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Employment concentration and resource allocation: one-company towns in Russia

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Summary

The paper looks at the effects of employment concentration on resource allocation with a particular focus on one-company towns in Russia: towns where a single company accounts for a significant share of total employment. Empirical analysis of firms' production functions indicates that firms located in one-company towns are characterised by lower labour productivity, higher marginal capital productivity and lower overall productivity pointing towards significant labour hoarding. One-company town firms are also found to be financially more vulnerable. The paper argues that the dominance of natural resources in the Russian economy and employment concentration are closely linked.

Keywords: employment concentration, one-company towns, labour productivity, Russia

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1. Introduction

Russia is an economy dominated by natural resources. Despite stated policy objectives of diversification, this dominance has actually increased over the past 20 years (Guriev, Plekhanov and Sonin, 2009).[1] This can be attributed to the boom in natural resource prices in the 2000s and to the resource re-allocations that have accompanied that boom. In this paper, we look at a related – but less acknowledged – feature of the Russian economy: its legacy of concentration in employment. We argue that the dominance of natural resources and employment concentration are in fact quite closely linked, with the latter affecting the composition of natural resource revenue spending.

In particular, natural resources are associated with rent income (revenue determined by international prices of resources net of extraction costs), a large proportion of which accrues to the government and state-owned companies. Various lobby groups naturally compete for these rents. Labour concentrations increase the bargaining power of lobby groups associated with respective enterprises, sectors or regions, as these concentrations increase the political cost of enterprise failure leading to (localised) social discontent. A combination of increased bargaining power and availability of rent income can make lobbying successful, with extra rent income allocated to areas of high labour concentration. This, in turn, delays enterprise restructuring, locks in labour concentration, and hinders competitiveness of manufacturing, thus maintaining or increasing both the resource dependence (relative importance of resource rents for the economy) and labour concentration. The paper provides partial empirical evidence consistent with this hypothesis.

Although extractive industries now account for only around 11 per cent of total value added in Russia, their true contribution is actually far higher. As much as 60 per cent of industrial production is concentrated in related sectors, such as refining or fertilisers, while a significant share of value added in services is accounted for by trade in natural resources and trans-shipment of oil, gas and minerals (Kuboniwa, Tabata and Ustinova, 2005; World Bank, 2004). Their weight in general government revenues is over 35 per

[1] In the 1980s the Soviet Union had a seemingly well diversified economy with manufacturing accounting for over 20 per cent of total output. Yet much of what were notionally non-natural resources tradables were actually only tradable within the CMEA.

cent and around 55 per cent of federal government revenues. While exports have shifted away from other CIS countries towards the EU-15, the composition of Russia's export basket has remained largely unchanged since the mid-1990s, with oil and gas exports continuing to dominate all regions. As such, most economic activity is concentrated in the periphery of the product space – mainly in hydrocarbons (Hausmann and Klinger, 2007).[2] Interestingly, while extractive industries only directly account for 1.5 per cent of total employment; their weight in value added is many multiples that of employment.

The growth in the relative size of the natural resource sector might have been expected as the restructuring of non-resource-based Soviet-era firms and industries played out, but the scale of shift and its apparent persistence requires explaining. In this paper we argue that part of the explanation can be traced to the way in which the inherited composition and location of output has had an impact on policy, largely due to the underlying sensitivity of Russian governments to the risk of mass unemployment; a sensitivity that, paradoxically, has likely been heightened by the absence of an unemployment insurance programme offering reasonable level of benefits.

To get a sense of why employment and, in particular, employment concentration has mattered, it should be noted that pre-transition, in 1989, with the exception of the wider region around Moscow, between 25 and 75 per cent of industrial employment in each region was concentrated in industries that had four or fewer firms in that region (Brown, Ickes and Ryterman, 1994). Further, even when a plurality of firms was operating in a locality, these were often within the same sector, resulting in many local economies being dependent on one particular industry. As discussed later, this mono-industry economic geography arose as a combination of enterprise locations having been driven primarily by natural resources, reliance on economies of scale and absence of market competition, and evacuation patterns during the Second World War.

This legacy has not been quick to wither away. A recent estimate has suggested that one-company towns – particularly severe instances of employment concentration that were

[2] Periphery of the product space is the part of the space that is relatively poorly connected with other industries. Connectedness of industries A and B is measured as the minimum of conditional probabilities of exporting good A conditional on exporting good B, and vice versa.

commonly created for strategic, military or economies-of-scale reasons — still exceed 400 and account for over 12 per cent of Russia's population.[3] Low labour mobility within Russia has further impeded restructuring of these entities and tended to sustain these loci of employment concentration. These in turn have continued to attract public resources with the specific purpose of stabilising employment, as well as maintaining some of the benefits, such as child care and health care, that these firms have provided in lieu of local government (Commander and Jackman, 1997). Put simply, the inherited employment distribution has materially affected the subsequent allocation of resources. Firms with concentrated employment have been able to lobby various levels of government due to the latter's sensitivity to raising open unemployment rates, particularly given a large spatial mismatch between job vacancies and workers.[4] This trend has been associated with the related growth in the size of the state and, in particular, by the growth in government consumption; phenomena driven in much of the last decade by the explicit aim of putting the public sector at the heart of the economy.

This paper looks at whether performance of one-company town enterprises in Russia is consistent with this hypothesis. Certainly, the predicament of one-company towns has often been in the media spotlight. However, this could be because the situation of these towns epitomises the problems of the Russian industry in general and these enterprises are in fact no different from firms elsewhere in the economy. However, our empirical comparison of production functions of enterprises reveals that one-company town enterprises tend to be characterised by significantly lower marginal products of labour and significantly higher marginal products of capital, suggesting substantial labour hoarding. These effects manifest themselves not only in a cross-section but also in a panel setting controlling for enterprise fixed effects, suggesting that productivity differentials have been widening. In addition, there is also evidence that overall productivity is substantially lower in one-company-town firms. Finally, the these firms are also found to be more indebted, and hence more financially vulnerable, than

[3] Institute for Social Policy, cited by Bloomberg, 27 May 2010.

[4] We will be able to look at this in more empirical detail in a later version of the paper using newly available RosStat data that reports subsidies by region and sector for recent years. An instance of this sensitivity is Pikalyovo, a town of around 23,000 inhabitants with two large cement plants where a strike in 2009 led to a visit by the Prime Minister and a promise of investment.

comparable enterprises located elsewhere, although the economic magnitude of differentials in indebtedness was not as high as that of differentials in the marginal products of labour and capital.

Taken together, these findings are consistent with the hypothesis that natural resource dependence and employment concentration reinforce one another. Commodity revenues make it possible to sustain less efficient enterprises in areas with concentrated employment. In turn, this impedes restructuring in the manufacturing sector and improvements in competitiveness, further locking in dependence on commodity revenues. It should be noted that the paper provides only a partial test of this hypothesis, by showing that enterprises in areas of high employment concentration have been consistently less efficient, and that efficiency differentials have been, if anything, widening. The link to commodity rents is implicit rather than explicit, and should be subject of future research.

The rest of the paper is structured as follows. Section 2 discusses the implications of a resource boom for allocation of resources and the interaction between resource dependence and inherited employment concentration structures that may reinforce each other. Section 3 provides an empirical analysis of enterprise performance in one-company towns in Russia. A conclusion follows.

