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ABSTRACT

The Determinants of Privatized Enterprise Performance in Russia*

Using data from a large enterprise-level panel designed to address this issue, we account for enterprise performance in Russia. We link performance to four aspects of the economic environment: enterprise ownership; corporate governance; market structures and competition; and financial constraints. We conclude that private ownership and improved performance are not correlated, though restructuring is positively associated with the competitiveness of the market environment. These findings on private ownership support those of previous studies, eg Earle and Estrin (1997). Moreover, we find evidence that financially unconstrained firms are better in their undertaking of restructuring measures than financially constrained firms. Further analysis suggests that causality runs from restructuring to financial constraint, rather than the reverse. Finally, our findings indicate strong complementarities between the four factors influencing improved company performance, confirming the view that these factors need to be considered jointly.

JEL Classification: D21, G34, L10 and P31

Keywords: competition, corporate governance, enterprise performance, investment and privatization

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NON-TECHNICAL SUMMARY

More than a decade into the transition period, Russia's economic performance has been disappointing. Compared to leading countries such as Poland, Hungary and the Czech Republic, Russia has been lagging in several indicators of reform success – life expectancy, enterprise restructuring, labour productivity, cumulative GDP growth, and inflation stabilization – despite undergoing the largest privatization in history. The standard interpretation, based on initial evidence, is that while Russian reformers had successfully changed the ownership structure away from state hands, the emergence and entrenchment of widespread insider privatization, combined with the lack of development of capital market institutions to exercise ownership discipline, meant that privatization had little impact on either performance or restructuring.

We attempt to shed more light on current understanding of determinants of enterprise performance by examining a more recent data set and by linking variables that have been previously treated separately in the literature. First, we use data from the first large-scale random sample conducted in Russia since the mid-1990s on enterprise restructuring. The underlying assumption is that having been collected five years after the end of privatization and almost a decade after the beginning of transition, this data will be more reliable in reflecting the impact of new ownership, incentive and information systems on the performance of companies.

Second, we seek to account for enterprise performance by linking it to four key aspects of economic environment outlined in contemporary literature: enterprise ownership; governance; market structures and competition; and financial constraints. Controlling for other factors, we can identify how variation in these four aspects will lead to variation in performance across the observed firms.

In general, the findings suggest that restructuring in Russian firms indeed remains modest, and productivity and investment levels low. Results of analysis of enterprise performance determinants, however, do not confirm standard theoretical hypotheses. We conclude that ownership and performance are not correlated in Russia. It is not evident that outsider ownership leads to better performance than insider ownership. Our findings do however suggest a positive association between restructuring and competitiveness of the market environment in which firms operate. Moreover, we find evidence of the binding financial constraints that exist for firms of all types, even though larger firms are better at obtaining short-term credit. Financial constraints emerge in our study as a fundamental issue for restructuring in Russian enterprises.

There are strong complementarities between these factors. We find that, taken together, domestic monopoly power, financial constraints and to a limited extent state ownership lead to inferior company performance across a wide range of measures. Most strikingly, there are clear interactions between state ownership and market structure. State ownership leads to improved performance across a number of measures when there is moderate domestic competition or import competition. State ownership reduces performance when there is domestic monopoly power. Financial constraints also depend on the ownership structure to some extent; they reduce performance across a variety of measures relative to what would pertain in insider owned firms.

The results of this work imply that despite the transfer of ownership rights, institutions providing managerial incentives similar to those existing in western economies have not fully evolved in Russia. Hence, our research suggests three major policy conclusions. First, as economic activities of Russian enterprises tend to be restricted to local and regional markets by administrative barriers, we suggest that the state policy should include additional measures limiting regional administrative barriers. Second, in view of strong tendencies of integration and cross-ownership in Russian industry, further facilitation of competition is necessary by lowering barriers to foreign competitors. Finally, to alleviate the problem of financing investment, we suggest that the government should promote equity financing by establishing modern corporate governance legislation and practice.

1. Introduction

Successful transition in Russia has always been viewed as one of the most important and exacting tasks facing post-communist reformers in Central and Eastern Europe, and their Western advisors. The process of transition was anyway seen to be daunting in relatively more open and reformed economies like Hungary or Poland (see Blanchard *et al* (1991), Portes *et al* (1993)). The huge scale and long communist traditions of Russia made obstacles to reform appear almost insurmountable; a view apparently confirmed when the reform process appeared to founder in the face of the August 1998 crash (see EBRD (1999)). However, reforms in Russia have included the largest privatisation in history (see Boycko, Shleifer, Vishny (1995)), which transferred ownership in tens of thousands of companies across the country.

