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Approved By
European Department

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THE STATE'S FOOTPRINT IN THE ECONOMY[1]

The Russian State leaves a deep footprint in the economy. The state's size was around 33 percent of GDP in 2016, but close to 40 percent for the formal sector. Available cross-country employment data suggests that the Russian state's is relatively large, similar to that of Scandinavian countries. In sectors where the state's share is high, economic concentration is larger, but concentration is large even in sectors where the state's share is low. Existing policies to protect and promote competition, including in state procurement, need to be strengthened.

A. Introduction

1. The mainstream narrative is that the Russian state is large and that its size increased considerably in the last few years. The increasingly large state, the narrative goes, has deepened the state's footprint, crowding out the private sector and negatively affecting economic dynamism. According to this view, the Russian state doubled in size to reach 70 percent of GDP. The claim was based on a comparison of EBRD estimates for Russia's state size in 2005, with the ratio of public sector revenues to GDP in 2012 as shown in Table 1, which comes from IMF (2014). However, the latter does not denote a GDP share, and thus was inconsistent with the former, which was calculated implicitly from an EBRD estimate of the size of the private sector. Despite these shortcomings, these figures were widely reported by the press and analysts contributing to shape views on Russia.

2. The channels through which a larger state may leave its footprint are varied, but the links between state's size, market competition, and the efficiency in resource use are direct. For instance, a large state can result in individual state-owned enterprises (SOEs), or state conglomerates, having a relatively dominant position in certain markets, potentially increasing market concentration and limiting competition. Also, a large state can either promote or limit competition through state procurement rules, with consequences for market access, the development of small and medium-sized enterprises (SMEs), and innovation. Moreover, the larger the size of the state, the more it will matter for the overall efficiency with which economic resources are allocated and used. This is particularly relevant in financial markets, which have a key role in the allocation of the economy's savings.[2]

3. Russia's legal framework and development plans support the view that a large state can affect competition and the use of resources. The "National Plan for the Development of Competition" argues that a large state can negatively affect competition as private companies do not enjoy the same state support as SOEs do. In turn, state procurement legislation (both for the government and SOEs)

[1] Prepared by Gabriel Di Bella, Oksana Dynnikova, and Slavi Slavov (EUR).

[2] The channels through which the state can leave its economic footprint are too many to consider in one paper. Obvious channels include tax policy, and budget spending composition. A large state's share in investment and employment has obvious repercussions in growth. SOEs with large balance sheets can be a source of macroeconomic risks, especially those operating in sectors subject to volatile conditions such as finance and energy.

recognize that the state's demand of goods and services is large, and that it can have a significant impact on the economy.[3] Accordingly, the procurement system aims at supporting competition by ensuring the participation of largest number of potential suppliers, and developing new suppliers by setting mandatory SME quotas, among other objectives.

4. This paper estimates the size of the Russian state and discusses some of the channels through which it leaves its footprint in the economy. To that end, it proposes a methodology to assess the state's share in value added, analyzes the relation between state's share and economic concentration (discussing competition policies and state procurement rules), and compares the SOEs performance with that of privately-owned companies for different sectors of economic activity.

5. The analysis suggests that the Russian State leaves a deep footprint in the economy. First, the Russian state's share in GDP was around 33 percent in 2016, and though this share did not change much in the past few years, it increased in banking and oil and gas extraction and processing. The state's share in the formal sector is larger, close to 40 percent. Second, cross-country comparisons are difficult due to lack of data on state's shares. However, available cross-country employment data suggests that the Russian state's is relatively large (about 31 percent), similar to that of Scandinavian countries. Third, sectors where the state's share is high (e.g., oil and gas extraction, natural monopolies, among other) are more concentrated than others, but concentration is large even in sectors where the state's share is low. In relation to this, policies to protect and promote competition are geared more at form than at substance. Fourth, state procurement legislation (both the General Government and SOEs) does not appear sufficiently aimed at strengthening competition and supporting SMEs.

B. A Review of Available Data

6. There were a few attempts to estimate the state's share in Russia's GDP. While multiple estimates of the state's size are available, they all are subject to methodological and other issues. Nevertheless, several consistent messages emerge from the available data: (i) The size of the Russian state is much smaller than 70 percent of GDP, with most measures pointing to a range of 30–35 percent; (ii) There has been no clear upward trend for the size of the Russian state in the past few years, although the weight of the state has increased in certain sectors, such as banking and oil extraction; and (iii) The Russian state is relatively large by international standards.

7. Russia's private sector was estimated to represent a lower share in GDP than that in other transition economies. According to EBRD estimates, Russia's private sector in 2010 was relatively small (65 percent) and the only one (other than Ukraine) that shrank between 2004 and 2010 (suggesting a relatively large and growing state; Figure 1). However, EBRD's series were constrained by data limitations (EBRD, 2005), and discontinued after 2010. More recently, using consolidated financial statements of the largest state-owned holdings and other assumptions, Krivoshapko (2017) assesses the state's share in supply at about 34 percent. Also, a study by the Center for Strategic Research (CSR, 2018) estimates that the state's share in GDP expanded from about 40 percent in 2006 to 46 percent in

[3] The legal framework defining the rules for the protection of competition and state procurement is in GOR (1995, 2006, 2010, 2011, 2012, 2013, 2017).

2016. CSR (2018) claims that the state's size stopped expanding in the last few years, but that the state's role in resource allocation strengthened, including through stronger influence of SOEs and state development institutions; pseudo privatization, and expansion of regulation. It highlights that the number of state entities declined in 2010–16, but that the state's direct and indirect participation in key sectors remains considerable.[4] From a regional perspective, the presence of the state across Russian regions is diverse. Regions with lower per capita income (which receive relatively larger federal transfers) generally have a larger state size (Di Bella, et. al. 2018).

8. From a cross-country perspective, available employment data suggest that the size of the Russian State is large. Although there is no cross-country data on the state's share in GDP, available OECD data on state employment suggest that the Russian state is large by international standards (lower than Denmark's and Norway's, but higher than Sweden's; Figure 1). The data suggests, however, that the state's share in employment has decreased since the early 2000s.[5] Other cross-country metrics suggest a more nuanced view. For instance, General Government expenditure in Russia represents about 35 percent of GDP, a relatively moderate level when compared with peers (and despite that it has increased from about 30 percent of GDP in the early 2000s).

C. Measuring the Size of the Russian State

9. Available estimates of the state's share in the economy have several shortcomings. They are generally based on the use revenues as an approximation of value added, without weighting state shares by value added per sector; they do not consider that value added is created by both the formal and informal sectors, and that the state only operates in the former; they overlook that the best approximation for the state's share in different sectors may be different (e.g., revenue or employment); and, they do not adequately discuss the issue of state perimeter. Ideally, obtaining the state's share in GDP requires calculating the ratio between the sum of the value added created by the state across all economic sectors, and GDP, as in the following expression:

$$\boldsymbol{\theta_t^G = \sum_{t=1}^{N} VA(i)\theta_t(i)^G / Y_t} \quad \textbf{(1)}$$

10. The estimates for the state's size will depend on how the state's perimeter is defined. In expression (1), θ_t^G is the state's share in GDP, $Y_t = \sum_{t=1}^{N} VA_t(i)$; N is the number of sectors; $VA_t(i)$ is the value added in sector i in t, and $\theta_t(i)^G$ is the state's share in sector i's value added in t. The size of $\theta_t(i)^G$ depends on the definition of the perimeter of the state. Clearly, general government services (e.g., public administration, defense) will be within the perimeter in all cases. But there can be different

[4] To estimate the state's size, CSR (2018) analyzes the largest 106 Russian companies in which state participation in ownership was 10 percent or more. Sales data is used as a proxy for value added. Using statutory financial statements for 2015, a different definition of state ownership (a state's share larger than 50 percent), and a different sample (the largest 100 companies per economic sector), CSR (2018) reports a SOEs share in sales of 40 percent.

[5] It is likely that the employment breakdown in Russia and Scandinavian countries is different, with the latter mostly focused in social services provision, versus a larger participation in productive activities in Russia.

criteria for firms owned totally or partially by the state. In a restrictive approach, $\theta_t(i)^G$ would only include the share of value added created by SOEs that are 100 percent state-owned. A less restrictive approach is to consider within $\theta_t(i)^G$, 100 percent of the value added of SOEs in which the state retains control (namely more than 50 percent ownership). A looser approach is to extend the state's perimeter to 100 percent of the value added of all SOEs in which the state has some ownership, even if below 50 percent. A stricter approach is to consider $\theta_t(i)^G$ as equivalent to the exact ownership state's share in the value added of a given SOE, even if that share is above 50 percent.[6]

11. Given that there are no official estimates of the state's share per economic sector, the task is to approximate them using alternative data. From the discussion above the National Statistical Institute is in the best position to calculate expression (1). However, there is no official data about $\theta_t(i)^G$. Then, the task is to approximate the state's share in value added using available official data. This approximation will be a second best to expression (1). Concretely, the approach is to assess the state's share using expression (2) below. In expression (2), $\bar{\theta}_t^G$ is the estimate for the state's share in GDP in t, and $\bar{\theta}_t(i)^G$ is the estimate for the state's share in sector i in t. Implementing expression (2) requires defining: (i) what variable will be used to approximate the state's share in value added per economic sector; and, the state's perimeter, (i.e. how entities are classified according to ownership).

$$\bar{\theta}_t^G = \sum_{i=1}^{N} VA(i)\bar{\theta}_t(i)^G / Y_t \qquad (2)$$

Value Added, Revenue and Employment

12. Revenue from sales or employment data per economic sector will be used to approximate the state's share in value added. Concretely, expression (3) shows the approximated state's share in value added per sector, where $X_t(i)^{G,j}$ denotes the variable $j = \{S, L\}$ used as a proxy for value added in sector i (where S is sales, and L is employment), and where $X_t(i)^j$ denotes the corresponding total for sector i (for either S or L). The approximated state's share per sector will be used in expression (2), together with actual value added. Official data on aggregate sales and employment per sector are available by ownership. Both data sets use the same definition of ownership, but have different coverage depending on the sector. Thus, the choice between employment or sales as the most reasonable approximation for value added depends on the sector under consideration. For instance, the state's share in the sales of services like education or health, or in public administration, is low, as these services are mostly provided free of charge and thus are not reflected in sales data; in contrast, health workers, teachers, and public servants working for state entities that provide services free of charge will be reflected in employment data.[7]

[6] For instance, if the public sector's ownership in a legal entity is 51 percent, a strict measure of the public sector's share of value added in that entity would that same 51 percent, while the remaining 49 percent would be considered as private.