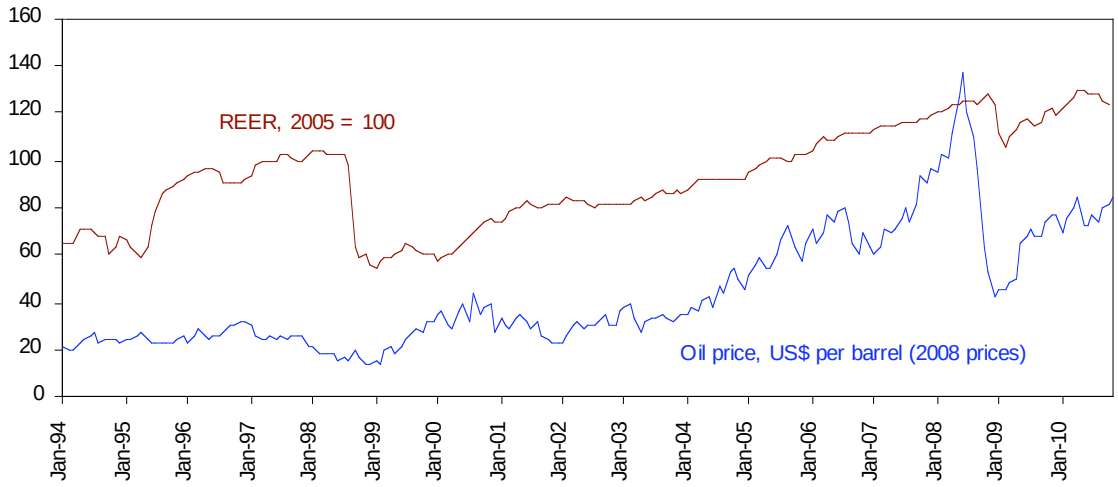
2. Resource allocation and one-company towns

2.1. Resource allocation with a booming sector

Chart 1 plots the evolution of the oil price[5] and the real exchange rate for Russia since the mid-1990s. Oil prices have oscillated sharply – from a low of under US$ 9 per barrel of Urals in late 1998 to a peak of US $138 in mid-2008, before falling to a trough of US$ 35 per barrel in the same year. By 2010, prices had rebounded to a range of US$ 75-85 per barrel. The chart also shows that since the early 2000s there has been a very strong appreciation of the exchange rate that was inflected only to a very limited extent at the height of the crisis in 2008-09. Clearly, Russia has been characterised by a booming natural resource sector that has affected relative prices.

Chart 1

Russia: oil price and real effective exchange rate (REER)



Sources: IMF International Financial Statistics, World Development Indicators and authors' calculations.
Note: Oil price is expressed in real terms (2008 prices) using US CPI.

In a general equilibrium setting with non-traded and traded goods, the price of the former will be determined endogenously through domestic supply and demand and the latter will be determined exogenously, with equilibrium occurring through adjustment of the price of the non-traded good relative to the traded good, the inverse being the real exchange rate (Salter, 1959; Corden, 1984). A booming natural resource price can induce resource

[5] Gas prices followed oil prices quite closely over most of this period.

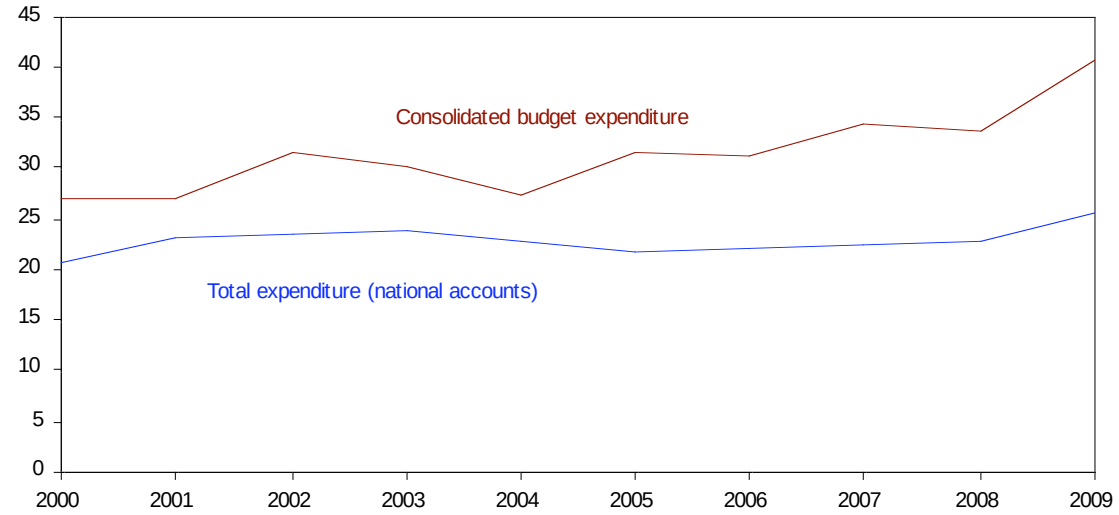
allocation effects, as excess demand for non-traded goods leads to real exchange rate appreciation. In addition, spending on non-tradables can raise their relative price. Both channels can affect the composition of output by raising the share of non-traded output in total output. However, any such shifting of resources into non-tradables may lower long-term growth on account of differences in productivity (Van Wijnbergen, 1984; Sachs and Warner, 2001). In short, an increase in the relative price of natural resources, as well as the fact that a part of the revenues from the booming sector will be directly spent on non-traded goods, can affect the dynamic structure of production. These effects could occur in the absence of any political economy considerations. However, as the bulk of revenues from the booming sector in Russia has accrued to government, given its (increasing) ownership and control of the natural resource sectors, political economy considerations are also likely to have been important.

Decomposing spending across tradables and non-tradables is always difficult, not least given data organisation and limitations. In Russia, this is accentuated due to the gap between notional and actual tradability; a legacy of the Soviet past.[6] Nevertheless, there are several indicators that we can use. Chart 2 gives the evolution of government size using two measures, the national and fiscal accounts. Government size according to the more inclusive fiscal measure increased sharply from around 27 per cent of GDP in 2000 to 40 per cent by 2009 while simultaneously accounting for around a quarter of aggregate consumption. The growing wedge between the fiscal and national accounts estimates of the size of government reflects the rising importance of transfers recorded both as budget expenditure and private consumption.

[6] Specificity in clients and suppliers also contributed to the scale of output contraction that occurred following the demise of the Soviet Union. See Blanchard and Kremer (1997) and Ickes (2008).

Chart 2

Russia: Government expenditure (in per cent of GDP)



Sources: Ministry of Finance, RosStat and authors' calculations.

