increase in the corresponding explanatory variable, and vice versa. The positive coefficient for any factor means that if in country 1 the value of this factor is higher than in country 2, country 1 fits into a group with a higher degree of integration than country 2. The opposite connection applies to negative betas.

For a set of explanatory variables, the authors followed the Melecky & Podpiera (2013) approach with some modifications.

We chose to include the following in the full regression model: population as a proportion of 50 countries (in %), GDP per capita fixed at constant 2005 US dollars (\$), the exports of goods and services to GDP ratio (% of GDP), the number of listed companies per 10,000 people, and the savings ratio as a percentage of disposable income. The purpose was to reflect the level of economic development of a specific country. The studies discussed above show that correspondence between the choice of an integration model and macroeconomic factors is crucial.

**IN ORDER TO INCLUDE** financial markets in the regression, we used a set of factors that describe its sectoral characteristics. These factors act as a proxy for estimating financial sector development. The banking sector is represented by a 5-bank asset concentration, which is defined by the Bankscope database as the assets of the five largest banks as a share of total commercial banking assets. Bank deposits to GDP ratio describes the total value of demand, time, and saving deposits at domestic deposit money banks as a share of GDP by International Monetary Fund, International Financial Statistics, and World Bank GDP estimates. The bank Z-score estimates the probability of default by the banking system and accounts for the volatility of returns. Deposit money bank assets to GDP ratio includes claims on the domestic real non-financial sector and comprises commercial banks and financial institutions that accept transferable deposits, such as demand deposits. Non-banking sectors are represented by the value of pension fund assets to GDP, the value of mutual fund assets to GDP, the life insurance premium volume to GDP, the total value of outstanding domestic private debt securities to GDP, stock market capitalization to GDP, and the stock market total value traded to GDP. Regulatory capital to risk-weighted assets measures the capital adequacy of deposit takers and is included in the regression as a proxy for regulatory government policy.

The last group of factors represents two government indexes: the government effectiveness index and regulatory quality index from The Worldwide Governance Indicators (WGI) project. The government effectiveness index captures quality of public services, quality of the civil service and its degree of independence from political pressures, quality of policy formulation and implementation, and credibility of the government's commitment to such policies. The regulatory quality index captures the government's ability to formulate and implement sound policies. All these factors can affect the transition to a more integrated model, since it demands high quality governance.

All explanatory variables, i.e. factors described above, are lagged by one period to avoid possible endogeneity. We do not account for autocorrelations, since this issue does not apply here. Countries make a decision on keeping or changing the model of regulation and supervision integration based on their macroeconomic and financial parameters in the previous year. Financial markets change rapidly, and governments need to react constantly by amending rules and by altering the regulative framework. Therefore, the problem of autocorrelation does not apply to this issue. In order to get robust results, we also created a set of

**Table 2: Determinants of the degree of prudential supervision integration**

Dependent variable: Prudential supervision integration classification			
Explanatory variables (L1: lagged by one year)	Estimated coefficient	Standard deviation	Probability
L1. Population as a proportion of 50 countries (%)	-0.0368	0.0265	0.1650
L1. GDP per capita (\$ at constant 2005 prices)	0.0140***	0.0031	0
L1. Exports of goods and services (% of GDP)	0.0230***	0.0025	0
L1. Government Effectiveness Index	-0.1800	0.2303	0.4340
L1. Number of listed companies per 10.000 people	-0.5637**	0.2730	0.0390
L1. 5-bank concentration (%)	-0.0043	0.0053	0.4160
L1. Bank deposits to GDP (%)	0.0042	0.0027	0.1240
L1. Deposit money bank assets to GDP (%)	-0.0013	0.0023	0.5550
L1. Z-score	-0.0093	0.0081	0.2480
L1. Pension fund assets to GDP (%)	0.0082***	0.0024	0.0010
L1. Mutual fund assets to GDP (%)	-0.0034***	0.0012	0.0040
L1. Life insurance premium volume to GDP (%)	-0.0469	0.0408	0.2500
L1. Outstanding domestic private debt securities to GDP (%)	-0.0028	0.0032	0.3910
L1. Regulatory capital to risk-weighted assets (%)	-0.0108	0.0226	0.6320
L1. Stock market capitalization to GDP (%)	-0.0079***	0.0017	0
L1. Stock market total value traded to GDP (%)	-0.0027***	0.0011	0.0140
L1. Regulatory Quality Index	0.7843***	0.21278	0
L1. Savings Ratio - % of disposable income	0.0016	0.0123	0.9250