[7] A few clarifications: Using the state's share in employment (or sales) to proxy the state's share in value added will not result in fully accurate estimates as capital/labor and revenue/value added ratios within sectors and across firms differ; sales data is available for legal entities operating in the formal economy, and thus, ownership ratios will be applied only on value added in the formal economy (this should not be a problem as the informal sector is fully non-state); and, to approximate the state's share in financial services, asset shares will be used as there is no data on sales.

$$\bar{\theta}_t(i)^{G,j} = X_t(i)^{G,j} / X_t(i)^j \quad (3)$$

The State's Perimeter

13. The main ownership categories in official data include:

- ***State and Municipal.*** They include state and municipal budgetary and extra-budgetary entities; unitary enterprises; and, the subsidiaries of entities that are 100 percent state-owned (e.g., Russian Road Company, Rosneftegaz, Russian Railways, and United Shipbuilding Corporation, among other).
- ***Government corporations.*** They include non-profit state-owned organizations established by special laws to implement government policies (e.g., Deposit Insurance Agency (DIA), National Development Bank (VEB), Rostech, Roskosmos, and Rosatom, among other).
- ***Mixed Russian.*** They include firms established jointly by state and non-state entities; and, firms established by state and foreign entities in which the foreign stake does not exceed 10 percent (e.g., Gazprom, Rosneft, and United Aircraft Corporation, among other).[8]
- **Private Russian; and, Foreign and Foreign/Russian.** Private Russian entities include those in which the state is not a shareholder (including those fully privatized); the subsidiaries of these entities; and, the subsidiaries of entities in which the state's stake is below 100 percent. This implies that most subsidiaries of entities like Gazprom or Rosneft (which themselves are classified as 'Mixed Russian') are classified as private.

14. This classification suggests that the state's perimeter should include state, municipal, and mixed Russian entities and government corporations. This results in a somewhat "loose" definition of the state, as the approximated state's share will include 100 percent of the value added of entities in which the state does not necessarily have a 100 percent stake. A justification for this approach is that even in cases in which the state's share is below 100 percent (or even 50 percent), the state will retain weight in decision making, influence, access to resources, among other.

15. The ownership criteria described above also suggest that available sales or employment data by ownership may result in a lower-than-warranted approximation for the state's share in output. To correct for the fact that most subsidiaries of partially state-owned firms are classified as non-state, expression (2) is calculated to include within the state's perimeter the subsidiaries of the largest 20 non-financial state conglomerates, whose parent companies are classified as 'Mixed Russian'. These include Gazprom, Rosneft, Transneft, Inter RAO, Rushydro, Rosseti, Rostelekom, Aeroflot, Tatneft, Alrosa, United Aircraft Corporation, Helicopters of Russia, United Engines, and United Shipbuilding Corporation.

[8] This category might contain companies without state participation (NGO/private) but presumably the share of such companies should be small.

Results

16. The state's share in output has increased marginally in the last few years, from 32 percent in 2012, to 33 percent in 2016. Table 2 reports the results of calculating expressions (2) and (3) by sector of economic activity. The state's share in market sectors is approximated by its share in sales, while the state's share in (mostly) non-market sectors ("Public Administration and Defense", "Compulsory Social Security", "Education", "Healthcare"; and, "Other Communal and Personal Services"), is approximated by the state's share in employment. The state's perimeter includes state, municipal, and mixed Russian entities and government corporations, as well as the subsidiaries of the largest 20 non-financial state-owned conglomerates whose parent companies are classified as 'Mixed-Russian'. For "Finances", the state's share is approximated by the share of state banks in banking sector assets as reported by the Central Bank.[9]

17. The state's share is large in extraction, natural monopolies, the financial sector and, naturally, in public services. The state is present, however, in most sectors of economic activity. There are many sectors that are largely private: agriculture and food processing, most manufacturing (excluding the defense and oil and gas processing), and trade. In the last few years, the state's share increased in oil and gas extraction and processing, and the financial sector.

18. The state's shares in formal sector activity and employment are quite large. Adjusting employment shares to correct for state ownership and data coverage, the state's share in employment climbs to 31 percent in 2016 (from an official figure of 28 percent). The upward adjustment is not large because of the significant size of informal employment (about 38 percent of total employment in 2016). This means that the share of state employment in formal employment is quite high, close to 50 percent.[10] Likewise, the state's share in value added created by the formal sector climbs to about 40 percent.

D. State's Size and its Footprint

19. The channels through which a larger state may leave its footprint are varied, though the links between state's size, market competition and efficiency resource use are quite direct. Broadly speaking, the large presence of the state in certain markets can result in individual SOEs (or state conglomerates) having a relatively dominant position, potentially increasing market concentration and limiting competition. A large state can also promote (or limit) competition through the procurement rules applied by both the government and SOEs: Restrictive procurement rules can constrain market access, SME development, and innovation. Moreover, the efficiency with which resources are assigned and used in certain markets (or the overall economy) will be associated with SOEs size: The larger SOEs' presence, the more they will matter for the overall efficiency with which

[9] Preliminary calculations suggest that including Foreign-state entities in the state's perimeter would increase the state's size by about 1 percentage point. The influence of the state in these entities is likely to be more muted than in those classified as "Mixed Russian".

[10] Available data suggests that, however, the state's share in employment has decreased since the early 2000s.

resources are allocated and used. This is particularly relevant in financial markets, which have a key role in the allocation of the economy's savings.

State's Size and Concentration: Competition and Procurement Policies in Russia

20. The relatively large Russian state contributes to concentration in several economic sectors. Table 3 shows that the state is more present in those sectors with the highest level of concentration (as measured by the Gini Coefficient).[11] The state's share is large in sectors deemed strategic (oil and gas extraction and processing, defense), in natural monopolies and public services (electricity, water and sanitation, heating, pipeline and railway transportation), in the financial sector (banking and other financial services), and (naturally), in public administration, defense, health and education.

21. Public policy recognizes that private companies do not compete on equal terms with state companies, which enjoy state support. Policies call to decrease the number of state entities, and tasks the Federal Anti-Monopoly Service (FAS) to evaluate market competition by ensuring that every economic sector contains no less than three firms (one of which should be privately-owned); that the number of breaches of anti-monopoly legislation by the state decreases; and, that the share of SMEs in state procurement (both of government and SOE's) increases.

22. However, economic concentration is high even in sectors in which the state's presence is relatively low. Table 3 shows that the state's share in economic sectors with the least economic concentration is, on average, quite low. However, even in cases in which the state's share is not large, economic concentration is relatively high, with Gini coefficients above 0.80 in most sectors of economic activity.

23. Legislation to protect and promote competition aims at preventing and suppressing monopolistic activities and unfair competition, and limiting the state's role in restraining competition. The Federal Anti-Monopoly Service (FAS) administers and enforces anti-monopoly legislation; regulates prices of natural monopolies; controls procurement of both the government and SOEs, including defense; and controls compliance with the law on foreign investment in strategic industries. The law prohibits the abuse of a dominant position, including by the state. FAS assesses competition in goods markets to detect a dominant position of a firm (or group of firms) or other factors damaging competition. Investigations are initiated to examine violations of anti-monopoly legislation; to approve mergers and acquisitions that may violate economic concentration benchmarks; and to decide on partition of firms. FAS also controls compliance with the law regulating natural

[11] Other measures of economic concentration are less appealing, as reporting units are considered individually. For instance, Gazprom holding is composed of more than 100 subsidiaries operating in extraction, refining and gas transportation. The consideration of holdings instead of each individual company should presumably result in higher measures of concentration.

monopolies. Competition-restricting agreements (cartels) could be punished by criminal penalties, including prison terms.[12]

24. Moreover, government procurement legislation recognizes that the state's demand of goods and services is large, and that it can have a significant impact on the economy. The system aims at ensuring the accountability, efficiency, fairness, transparency, and effectiveness of state purchases. Procurement is also used for SME development, as SMEs enjoy a 15 percent quota. The system is designed to support competition by ensuring the largest number of potential suppliers, and implementing all procurement via anonymous electronic auctions (to become mandatory in 2019). Rules exist to ensure transparency and free access for state procurement, although special regulations apply for defense purchases. The Ministry of Finance controls contract execution and bidding prices, while FAS is tasked with the protection of competition (preventing bid rigging, conflicts of interest, and corruption). The Accounting Chamber controls procurement contracts ex-post.

25. Government procurement is also used to support the development of Russian manufacturing, limiting somewhat foreign competition. This is done through domestic content rules and price preferences. Restrictions on foreign goods and services exist in the form of "third is a crowd" rule (a foreign bid is ruled out in case there are bids by two Russian suppliers or the Eurasian Economic Union, EAEU). Russian suppliers enjoy a 15 percent price preference. In general, when preferences are used, procurement aims at Russian producers competitive in external markets.