Initial evidence suggested that, while Russian reformers had successfully changed the ownership structure away from state hands, the emergence and entrenchment of widespread insider privatisation, combined with the lack of development of capital market institutions to exercise ownership discipline, meant that privatisation had little impact on either company performance or restructuring. This finding was deduced in a number of studies during the mid 1990s (e.g. Earle and Estrin (1997), Estrin and Wright (1999) and has become the standard interpretation in a number of important surveys (e.g. Nellis (2000), Djankov and Murrell (2000)). The problem was exacerbated by the low levels of competition in Russia caused by the unfavourable enterprise size distribution bequeathed by planners, large distances and poor transport infrastructure, as well as regional policies (see Brown and Earle (2001)).

However, these results were all derived from enterprise surveys undertaken only one or two years after privatisation (1993 – 1996). This was also the period when firms were seeking to recover from disorganisation (see Blanchard and Kremer (1997)). Moreover given the long heritage of communism and planning, they were undertaken too early to deduce definitive conclusions on the impact of the new ownership, incentive and information systems on the performance of companies.² We were therefore motivated to undertake a second large-scale enterprise survey, based to some extent on the first survey undertaken by the World Bank in 1994 (see Commander, Fan and Schaffer (1996)).³ The survey was undertaken through the Bureau of Economic Analysis between mid 1998 – 1999, and was carefully constructed to be a random sample within the population of firms considered. The sample was relatively large – 437 firms – and was confined to six two digit manufacturing industries; to firms employing between 100 and 5000 workers; and to 11 regions within the four main economic zones. Comparison with Goskomstat data confirms that our sample is reasonably representative of the relevant national patterns.

Our conceptual framework follows the literature in seeking to link enterprise performance to four key aspects of the economic environment; ownership; governance; market structures and competition, and financial constraints. One can conceive of enterprises pre-reform as operating away from profit maximising equilibrium in two senses. First, levels of output, employment and perhaps capital would exceed those implied by a profit-maximising rule, because of planners preference for gigantism (see e.g. Bennett (1989)). Secondly, firms would be operating well within their production possibility frontiers because of weak

² A point stressed in the papers themselves see e.g. Earle and Estrin (1997); Introduction.

³ There have been other surveys of Russian firms, in the past three years, on a variety of issues including innovation, corruption, and the new-market economy. None have returned to the fundamental theme of the determinants of company performance, based around a large-scale random survey.

managerial incentives. The reform process represents a number of major changes to the economic environment, leading to adjustments in output, inputs, prices and total factor productivity. Once sectoral and regional factors have been controlled for, one can identify the four areas in which variation in the environment will lead to dispersion in the pattern of behaviour.

The first concerns ownership structure. In principle the propositions here are straightforward – private ownership will improve monitoring, help to resolve the principal-agent problem which allows poor managerial performance and sharpen incentives (see Vickers and Yarrow (1995)). As a result, one would expect privately owned firms to perform better than state owned ones – in terms of total factor productivity and therefore profitability, unit costs and financial performance.

The situation was not quite so straightforward in Russia however. Privatisation was mainly to insiders – workers and managers – whose incentives to improve performance were more ambiguous (see Earle and Estrin (1996)). Indeed, perhaps the fundamental problem in Russia is that privatisation yielded effective control over enterprises to managers, who on average faced dispersed insider (worker) or outsider (investment funds, former workers, banks) owners. However it did not give them sufficient ownership – typically less than 10% of the total stock (see Earle and Estrin (1997)). In consequence, the incentives to restructure and improve profitability were frequently outweighed by those to expropriate the assets for themselves (see Stiglitz (1999)).

All this implies that one cannot simply compare performance in state and private firms, without also taking into account carefully the ownership structure – insider or outsider,

manager or worker, dispersed or concentrated. Moreover, ownership itself is not necessarily the key – control and mechanisms of corporate governance also play a significant part in ensuring private ownership can deliver improved performance. In the survey, we therefore included very detailed information on the structure of ownership, as well as its evolution through time, and on systems for corporate governance, including managerial evaluations of the balance of influences over major enterprise decisions.

