Christian Hattendorff

Economic concentration and finance: Evidence from Russian regions

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Abstract

The paper investigates the relationship between economic concentration and level of financial development to illuminate the linkage of real economy structure and financial markets. Using data from 81 Russian regions for the period 2005–2011, empirical evidence is offered to show that poor diversification weakens credit. Geographical variables are used as instruments of concentration in accounting for endogeneity. This work supports previous findings at the national level that policymakers seeking to promote economic development should place stronger emphasis on output diversification.

Christian Hattendorff, Institute for East European Studies, Freie Universität Berlin, Garystr. 55, 14195 Berlin. Email: christian.hattendorff@fu-berlin.de.

1   Introduction

The recent economic turmoil in Russia has been attributed to numerous factors, including political uncertainty, the impacts of Western sanctions and an unfavorable investment climate. Where most economists agree, however, is on Russia's failure to diversify its economy. Output and exports are concentrated to a few sectors, particularly oil and gas. Since world markets largely set resource prices, resource-dependent Russia faces constant exposure to exogenous price shocks that sometimes leads, as seen in December 2014, to severe short-term fluctuations in stock and foreign exchange markets. In addition to forcing people and companies to adopt short-horizon coping strategies, economic concentration may also harm the economy over the long run by impairing the function of markets and levels of investment.

Downgrades of national and regional credit markets are a possible long-run effect of concentration and its associated volatility. Given that finance is widely seen as a major driver of growth, the lack of access to finance can curb economic development (e.g. Levine, 2005; Rajan and Zingales, 1998). The present study investigates this apparent link between economic concentration and financial development in the context of Russia's regions.

The literature identifies various determinants of finance. An important factor is the level of income, which correlates positively with both the size and quality of the financial system. Demand for financial services increases as the economy grows in size and complexity (Huang, 2010). The quality of institutions, the legal system and sophistication of financial regulation also affect the function of the financial sector (e.g. Beck, Demirgüç-Kunt and Levine, 2003; La Porta, Lopez-de-Silanes, Shleifer and Vishny, 1998; Mayer and Sussman, 2001). Do and Levchenko (2007) add that moderate inflation (an indicator of prudent monetary policy) and high levels of secondary education may play roles in bolstering finance. Huang and Temple (2005) show that openness to trade increases bank-based financial development. On point with this discussion, Ramcharan (2006) finds that well-diversified economies tend to have larger credit markets than less-diversified economies.

The literature also addresses the argument that poor diversification impairs growth. For example, high economic concentration is seen to increase vulnerability to fluctuations in goods prices and changes in demand (e.g. Naudé, Bosker and Matthee, 2010; Lederman and Maloney, 2007; Hesse, 2008). These authors contradict the traditional view that countries should specialize in few sectors to exploit their comparative advantage. Hausmann and

Rodrik (2003) find that countries with high economic concentration are less likely to benefit from welfare-enhancing knowledge spillovers than their less-concentrated counterparts. Concentration typically leads to increased volatility (Malik and Temple, 2009; Lederman and Maloney, 2012), including terms-of-trade and output volatility that impede economic development (Ramey and Ramey, 1995; Imbs, 2007; Blattman, Hwang and Williamson, 2007).

The negative effect of resource abundance on growth, or "resource curse," constitutes a third relevant strand of the literature. Resource abundance, particularly resource dominance, strongly correlates with economic concentration (Bond and Malik, 2009). Indeed, several recent studies suggest that poor diversification of the economy is the single most important factor in invoking the curse (e.g. van der Ploeg and Poelhekke, 2009; Lederman and Maloney, 2012). There is also evidence that resource-rich countries have a less-developed financial system than their less-endowed counterparts (Beck, 2011; Kurronen, 2015; Hattendorff, 2014). Applying a cross-country approach, Hattendorff (2014) suggests this might be due to export concentration.

Why should economic concentration affect financial development? Portfolio theory says that risk-averse agents prefer diversification under uncertainty, so high concentration and the associated volatility may induce investors to demand a risk premium that leads to higher interest rates and lower investment. The resource-curse model of Hausmann and Rigobon (2003) may provide some hints here. Applying a Dutch disease setting with a dominant resource sector, they show that labor movement in a highly specialized economy does little to buffer demand shocks. According to their model, this leads to higher exchange rate volatility, which, assuming risk aversion, translates into higher real interest rates. Investment falls, as well as (extending Hausmann and Rigobon's argument) private credit.