26. SOEs procurement rules are more flexible than those for the government. The law regulates procurement by SOEs, state-regulated entities (including utility companies, monopolies), and entities receiving state support (subsidies, credits, grants), among other. SOEs include parent companies and subsidiaries with a state's share higher than 50 percent. FAS decides on the application on the law.[13] The law sets rules for SOEs' procurement including SME quotas (18 percent of total purchases), innovation support, publication of procurement plans for five years ahead. Criteria to identify SMEs is the same as with government procurement. The sets information disclosure requirements and mandates SOEs to publish internal procurement regulations (resulting in more freedom to choose procurement types), and to implement procurement plans according to them.

27. Most SOE procurement contracts are settled through non-competitive methods. This is not a surprise as legislation allows SOEs the use of such methods. Concretely, only 4 percent of SOEs'

[12] FAS is part of Federal Government, under the Prime Minister, who appoints its head. To assess competition, FAS defines the perimeter of the market; calculates concentration levels (using concentration ratios or the Herfindahl index); and, diagnoses a dominant position of a firm (a group of firms) on a case by case basis. A market share below 35 percent is usually not considered dominant, while a share above 50 percent is. FAS and CBR are responsible for ensuring competition in the financial sector, and they developed a road map to that end. They jointly establish criteria to detect dominant market positions, and to approve mergers and acquisitions. FAS evaluates whether the price of a financial service reflects monopolistic conditions.

[13] However, FAS does not compile nor maintains a register of firms with a state's share (directly or indirectly) larger than 50 percent

procurement in 2017 was made via competitive methods (i.e., using tenders and auctions); 31 percent was concluded through single-supplier methods; while about 65 percent was made via other non-competitive methods (numbering about 5000 various procurement types), resulting in more than 95 percent of non-competitive procurement contracts.[14] In volume terms, single-supplier procurement accounted for more than 50 percent of the total procurement. To increase transparency and prevent collusion, the law regulating SOE procurement was amended to streamline and itemize competitive and non-competitive procurement methods.[15] Over 50 percent of SOEs purchases were made by the top 5 largest SOEs (including Rosneft and three of its subsidiaries, as well as Russian Railways).

28. The effective use of competitive methods is somewhat better in government procurement, but supplier concentration is high. The share of single-supplier procurement (around 25 percent at the stage of pre-announcement), increased to 60 percent of implemented procurement, as the law allows purchases if the auction fails but one appropriate bid was submitted (or remained after removing bids that did not fit formal requirements). A new auction occurs either when no bids were submitted, or no bids satisfied the requested requirements. Results also suggest strong supplier concentration, with 4 percent of suppliers accounting for 80 percent of government purchases. Electronic auctions were used for 55 percent of tender notices (CSR, 2017).

29. Competition in state procurement is further impaired by a partial definition of SMEs. Although procurement legislation mandates SME quotas for state purchases, a subsidiary of a large holding fitting the legal SME definition qualifies to fill the SME quota.

State's Size and Efficiency

30. State entities appear to use economic resources less efficiently that privately-owned firms. A comparison of Return-on-Assets for 2012–16 between SOEs and privately-owned firms suggest that latter outperform the former in most market sectors.

31. Private entities broadly outperform SOEs across for activities with both low and high value added. Figure 2 shows ROAs for a few economic activities (at the 2-digit level) for 2016. SOE performance appears like that of private sector companies in some sectors (e.g., crude oil and gas extraction, oil and coke refining, but in most cases ROA of private sector firms is higher than that of SOEs. This is valid for both agriculture, manufacturing (e.g., the production of electrical equipment, machinery and equipment), and in public services (electricity, gas, steam, sewage). In most cases, the cumulative distribution of ROAs for the state entities is to the left of that for private sector entities, suggesting an empirical distribution of returns for SOEs that is to the left to that of the private sector.

32. The distribution of firms per economic sector and their relative size suggests that there is large room for consolidation and efficiency gains. Out of about 32,500 SOEs, around 500 represent more than 85 percent of revenues, suggesting that many smaller firms operating in similar economic

[14] GOR (2018).

[15] Amendments will become effective by mid-2018. Clarity on whether a procurement type is competitive or not should allow for a better state monitoring of SOEs corporate procedures.

sectors could be consolidated with resulting efficiency gains. Better governance and management of state property could also increase efficiency. As a more competitive market place is developed and state management becomes more efficient, a clear exit strategy for sectors where there is no economic rationale for state ownership (including the banking sector), should be developed. The strategy should be competition-enhancing, as economic concentration is already high in most market segments.

E. Summary and Policy Implications

33. Staff estimates suggest that the state represented about one third of Russia's value added (VA) in 2016, smaller than in the mainstream narrative but nonetheless large. The Russian state represents close to 40 percent of formal sector activity and 50 percent of formal sector employment. SOEs are present in most sectors of activity. The state's share in VA was approximated by its share in sales for market activities, and by employment for non-market activities. Estimates include within the state's perimeter the resident subsidiaries of the 20 largest state-controlled non-financial companies, which are generally classified as private in official data. In the last 5 years, the state's share in VA increased significantly in energy and banking, but only slightly overall (from 32 to 33 percent of GDP). Cross country OECD data on state employment suggest that the Russian state is large by international standards. The large state leaves its footprint in the form of lower efficiency in the use of resources, and in reduced market competition.

34. The relatively large Russian state contributes to concentration in several economic sectors, though concentration is high even in sectors with low state presence. Comparing the top 15 most concentrated economic activities with the 15 least concentrated shows that the state has a stronger presence in the former than in the latter. SOEs' presence is large in strategic sectors (energy, defense) and natural monopolies (electricity, gas, water, and railway transportation), but also in the financial sector. Even in sectors in which the state's presence is not large, economic concentration is high, despite the work of the Federal Anti-Monopoly Service (which administers and enforces anti-monopoly legislation).

35. Given the large state, procurement policies are essential to promote competition. Legislation on government procurement recognizes that the state's demand of goods and services is large, and that it can have a significant impact on the economy. However, most SOE procurement occurs through non-competitive methods and supplier concentration is high. Moreover, the law allows for SME quotas to be used by subsidiaries of larger firms and the unconstrained use of price advantages for domestic suppliers, both of which limit market access, efficiency, and value chain development.

36. SOEs appear to underperform relative to non-state firms in a variety of economic activities. A comparison of gross returns on assets in various market activities at the two-digit level between state and non-state entities for 2016 shows that the cumulative distribution of returns for SOEs is often to the left of that for non-state entities. Lower competition and efficiency are not the only channels through which the state's footprint may be negatively affecting economic performance. The large state presence in the financial sector may result in a biased allocation of savings that benefits large players, both state and non-state, further supporting economic concentration. Increase competition and

encourage private initiative, including via privatization and reduction of the footprint of the state. State ownership creates at times a conflict of interest (owner and regulator) undermining competition.

37. Reducing the state's footprint over the medium term should boost economic growth. Actions need to be carefully sequenced as outright privatization will likely result in more economic concentration. Efforts should be first geared at enhancing competition by promoting market entry, and leveling the playing field in public procurement by reducing supplier concentration and facilitating SME development. Out of about 32,500 SOEs, around 500 represent more than 85 percent of revenues, suggesting large room for consolidation, and efficiency gains through better management of state property. As a more competitive market place is developed and state management becomes more efficient, a clear exit strategy needs to be developed for those sectors where there is no economic rationale for state ownership, including the banking sector. The strategy should be competition-enhancing, as economic concentration is already high in most market segments.

Table 1. Russia: Estimated Public Sector Finances Overview, 2012 (Percent of GDP)

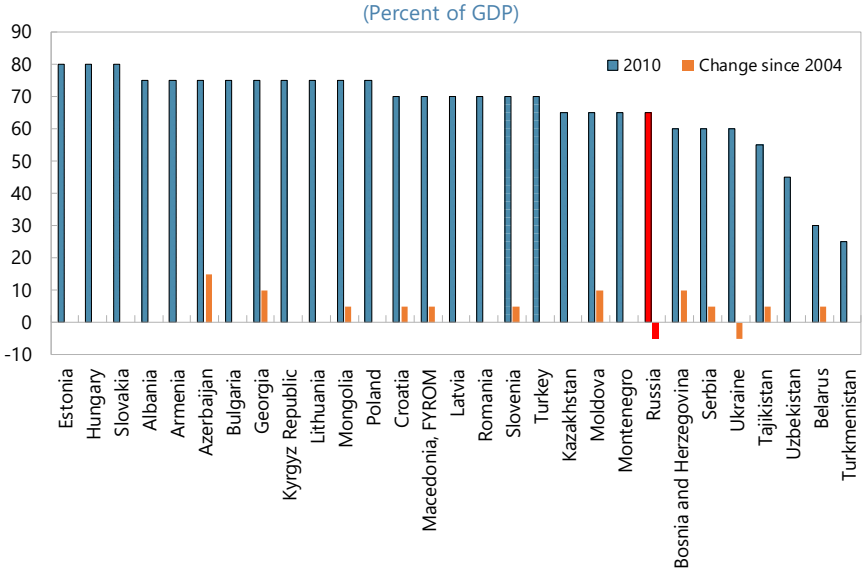
	General Government				Public Corporations [2]					
	Central[1]	Sub-national	Consoli-dation	Total[6] (Consolidated)	Non-Financial	Financial	Consoli-dation	Total[6] (Consolidated)	Consoli-dation	Public Sector[6] (Consolidated)
Net Lending/Net Borrowing	**2.7**	**0.4**		**3.0**	**-0.8**	**0.8**		**-0.1**		**3.0**
Revenue	30.4	25.0	-10.9	44.4	23.1	5.6	0.0	28.6	-1.7	71.3
Expenditure	27.7	24.6	-10.9	41.4	23.9	4.8	0.0	28.7	-1.7	68.4
Net Financing	**2.7**	**0.4**		**3.0**	**-0.8**	**0.7**		**-0.1**		**2.9**
Acquisition of Financial Assets	3.6	1.4	-0.7	4.3	0.2	10.9	-0.8	10.3	-1.1	13.5
Acquisition of Liabilities	1.0	1.0	-0.7	1.2	1.0	10.2	-0.8	10.4	-1.1	10.5
Net Financial Worth	**16.2**	**1.9**		**18.1**	**-31.2**	**-4.9**		**-36.1**		**-18.0**
Financial Assets	30.5	8.7	-5.0	34.2	17.0	73.8	0.0	90.8	-25.2	99.7
Liabilities[5]	14.3	6.8	-5.0	16.1	48.1	78.7	0.0	126.9	-25.2	117.7
Of which: Shareholders' equity					*32.4*	*11.3*		*43.7*	*-11.4*	*32.3*
Net Worth (excl. pensions)[3]	**240.8**	**22.7**		**263.5**	**0.0**	**0.0**		**0.0**		**263.5**
Nonfinancial Assets[4]	224.6	20.8		245.4	31.2	4.9		36.1		281.5
Of which: Subsoil assets	*200.0*	*0.0*		*200.0*						*200.0*
Alt. Net Worth (incl. pensions)	**-41.2**	**22.7**		**-18.5**						**-18.5**
Pension liabilities	282.0	0.0		282.0						282.0