The third major area that can impact on company performance is the competitiveness of the market environment. In general, even when corporate governance is weak, enterprises can be forced to improve performance by tough competition in their market. This of course depends in part on the effectiveness of the bankruptcy threat, and the monopoly rentals available to the firms (see Nickell (1996)). Several outcomes are feasible. Firms operating in more competitive environments may face pressures to restructure but be unable to find the revenues to do so, while their more monopolistic competitors may be able to finance improved performance. At the end of the day, the direction of the relationship between competitive pressure and company performance is an empirical question, and one which seems likely to interact with ownership structure (see Angelucci *et al* (2001)).

The role of bankruptcy and the need for funding from profits illustrates our final area of concern – financial constraints. Much of the previous discussion implicitly assumes that capital is available at a fixed interest rate at infinitely elastic supply. In practice in Russia this is not true – capital is scarce and allocated more by rationing than price. These exogenous financial constraints can of course restrict restructuring and directly influence total factor productivity and company performance.

In this paper, we use the data from our stratified random sample to look separately at the four influences on company performance. In the following section, we introduce our methodology and data set, before considering ownership and corporate governance in the third section. Competition and performance are addressed in the fourth section and the effects of financial constraints in the fifth. The sixth section attempts to bring our findings together by drawing a picture of a “successful” Russian enterprise while conclusions, including interactive effects and policy findings are contained in the seventh section.

2. Survey Methodology

Our survey was designed to enable the analysis of the relationships between performance, ownership, corporate governance, restructuring, and finance among privatised Russian enterprises. The questionnaire was developed between mid-1998 and end-1999. It was tested in two pilot runs in 1998 and the beginning of 2000 with significant corrections made after the first pilot and some minor changes after the second one. Following this second pilot, the full survey was undertaken in the Spring of 2000. We surveyed 437 enterprises which were randomly sampled from a population list stratified in the manner explained in sub-section 2 below. Given the focus of this study, and the resultant stratification and sampling criteria, our sample was never intended to be representative of Russian industry. Nonetheless, sub-section 3 presents a comparison of the major indicators of our sampled firms with those of the Russian industrial population in order to give some assessment of our sample biases. Sub-section 4 concludes.

2.1 Questionnaire and Survey Data

The survey data were collected by direct face-to-face interviews with one of the top-managers of the enterprise: in most of the cases the general manager (director/general director) or economic/financial director.⁴ The distribution of respondents by position is given in table 2.1 below. However, owing to the detailed nature of the requested quantitative data, this section of the survey was generally collected separately from the accounting or economic department of the enterprise.

⁴ In Russia the top manager position may have different names In the 'Director' category we include: Director General, Executive Director, Acting Director, Director (if he is the only one with a title). In 3 cases respondents were presidents of the company and in one — the Chairman of the Board. The category 'Deputy director'

Table 2.1 Position of the respondent

| Position of respondent | Freq. | Percent | Cum(%) |
|------------------------|------------|---------------|--------|
| Director | 189 | 43.3 | 43.25 |
| Deputy director | 218 | 49.9 | 93.14 |
| Other top management | 30 | 6.9 | 100.00 |
| <i>Total</i> | <i>437</i> | <i>100.00</i> | |

Source: Authors' calculations

The questionnaire includes six major blocks of questions:

- indicators of economic activity and factors of production (output, capacity and labor utilization, costs, financial in- and outflows, structure of assets, investment activity, etc.);
- information on restructuring activities of the enterprise (such as shedding of labor, introduction of new technologies, new products, etc.);
- market structure data (competition, price elasticity, enterprise activity on different geographical markets);
- ownership and corporate governance data (ownership structure, ownership concentration, board composition, some information on top-management of the enterprise);
- data on financial constraints (availability of external financing, state assistance, etc.);
- a block of control variables such as region, industrial code, legal type of enterprise, date and method of privatization and others.

includes Deputies of the top manager and in one case Chief Engineer. In the 'other' category there are mostly

Where feasible, the data was generally collected for the years 1997-1999: hence the sample covered both pre- and post-crisis years. The general principle for composing the questionnaire was to duplicate information regarded as most important; hence e.g., more than one question (quantitative, rank, qualitative) would be included to permit construction of an indicator for main characteristics of the firm⁵.

2.2 Sampling Strategy

From the very beginning the results of this survey were not designed to be representative of the Russian economy nor even of Russian industry. The survey was carried out to enable evaluation of the adjustment of Russian privatised industrial enterprises to new conditions in the transitional economy of the late 1990s. This rationale together with the restricted number of enterprises surveyed (400 enterprises were to be interviewed) led to the sample having some specific features. Moreover the general population of the firms from which the sample was drawn was limited to enterprises in certain industries, size, regions, form of ownership and age (date of establishment of the enterprise). The precise nature of these criteria are explained in detail in the following sub-sections.