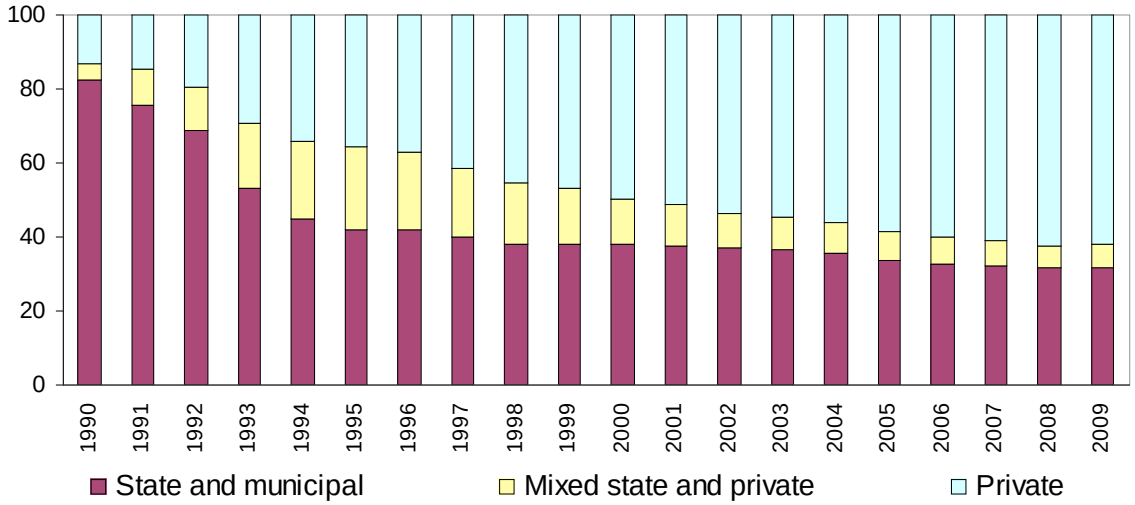
2.2. Political economy

Part of the increase in government size can be attributed to the expansion of public employment. Government employment at federal, regional and municipal levels grew by over 35 per cent from 1998 to 2000 and from 2007 to 2009. Chart 3 amplifies the point regarding the importance of public sector employment. Although the share of state and mixed ownership firms that were legal entities in total firms was around 11 per cent, employment in state and mixed firms was almost 40 per cent in 2007.[7] A sectoral breakdown would show some preponderance of state ownership in energy and natural resource sectors but also a significant presence in manufacturing and chemicals, among other sectors. Given that government and social services, health and education accounted for around 25 per cent of total employment at this time, it is evident that the public sector has remained large. In short, resource allocation effects towards non-tradables seem to have been significant.

[7] Calculated as firms and organisations including commercial firms, non-commercial organisations and state institutions registered as legal entities, see Sprenger (2008).

Chart 3

Russia: employment share by ownership type (in per cent)



Sources: RosStat and authors' calculations.

Further, employment-motivated spending has been wider. Although explicit subsidies to the entire firm sector have remained small – in the range of 2 to 5 per cent of GDP – this does not capture the full scale and scope of public transfers. The fiscal stimulus package of 2009-10 had a combination of social spending and support to large firms that accounted for the largest share of the package, amounting to over 3 per cent of GDP. Declared spending on one-company towns alone in 2010 has been initially put at around US$ 900 million.[8] In addition, in 2009 the government set up a working group on one-company towns whereby these towns can submit redevelopment programmes and applications for federal co-financing of various investment projects ranging from infrastructure to capital stock modernisation. By the end of 2010 around 50 comprehensive investment plans had been agreed. All of this suggests that the firm sector and, perhaps particularly, those with concentrated employment have received significant support from government or government controlled institutions.

The impact of high natural resource prices on an economic structure characterised already by low productivity, as well as the persistence of non-market based criteria for resource allocation, is also likely to have political economy dimensions. At its most simplistic, the

[8] Speech of the Russian Prime Minister, 20 May 2010.

median voter over time may have increasingly come to resemble a public sector worker. Yet the classic median voter model does poorly in linking median preferences to policy outcomes and, in the Russian instance, would additionally have to be qualified by the institutional parameters that have surely affected how preferences have been aggregated or indeed have mattered as pluralistic electoral behaviour appears to have been diminished over the reference period.[9] Yet even though this point seems relevant, the government – federal and subnational – has clearly remained very sensitive to economic performance (as indicated by the size and configuration of the stimulus programme of 2009-10) and to employment (as indicated by the presence and size of the one-company town programmes). This has influenced the direction and composition of public spending, as commodity rents have been realised. Economic policy and public spending have aimed to raise general living standards through growth[10] and, at the same time, achieve some redistribution in order to limit unemployment and social unrest.[11] The latter risk, as already mentioned, has been accentuated by the inheritance of concentrated employment and labour market inefficiencies, notably spatial mismatch.

We argue that the way in which the resource rents have been allocated in Russia has been affected by the inherited configuration of output and employment as well as by the motivation of politicians. Incumbent politicians can acquire an incumbency advantage by using a permanent increase in natural resource rents to 'buy' support through generating employment in the public sector.[12] But how politicians allocate those resources may also lead to severe misallocation both on account of the scale of support buying or through the way in which it is channelled. In the Russian case, the latter seems particularly relevant, not least because public employment is generally inefficient. Further, the adverse effects of resource rent allocations have also been found to be larger where political and other

[9] For example, the Heritage and Polity IV political indicators both indicate a decline in democratic status.
[10] See, for example, the declared objectives of government economic policy in the immediate aftermath of the 2008 crisis.
[11] This relates to the wider literature as to whether natural resources tends to be associated with authoritarian political behaviour or whether dominance of natural resources is more a reflection of political authoritarianism. See, among others, Acemoglu, Robinson and Verdier (2006).
[12] For a model that links politics, natural resources and institutions, see Robinson, Torvik and Verdier (2006). The incumbency bias arises because the incumbent can credibly determine employment in advance.

institutions are weak and limit transparency.[13] Institutional integrity and capacity in Russia, under most measures, has been low and often declining in the recent past.

In this framework, the next sections offer an empirical test of whether enterprises in one-company towns have been less efficient, suffered from relative resource misallocations and have been financially more vulnerable (in terms of their levels of indebtedness) compared with enterprises in more diversified localities. We find support for these hypotheses. It is preceded by a short overview of the economic literature on one-company towns.

2.3. One-company towns: an overview

Although one-company towns are often associated with centrally planned economies, they were in fact common elsewhere. One-company towns had grown up in the United States towards the end of the 19th century, particularly in the industrial areas of the Mid-West,[14] and at their peak were over 2,500 in number, accounting for up to 3 per cent of the US population. In the United Kingdom, the Cadbury company town of Bourneville and Lord Lever's Port Sunlight were the best known examples. They reflected a paternalistic motivation by their employers towards their workers (Green, 2010; Solecki, 1996). But other one-company towns, particularly in the mining industry, were characterised by less benign conditions, being driven primarily by geographic considerations (Fishback and Lauszus, 1989, for the United States; Gibson (1990) for Australia).

One-company towns became particularly widespread in the Soviet Union. This reflected a combination of size (the vast land mass), relatively low population density, and significant deposits of various natural resources, often located in areas with a very inhospitable climate (for example, Norilsk). In part, it also reflected the preference of central planners for scale economies and low input (energy) prices. Finally, a significant number of large industrial enterprises were moved further east from their historical

[13] See Mehlum, Moene and Torvik (2006).
[14] Pullman, Ohio, built for the 6,000 employees of George Pullman's railway company, and McDonald, Ohio, created by Carnegie Steel Company, are prominent examples. See Buder (1967) for an overview.

locations during the Second World War. Many of them remained in their new locations – locations chosen precisely for reasons of poor accessibility.

The economic literature on one-company town enterprises is relatively modest. Rama and Scott (1999) have looked at incomes in one-company towns in Kazakhstan, where mono-towns were also common, using data from the 1996 living standards survey and found that labour earnings in a town decreases by approximately 1.5 per cent when the share of its population working for the anchor company decreased by 1 per cent. This could be interpreted as evidence of leverage of one-company enterprises during the early years of transition. Commander and Jackman (1997) looked at the incidence of non-monetary compensation in transition firms, including one-company and one-industry towns, and showed how the dependence of local public services on the viability of a firm or industry was a serious structural defect in the system of local government finance.