Notes: \*\*\* - 1% significance; \*\* - 5% significance; \* - 10% significance

Source: Authors' calculation.

partial order probit models constructed as a simple one-on-one regression for each pair of classification and factor. After that, we applied post-estimation methods of probability prediction to a full regression model in order to check if Russia fit in estimated linkages. Since Russia was excluded from all regression estimations, the final formula is able to provide an unbiased estimation of the probability of Russia fitting into each identified regulative group.

## Determinants of the degree of integration

Our main analysis results concerning the determinants of the degree of prudential supervision integration are presented in table 2, which demonstrates the regression results for the full model.

We did not take into account data for Russia in order to analyze the compatibility of the Russian data and the chosen regime for each group after receiving a formula with estimated coefficients. All of the factors included in the model were lagged by one period in order to avoid possible endogeneity problems. The regular estimations of measures of the quality of models, such as coefficient of determination, do not apply to maximum likelihood methods.

Population has a negative influence on supervision integration in each estimated specification. An economy with a smaller population is more likely to have a smaller financial market, which makes the greater integration process easier and more affordable. The sizes of financial sectors are more likely to be small, so the integration of supervision into a single agency will provide savings on staff costs and several individual supervisors.

Greater development and openness of a country allows mobilization of the resources and enables a higher degree of supervisory authorities' integration. This is consistent with Melecky's and Podpiera's conclusions. Banks and other financial institutions in developed countries have more complex structures or may form financial conglomerates. Therefore, there is a need to organize integrated supervision over the organizations that are carrying out activities in several areas. Signs of the coefficients of GDP per capita and export of goods and services are predictably significant and positive in all estimated specifications.

Improvement in the quality of a country's governance leads to greater integration of supervision. As a proxy for this factor, we selected an index of government effectiveness. An increase in the number of listed companies leads to complications for prudential supervision being performed by a sole integrated agency. In this regard, a large number of companies increases the probability of choosing a less integrated model of supervision. This is also consistent with Melecky's and Podpiera's conclusions; the more developed a stock market compared to a banking sector, the less integrated supervision would be. The z-score compares the capitalization and profitability of banks to the volatility of their income. The estimated coefficient is not significant, but it is negative in all estimated specifications, which suggests the division of supervision in case of a banking system's default risk.

Stock market capitalization (the ratio of the value of all securities in the market to GDP) and the ratio of stock market total value traded to GDP both have significant negative coefficients in all specifications, reflecting the negative effect of the size of the securities market on the probability of prudential supervision integration. This is also consistent with Melecky and Podpiera's conclusions.

**Table 3: Determinants of the degree of conduct-of-business integration**

Dependent variable: conduct-of-business integration classification			
Explanatory variables (L1: lagged by one year)	Estimated coefficient	Standard deviation	Probability
L1. Population as a proportion of 50 countries (%)	-0.0630**	0.0280	0.0250
L1. GDP per capita (\$ at constant 2005 prices)	-0.0049	0.0034	0.1490
L1. Exports of goods and services (% of GDP)	-0.0056**	0.0022	0.0110
L1. Government Effectiveness Index	0.1584	0.2452	0.5180
L1. Number of listed companies per 10.000 people	-1.0434***	0.2930	0
L1. 5-bank concentration (%)	0.0146**	0.0058	0.0110
L1. Bank deposits to GDP (%)	0.0115	0.0128	0.2170
L1. Deposit money bank assets to GDP (%)	-0.0012	0.0023	0.6190
L1. Z-score	-0.0012	0.0087	0.8950
L1. Pension fund assets to GDP (%)	0.0151***	0.0025	0
L1. Mutual fund assets to GDP (%)	0.0017	0.0012	0.1660
L1. Life insurance premium volume to GDP (%)	0.0762**	0.0379	0.0440
L1. Outstanding domestic private debt securities to GDP (%)	-0.0046	0.0031	0.1350
L1. Regulatory capital to risk-weighted assets (%)	-0.0362	0.0241	0.1330
L1. Stock market capitalization to GDP (%)	-0.0047***	0.0018	0.0080
L1. Stock market total value traded to GDP (%)	-0.0034***	0.0013	0.0090
L1. Regulatory Quality Index	0.1247	0.2403	0.6040
L1. Savings Ratio - % of disposable income	0.0491***	0.0136	0

Notes: \*\*\* - 1% significance; \*\* - 5% significance; \* - 10% significance Source: Authors' calculation.