Heads of Departments (Planning, Economic, etc.)

⁵ For some questions where pilot surveys showed a low response rate several options were given to respondent. For example, if it was impossible to get information on separate shares for workers and managers the revised instrument included an option to report the cumulative share of insiders.

2.2.1 Selection of Industries

The sample was confined to the population of firms that belong to manufacturing industries according to Russian Industrial Classification (OKONH). The following two-digit industries were selected:

- 13 - Chemical & Oil-chemical industry;
- 14 - Machinery building & metal-working industry;
- 15- Wood & Paper industry;
- 16 – Stone & Clay (Production of building materials) industry;
- 17 - Light industry;
- 18 - Food industry.

It should be noted that the list does not include the Ferrous and Non-Ferrous metal industries. These were excluded for several reasons. Firstly, as the Russian Industrial Classification does not separate mining and metal production at the two-digit level, the decision to exclude extractive industries precluded the inclusion of metal production. Secondly, the concentration of production in the Ferrous metal industry is extremely high (12 Russian metal plants produce about 90% of ferrous metal; the Non-Ferrous metal sector concentration is lower but still very high). Moreover, metal industry enterprises tend to be large, and hence well above our upper size limit (which is justified below). Consequently it would prove almost impossible to obtain a statistically valid sample for these industries. In addition, as metal plants are unusually export oriented (export share of 80-95 percent), any comparisons between them and other firms would prove rather difficult and uninteresting for our purposes.

As a result the industrial stratification was chosen such that the sample would be approximately evenly distributed across our chosen two-digit industries. However, in practice

it proved extremely difficult to meet these quotas for some industries, particularly given the need to sample privatised enterprises whilst adhering to the size and regional stratification dimensions. The actual distribution is reported in table 2.2 below, and illustrates that our sample slightly over-represents the machinery sector relative to the industrial population. Nonetheless, there are sufficient observations in each industry to control for industry-specific factors.

Table 2.2 Distribution by Industry

| Industry | Code | Observations | % |
|--------------|------|--------------|------------|
| Chemicals | 13 | 56 | 12.8 |
| Machinery | 14 | 108 | 24.7 |
| Wood | 15 | 66 | 15.1 |
| Stone&clay | 16 | 72 | 16.5 |
| Light | 17 | 72 | 16.5 |
| Food | 18 | 63 | 14.4 |
| <i>Total</i> | | <i>437</i> | <i>100</i> |

Source: Authors' Calculations

2.2.2 Size Categories

To make our surveyed enterprises more comparable, we restricted the size of our sampled firms to between 100-5000 employees⁶. Small enterprises with below 100 employees were excluded because: (a) they work under specific tax and accounting rules that often make them incomparable with others; (b) although extremely important for market institutions in the long run — c.f. Poland — they currently account for less than 4 percent of industrial output in Russia, and (c) the Russian SME sector — which has been extensively surveyed for specific

SME studies by different researchers in recent years — generally necessitates larger, more specific samples, and was not the focus of this particular study.

The upper size limit of 5000 employees was chosen as there are a small number of such big firms in most of the industries, and most have unique features that makes them more suitable for case-studies than for statistical analysis.⁷ Very large firms in Russia are often located in so called mono-towns, which leads to a very specific type of behaviour and is reflected in their performance. Moreover, very big firms tend to not exist in the same economic environment as other enterprises, but instead form their own environment to suit their interests: e.g., owing to a special kind of relationship with authorities, natural monopolies, and so on .⁸

As in the case of the industrial stratification, our aim was to distribute our sample more or less evenly across three broad size categories: 100-500 employees, 501-1000 employees and 1001-5000 employees. As table 2.3 below illustrates, this stratification was broadly met by the actual sample.

Table 2.3 Distribution by Size in 1999

| | Total | 100-500 | % | 501-1000 | % | >1000 | % |
|-----------------------------------|--------------|----------------|----------|-----------------|----------|-----------------|----------|
| Selected Industries, observations | 437 | 147 | 33.6% | 139 | 31.8% | 151 | 34.6% |
| Average size (employees) | 891 | 265 | | 703 | | 1820 | |

Source: Authors' calculations

⁶ Employment was selected as a measure of size in accordance with both Russian legislation for separating SMEs and large enterprises, and common practice.