The results of the present paper support the hypothesis that economic concentration weakens credit markets. The main explanatory variable is significant in a cross-section of Russian regions and a panel analysis. Furthermore, these findings hold for the applied instrumentation strategy and for the performed robustness checks.

The paper is structured as follows. Section 2 presents the empirical strategy to identify the effect of concentration on finance. Data are described in Section 3. The results are presented in Section 4. Section 5 concludes.

2   Empirical strategy

Even taking as given that a negative link exists between concentration and financial development at the national level as suggested by Ramcharan (2006) and Hattendorff (2014), within-country analysis may offer an opportunity to control for unobserved country-specific factors such as rule of law and other aspects of national institutional environment. The within-country approach overcomes some of the possible simultaneity and selection biases of cross-country studies. For the Russian Federation, therefore, I construct a dataset made up of annual figures from 81 Russian regions from 2005 to 2011.

Many of Russia's regions possess highly concentrated economic structures. Beyond this, there are three further advantages to including Russian regional data in the analysis. First, the sheer number of regions provides a large dataset. Second, there is extensive cross-regional heterogeneity in terms of financial development, output concentration and other economic variables. Finally, a significant part of the Russian economy is inherited from the Soviet Union, where economic decisions were often based on exogenous political motives. This could potentially reduce the endogeneity problem with the main right-hand side variable concentration.

My hypothesis is initially tested in a cross-section of regions, where all variables are averaged over time. The regression equation is estimated with ordinary least squares (OLS):

$$FD_r = \alpha + \beta \, CON_r + \boldsymbol{\gamma} \, \boldsymbol{X_r} + \epsilon_r. \tag{1}$$

FD denotes the region *r*'s level of financial development, typically measured by the amount of credit to gross regional product (GRP). *CON* is the measure of economic concentration, namely a Herfindahl-Hirschman index, and X is the vector of control variables. ϵ_r denotes the error term. The controls include regional income per capita, openness to trade, institutional quality, education and inflation.[1]

As indicated above, the estimation suffers from endogeneity because concentration (*CON*) is likely to be correlated with the error term. A better financial system fosters economic activity and thereby output diversification, e.g. by diminishing macroeconomic volatility (van der Ploeg and Poelhekke, 2009). I apply the following instrumentation strategy to

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[1] See also Hattendorff (2014).

identify the direction of causality. Similar to Hattendorff (2014), geographical instrumental variables are used for the main explanatory variable concentration. Generally, geography is exogenous and can hardly be influenced in the short or medium term, in particular not by the financial sector. Here, the region's distance to Moscow and its average temperature serve as the instruments. It is assumed that remoteness negatively affects local production and thus economic diversification by increasing trade costs (Melitz, 2003). Moscow is indisputably the economic center of the country, so the greater a region's distance from Moscow, the more remote it is. Additionally, unfavorable climatic conditions are assumed to be an impediment to production and diversification. This is captured by the region's average temperature (Bond and Malik, 2009). Both instruments are used in equation (1) with two-stage least squares (2SLS).

In addition, I estimate a panel specification with region and time fixed effects to control for omitted variables. The corresponding regression equation is:

$$FD_{rt} = \alpha + \beta\,CON_{rt} + \boldsymbol{\gamma\,X_{rt}} + \delta_r + \delta_t + \epsilon_{rt}, \tag{2}$$

where δ_r denotes region fixed effects and δ_t time fixed effects. Note that the oil price, which could potentially distort the results in the cross-section, is captured by the time fixed effects because it is set at world markets and applies to all regions.

Robustness checks account for the exclusion of certain regions, variation of the financial development measure, as well as alternative explanations for the empirical outcome.

3 Data

The analysis is based on annual panel data over the time period 2005 to 2011.[2] I collect 543 observations from 81 Russian regions (Appendix Table 5). Due to political instability and poor data quality, the Chechen Republic is excluded from the start. Otherwise, all types of regions are included in the basic sample (i.e. oblasts, republics, autonomous regions, etc.). As shown below, some specifications exclude certain regions (e.g. the Caucasus area and rich regions). The primary data sources are the Russian Federal State Statistics Service

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[2] The time period is limited due to data constraints.