The regulatory quality index reflects the ability of the government to formulate and implement effective regulatory policy that promotes development. Significant positive estimated coefficients in all specifications for this factor means that the transition to a more integrated prudential supervision can be effective only if it is supported by high quality control and standards of governance.

The following factors characterize the size of non-banking financial market sectors: the ratio of pension fund assets to GDP, the ratio of mutual fund assets to GDP, the ratio of life insurance premium volume to GDP, and ratio of outstanding domestic private debt securities to GDP. Only the size of the pension sector is positive and significant in a full regression. Higher amounts of pension fund assets are usually more characteristic for more developed economies. Therefore, the higher this amount is, the more integrated supervision is.

In the same way, we constructed and evaluated a set of ordinal probit pool models in order to determine the effects of selected factors on the probability of choosing certain degrees of business conduct integration. Table 3 presents the regression results for full model.

Population has a negative impact in each estimated specification, as well as for supervision models. For a smaller economy,

it may be reasonable to integrate regulation into a single body to simplify the control system and to save time and personnel costs. Income level in all regressions has a positive influence on integration. When the level of development increases, countries need to introduce enhanced regulation and strengthen integration to improve the efficiency of financial sector monitoring.

An improvement in governance quality has a positive effect on the integration of regulation and supervision. The coefficient of the government effectiveness index in full regression is positive and not significant, but the coefficient becomes significantly positive in the partial specification, with this index and the number of listed companies. The number of listed companies significantly and negatively affects the integration of regulation in all specifications. When the number of market participants increases, the market structure becomes more complex, and a move to a more integrated regulative model becomes more difficult.

The stock market's size has a negative effect on the integration of regulation. The estimated coefficients of stock market capitalization and the ratio of stock market total value traded to GDP have a significant and negative impacts in all specifications. The sizes of non-banking financial market sectors, such as pension funds, mutual funds, and life insurance, have positive effects on the integration of regulation. The evaluation results show that the development of financial sectors needs a sophisticated and effective regulative model, integrated and unified monitoring processes, and common business standards rules.

The regulatory quality index has a significant positive effect in all specifications. Therefore, transition to a more integrated regulation model is possible only if there is a high quality of regulation.

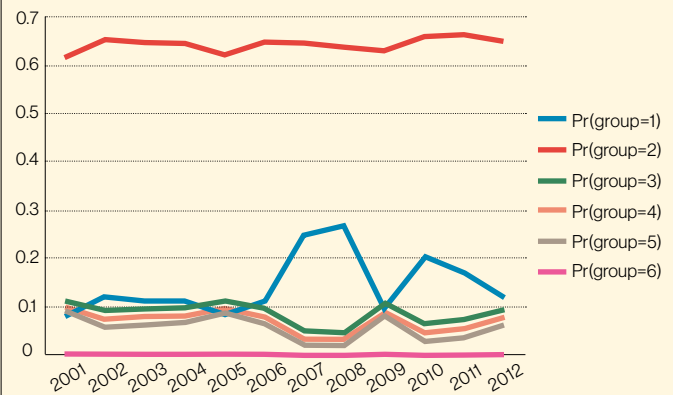
## Prudential supervision and regulation in Russia

In the final stage of our analysis, we assessed comparability of the regulative regime in Russia with six degrees of supervision integration. Based on post-estimation procedures after the regression estimation, we constructed six series in accordance with the proposed classification of supervision during the 1999–2012 period. Each series contains data for the predicted probability of each category of dependent variable. This reflects the likelihood of adoption of each supervisory model in Russia in each year. The results are illustrated in figure 3.