3. Empirical analysis

3.1. Data

To identify enterprises in one-company towns and assess their relative performance, the analysis below uses the Orbis database of Russian enterprises collected by Bureau van Dijk over the period 2003–08. The database provides annual information on the majority of Russian firms, covering basic balance sheet aggregates, total employment, industry affiliation and enterprise location. The panel is unbalanced and coverage generally improves over time. Table 1 summarises the basic descriptive statistics for selected variables for companies with more than 25 employees. The table is based on data for 2007. In addition – and for comparison purposes – the lower part of the table includes a summary for some of the variables used in the analysis for the monotown companies.

Table 1

Descriptive statistics for selected variables

Variable	*Mean*	*St. dev.*	*Median*	*Min*	*Max*	*k var*
			Overall			
Production variables (in thousands of US dollars, unless otherwise indicated)						
Operating revenue (turnover)	15,100	143,300	2,109	1	6,094,733	949.0
Employment (persons)	200	793	59	25	31,441	395.8
Total assets	12,597	129,980	1,225	2	4,986,583	1,031.9
Fixed assets	6,141	76,789	244	1	2,855,421	1,250.3
Total assets per employee	44.9	333.6	16.7	0.0	25,151.8	742.6
Fixed assets per employee	18.7	221.8	3.4	0.0	16,896.0	1,185.3
Revenue per employee	35.5	234.9	20.5	0.0	18,949.1	661.0
Financial structure variables (in per cent, unless otherwise indicated)						
Tangibility ratio	29.2	22.8	25.4	0.0	99.7	78.1
Profitability ratio	12.3	18.5	8.9	-99.7	99.9	150.4
Long-term debt-to-assets r.	6.9	16.3	0.0	0.1	99.6	236.2
Debt-to-assets ratio	18.6	23.0	8.6	0.0	99.8	123.7
			One-company town enterprises (using the 5 per cent cut-off)			
Production variables (in thousands of US dollars, unless otherwise indicated)						
Operating revenue (turnover)	129,412	492,275	13,001	3	4,098,520	380.4
Employment (persons)	1,564	3,446	466	52	31,441	220.3
Total assets	134,369	526,353	10,239	26	3,466,946	391.7
Fixed assets	79,949	343,551	3,815	1	2,799,211	429.7
Total assets per employee	50.5	132.5	22.4	0.1	1,250.3	262.3
Fixed assets per employee	27.5	98.4	7.4	0.0	1,009.5	357.4
Revenue per employee	30.5	61.4	18.6	0.0	608.7	201.3
Financial structure variables (in per cent, unless otherwise indicated)						
Tangibility ratio	40.2	20.5	39.1	0.1	95.9	51.0
Profitability ratio	11.8	15.1	9.0	-42.9	72.1	128.0
Long-term debt-to-assets r.	11.1	19.3	0.0	0.0	93.3	173.9
Debt-to-assets ratio	27.4	25.6	19.7	0.0	99.8	93.4

Sources: Bureau Van Dijk, authors' calculations.

Note: Based on year 2007; 7,080 observations for production variables (of which 177 in one-company towns); and 17,050 observations for financial structure variables (of which 561 in one-company towns). K var is coefficient of variation (in per cent).

The judgement about what constitutes a one-company town – that is, a town dominated by one enterprise – is inevitably subjective, as almost no town has strictly one firm operating in it. In this light and in order to identify enterprises that account for a large share of employment in their respective locations, the population data were matched for each town using the 2002 population Census results published by the Office of Statistics

(RosStat).[15] Thus, each mining and manufacturing enterprise can be characterised in terms of the share of the local population it employs. In the absence of detailed data on demographics and employment structure in each town it is necessary to make a judgement on what share of population employed by an enterprise will qualify it as a monotown enterprise. Back-of-envelope estimates, as well as some prominent examples of one-company towns, suggest a threshold of around 5 per cent. On average, the employment-to-population ratio in Russia is around 48 per cent and has been broadly stable over years and across regions. Most people are employed in services, manufacturing accounts for 16.5 per cent of total employment, and mining for an additional 1.5 per cent. Thus, on average, manufacturing and mining employ around 8.5 per cent of the population. Services tend to be concentrated in large and coastal cities, and agriculture in rural areas, implying that manufacturing-oriented, one-company towns will have a much higher share of population employed in manufacturing and mining. Nonetheless, services (including government and social services, education, health care, real estate and construction) are still likely to account for around two-thirds of employment. Thus an enterprise employing 5 per cent of the population is likely to account for more than a third of employment in core industries (manufacturing and mining) while a manufacturing enterprise employing 10 per cent of the population will almost certainly dominate the economy of the locality and the livelihood of its people.

These thresholds also seem to be consistent with cases of one-company enterprises that have made headlines in Russia since 2008-09. For example, a city with a population of 16,000 – Baikalsk in Irkutsk Region – came to prominence for environmental and social considerations. The livelihood of the majority of the population depends on a single enterprise, a paper factory built in the 1960s, which is a major polluter situated on the banks of the world's largest fresh water lake. Before the suspension of activity in 2008 the factory employed around 2,300 people or 14 per cent of the population. After numerous protests, the government granted the factory exemption from ecological standards applied around the Baikal Lake and production has resumed. The town was also included in the monotown assistance federal programme.

[15] The Census provides population figures individually for all towns with a population over 3,000 as well as for smaller towns and villages in less densely populated areas.

Avtovaz, the giant car maker which employed around 100,000 people and had to be bailed out by the federal government when demand for passenger cars dropped sharply at the height of the financial crisis, accounts for a similar share of the population in Togliatti, a 700,000-plus city in the Samara Region. Although Togliatti is much larger than Baikalsk and is not a single industry city in a strict sense – it is home to Russia's biggest ammonia manufacturer and a major dairy factory – Avtovaz is absolutely central to the local economy.

Pikalyovo, a town in Leningrad Region with 23,000 people, became widely known in June 2009 when employees of three local enterprises blocked the St Petersburg-Vologda highway demanding that wage arrears be cleared and job security ensured.[16] The enterprises are closely interlinked, having been part of one cement production chain. However, the cement factory alone, which employed around 800 people, falls short of the 5 per cent of population threshold. Nonetheless, together, the related enterprises employ over 10 per cent of the population and effectively determine the fortunes of this one-industry town.

In a similar vein, the World Bank (2010) highlights the case of Dalnegorsk, a remote town in the Russian Far East with a population of 40,000 people. The local economy is underpinned by two enterprises, Dalpolimetal, a zinc producer founded in 1897 and employing 2,000 people, and Bor, a boric acid producer founded in 1958 and employing over 3,400 people (both Dalnegorsk firms clear the 5 per cent threshold but neither employs more than 10 per cent of the town's population). Both enterprises are in a difficult financial situation and diversification options for the city are constrained by its very remote location.

The definition of a one-company town enterprise as one that employs over 5 per cent of the population seems to accommodate these recent high-profile cases. A stricter 10 per cent threshold can also be applied. The key limitation of both definitions is the possibility that an enterprise is split vertically along the value added chain into separate independent enterprises and none of the components clear the definition threshold or, conversely, that

[16] A notable piece of political theatre followed, in which the Prime Minister on camera berated the owner of the plant, the oligarch, Deripaska. That did not, however, stop the latter's Basic Element being a major recipient of public support in the crisis.

the accounts of the enterprise are consolidated into a nationwide industrial group which owns different production facilities. While both consolidation and disaggregation cases can be found in the data, they do not seem to be widespread.