1/ Including Social Security Funds, consolidated
2/ Estimates based on the 26 largest corporations by liability.
3/ Net Worth refers to the difference between assets and liabilities (including shareholders' equity). For public corporations it equals to zero when the market price of equities is not available.
4/ Central government: including PPPs assets of 2% of GDP (estimation)
5/ Central government: including government pension liabilities of 3% of GDP and PPPs of 2% of GDP (estimation)
6/ The totals are consolidated, i.e. intra-flows/stocks within the related sector are eliminated.

Figure 1. The Russian State Size: Cross Country Comparison

Private Sector Share in Transition Economies

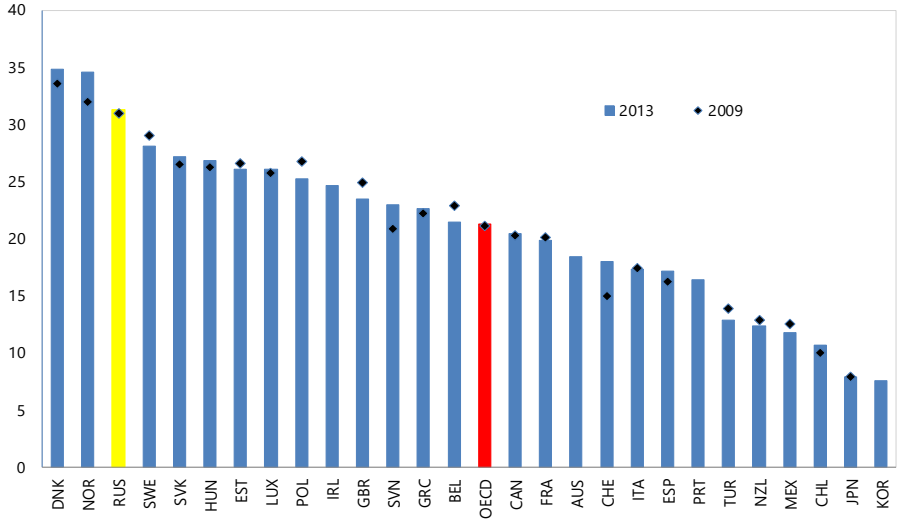
(Percent of GDP)



Source: EBRD.
Note: For Turkey, Serbia, and Montenegro, the change displayed is since 2008, 2007, and 2007, respectively, rather than 2004.

Share of Public Sector Employment in Total Employment, 2009 and 2013

(Percent)



Sources: OECD; and Rosstat.

Table 2. Russia: The State's Share

2016

Economic Sector	Raw Sales Shares	Adjusted Sales Share	Assets Share	Labor Share	Total
Market Sectors					
Agriculture, Hunting, Forestry, Logging	2	2			
Fishing, hatcheries, and related services	2	2			
Mining and Extraction	4	**44**			
Manufacturing	19	**21**			
Electricity, gas, steam and hot water	36	**52**			
Construction	4	4			
Wholesale and retail trade; Repairs	4	9			
Hotels and Restaurants	3	5			
Transport and Communications	34	**48**			
Finances			**59**		
Real estate, renting and related services	9	9			
Non-Market Sectors					
Public Administration, Defense, Social Security				**99**	
Education				**92**	
Health and Social Work				**87**	
Other Communal and Personal Services				**48**	
Households with employed persons				0	
Gross Value Added					**33**

2012

Economic Sector	Raw Sales Shares	Adjusted Sales Share	Assets Share	Labor Share	Total
Market Sectors					
Agriculture, Hunting, Forestry, Logging	4	4			
Fishing, hatcheries, and related services	3	3			
Mining and Extraction	8	**34**			
Manufacturing	18	**20**			
Electricity, gas, steam and hot water	37	**57**			
Construction	5	6			
Wholesale and retail trade; Repairs	6	11			
Hotels and Restaurants	14	16			
Transport and Communications	38	**52**			
Finances			**50**		
Real estate, renting and related services	10	11			
Non-Market Sectors					
Public Administration, Defense, Social Security				**100**	
Education				**93**	
Health and Social Work				**90**	
Other Communal and Personal Services				**51**	
Households with employed persons				0	
Gross Value Added					**32**

Source: IMF staff on the basis of official data.

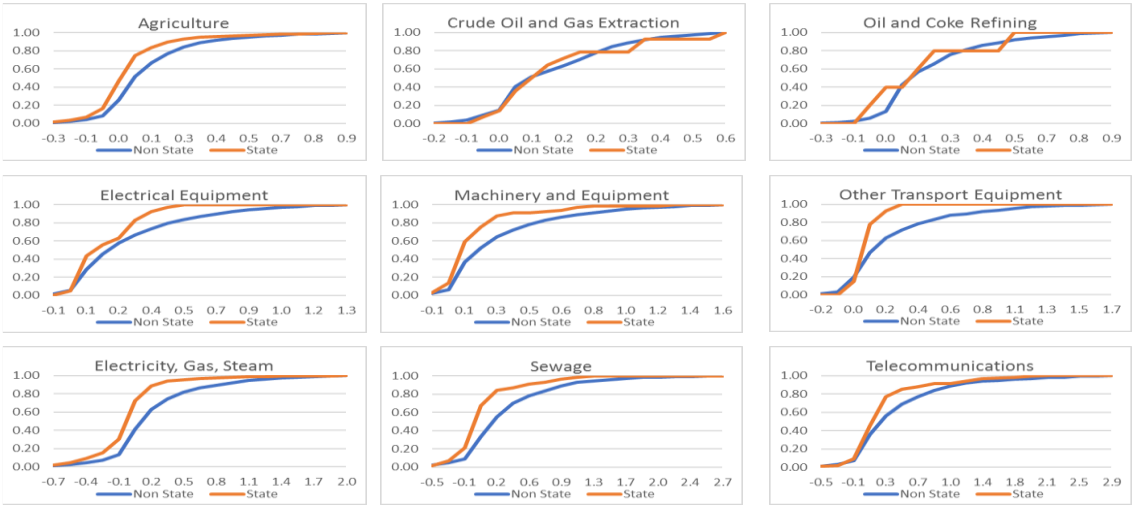
Table 3. Russia: Market Concentration and State Ownership

15 Most Concentrated			15 Least Concentrated		
Economic Sector (2-digit level)	Gini	State's Share	Economic Sector (2-digit level)	Gini	State's Share
1 Telecommunications	0.95	22	1 Waste Disposal	0.70	26
2 Management Consulting	0.95	40	2 Security and Investigation	0.71	16
3 Insurance-Pension Funds	0.95	53	3 Hotels	0.78	5
4 Postal-Courier Services	0.95	73	4 Sewage	0.78	34
5 Electricity, Gas, Steam	0.94	57	5 Restaurants	0.79	6
6 Metallurgical Production	0.94	3	6 Employment and Recruting	0.81	0
7 Land-Pipeline Transport	0.94	69	7 Production of TV, Films	0.82	2
8 Chemicals Production	0.94	14	8 Building Maintenance	0.82	6
9 Beverage Production	0.94	5	9 Coal Mining	0.82	3
10 Motor Vehicles	0.93	2	10 Forestry	0.83	3
11 Oil and Coke Refining	0.93	15	11 Real Estate	0.84	8
12 Air Transport	0.93	47	12 Specialized Construction	0.84	2
13 Crude Oil and Gas Extraction	0.93	67	13 Furniture Production	0.84	0
14 Research and Development	0.92	51	14 Polygraphic-Copying Information	0.85	3
15 Other Transport Equipment	0.92	55	15 Veterinary Activity	0.85	1
Median	**0.94**	**46.5**	**Median**	**0.82**	**3.2**

Source: IMF Staff on the basis of official data.

Figure 2. Russia: Economic Performance and State Ownership

(Selected Market Activities in 2016—Cumulative Frequency Distribution of Gross Return over Assets, Percent)



Note: A Curve that is to the left indicates lower cummulative returns

Source: IMF staff on the basis of official data.

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THE ROLE OF THE STATE IN THE RUSSIAN BANKING SECTOR[1]

A. Introduction

1. State-owned banks (SOB) represent over two-thirds of the banking system by assets. SOB also have access to much cheaper and stable funding compared with privately-owned banks (POB) due to a combination of the following factors: (i) wide branch networks that allow access to low-cost retail deposits; (ii) placements of government deposits; and (iii) state implicit and explicit guarantees on certain liabilities. The cost of funding advantage allows them to dominate lending in many sectors, particularly for large corporates and households. For private bank, this situation could have encouraged aggressive risk-taking behavior, relative weakness in generation of profits and correspondingly in strengthening of capital buffers.