(Rosstat), the official Russian EMISS database, as well as data provided by the Central Bank of the Russian Federation (CBR).[3] See Appendix Table 4 for summary statistics.
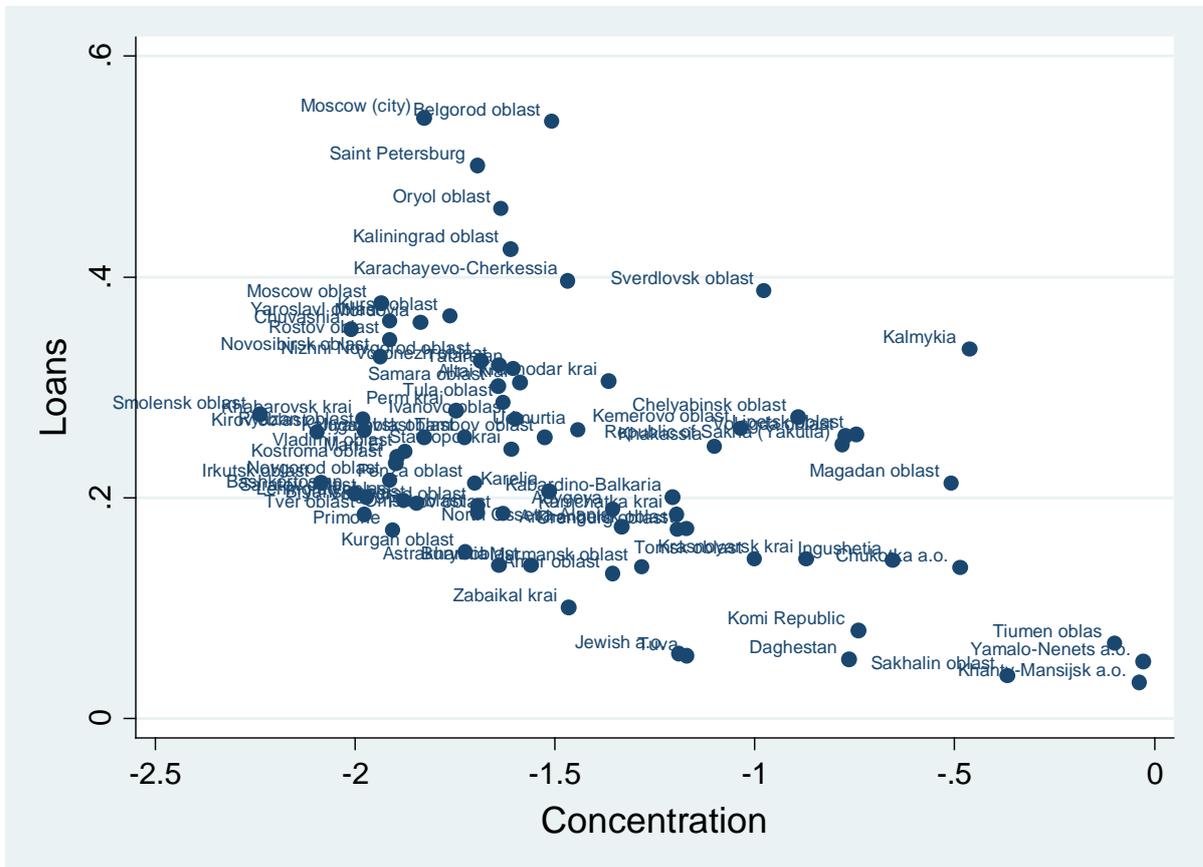
The level of financial development is measured by corporate loans from banks (excluding interbank loans) relative to gross regional product (GRP). This measure corresponds relatively well to private credit to GRP, which is usually applied in international studies dealing with the issue. It accounts for bank-based finance, which is the predominant type of financing in Russia, particularly at the regional level. An alternative measure used in the sensitivity analysis below is the ratio of residents' banking deposits to GRP. Generally, the quality of the financial system is assumed to increase with size (e.g. Do and Levchenko, 2007). Acknowledging that recent work has cast doubt on the proposition that a larger financial sector is unambiguously advantageous for the economy (Arcand, Berkes and Panizza, 2011), I nevertheless make this assumption here, because, as an emerging market, there is reason to believe that more finance is a good thing in Russia's case. Following Guiso, Sapienza and Zingales (2004), it is expected that local financial development is important, despite increasing international financial integration. The financial indicators come from the CBR.