Finally, to avoid a situation where enterprises around the 5 per cent threshold switch their status from year to year, maximum employment over the period 2003-08 is used to assign the one-company town status.

3.2. One-company town enterprises: descriptive statistics

Overall, the list of one-company enterprises (using the 5 per cent cut-off) comprises 868 firms with wide dispersion across regions and industries, of which 392 companies also clear the 10 per cent threshold. This list is not comprehensive as it is subject to disaggregation and consolidation caveats, and a number of relevant firms may not feature in the Orbis database or may not have their employment or industry recorded correctly, as Orbis covers around 84 per cent of manufacturing and mining employment reported and assigned to individual industries in RosStat yearbooks. Nonetheless, it is likely to provide a close first approximation of reality.

Table 2 shows that one-company town enterprises account for over 17 per cent of overall employment in mining and manufacturing. They are particularly prevalent in the industrial core of Russia – the Urals Federal District – where they employ every third manufacturing and mining worker. In terms of industry breakdown (Table 3), mining comes first with roughly half of employment concentrated in one-company town enterprises. This is intuitive, as mining towns tend to grow for the specific purpose of minerals extraction and remain undiversified economic localities in often remote areas. One-company town enterprises also account for 31 per cent of employment in vehicle manufacturing; 23 per cent in metals; 17 per cent in petrochemicals; and 15 per cent in wood processing and paper manufacturing. Coincidentally, the examples mentioned above cover all these industries. But even in light industry, a non-negligible share of employment is accounted for by one-company towns (up to 10 per cent in the textile sector).

Table 2. Russian Manufacturing and Mining Employment by Region

(Number of employees)

Federal district	*One-company towns with 10 per cent cut-off*	*One-company towns with 5 per cent cut-off*	*Dataset total*	*RosStat total (2007)*
Urals	346,563	458,987	1,076,459	1,260,154
Volga	342,359	580,781	1,948,471	2,622,974
North West	121,698	143,932	898,321	1,061,758
Central	142,794	347,498	2,780,811	2,857,005
Far East	30,235	36,616	218,918	324,615
Siberia	73,305	109,315	852,271	1,222,721
South	16,576	28,217	601,995	884,242
TOTAL	**1,073,530**	**1,705,346**	**8,377,246**	**10,233,469**

Federal district	*OCT (5%) in per cent of dataset employment*	*Dataset in % of RosStat employment*	*OCT (5%) in per cent of RosStat employment*	*OCT (10%) in per cent of RosStat*
Urals	42.6	85.4	36.4	27.5
Volga	29.8	74.3	22.1	13.1
North West	16.0	84.6	13.6	11.5
Central	12.5	97.3	12.2	5.0
Far East	16.7	67.4	11.3	9.3
Siberia	12.8	69.7	8.9	6.0
South	4.7	68.1	3.2	1.9
TOTAL	**20.4**	**81.9**	**16.7**	**10.5**

Sources: RosStat, Bureau Van Dijk, authors' calculations.

Note: RosStat total is based on the 2007 data.

Table 3

Russian manufacturing and mining employment by industry

(Number of employees)

Industry	*One-company towns with 10 per cent cut-off*	*One-company towns with 5 per cent cut-off*	*Dataset total*	*RosStat total*
Manufacturing	**664,983**	**1,228,399**	**7,364,325**	**9,258,943**
Vehicles	202,179	358,075	772,839	1,147,900
Metals	132,882	264,028	1,105,241	1,153,700
Petrochemicals	79,018	153,709	806,253	931,300
Wood and paper	74,584	119,018	599,451	739,400
Minerals	50,665	81,917	511,682	675,000
Textiles	34,225	47,445	301,259	509,900
Food	57,167	106,267	1,388,482	1,456,500
Electronics	14,270	36,543	851,200	905,700
Machinery	7,936	43,276	848,098	1,108,600
Other manufacturing	12,057	18,121	179,820	630,943
Mining	**408,547**	**476,947**	**1,012,921**	**974,526**
Oil and gas	125,896	142,087	270,229	619,400
Other mining	282,651	334,860	742,692	355,126
TOTAL	**1,073,530**	**1,705,346**	**8,377,246**	**10,233,469**

Industry	*OCT (5%) in per cent of dataset employment*	*Dataset in % of RosStat employment*	*OCT (5%) in per cent of RosStat employment*	*OCT (10%) in per cent of RosStat*
Manufacturing	**16.7**	**79.5**	**13.3**	**7.2**
Vehicles	46.3	67.3	31.2	17.6
Metals	23.9	95.8	22.9	11.5
Petrochemicals	19.1	86.6	16.5	8.5
Wood and paper	19.9	81.1	16.1	10.1
Minerals	16.0	75.8	12.1	7.5
Textiles	15.7	59.1	9.3	6.7
Food	7.7	95.3	7.3	3.9
Electronics	4.3	94.0	4.0	1.6
Machinery	5.1	76.5	3.9	0.7
Other manufacturing	10.1	28.5	2.9	1.9
Mining	**47.1**	**103.9**	**48.9**	**41.9**
Oil and gas	52.6	43.6	22.9	20.3
Other mining	45.1	209.1	94.3	79.6
TOTAL	**20.4**	**81.9**	**16.7**	**10.5**

Sources: RosStat, Bureau Van Dijk, authors' calculations.

Note: Rosstat total is based on 2007 data.

3.3. Empirical analysis: enterprise performance

To assess whether the performance of one-company town enterprises is systematically different from enterprises elsewhere, simple production functions can be considered relating total output to capital stock, labour, and industry and location characteristics. Consider the following specification:

$$y_{it} = \alpha_{1i} + \beta_1 k_{it} + \gamma_1 l_{it} + \delta_t + \varepsilon_{it} \qquad \text{(R1)}$$

where y is the logarithm of total turnover (the best available proxy for total sales), k is the logarithm of capital stock (fixed assets), l is the logarithm of the number of employees (in full-time equivalents), δ are year fixed effects, subscript i denotes enterprise and subscript t denotes year. All sales and balance sheet variables are expressed in US dollars in constant prices using GDP deflators adjusted for exchange rate fluctuations.

In fixed effects regressions, which control for time-invariant characteristics of enterprises, the status of one-company town enterprises will be part of the fixed effect and cannot be identified separately. However, differences in marginal products of labour and capital (slope coefficients of k_{it} and l_{it}) between one-company town enterprises and other firms can be identified using the following augmented specification:

$$y_{it} = \alpha_{2i} + \beta_2 k_{it} + \beta_3 k_{it} * D_i + \gamma_2 l_{it} + \gamma_3 l_{it*} D_i + \delta_t + \varepsilon_{it} \qquad \text{(R2)}$$

where D_i is a dummy variable for one-company town enterprises using a 5 per cent (or alternative) threshold. Coefficient β_3 shows additional marginal product of capital in one-company towns relative to enterprises elsewhere, while coefficient γ_3 shows difference in labour productivity between one-company town enterprises and other firms.

Table 4 shows results of fixed effects estimation for all manufacturing (and mining) firms in the sample with 25 employees or more. Column A reports results for a basic production function of the type (R1), in column B interaction terms between capital and one-company town enterprise and labour and one-company town enterprise are added. Further columns report results of several robustness checks. In column C mining companies are included alongside manufacturing companies, and in column D total assets substitute for fixed assets. The key results remain unaffected.