The predicted probability of how Russian data corresponds to each group of countries revealed that Russia most likely fell within the second group. Indeed, the Russian regulative framework before September 2013 coincided with this probability. The probability for fitting in the 6<sup>th</sup> group, with maximum integration of supervision within a central bank, is the lowest, close to zero. However, after September 2013, Russia opted for a transition towards a centralized mega-regulator model under the CBR control.

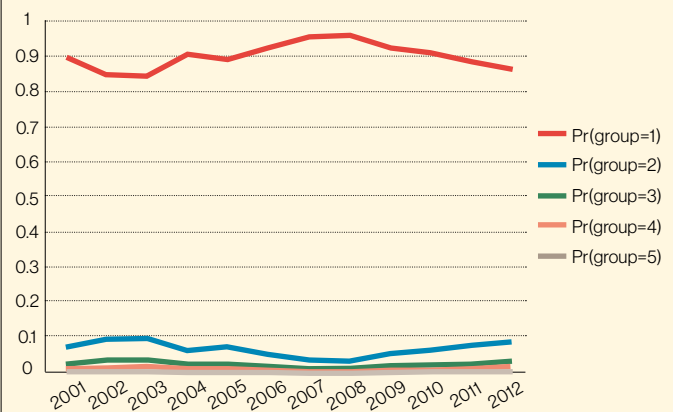
Using the same approach, we obtained estimates for the integration of conduct-of-business supervision in Russia during the 1999–2012 period. We constructed five series for each group according to the suggested classification of regulatory models.

**Figure 3: Predicted probability of Russia's compliance with six groups of prudential supervision**



Source: Authors' calculations. Numbers in the legend indicate the model of prudential supervision according to the classification in Table 1.

**Figure 4: Predicted probability of Russia's compliance with five groups of conduct-of-business supervision**



Sources: Authors' calculations. Numbers in the legend indicate the model of conduct-of-business supervision according to the classification in Table 1.

Each series reflects the likelihood of Russia falling within a corresponding group of conduct-of-business supervision for each year. Figure 6 shows the results of estimations.

**THE PREDICTED PROBABILITY** of the Russian data's compliance with each group of countries revealed that Russia most likely would fall within group no. 1. This corresponds to the time series data before September 2013. The probability for falling within group no. 4 with maximum integration of conduct-of-business supervision within a central bank as the only controlling authority rose slightly and remained close to zero throughout the period. However, in 2013, Russia moved into group 4, which implied a concentration of regulatory functions in one authority, the CBR, responsible for consolidated prudential supervision.



The quantitative analysis suggests that Russia is closer to the sectoral prudential supervision model. Additionally, Russia is fairly close to a relatively simple regulation model. The latter presupposes that separate agencies regulate non-banking financial institutions and that there is no special regulator of competition in the banking sector. This means that special attention should be paid to the effectiveness of the regulatory function, involving creation of conditions for fair competition between financial market participants and protection of financial consumers' rights. The excessive consolidation of regulation and supervision within one authority in combination with the weakness of non-banking conservative institutional investors impede development of the latter. This in turn contributes to a deficit of long money within the Russian financial system.

## Conclusions

A sophisticated and effective financial system is characterized by increasing integration of regulation and prudential supervision. It relies on an optimal balance between financial stability and maintenance of fair competition between financial intermediaries. Our analysis confirmed that the degree of integration of the regulation and prudential supervision models depends largely on the level of economic development, sophistication of the financial system and government effectiveness. The regression analysis has demonstrated that factors such as population and economy size have negative effects on the integration of financial regulation. Quality of governance, size of the non-banking financial market sector and regulatory effectiveness have positive effects.

Post-estimation analysis shows that a new model of rigid integration of prudential supervision and regulation that emerged in Russia in 2013 does not fully take into account the institutional environment of the country's financial system. Integration of financial market regulation into the CBR as the only mega-regulator involves a transition to a higher level of concentration of regulation and prudential supervision. This increases the risks of both excessive administrative pressure on the insufficiently developed non-banking financial institutions and weakening of the competitive environment. The results of the regression analysis presented here suggest that Russia is closer to the sectoral prudential supervision model. Russia would still benefit from a relatively simple regulation model with sectoral regulation and absence of conduct-of-business regulation. ✕

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