The measure of economic concentration is a Herfindahl-Hirschman index, which is the sum of squared output shares of sectors. It is calculated on the basis of the OKVED sector classification used by Rosstat. However, including all of the OKVED industries provides little informative value in terms of economic diversification. Thus, it makes sense to construct the variable using the agricultural (A) and fishing sector (B) as 1-digit sectors, as well as the resource (C) and manufacturing sector (D) as 2-digit sectors, with the latter divided into subsectors, e.g. fuels (CA) and mining (CB). In total, 16 sectors and subsectors are captured by the measure (see Appendix Table 6). This approach resembles earlier concentration studies based on the popular ISIC sector classification, thereby ensuring comparability. The measure is expressed in natural logs. Concentration is instrumented by remoteness, i.e. the log of distance to Moscow in kilometers, as well as the regional average temperature in July (or alternatively in January) in degrees Celsius.

The control variable income is real GRP per capita (base year 2004). Trade openness is the sum of imports and exports (CIS and non-CIS) relative to GRP. The quality of

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[3] The data were partly taken from the database on economic and political indicators for the Russian regions created by the International Center for the Study of Institutions and Development (ICSID) of the Higher School of Economics Moscow and from the CEIC database.

institutions is captured by the size of bureaucracy, which is calculated as the number of pub-lic officials in total population, excluding federal employees (following Libman, 2012). Roughly speaking, the larger the bureaucracy, the greater the rent-seeking and corruption and the lower the institutional quality. Level of education is measured in terms of the share of the regional population with university education. Although the average inflation rate shows relatively little variation across regions, it is included in the regressions. Robustness checks use as additional controls the share of oil and gas in regional production (sector CA, own calculations) and CBR figures on the stock of overdue loans.[4]

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[4] Some of the control variables are expressed in logs (see Section 4).

4   Results

The following section presents the empirical results. As can be seen in the above graph, there seems to be a negative correlation between the amount of loans and the degree of economic concentration.[5] Of course, this is only a simple bivariate relationship.

Cross-section

Table 1 depicts the outcome of the cross-sectional OLS regressions. In the first column, the full sample with 81 regions is applied. The coefficient on concentration is negative, but insignificant. Further analysis suggests that the Republic of Altai is an extreme outlier (not depicted in the graph, with a loans-to-GRP ratio of 0.94), which is why I exclude the observation in the following specifications. At this point, concentration enters significantly into the regression. It is robust to the inclusion of several control variables (Columns 2 to 4). As expected, the coefficients on trade openness and education are positive, while the coefficient on size of bureaucracy is negative, but insignificant. Inflation seems to have little explanatory power. Surprisingly, and in contrast to international studies, income is negatively correlated with financial development. Dropping Moscow, a notorious outlier in empirical work on Russian regions, does not change the results substantially (Column 5).

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[5] In the graph, "Loans" are corporate loans to GRP and "Concentration" is the log of the Herfindahl-Hirschman index of sectors.

Table 1   Cross-section OLS, averages, 2005–2011

	1	2	3	4	5
		- Rep. of Altai	- Rep. of Altai	- Rep. of Altai	- Rep. of Altai and Moscow
Dep. Var. (FD)	Corp. Loans to GRP	Corp. Loans to GRP	Corp. Loans to GRP	Corp. Loans to GRP	Corp. Loans to GRP
Log(Concentration)	-0.071	-0.096 ***	-0.076 ***	-0.072 ***	-0.068 **
	(0.058)	(0.018)	(0.024)	(0.027)	(0.026)
Log(GRP p.c.)	0.029		-0.014 *	-0.013	-0.014 *
	(0.018)		(0.008)	(0.009)	(0.008)
Log(Openness)	0.056 ***		0.045 ***	0.042 ***	0.041 ***
	(0.015)		(0.013)	(0.011)	(0.012)
Size of Bureaucracy	0.241			-3.724	-3.661
	(9.058)			(2.641)	(2.636)
Education	0.008 **			0.007 ***	0.006 **
	(0.004)			(0.002)	(0.003)
Inflation	-0.214			1.280	1.350
	(2.017)			(1.472)	(1.477)
Constant	0.342	0.101	0.359 ***	0.052	0.095
	(0.307)	(0.028)	(0.119)	(0.202)	(0.198)
Observations	81	80	80	80	79
R^2	0.26	0.20	0.31	0.44	0.38

Robust standard errors are in parantheses. ***, ** and * indicate significance at the 1%, 5% and 10% level.