There are a few empirical regularities that emerge from the fixed effects analysis. Most importantly, the coefficients on the interaction term between labour and one-company town dummy is negative and significant, while the interaction term between proxies for capital and the one-company town dummy is positive and significant. These results are indicative of labour hoarding in one-company towns and/or underinvestment in capital stock and technological modernisation. As a robustness check, we include a similar table (Annex Table A1) which uses a one-company town dummy set at a higher threshold (10 per cent). The results regarding the coefficients of labour and capital remain unaffected, but the interaction terms mostly lose their significance (only the interaction term between employment and the one-company town in column C is significant, albeit at a 10 per cent level of significance).

The coefficient of the interaction term between employment and one-company town dummy is negative and significant, suggesting that a 10 per cent increase in employment in one-company town companies is associated with an approximately 1.5 percentage point lower increase in output than at other comparable enterprises. As mentioned above, the sign of the interaction term is also indicative of possible labour hoarding in these types of companies. On the other hand, an increase in capital in one-company towns is associated with a 1.5 or 3 per cent higher increase in output compared with peers elsewhere (depending whether fixed or total assets are used as proxies for capital). This could be an indication of possible underinvestment in capital stock and technological modernisation.[17]

[17] To check if the results for one-company town enterprises merely reflect the fact that one-company town enterprises tend to be large, robustness checks also included specifications with dummy variables for other large enterprises (those employing more than 500 people or more than 1,000 people) and the respective interaction terms with measures of labour and capital. The effects specific to one-company towns persist. In addition, the estimation provides some evidence of labour hoarding and lower marginal product of labour in large companies. The results are available upon request.

Table 4

Production functions: fixed effects estimation

Dependent variable: Operating revenue, log

Fixed effects	A	B	C	D
Employment, log	.878*** (.012)	.880*** (.012)	.887*** (.012)	.764*** (.011)
Fixed assets, log	.197*** (.007)	.195*** (.007)	.198*** (.006)	
Total assets, log				.411*** (.009)
Log employment * OCT		-.143* (.082)	-.169* * (.070)	-.117 (.084)
Log fixed assets * OCT		.169* (.094)	.150 * (.079)	
Log total assets * OCT				.330*** (.124)
Constant	2.247*** (.055)	2.238*** (.055)	2.202*** (.054)	1.014*** (.058)
Year fixed effects	Yes	Yes	Yes	Yes
Number of observations	56,332	56,332	61,196	63,027
Number of groups	19,179	19,179	20,981	20,950
R_	0.61	0.61	0.62	0.66

Note: Estimated by fixed effects, robust standard errors in parentheses. All variables are expressed in real terms using GDP deflators. Sample includes manufacturing firms employing 25 people or more, 2003-08. OCT is one-company town enterprise dummy (using 5 per cent cut-off). *** indicates significance at 1 the per cent level, ** at the 5 per cent level, and * at the 10 per cent level.

Fixed effects estimation may understate productivity problems in one-company towns because the time-invariant (systematic) component of lower output of these enterprises, if any, will be subsumed by enterprise fixed effects. A complementary approach would be to focus on cross-enterprise dimensions of the dataset and analyse the between effect estimates of productivity. Between effects estimation exploits differences in average output over a certain period of time (2006-08 in this case) and differences in time averages of the explanatory variables.[18] Specification (R3) is a cross-sectional adaptation of specification (R2): augmented with industry dummies (at two-digit level), federal district dummies, as well as a dummy variable for one-company town enterprises (denoted X_i).

$$y_{it} = \alpha_3 + \beta_4 k_{it} + \beta_5 k_{it} * D_i + \gamma_4 l_{it} + \gamma_5 l_{it*} D_i + \sigma D_i + \lambda X_i + \eta_{it} \qquad \text{(R3)}$$

[18] For cross-sectional analysis the sample was restricted to the subperiod of 2006-08 as data availability for the earlier period (2003-05) is relatively poor. The results generally hold if the entire period of 2003-08 is considered.

Table 5 summarises the results of the between effects estimation. Column A reports coefficients of a basic production function, which is augmented with one-company enterprise dummy and the corresponding interaction terms in column B. As expected, the implied differences in productivity between one-company town enterprises and other firms become larger. Firstly, the one-company town dummy is negative and significant, and its magnitude is far higher than those of the industry or regional dummy. In quantitative terms, it suggests that the output of a one-company town enterprise is up to 70 per cent lower compared with its peers, other things being equal.[19] Coefficients on the interaction terms suggest that the marginal product of labour is lower and marginal product of capital is higher in one-company town enterprises and these effects are statistically and economically significant. These results are indicative of labour hoarding in one-company towns and/or underinvestment in capital stock and technological modernisation. As a robustness check we include an annex table (Table A2) which uses a higher threshold one-company town dummy (10 per cent). The one-company town dummy is still negative and significant, with comparable magnitude to the one at the five per cent threshold. In addition, the coefficients on the interaction terms are broadly the same in terms of sign and magnitude (however, the interaction term between the one-company town dummy and employment loses its significance across all models).

The coefficient of the interaction term suggests that an increase of employment by 10 per cent in the one-company town companies is associated with an average of 3 percentage point lower increase in output compared with other enterprises. Similarly, an increase in capital in one-company towns is associated with a 3 percentage point higher increase in output. Just as in the fixed effects estimations above, the results suggest possible labour hoarding and underinvestment in capital taking place in one-company towns.

[19] Logarithmic transformation implies that the coefficient σ of the one-company town dummy variable corresponds to the term e^{σ} in multiplicative production function of Cobb-Douglas type. For instance, the coefficient of -1.2 corresponds to a multiplicative term of 0.3.

Table 5

Production functions: cross-section analysis

Dependent variable: Operating revenue, log

Between effects	A	B	C	D	E
Employment, log	0.891 (.010)***	0.904 (.011)***	0.916 (.010)***	0.917 (.010)***	0.608 (.010)***
Fixed assets, log	0.121 (.005)***	0.119 (.005)***	0.109 (.004)***	0.118 (.004)***	
Total assets, log					0.414 (.006)***
Log employment * OCT		-0.280 (.084)***	-0.251 (.085)***	-0.231 (.067)***	-0.209 (.085)**
Log fixed Assets * OCT		0.337 (.052)***	0.350 (.053)***	0.280 (.041)***	
Log total Assets * OCT					0.329 (.063)***
OCT		-1.199 (.423)***	-1.508 (.426)***	-1.074 (.351)***	-2.005 (.434)***
Constant	2.526 (.072)***	2.495 (.073)***	2.558 (.037)***	2.493 (.048)***	1.592 (.066)***
Regional dummies	Yes	Yes	No	Yes	Yes
Industry dummies	Yes	Yes	No	Yes	Yes
Number of observations	28,511	28,511	28,511	30,954	31,631
Number of groups	13,385	13,385	13,385	14,602	14,751
R_	0.56	0.56	0.56	0.57	0.64

Note: Estimated by the between estimator, robust standard errors in parentheses. All variables are expressed in real terms using GDP deflators. Sample includes manufacturing firms employing 25 people or more, 2006-08. OCT is one-company town enterprise dummy (using 5 per cent cut-off). *** indicates significance at 1 the per cent level, ** at the 5 per cent level, and * at the 10 per cent level.

Columns C, D, and E report the results of several robustness checks. In column C industry and regional dummies are dropped; in column D mining firms are included alongside manufacturing enterprises; and in column E total assets substitute for fixed assets.[20]

[20] When dummy variables for other large companies are included separately or jointly with one-company town dummies, the differentials in marginal products of labour and capital for one-company town enterprises prove to be much stronger than for large companies overall.