2. A large degree of concentration in the banking sector could reduce the level of competition and efficiency. As discussed by Anzoategui et al (2010, pg. 2), lack of competition in the banking sector can result in higher prices for financial products and reduced access to finance, especially for smaller firms (Beck, Demigurc-Kunt and Maksimovic, 2004 and Cetorelli and Strahan, 2006). With respect to efficiency, an inefficient banking sector with limited competition can adversely affect saving decisions and the optimal allocation of credit with negative effects on investment and economic growth (Levine, 2004). However, a high degree of concentration not necessarily implies lack or a low degree of competition, which also depends of the other factors like the degree of contestability. In this context, an empirical analysis is needed to assess the degree of banking sector's competition and efficiency.

3. This study looks to assess how ownership impacts profitability, the degree of competition and the relative efficiency of Russian SOBs. The main two categories of ownership that we are interested in are privately-owned banks (POBs), and stated-owned banks (SOBs). We start by assessing stylized facts about capitalization and profitability of the banking sector. Then, using Data Envelopment Analysis (DEA), we examine whether the relative efficiency of SOBs in Russia is different from POBs, and also the relative efficiency of Russian banks compared to a sample of peer countries. Finally, we compute the degree of market power, from the observed bank behavior, of SOB and we compare it with the one of POB and foreign-owned banks.

4. The analysis suggests that the Russian banking system is far from the efficiency frontier and that ownership structure might be playing a role on competition. SOBs have healthy balance sheet than POBs, however their profitability is lower, except Sberbank which has high profitability both within Russia and, also, compared to peer countries. In general, system level profitability of the Russian banking system is better than the average in peer countries. However, the

[1] Prepared by Marco Arena, Alexander Culiuc, and Marzie Taheri Sanjani (EUR). We would like to thank Samuel Victor Romero Martinez for excellent research assistantship, additionally, Mustafa Saiyid and Ivo Kznar for their helpful feedback and comments.

DEA finds that Russian SOBs efficiency has been declining relative to that of POBs. And, cross country analysis shows that Russian banks are less efficient than peers, and there is no indication of convergence. With respect to competition, the results suggest that the Russian banking sector can be best characterized as operating under monopolistic competition, and that foreign-owned banks appear to be the most competitive. However, while the degree of competition for private banks would be larger than the one for SOBs, it was not statistically significant.

B. Russia's Banking Sector: Bird's Eye View

5. The Russian economy is recovering from the 2015–16 recession, and the banking system is stable and liquid. The relatively modest response to the large external shocks reflects the authorities' effective policy response—floating exchange rate, banking system liquidity support and capital injections, and limited fiscal stimulus coupled with restrictive incomes policies. Continuous effort in cleaning up the banking sector and closing weaker banks has helped the stability of the banking system. In 2017, CBR closed 62 credit institutions, compared to 110 in 2016, which brings the total number of credit institutions to 561 at end-2017, down from 923 at end-2013.

Table 1. Top Banking Groups in Russia

	Bank Name	Ownership	Total Value Assets (US$ Bln)	Share in system assets (%)	Share in system deposits (%)	Share in system loans (%)
1	Sberbank of Russia	State	388	29.4	32.9	34.4
2	Total VTB group	State	231	17.5	17.9	17.4
3	Gazprombank	State	92	7.0	7.8	7.7
4	Total Moscow Exchange group	Private	58	4.4	1.2	2.3
5	Russian Agricultural Bank	State	51	3.9	4.4	4.1
6	Total Alfa group	Private	44	3.3	3.7	3.5
7	Total Otkritie group	Private	35	2.6	1.9	2.5
8	Total Credit Bank of Moscow group	Private	32	2.4	2.0	3.3
9	Total B&N Bank group	Private	28	2.1	1.2	0.8
10	Total Promsvyaz group	Private	24	1.8	1.8	1.9
11	Total Soc. Gen. group	Foreign	20	1.5	1.2	1.4
12	AO UniCredit Bank	Foreign	19	1.4	1.4	1.5
13	Total Sovcombank group	Private	15	1.1	0.8	0.5

Source: Fitch Ratings, Russian Banks Datawatch (Based on data by end-November 2017).

6. The financial system is is dominated by banks with assets amounting to about 93 percent of GDP as of end-2017.[2] Over two-thirds of Russia's banking system is SOBs, divided into three main groups: development institutions, commercial banks, and hybrid banks (see Table 1). The larger state-owned commercial banks (groups) include Sberbank, the VTB Bank group, and Gazprombank, which had over 50 percent of the system assets by the end of 2017. These three banks operate in commercial terms (with no policy mandate), and in similar market segments as all the private (domestic or foreign) banks. At the other end of the spectrum is VEB, the main state development institution, which has a broad policy mandate, subject to a legal obligation not to

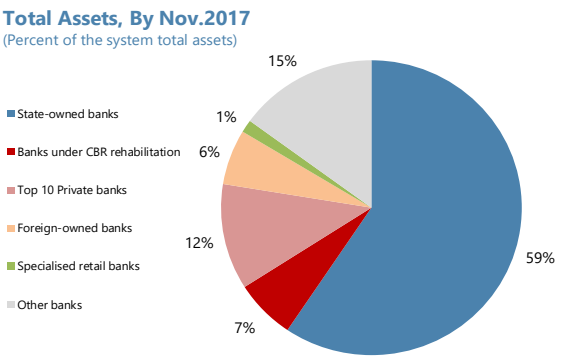
[2] Pension funds, insurance, and mutual funds have assets of 4.1, 2.2, and 2.1 percent of GDP, respectively.

compete with commercial credit institutions and does not collect retail deposits. The hybrid state-owned bank, Agricultural Bank (RAB), has a policy mandate to focus on agribusiness, but it also engages in broader commercial banking activities. Among Russian POBs, Alpha Bank is leading in the industry.

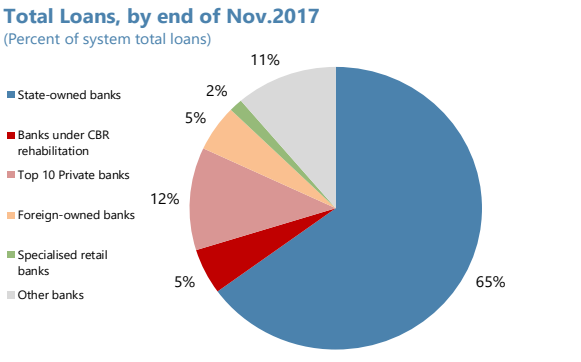
7. In 2017, the share of SOBs grew with the CBR rescue of some large private banks. The CBR intervened Bank Otkritie FC (biggest private lender) and B&N Bank (12th largest in assets) via the Bank Consolidation Fund (BCF) and has become the owner of these banks, increasing the share of SOBs in the system. The CBR recently announced that both banks will be merged by April 2019. Other relatively large private banks (Rost Bank, 15th largest and Trust Bank, 17th largest), who were rescued in 2014 by B&N and Otkritie FC, were also taken over by the CBR under the BCF in March 2018.

8. The banking sector is heavily concentrated, and the state plays an important role. SOBs have around 66 percent of the system assets, while POBs have around 12 percent, and foreign owned banks and specialized retail banks have around 6 percent and 1 percent of system assets, respectively (see text chart). Looking at the loan structure of the sector presents a similar picture, with the top four largest SOBs representing around 58 percent of the market. The picture is, of course, symmetric on the share of deposits.

Figure 1. Assets and Loans



Sources: Fitch Rating, Russian Banking Sector Datawatch 11M17; and IMF staff calculations.



Sources: : Fitch Rating, Russian Banking Sector Datawatch 11M17; and IMF staff calculations.

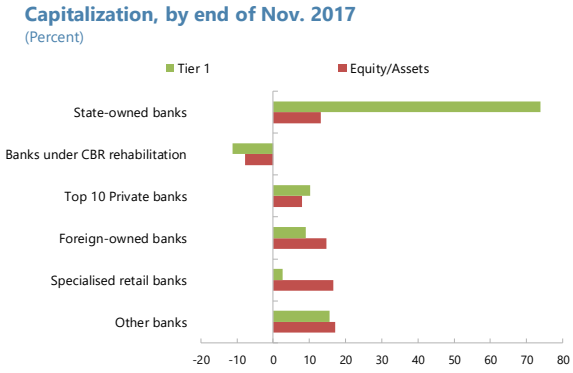
9. Previous studies of Russia's banking sector suggest that SOBs are less efficient than POBs and the overall Russian banking system is less efficient than other peer countries banking sectors, because of the high level of concentration and low competition. Private domestic banks are more efficient than public banks (Fries and Taci (2004), Mamonov and Vernikov (2015) while the findings are mixed for foreign ownership. Yildirim and Philippatos (2007) show that Russian banks are among the least efficient in the sample. Furthermore, they show that higher competition improves cost/profit efficiency, but system concentration is inversely related to profit efficiency. Both factors work against Russian banking profitability. Anzoategui et al. (2010) assess competition in the

banking sector and find that the degree of competition in the Russian banking sector is consistent with monopolistic competition; additionally, SOBs are less competitive than POBs. Grigorian and Manole (2006) result present evidence that foreign ownership and restructuring improve efficiency, and so does consolidation. Privatization does not inevitably lead to efficiency gains.

10. But, SOBs have healthier balance sheet than POBs. The SOB's exhibit higher Tier I capital ratio[3] that the rest of the system, and have similar equity-to-assets ratio than the foreign-owned banks. A comparison of the loan quality of banks[4] by their ownership, indicates that overdue amounts on loans are high for specialized retail banks and private banks but less so for state and foreign owned banks (see Text Chart). In addition, in a cross-country comparison, SOBs level of capitalization is in line with similar banks[5] (see Table 2).