The results of the instrumentation strategy with 2SLS are presented in Table 2. Panel A shows the second stage, Panel B the first stage. The specifications in Columns 1 and 2 are based on the full sample, while Column 3 excludes the Republic of Altai and Column 4 the Republic of Altai and Moscow. The instrument remoteness (distance to Moscow) is positively and significantly related to concentration (Panel B), with a satisfying partial F-statistic (10.75). As a result, a remote region tends to have a less diversified economic structure. In contrast, the average temperature in July delivers very poor instrument diagnostics and leads to meaningless results in the second stage (Column 2). Substituting the average temperature in January with the average temperature in July does not alter the outcome (not depicted in

the table). Using the suitable instrument remoteness, the coefficient on economic concentration is negative and significant in all specifications (Panel A). Here, the exclusion of the Republic of Altai does not appear to be crucial. The coefficients on the control variables are similar to those in Table 1. Overall, both the OLS cross-section and the 2SLS analysis support the hypothesis of a negative link between concentration and financial development.

Panel analysis

In order to exploit the time variation in the data, I estimate a panel specification with region and time fixed effects. This accounts for both constant region-specific characteristics and global factors that change over time. Table 3 shows four regressions, where financial development is again measured by corporate loans to GRP and where the full set of controls is applied. With all 81 regions, the coefficient on concentration is negative, but insignificant. Other than in the OLS cross-section, the exclusion of the Republic of Altai does not change the significance of β considerably (Column 2). Because region fixed effects are taken into account here, a possible measurement error of this observation does not distort the estimation. However, without Moscow, concentration enters significantly at the 10% level (Column 3). The elimination from the sample of Moscow, due to its distinctive character as the dominant economic center of the country, is in line with many studies on Russian regions. Remarkably, β is the only significant coefficient, whereas the controls seem to have less explanatory power. These results hold when Moscow is the only region excluded.[6]

Column 4 depicts a specification where the measure of finance is limited to corporate loans in Russian rubles (i.e. loans in foreign currencies excluded). Here, the coefficient on concentration is significant at the 5% level. This rise in significance can be observed throughout the empirical analysis. It seems that concentration primarily affects lending in rubles rather than in foreign currencies.[7]

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[6] The exclusion of St. Petersburg, another important economic center, leaves the results essentially unaffected.
[7] The data do not allow a GMM approach.

Table 2   Cross-section 2SLS, averages, 2005–2011

	1	2	3	4
			- Rep. of Altai	- Rep. of Altai and Moscow
Panel A: 2nd Stage				
Dep. Var. (FD)	Corp. Loans to GRP	Corp. Loans to GRP	Corp. Loans to GRP	Corp. Loans to GRP
Log(Concentration)	-0.229 ***	-4.450	-0.235 ***	-0.242 ***
	(0.080)	(82.077)	(0.074)	(0.090)
Log(GRP p.c.)	-0.001	0.738	0.017	0.018
	(0.022)	(14.319)	(0.016)	(0.019)
Log(Openness)	0.043 **	-0.170	0.034 **	0.034 **
	(0.017)	(4.116)	(0.015)	(0.015)
Size of Bureaucracy	17.202	330.796	7.635	8.082
	(14.303)	(6126.675)	(6.577)	(7.473)
Education	0.011 ***	0.054	0.009 ***	0.009 ***
	0.003	(0.854)	(0.002)	(0.003)
Inflation	-0.210	-1.964	1.327	1.312
	(2.381)	(42.257)	(1.968)	(2.005)
Constant	-0.365	-18.126	-0.653	-0.692
	(0.498)	(345.803)	(0.417)	(0.491)
Panel B: 1st Stage				
Dep. Var.	Log(Concentr.)	Log(Concentr.)	Log(Concentr.)	Log(Concentr.)
Log(Remoteness)	0.103 ***		0.102 ***	0.100 ***
	(0.031)		(0.031)	(0.033)
Av. Temperature July		-0.001		
		(0.022)		
Partial F-Test	10.75	0.003	10.76	9.13
Partial R²	0.12	0.000	0.12	0.09
Observations	81	81	80	79

Robust standard errors are in parantheses. ***, ** and * indicate significance at the 1%, 5% and 10% level.

Robustness

A number of robustness checks are conducted to test the above findings. First, the measure of financial development is varied by using deposits to GRP instead of corporate loans. The corresponding estimation results do not differ substantially from those before. Note that the Republic of Altai is not an outlier here and that its exclusion in the cross-section is much less important.