3.4. Empirical analysis: indebtedness and financial vulnerability

The analysis above suggests that the problems of one-company town enterprises are not merely problems of an average Russian enterprise put in the spotlight because of its significance in the local economy. They appear to be compounded by even greater labour hoarding, lack of restructuring, and hence lower productivity. A related question is whether these enterprises are also more indebted and more financially vulnerable than their counterparts in more diversified local economies.

Following Rajan and Zingales (1995), the basic specification (R4) explaining indebtedness of a firm (ratio of debt to total assets, *Dd*) includes a measure of tangibility (the ratio of fixed assets to total assets, *Tng*), firm size (in terms of employment or turnover, *Size*), profitability (the return on assets, *Prf*) and industry affiliation and region (*X*):

$$Dd_{it} = \alpha_{it} + \beta Tng_{it} + \gamma Size_{it} + \mu Prf_{it} + \sigma D_i + \lambda X_i + v_{it} \qquad \text{(R4)}$$

Tangibility is expected to be positively associated with debt-to-assets ratio because more capital-intensive firms can offer better collateral on the one hand, and tend to require more external financing for investment projects on the other. Size is also expected to have a positive effect, while the effect of profitability is ambiguous: profitable firms may have more opportunities to finance investments out of cash flow but they may also seek to expand more aggressively. In addition, specification (R4) includes a dummy variable for one-company town enterprises (*D*). As the analysis focuses on cross-firm differences in average indebtedness, the model is estimated using the between panel estimator effectively employing average indicators for each firm for the period 2006-08.

Table 6 summarises the results for censured Tobit regressions when the long-term debt to assets ratio is used as a measure of financial leverage. Column A reports the basic Rajan and Zingales (1995) specification augmented with the one company town dummy. Consistent with their analysis, the coefficients on tangibility and size are positive and significant, while the coefficient of profitability is negative and significant. The magnitude and significance of the one company town coefficient suggests that enterprises in one-company towns have, on average, higher long-term debt-to-assets ratios. In numerical terms the size of the coefficient would imply that the long-term debt to assets

ratio in the one-company towns is on average about 1.5 per cent higher. Columns B, C, and D report additional model specifications. In model B, regional and sector dummies are introduced to the main specification, while in model C, the sample includes manufacturing and mining companies. Finally, in column D, logarithm of revenue per employee is included as an additional explanatory variable. This does not affect the results.

Table 6

Financial leverage: long-term debt

Dependent variable: Long-term debt-to-assets ratio

Tobit estimates	**A**	**B**	**C**	**D**
Tangibility	.451*** (.012)	.397*** (.012)	.407*** (.012)	.431*** (.018)
Employment, log	.036*** (.002)	.039*** (.002)	.036*** (.002)	.040*** (.003)
Profitability	-.079 *** (.022)	-.071 *** (.020)	-.084 *** (.022)	-.064 *** (.021)
OCT	.054 *** (.013)	.036 *** (.013)	.021 * (.012)	.066* * (.026)
Revenue per employee, log				.040*** (.003)
Constant	-.434*** (.010)	-.350** * (.021)	-.413** * (.013)	-.514** * (.032)
Regional dummies	No	Yes	Yes	Yes
Industry dummies	No	Yes	Yes	Yes
Number of observations	22,715	22,715	24,845	12,633
Pseudo R_	0.12	0.14	0.14	0.14

Note: Estimated by the tobit estimator using averages over 2006-08, standard errors in parentheses. Revenue is expressed in real terms using GDP deflator. Tangibility is the ratio of fixed assets to total assets; profitability is EBIT-to-assets ratio. Sample includes manufacturing firms employing 25 people or more, 2006-08. OCT is one-company town enterprise dummy (using 5 per cent cut-off). *** indicates significance at 1 the per cent level, ** at the 5 per cent level, and * at the 10 per cent level.

Table 7 summarises the results when the financial leverage proxy is broader and uses the ratio of long-term debt and short-term debt to assets as a dependent variable. The models are analogous to the models in Table 6. As in Table 6, the proxies for tangibility and size are positive and significant, while the proxy for profitability is negative and significant. The magnitude of the coefficient on the one-company dummy suggests that the debt-to-assets ratio is about 3 percentage points higher in one-company town enterprises, other

things being equal. This coefficient is statistically significant at the 5 per cent level in most specifications.[21]

Table 7

Financial leverage: long-term and short-term debt

Dependent variable: Long-term debt-to-assets ratio

Tobit estimates	A	B	C	D
Tangibility	.320*** (.010)	.235*** (.010)	.245*** (.010)	.255*** (.014)
Employment, log	.031*** (.001)	.033*** (.001)	.029*** (.001)	.034*** (.002)
Profitability	-.180 *** (.052)	-.161 *** (.047)	-.178 *** (.048)	-.141 *** (.054)
OCT	.070 *** (.013)	.047 *** (.012)	.027 ** (.011)	.067 *** (.022)
Revenue per employee, log				.027 *** (.003)
Constant	-.093*** (.010)	-.021 (.019)	-.063** * (.011)	-.121** * (.025)
Regional dummies	No	Yes	Yes	Yes
Industry dummies	No	Yes	Yes	Yes
Number of observations	22,508	22,508	24,592	12,468
Pseudo R_	0.12	0.21	0.20	0.19

Note: Estimated by the tobit estimator using averages over 2006-08, standard errors in parentheses. Revenue is expressed in real terms using GDP deflator. Tangibility is the ratio of fixed assets to total assets; profitability is EBIT-to-assets ratio. Sample includes manufacturing firms employing 25 people or more, 2006-08. OCT is one-company town enterprise dummy (using 5 per cent cut-off). *** indicates significance at 1 the per cent level, ** at the 5 per cent level, and * at the 10 per cent level.

As a robustness check, we also include two equivalent tables which use a higher threshold one-company town dummy (10 per cent). Table A3 uses the ratio of long-term debt to assets as a measure of financial leverage, while in Table A4 the dependent variable is the ratio of the sum of long-term debt and short-term debt (loans) to total assets. As in Tables 6 and 7, the magnitude and significance of the main determinants of financial leverage remain unaffected by use of the new dummy variable. Hence, both tangibility and size are positive and significant across all models, while profitability is negative and significant. The size and magnitude of the new dummy variable are comparable to those in Tables 6 and 7, although its significance drops in model C in Table A4.

[21] As before, the exercise was reproduced using dummy variables for large companies. The coefficients for monotown companies retained their sign and statistical significance, while the large company dummy proved to be insignificant.

4. Conclusion

Our paper has explored the links between resource dependence, employment concentration and resource allocation. We argue that dependence on commodity rents and high employment concentrations – manifested in the widespread presence of one-company towns – can interact, locking in a pattern of sub-optimal resource allocation while also impeding enterprise restructuring, modernisation and diversification of the economy. For political economy reasons, resource rents are channelled to localities with high employment concentration, which primarily supports labour hoarding. In turn, this can lead to a further decline of the non-resource sector (already affected by the change in relative prices and the real exchange rate). As such, the boom in natural resources in Russia has been associated with resource rent allocations that respect political objectives, notably of support buying (or perhaps, more accurately, opposition neutralising). With weak institutions, this is likely to have accentuated adverse efficiency effects.

Empirical support for these conjectures has been marshalled in our paper by identifying one-company towns using a large dataset of Russian enterprises and matching enterprise data with Census population data for the towns in which firms are located. Our analysis has confirmed the significance of one-company towns more than 20 years into transition – they were found to account for 13 to 17 per cent of manufacturing employment country-wide and over a third of manufacturing employment in the Urals Federal District, the industrial core of Russia.