Figure 2. Loan Book and Capitalization

Sources: Fitch Rating, Russian Banking Sector Datawatch 11M17; and IMF staff calculations.



Sources: Fitch Rating, Russian Banking Sector Datawatch 11M17; and IMF staff calculations.

Table 2. Capital Ratio: Cross-Country Comparison

Capital, Average (2008-2017)										
		Russia	Poland	Germany	China	India	Brazil	Spain	Thailand	Average (excluding Russia)
Reg. T1 Ratio Weighted by Assets (%)	State	11.1	14.7	11.3	10.8	9.4	10.7	11.5	11.0	11.4
	Private	10.4	13.6	13.4	9.9	12.5	12.7	11.0	13.4	12.4
	System	11.0	14.2	13.1	10.7	10.3	11.7	11.0	12.8	12.0

Sources: Fitch Connect; and IMF staff calculations.

11. However, SOBs, excluding Sberbank, are less profitable than POBs (see Table 3). Despite, all the advantages that SOBs enjoy over POBs, i.e. implicit and explicit state guarantees, as well as access to government deposit which tends to lower funding costs, SOBs-excluding Sberbank,

[3] This ratio for given an ownership type is defined as the ratio of Tier I capital of the banks with the specified ownership type over the total system level Tier I capital, using the Fitch Ratings, Russian Banks Datawatch 11M17.

[4] The green bars in the chart are loan impairment reserves to gross loan ratio (LIR)—effectively provisions set aside against losses on loans arising from non-payment by borrowers on scheduled P&I plus any accrued interest. Ideally LIR should be equal to or more than accumulated accrued interests and overdue instalment.

[5] The choice of sample period in the Table 2 was picked to ensure we capture different parts of the business cycle including the GFC. In these charts, the recently bailout banks are included in private banks.

profitability is lower than POBs. Moreover, POBs profitability is better than average of POBs among peer countries. Sberbank's profitability is high compared with the Russian system and also with respect to SOBs and POBs in peer countries. In aggregate, the Russian banking sector is doing better than the average of peer countries.

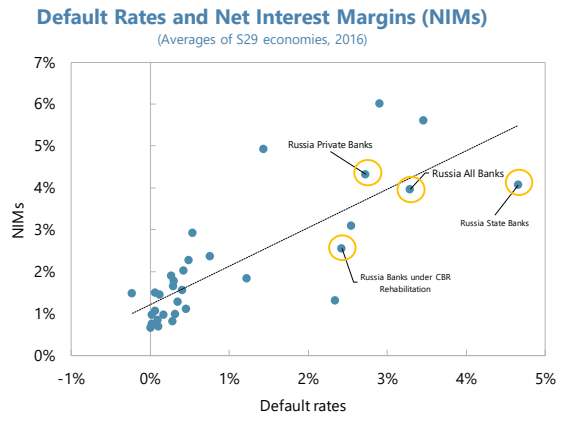
Table 3. Profitability: Cross-Country Comparison

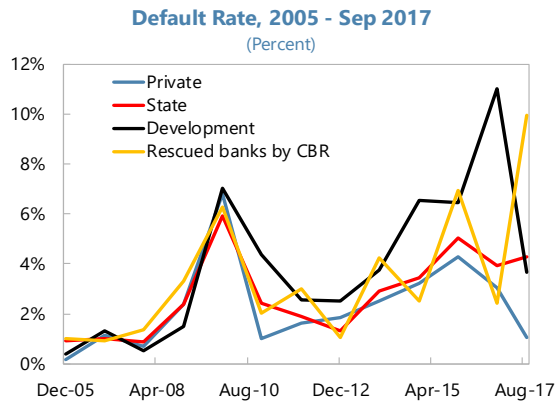
Profitability, Average (2008-2017)											
		Russia	Poland	Germany	China	India	Brazil	Spain	Thailand	Turkey	Average (excluding Russia)
ROA (return on assets)	State (exl. Sberbank)	0.1	1.5	0.1	1.2	0.5	1.0	0.1	1.2	2.0	1.0
	Sberbank of Russia	2.1									
	Private	1.2	1.3	0.2	1.2	1.5	1.7	0.6	1.7	1.9	1.3
	System	1.0	1.4	0.2	1.2	1.0	1.3	0.5	1.5	1.9	1.1
ROE (return on equity)	State (exl. Sberbank)	(0.8)	12.3	1.5	19.9	8.7	18.9	(2.2)	13.2	20.6	11.6
	Sberbank of Russia	18.8									
	Private	19.6	11.4	5.3	20.2	14.9	21.2	8.7	16.1	16.0	14.2
	System	13.8	11.8	3.4	19.9	11.4	20.0	7.4	15.0	17.5	13.3
Net Interest Margin	State (exl. Sberbank)	1.9	2.0	0.4	1.4	0.6	1.9	0.6	1.8	2.3	1.4
	Sberbank of Russia	3.3									
	Private	2.5	1.5	0.5	1.5	1.0	3.3	1.1	1.6	2.2	1.6
	System	2.4	1.7	0.4	1.4	0.8	2.6	1.0	1.7	2.2	1.5
Operating Expense / Operating Income	State (exl. Sberbank)	94.0	61.5	111.2	45.3	66.5	81.3	105.0	67.6	51.9	73.8
	Sberbank of Russia	63.7									
	Private	77.3	64.2	86.8	51.5	57.2	72.5	76.5	54.9	56.8	65.0
	System	74.2	62.2	86.6	45.8	64.6	76.1	77.2	59.0	55.8	65.9

Sources: Fitch Connect; and IMF staff calculations.

12. Net interest margins of POBs are higher, although there are some suggestions of SOBs' mispricing risk. The scattered chart below shows the NIMs versus default rates of 29 economies using the data by the end of 2016.[6] The default rate of SOBs is around 1 percent higher than POBs, which might indicate higher risk-taking due to implicit or explicit state guarantees. However, this is mainly due to the inclusion of development banks in the state banking group (see Figure 1). Excluding the development banks, SOBs default rate has historically been only slightly higher than POBs.

Figure 3. Net Interest Margins and Default Rates





Sources: Fitch Connect and IMF staff calculation.

[6] The default rate is computed as the ratio of loan impermanent to gross loans.

C. Assessing Banking Sector Efficiency: Data Envelopment Analysis (DEA)

13. Standard banking indicators offer a useful view of the relative performance of banks and banking systems: they are familiar and easy to interpret. However, as most banking indicators summarize relationships between only two concepts—often an input and an output (e.g., assets and profits, loans and interest income)—each indicator can only provide a partial picture. There is also no robust way of combining multiple banking indicators into a single "efficiency score" to characterize a bank or banking system. Financial ratios also do not lend themselves to easily assess how far a bank/banking system is from the frontier (i.e., most efficient banks).

14. Data Envelopment Analysis (DEA) is a parametric, linear programming technique that can complement standard financial indicators to assess the efficiency of banks and banking systems. The DEA, developed by Charnes, Cooper and Rhodes (1978) has been widely applied to the banking sector[7], allowing to assess of how efficient are banks at turning multiple inputs (e.g., deposits, equity, personnel, fixed assets) into multiple outputs (interest-bearing assets, income, profits). By its nature, the DEA is also a benchmarking tool. It uses information on the input-output combinations of individual entities to construct an efficiency frontier enveloping the data. This frontier is then used to measure the efficiency of the individual entities relative to a benchmark entity, chosen by the model.

15. A critical step in conducting a DEA analysis is the selection of the relevant inputs and outputs (see Text Chart), which is guided by the author's interpretation of what constitutes "production of banking services". This analysis subscribes to the intermediation approach[8], which dominates empirical research of banking sector efficiency. It views banking activity as transforming the money borrowed from depositors into the money lent to borrowers, using labor and capital. Deposits or their costs (interest expense) are two key inputs. Labor and fixed capital are proxied by non-interest expenses (or its subcomponents—personnel and other operating expenses), and equity is the input that absorbs for the risk differential between riskless deposits and risky loans. The main outputs are income-earning assets or their subcomponents—net loans and securities. Finally, profits are necessary to ensure that the bank maintains capacity to continue operating; operating income is an alternative (albeit less direct) indicator of the bank's viability. There is a large set of input-output combinations utilizing the above-listed options; the analysis focuses on the six options presented in the text table. As there are no obvious advantages to each individual model, most of the results that follow represent simple averages of all six, but results don't vary significantly across models (see below).

Model	Inputs							Outputs				
	Deposits	Interest Exp	Non-Int Op Exp	Personnel Exp	Other Op Exp	Equity	Employees	Earning Assets	Net Loans	Securities	Op Profits	Op Inc
1	x		x			x		x			x	
2	x		x			x			x	x	x	
3	x		x			x			x	x		x
4		x		x	x			x			x	
5		x		x	x				x	x	x	
6		x		x	x				x	x		x

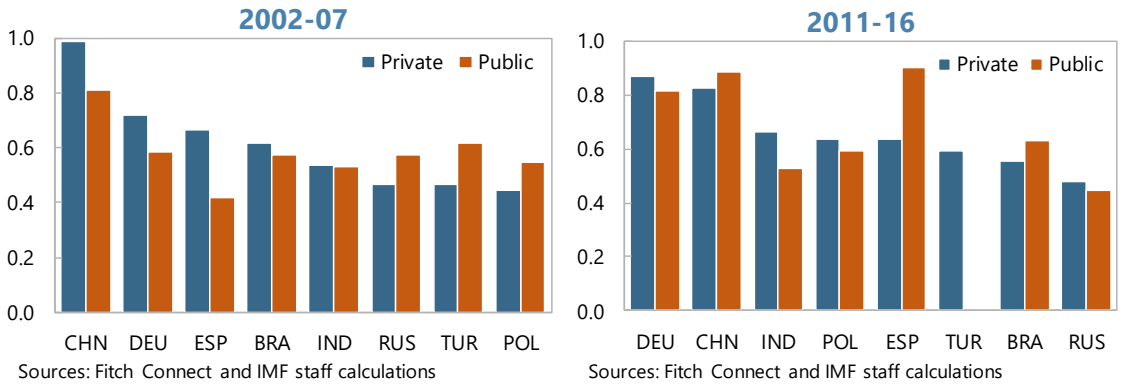
[7] Early studies, such as Berger and Humphrey (1997), focused on banking sectors of advanced economies. Since then, single- and multi-country studies have covered the full range of countries.