As an additional control variable, I add the amount of overdue loans, a potential determinant of finance. A further control is the share of oil and gas in regional production. In some regions, the oil-and-gas sector accounts for a large part of the local economy and thus could influence the outcome in another way than via concentration. However, the inclusion of these variables does not alter the general findings.

As indicated above, some of the results are sensitive to outliers and the variation of the sample. To test robustness, I vary the set of regions with regard to some specific characteristics. One criterion is whether the region is in the Caucasus area, which suffers from high political instability. The other criteria refer to the region's wealth and economic concentration. Dropping the Caucasian regions, the richest and the most concentrated regions does little to change the main results – although some coefficients are less significant.

As explained in Section 3, the concentration measure is based on a specific selection of OKVED sectors for a number of reasons. Still, the choice of sectors may be criticized. I consider this relatively unproblematic because the Herfindahl-Hirschman index with the selected OKVED sectors and the one with all OKVED sectors are correlated (coefficient of about 0.6). Moreover, excluding the regions where the share of the selected sectors A, B, C and D in total output is relatively small (or large) leaves the results basically unaffected. The overall results are robust to the variation of the calculation method, i.e. using a modified Herfindahl-Hirschman index from the UNCTAD (Hattendorff, 2014).

Finally, it could plausibly be argued that the results are driven by factors other than those described here. In regions with a few large and dominant companies, low financial development might be caused by low demand for financing. A firm that operates at the national or international level can easily borrow outside the region and does not necessarily resort to local credit sources. Lower financial demand might also be attributed to technological differences across sectors (following the approach of Rajan and Zingales, 1998). In a region with a few dominant firms that are not dependent on external finance, this might

decrease financial development (Do and Levchenko, 2007). Accounting for the size of population and the number of firms in the region, however, suggests these arguments play a minor role.

Table 3   Panel with region and time fixed effects, 2005–2011

Dep. Var. (FD)	1	2 - Rep. of Altai	3 - Rep. of Altai and Moscow	4 - Rep. of Altai and Moscow
	Corp. Loans to GRP	Corp. Loans to GRP	Corp. Loans to GRP	Corp. Loans to GRP (only RUB)
Log(Concentration)	-0.049	-0.050	-0.061 *	-0.055 **
	(0.034)	(0.034)	(0.032)	(0.027)
Log(GRP p.c.)	0.000	0.001	0.002	0.003
	(0.007)	(0.006)	(0.005)	(0.004)
Log(Openness)	0.028	0.015	0.014	0.007
	(0.020)	(0.015)	(0.015)	(0.014)
Size of Bureaucracy	-7.403	-5.023	-4.800	0.355
	(6.591)	(6.416)	(6.353)	(4.465)
Education	0.000	-0.000	-0.000	-0.000
	(0.002)	(0.001)	(0.001)	(0.001)
Inflation	-0.130	-0.095	-0.120	0.007
	(0.154)	(0.149)	(0.147)	(0.110)
Region FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Observations	543	537	530	531
Number of Regions	81	80	79	79
R^2	0.87	0.86	0.85	0.86

Standard errors clustered at the regional level are in parantheses. ***, ** and * indicate significance at the 1%, 5% and 10% level.

5   Conclusion

The present paper sheds light on the relationship between economic concentration and bank-based finance by applying a within-country analysis with Russian regional data from 2005 to 2011. As highlighted in Section 1, poor diversification has a number of negative consequences for an economy. I argue this may also occur via a financial channel as concentrated economies suffer from lower growth due to a lack of financial development. This may be particularly important in the case of resource-rich regions, which are often dominated by a few sectors.

My results largely support this hypothesis. The cross-sectional OLS estimations provide negative and significant coefficients on concentration (when the extreme and atypical outlier Republic of Altai is excluded from the sample). To overcome the endogeneity problem, concentration is instrumented. The 2SLS regressions with the geography-based instrument remoteness, that is, distance to Moscow, strongly support the findings. The panel analysis with region and time fixed effects, which controls for omitted variables, shows less significant coefficients. Nonetheless, once the typical outlier Moscow is dropped from the sample, concentration enters significantly into the regressions. The impact of concentration on finance is substantial.