Comparison of production functions of enterprises revealed that one-company town enterprises tend to be characterised by significantly lower marginal products of labour and significantly higher marginal products of capital, suggesting substantial labour hoarding in one-company-town firms. These effects manifest themselves not only in the cross-section but also in a panel setting controlling for enterprise fixed effects, suggesting the widening of productivity differentials. In addition, there is also evidence that overall productivity is substantially lower in one-company-town firms. Finally, the latter were also found to be more indebted, and hence financially vulnerable, than comparable enterprises located elsewhere, although the economic magnitude of differentials in

indebtedness was not as high as that of differentials in the marginal products of labour and capital.

Overall, the analysis suggests that employment concentration, including in its extreme form of one-company towns, presents specific policy challenges. In particular, it appears that distortionary resource allocation has been particularly acute in the case of one-company towns. Support to loci of concentrated employment, drawing on natural resource rents, may have achieved some form of employment (although not earnings) stability and abatement of social tension but, coupled to the broader re-allocation of resources to public consumption, this has undoubtedly imposed costs. Further, these sorts of transfer policies appear to have been used as substitutes for, rather than as complements to, other policies designed to help restructuring and reallocation, such as better policies for entry as well as for retraining and other measures aimed at better labour market performance. While allocations to one-company towns are not the largest component of resource rent allocations, put together with other components, the pattern that can be observed is one that is likely to be antithetical to diversification and accelerated growth; objectives that, at least notionally, have been espoused by the Russian government.

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Annex

Table A1

Production functions: fixed effects estimation (10 per cent threshold)

Dependent variable: Operating revenue, log

Fixed effects	**A**	**B**	**C**	**D**
Employment, log	.878*** (.012)	.879*** (.012)	.885*** (.012)	.762*** (.011)
Fixed assets, log	.197*** (.007)	.196*** (.007)	.199*** (.006)	
Total assets, log				.413*** (.009)
Log employment * OCT10		-.065 (.083)	-.120* (.066)	-.100 (.095)
Log fixed assets * OCT10		.215 (.154)	.179 (.120)	
Log total assets * OCT10				.231 (.188)
Constant	2.247*** (.055)	2.240*** (.055)	2.205*** (.053)	1.030*** (.057)
Year dummies	Yes	Yes	Yes	Yes
Number of observations	56,332	56,332	61,196	63,027
Number of groups	19,179	19,179	20,981	20,950
R_	0.61	0.61	0.61	0.68

Note: Estimated by fixed effects, robust standard errors in parentheses. All variables are expressed in real terms using GDP deflators. Sample includes manufacturing firms employing 25 people or more, 2003-08. OCT10 is one-company town enterprise dummy (using 10 per cent cut-off). *** indicates significance at 1 the per cent level, ** at the 5 per cent level, and * at the 10 per cent level.

Table A2

Production functions: cross-section analysis, 10 per cent threshold

Dependent variable: Operating revenue, log

Between estimates	A	B	C	D	E
Employment, log	0.891 (.010)***	0.898 (.010)***	0.911 (.010)***	0.912 (.010)***	0.603 (.010)***
Fixed assets, log	0.121 (.005)***	0.120 (.005)***	0.111 (.004)***	0.120 (.004)***	
Total assets, log					0.417 (.006)***
Log employment * OCT10		-0.037 (.117)	-0.021 (.118)	-0.097 (.089)	0.057 (.124)
Log fixed assets * OCT10		0.222 (.068)***	0.238 (.069)***	0.252 (.053)***	
Log total assets * OCT10					0.209 (.093)**
OCT10		-2.100 (.655)***	-2.353 (.661)***	-1.951 (.520)***	-3.068 (.706)***
Constant	2.526 (.072)***	2.506 (.073)***	2.571 (.037)***	2.503 (.048)***	1.597 (.066)***
Regional dummies Industry dummies	Yes Yes	Yes Yes	No No	Yes Yes	Yes Yes
Number of observations	28,511	28,511	28,511	30,954	31,631
Number of groups	13,385	13,385	13,385	14,602	14,751
R_	0.56	0.56	0.56	0.57	0.64

Note: Estimated by the between estimator, robust standard errors in parentheses. All variables are expressed in real terms using GDP deflators. Sample includes manufacturing firms employing 25 people or more, 2006-08. OCT10 is one-company town enterprise dummy (using 10 per cent cut-off). *** indicates significance at 1 the per cent level, ** at the 5 per cent level, and * at the 10 per cent level.

Table A3

Financial leverage: long-term debt, 10 per cent threshold

Dependent variable: Long-term debt-to-assets ratio

Tobit estimates	A	B	C	D
Tangibility	.451*** (.012)	.397*** (.012)	.407*** (.012)	.431*** (.018)
Employment, log	.036*** (.002)	.039*** (.002)	.036*** (.001)	.041*** (.003)
Profitability	-.079 *** (.022)	-.071 *** (.020)	-.084 *** (.022)	-.064 *** (.021)
OCT	.069 *** (.019)	.052 *** (.019)	.030 * (.017)	.095** (.036)
Revenue per employee, log				.040*** (.003)
Constant	-.436*** (.010)	-.351** * (.021)	-.414** * (.013)	-.515** (.032)
Regional dummies	No	Yes	Yes	Yes
Sector dummies	No	Yes	Yes	Yes
Number of observations	22,715	22,715	24,845	12,633
Pseudo R_	0.12	0.14	0.14	0.14

Note: Estimated by the tobit estimator using averages over 2006-08, standard errors in parentheses. Revenue is expressed in real terms using GDP deflator. Tangibility is the ratio of fixed assets to total assets; profitability is EBIT-to-assets ratio. Sample includes manufacturing firms employing 25 people or more, 2006-08. OCT10 is one-company town enterprise dummy (using 10 per cent cut-off). *** indicates significance at 1 the per cent level, ** at the 5 per cent level, and * at the 10 per cent level.

Table A4

Financial leverage: long-term and short-term debt, 10 per cent threshold

Dependent variable: Long-term debt-to-assets ratio

Tobit estimates	A	B	C	D
Tangibility	.321*** (.010)	.235*** (.010)	.246*** (.010)	.256*** (.014)
Employment, log	.032*** (.001)	.033*** (.001)	.029*** (.001)	.034*** (.002)
Profitability	-.180 *** (.052)	-.161 *** (.047)	-.178 *** (.048)	-.141 *** (.054)
OCT10	.065 *** (.018)	.045 ** (.018)	.019 (.016)	.080 ** (.031)
Revenue per employee, log				.027 *** (.003)
Constant	-.098*** (.010)	-.024 (.019)	-.065** * (.011)	-.123** * (.025)
Regional dummies	No	Yes	Yes	Yes
Sector dummies	No	Yes	Yes	Yes
Number of observations	22,508	22,508	24,592	12,468
Pseudo R_	0.12	0.21	0.19	0.19

Note: Estimated by the tobit estimator using averages over 2006-08, standard errors in parentheses. Revenue is expressed in real terms using GDP deflator. Tangibility is the ratio of fixed assets to total assets; profitability is EBIT-to-assets ratio. Sample includes manufacturing firms employing 25 people or more, 2006-08. OCT10 is one-company town enterprise dummy (using 10 per cent cut-off). *** indicates significance at 1 the per cent level, ** at the 5 per cent level, and * at the 10 per cent level.