[8] See Sealey and Lindley (1977).

16. The analysis uses bank-level data for eight countries with bank-dominated financial systems. An attempt was made to include countries where public sector banks also play a prominent role. The DEA exercises covered around 600 banks over the period 2002–2016. As the DEA is inherently a cross-sectional exercise, efficiency was assessed using data averaged over three-year periods (five in total). Results are expressed in terms of technical efficiency scores under the assumption of constant returns to scale, where 1 means that the bank is at the empirical efficiency frontier, and values closer to zero indicate greater distance to the efficiency frontier.

17. Russia's large banks are lagging their peers, and the gap has not shrunk. Figure 4 depicts simple averages of the efficiency score for top 10 banks in each country, separated by ownership. Even during the boom years, Russian banks were not close to the frontier. In the latest period, marked by the crisis and weaknesses in the banking sector, Russian banks have fallen even further behind. However, it should be notes that creating a single empirical efficiency frontier for a number of countries assumes that all have access to the same production technology, an assumption which is unlikely to hold in practice, and that can generate bias. However, the evolution over time in the relative efficiency of each country's banking sector is less susceptible to bias.

Figure 4. Efficiency Scores of Top 10 Banks Across Countries



Note: Scores are simple averages within each group, results averaged over all models.

Sources: Fitch Connect and IMF staff calculation.

18. Russian banks were never close to the frontier, and state-owned banks are losing their edge. Figure 5 documents the evolution of DEA technical efficiency scores recorded by largest banks over time. SOBs were doing relatively well in the pre-GFC period, but this edge over private banks has eroded over time, with the average large SOBs falling behind in the 2014–16 period, despite their inherent advantages (e.g., lower funding costs due to implicit state guarantee). However, there is considerable heterogeneity among banks, including in SOBs. For example, since mid-2000s, Sberbank has consistently ranked among most efficient banks, exhibiting higher efficiency scores than other SOBs; a testament to its exceptionally low funding costs and scale, which makes it a primary destination for financing large projects by prime corporates.

Figure 5. Efficiency Scores of Largest Russian Banks Across Time

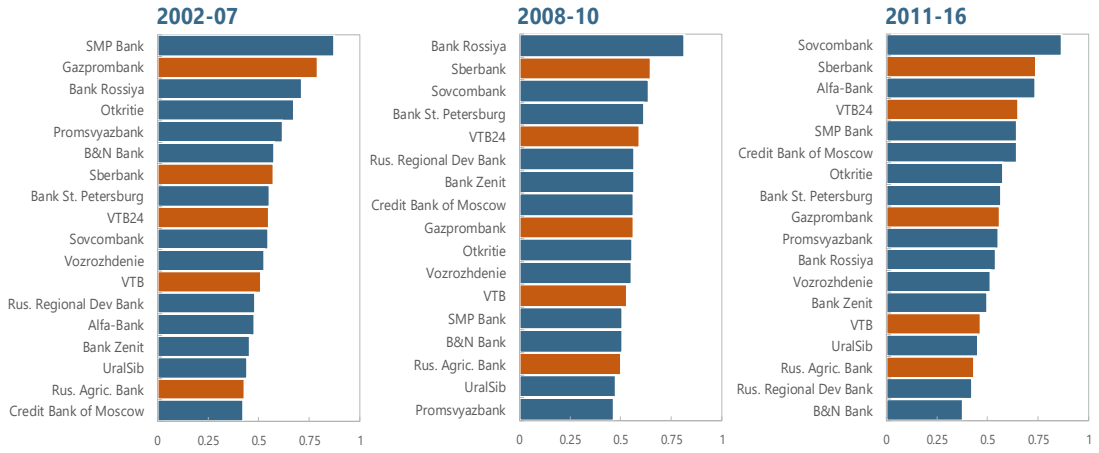
Note: Scores are simple averages, results averaged over all models.

Sources: Fitch Connect and IMF staff calculation.

19. The rankings across banks are fluid over time, but the general picture remains unchanged. Figure 6 shows the evolution over time of Russia's largest twenty banks. Throughout the period, the top spot was held by a private bank, but SOBs – Sberbank since the GFC—followed closely.

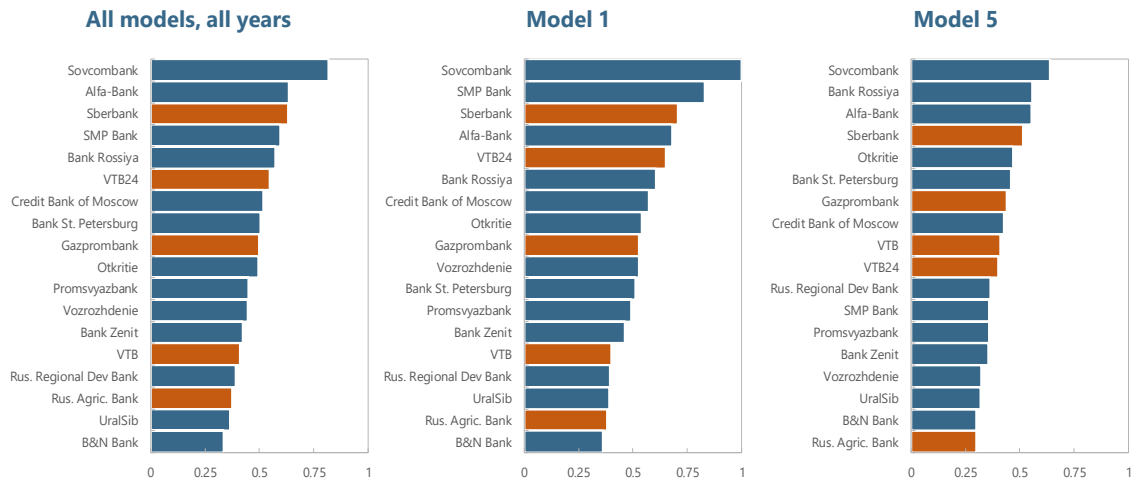
20. Individual bank scores differ across models, but do not alter ranking patterns. Figure 7 below shows variation in bank-level rankings across some of the covered in the analysis for the entire 2002–16 period. The scores themselves vary significantly between models 1 and 5; the former exhibits more heterogeneity, and a few banks manage to get to or close to the technical frontier within the cross-country sample. This underlines the sensitivity of results in this section. However, it's notable that the ranking pattern is similar: private banks take top spots, Sberbank is in the top quintile, and the other SOBs are distributed fairly uniformly across remaining quintiles.

Figure 6. Individual Efficiency Scores of Largest Russian Banks Across Time



Sources: Fitch Connect and IMF staff calculation.

Figure 7. Individual Efficiency Scores of Largest Russian Banks Across Models



Sources: Fitch Connect and IMF staff calculation.

D. Measuring Competition: A Non-Structural Approach

21. As discussed by Claessens and Laeven (2004), competitiveness of an industry cannot be measured by market structure indicators ("structural approach"), such as number of institutions and concentration indexes (Structure-Conduct-Performance paradigm) because the degree of contestability can be a more important determinant or driver of competition.[9] At the same time, the authors mentioned that the use of performance measures, such as the size of the banking margins or profitability, do not necessarily provide an indication of banking system's competitiveness because these measures are also reflecting a different number of factors like

[9]Also, as discussed in Anzoategui et al. (2010), some studies have shown that at times concentration is not a reliable measure of competition (Cetorelli, 1999) and the link between concentration and performance is not always positive as suggested by the Structure-Conduct-Performance paradigm (Jackson, 1992).

macroeconomic performance, the quality of the institutional framework and judicial system, banks specific factors such as the scale of operations.

22. A stream of empirical literature proposes the use of a non-structural approach to overcome the limitations of market structure indicators. As discussed by Anzoategui et al (2010), the non-structural approach measures competition without using explicit information about the structure of the market, focusing on obtaining estimates of market power from the observed behavior of banks. In the same vein, Claessens and Laeven (2004) propose that the degree of competition in the banking system should be measured with respect to the actual behavior of bank conduct.

23. The analysis that we use follows the Panzar and Rosse (1987) methodology. This methodology uses bank-level data to assess the extent to which a change in factor input prices is reflected in (equilibrium) revenues earned by a specific bank. Panzer and Rosse show that the sum of the elasticities of a firm's revenue with respect to the firm's input prices ("H-statistic") can be used to identify the extent of competition in the market. As discussed by Anzoategui et al (2010), under perfect competition, the H-stat should be equal to one, because any increase in input prices should increase total revenues by the same amount. On the other hand, under monopoly, the H-stat will be zero or negative because an upward shift in the marginal cost curve will be associated with no change or a reduction in revenue. An H-stat between zero and one will reflect monopolistic competition in the banking sector. One clear advantage of this approach is that it allows to study differences between types of bank ownership.