Thus, this study provides evidence in favor of the hypothesis and confirms previous studies using cross-country data (although the outcome is somewhat sensitive to outliers and based on a limited time period). As Russia is an emerging economy, where financial markets are not perfectly developed and measurement errors occur, generalizations should be treated with caution. Nevertheless, these findings suggest it may be prudent to also consider the sectoral structure of an economy as a determinant of finance.

Regarding policy advice, output diversification appears warranted at both the national and regional level. Appropriate measures include improving institutions and the business climate, as well as pursuit of prudent macroeconomic policies (see also Hattendorff, 2014). Moreover, federal and regional governments should foster other credit market factors as well (e.g. financial regulation).

Future research could specify the theory and identify further mechanisms that explain the link between economic concentration and the financial system.

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Appendix

Table 4   Summary statistics, averages, 2005–2011

	Obs.	Mean	Std. Dev.	Min	Max
Corporate Loans to GRP	81	0.247	0.135	0.033	0.943
Deposits to GRP	82	0.798	1.795	0.000	15.622
Concentration	82	0.292	0.203	0.107	0.972
Trade Openness	82	0.325	0.281	0.017	1.476
Size of Bureaucracy	82	0.006	0.003	0.002	0.025
Education	82	0.257	0.048	0.182	0.477
Inflation	82	0.104	0.007	0.090	0.120
Distance to Moscow (km)	82	2,371	2,697	0	11,876
Av. Temperature in July (°C)	82	19.20	3.11	10.13	26.57
Av. Temperature in January	82	-12.12	7.51	-33.68	1.1
Share of Oil and Gas	82	0.144	0.256	0	0.986
Overdue Loans to GRP	82	0.033	0.039	0.000	0.242

The summary statistics list the number of observations, the mean, the standard deviation, the minimum as well as the maximum value of the distribution. The Nenetsky Area is only included in the regressions using deposits to GRP. The data are explained in Section 3.

Table 5   List of regions

Adygeya	Kirov Oblast	Republic of Sakha (Yakutia)
Altai Krai	Komi Republic	Rostov Oblast
Amur Oblast	Kostroma Oblast	Ryazan Oblast
Arkhangelsk Oblast	Krasnodar Krai	Saint Petersburg
Astrakhan Oblast	Krasnoyarsk Krai	Sakhalin Oblast
Bashkortostan	Kurgan Oblast	Samara Oblast
Belgorod Oblast	Kursk Oblast	Saratov Oblast
Bryansk Oblast	Leningrad Oblast	Smolensk Oblast
Buryatia	Lipetsk Oblast	Stavropol Krai
Chelyabinsk Oblast	Magadan Oblast	Sverdlovsk Oblast
Chukotka A.O.	Marij El	Tambov Oblast
Chuvashia	Mordovia	Tatarstan
Daghestan	Moscow (City)	Tiumen Oblast
Ingushetia	Moscow Oblast	Tomsk Oblast
Irkutsk Oblast	Murmansk Oblast	Tula Oblast
Ivanovo Oblast	Nenets A.O.	Tuva
Jewish A.O.	Nizhni Novgorod Oblast	Tver Oblast
Kabardino-Balkaria	North Ossetia-Alania	Udmurtia
Kaliningrad Oblast	Novgorod Oblast	Ulyanovsk Oblast
Kalmykia	Novosibirsk Oblast	Vladimir Oblast
Kaluga Oblast	Omsk Oblast	Volgograd Oblast
Kamchatka Krai	Orenburg Oblast	Vologda Oblast
Karachayevo-Cherkessia	Oryol Oblast	Voronezh Oblast
Karelia	Penza Oblast	Yamalo-Nenets A.O.
Kemerovo Oblast	Perm Krai	Yaroslavl Oblast
Khabarovsk Krai	Primorie	Zabaikal Krai
Khakassia	Pskov Oblast	
Khanty-Mansijsk A.O.	Republic of Altai	

Though Khanty-Mansijsk and Yamalo-Nenets officially belong to the Tiumen oblast, they are treated separately throughout the analysis.

Table 6   List of OKVED sectors

Sector	Description
A	Agriculture, hunting and forestry
B	Fishing
CA	Fuels
CB	Mining products
DA	Food products
DB	Textile
DC	Leather products and footwear
DD	Wood products
DE	Paper and paper products
DG	Chemical products
DH	Plastic products
DI	Nonmetal mineral products
DJ	Metal products
DL	Electric machinery
DM	Transportation equipment
DN	Other industries

OKVED: All Russian Classification of Branches of the National Economy. As described in the ICSID database.

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