The H-stat is calculated from a reduced form revenue equation and estimates the sum of the elasticities of the total revenue of the banks with respect to the bank's input prices:

$$\ln(P_{it}) = \alpha_i + \beta_1 * \ln(W1_{it}) + \beta_2 * \ln(W2_{it}) + \beta_3 * \ln(W3_{it}) + \gamma * \ln(Z_{it}) + \delta * D_t + \varepsilon_{it}$$

Where P_{it} is the ratio of gross revenues to total assets (proxy banks' output price), $W1_{it}$ is the ratio of interest expenses to total deposits and money market funding (proxy input price of deposits), $W2_{it}$ is the ratio of personnel expenses to total assets (proxy input price of labor), $W3_{it}$ is the ratio of other operating and administrative expense to total assets (proxy input price of equipment/fixed capital). The subscript i denotes bank i, and the subscript t denotes year t. As control variables, the matrix Z includes the ratio of equity to total assets, the ratio of net loans to total assets, and total assets. D is a vector of time (year) dummies. We take natural logarithms of all variables and estimate the specification using fixed-effects.

24. We use bank-level data from Fitch Connect, a database containing bank financial statements used in number of country and cross-country studies. The sample of credit institutions includes universal commercial banks, wholesale commercial banks, trading and investment banks, bank holding companies, and retail and consumer banks.[10] The coverage, in terms of assets, is above 80 percent of the system (see Table 4).

[10] Non-bank credit institutions, asset management companies, security firms, and development banks are not included in the sample used for the regression.

Table 4. Number of Credit Institutions Included in the Analysis

Year	Operating credit institutions in the Russian Federation	Credit institutions included in Fitch Connect[1/]	Credit institutions included in the regression analysis[2/]	Year	Operating credit institutions in the Russian Federation	Credit institutions included in Fitch Connect[1/]	Credit institutions included in the regression analysis[2/]
2005	1235	704	679	2011	978	930	894
2006	1189	911	875	2012	956	901	865
2007	1136	957	918	2013	923	876	842
2008	1108	919	887	2014	834	788	755
2009	1058	975	940	2015	733	692	661
2010	1012	967	931	2016	623	542	511

[1/]Sample based on non-consolidated statements and local accounting reporting standards (GAAP).
[2/]Sample excludes non-bank credit institutions, asset management companies, security firms, and development banks.
Source: Fitch Connect and IMF staff calculations.

The type of ownership (SOB, foreign-owned bank, or POB) is determined by using different sources: Fitch, Banki.ru, Bankodrom.ru, Central Bank of Russia, and Anzoategui (2010).[11] For our sample period, we identify 74 banks as foreign-owned.[12] On the other hand, 25 banks were identified as SOBs.

25. The Russian banking sector can be best characterized as operating under monopolistic competition (see Table 5), given an H-statistic equal to 0.45 and considering that we can reject the nulls hypothesis that the H-stat equal zero and, also, 1. By type of ownership, foreign-owned banks appear to be the most competitive. Table 6 presents the hypothesis testing for the H-stats, showing that the H-stat of foreign-owned banks is statistically larger than the ones for POBs and SOBs. While the H-stat for POBs is larger than the one for SOBs, it is not statistically different.[13] The equilibrium condition is accepted in all cases.

[11] We are thankful to Soledad Martinez-Peria and Diego Anzoategui for sharing their database of Russia.

[12] As of end-2017, the Central Bank of Russia identifies 85 banks with foreign participation above 50 percent and 65 banks as fully foreign-owned.

[13] Anzoategui et al. (2010) using bank-level balance sheet and income statement (annual) data from Bankscope for the period 2002–08 estimate a H-stat of 0.74. Also, the authors find that SOBs appear to be less competitive than privately-owned banks and they do not find significant differences in the competitive behavior of foreign and domestic banks. Mamonov (2010) estimate the H-stat of 0.697 for the period 2004–09 using quarterly data and fixed sample of banks (525) with complete data for the period under analysis. Nabiyev et al. (2016) estimate an H-stat of 0.55 using annual bank-level data from Bankscope for the period 2001–13.

Table 5. H-Statistics by Type of Ownership

	H-stat	Ho: H-stat=0, P-value	Ho: H-stat=1, P-value
All banks in the sample	0.447	0.000	0.000
Private domestic	0.432	0.000	0.000
State-owned banks	0.383	0.000	0.000
Foreign-owned	0.564	0.000	0.000

Table 6. Hypothesis Testing for H-Statistics

	Ho: H-stat (i) > H-stat (ii)	Ho: H-stat (i) < H-stat (ii)
Private domestic (i) vs SOBs (ii)	0.705	0.295
Foreign-owned (i) vs Private domestic (ii)	0.983	0.017
Foreign-owned (i) vs SOBs (ii)	0.952	0.048

26. The degree of competition would be higher for larger POBs. Given the potential high degree of heterogeneity within the group of domestic POBs and SOBs, we explored whether the H-statistic change for larger banks. We divide the sample of domestic POB and SOBs based on the distribution of total assets in each group (above 80th percentile, 90th percentile, 95th percentile, and 99th percentile). Table 7 shows that in the case of domestic private banks, the H-stat would increase for larger banks. While the H-stat for the group of POBs with assets above the 99th percentile is statistically larger than the H-stat for the whole group of domestic POBs, we cannot be conclusive of the result because the equilibrium condition was not accepted in all cases. In the case of SOBs, the H-statistic would not change for larger SOBs (the equilibrium condition was accepted).

Table 7. H-Statistic by Asset Size

	H-stat, total assets>80th percentile	H-stat, total assets>90th percentile	H-stat, total assets>95th percentile	H-stat, total assets>99th percentile
Domestic private	0.445***	0.482***	0.521***	0.670***
State-owned banks	0.297***	0.198*		

***, **, * denotes statistically different from zero at 1, 5, and 10 percent.

27. SOBs and domestic POBs in Brazil and India would exhibit a similar degree of competition. We also estimate the H-statistic by type of ownership for the banking sectors of Brazil and India, which have an important participation of SOBs[14], to observe how SOBs perform in their respective systems. In the case of Brazil, SOBs' degree of competition is statistically similar to the one of domestic POBs and to the one for large foreign-owned banks (see Table 8). The equilibrium condition is accepted in all cases. In the case of India, the degree of competition of SOBs is statistically similar to the one of domestic POBs (see Table 9). [15]

Table 8. H-Statistics for the Brazilian Banking Sector

	H-stat	Ho: H-stat=0, P-value	Ho: H-stat=1, P-value
Banking sector	0.64	0.000	0.000
Domestic private	0.71	0.000	0.000
State-owned	0.63	0.000	0.000
Federal	0.58	0.000	0.000
State	0.68	0.000	0.000
Foreign-owned	0.46	0.000	0.000
Foreign-owned (assets above 75th percentile)	0.73	0.000	0.000

Table 9. H-Statistics for the Indian Banking Sector

	H-stat	Ho: H-stat=0, P-value	Ho: H-stat=1, P-value
Domestic private and public banks	0.65*	0.000	0.000
Public banks	0.55	0.000	0.000
Private banks (group I)1/	0.71	0.000	0.000
Private banks (group II)1/	0.59*	0.000	0.000

1/ Definition based on the Reserve Bank of India's publication "A Profile of Banks 2012–2013", which presents a division between old and new private sector banks.

*The equilibrium condition was not accepted.

28. However, the degree of competition of SOBs in Brazil and India would be larger than the one of SOBs in Russia. The H-statistic of SOBs in Brazil and India is larger, statistically, than the one for Russian's SOBs (see Table 10), which would imply that Russian's SOBs are less competitive

[14] Public banks (federal and state) in Brazil represent about 42 percent of total assets. In the case of India, public sector banks represent about 70 percent of scheduled commercial banks' total assets. The ownership classification was done based on the information available in the websites of the Central Bank of Brazil and the Reserve Bank of India.

[15] Fitch Connect reports financial information for only few foreign-owned banks in India, which mainly operate as branches. For this reason, the analysis was not performed for public and domestic private banks.

than are SOB's in Brazil or India. However, care is needed with this interpretation because financial ratios are also reflecting a different number of factors like macroeconomic performance, regulatory differences, the quality of the institutional framework and judicial system, and bank specific factors (e.g., risk profiles and business models) which would not allow a direct comparison of the H-statistics.

Table 10. Comparison of H-Statistics for SOBs in Russia, India, and Brazil

	Ho: H-stat (i) > H-stat (ii)	Ho: H-stat (i) < H-stat (ii)
SOBs Brazil (i) vs SOBs Russia (ii)	0.974	0.026
SOBs India (i) vs SOBs Russia (ii)	0.950	0.050

E. Summary and Policy Implications

29. SOBs have healthy balance sheet compared to POBs, however their profitability is lower, except for Sberbank which has high profitability both within Russia and also compared to peer countries. In general, system level profitability of the Russian banking system is better than the average one of peer countries.

30. The Russian banking system is far from the efficiency frontier. The analysis using data envelopment analysis (DEA) finds that Russian POBs have been slipping relative to POBs. And, cross country analysis shows that Russian banks are less efficient than peers, and there is no indication of convergence.

31. Competition does not seem high, and the ownership structure might be playing a role. The results suggest that the Russian banking sector can be best characterized as operating under monopolistic competition, and that foreign-owned banks appear to be the most competitive. However, the degree of competition of POBs is larger than the one for SOBs, bit it is not statistically different. An analysis based on the size of banks provides some indication that the degree of competition would be higher for larger POBs.

32. The authorities are encouraged to increase the private initiative, including via privatization and reduction of the footprint of the state. While the results suggest a low degree of competition of Russian SOBs, we cannot be conclusive that this is only due to the type of ownership rather than to the quality of management or to the pursue of a different mandate even though many SOBs formally operate as commercial banks. However, the results are also indicative that larger, in term of assets, POBs would have a higher degree of competition. The latter suggest the need of economies of scale (cost-efficiency arguments), which would mainly be feasible through a reduction of the state's participation in the system. To increase private sector participation in the banking sector the sequencing is critical. The first step should be to strengthen the institutional architecture to avoid further concentration of economic power after privatization, which includes strengthening transparency, accountability, and governance standards in the corporate sector.

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