⁷ See P.Kuznetsov, A.Muraviev 'Ownership structure and firm performance in Russia's industrial firms' for an example of a recent econometric approach to the analysis of very big Russian firms ('blue chips').

⁸ The initial list of enterprises from which the sample was drawn was based on the Goskomstat Enterprise Registry data included in ALBA-Y database. The registry includes information for about 30,000 medium and large Russian industrial enterprises, accounting for 65-85 percent of output and employment in the selected

2.2.3 Selection of Regions

Our choice of regions was based on two considerations. The limited number of enterprises to be sampled was insufficient to get representative sub-samples for all or even the majority of regions (oblast, kray, republics) of Russia (89 subjects). On the other hand the regional dimension of the entrepreneurial and investment climates in Russia are acknowledged by most researchers, and hence the regional dimension should be included in any analysis. The palliative solution chosen was to select a limited number of regions belonging to four macro-zones: European Russia, the Volga, the Urals and Siberia. European Russia was represented by two Russian capitals — Moscow and St-Petersburg — together with their respective oblasts (Moscow oblast and St-Petersburg oblast); three regions belong to Volga macro-zone — Nizhny Novgorod, Samara, Volgograd; the Ural macro-zone is also represented by three regions — Chelyabinsk, Perm, Ekaterinburg (Sverdlovskaya oblast), while the Siberia macro-zone included enterprises from Novosibirsk, Krasnoyarsk and Omsk.

We recognize, however, that our approach does not permit reliable analysis of all regional specifics. In particular, regional policies can differ significantly within one macro-zone (Tatarstan, Uliyanovsk and Nizhny Novgorod regions in Volga zone provide good and well known examples). Nevertheless, in many cases the geographical position itself and the distance from the centre are likely to be factors contributing to the macro-zone economic environment and enterprise behavior.

Nonetheless, we did not apply strict regional quotas, having decided that for the purposes of this study the size and industrial stratifications were the most important criteria. Indeed we

industries. Utilising this database enabled us to use historical time series data in the analysis and at the same

initially aimed to survey in only eight regions across our four macro-zones. One region in each macro-zone was ‘reserved’ for use if the size and industry quotas could not be met in two regions. This strategy resulted in some regions (‘reserved’ ones) having a relatively smaller number of observations. Table 2.4 below shows the regional structure of the sample.

Table 2.4 Regional Distribution

| Region | No. of Firms | % of Total |
|---|-------------------|---------------------|
| <i>Central macro-zone subtotal</i> | <i>122</i> | <i>27.9</i> |
| Moscow | 36 | 8.2% |
| Moscow oblast | 41 | 9.4% |
| St-Peterburg | 30 | 6.9% |
| St-Peterburg oblast | 15 | 3.4% |
| <i>Volga macro-zone subtotal</i> | <i>115</i> | <i>26.3%</i> |
| Nizhny Novgorod oblast | 64 | 14.6% |
| Samara oblast | 39 | 8.9% |
| Volgograd oblast | 12 | 2.7% |
| <i>Ural macro-zone subtotal</i> | <i>111</i> | <i>25.4%</i> |
| Ekaterinburg oblast | 50 | 11.4% |
| Perm oblast | 43 | 9.8% |
| Chelyabinsk oblast | 18 | 4.1% |
| <i>Siberia macro-zone subtotal</i> | <i>89</i> | <i>20.4%</i> |
| Krasnoyarsk kray | 37 | 8.5% |
| Novosibirsk oblast | 40 | 9.2% |
| Omsk oblast | 12 | 2.7% |
| Total | 437 | 100.0% |

Source: Authors' calculations

time did not significantly narrow the population of firms to select from.

2.2.4 Establishment Year and Form of Ownership

As our analysis is concerned with post-privatisation behaviour, changes in ownership and corporate governance at former Soviet industrial enterprises, only those enterprises in existence before 1992 (the beginning of transitional reforms in Russia) were eligible for selection. Hence enterprises organized after 1992 as spin-offs of former Soviet ones were excluded. Irrespective of this choice, the vast majority of *de novo* firms were excluded as a result of the lower size restriction which prevented SMEs from entering the sample. Preliminary analysis showed that the number of big (more than 100 employees) *de novo* firms in the selected industries and regions in Russia is so small as to preclude the possibility of obtaining a representative sample of such enterprises.

Similarly, the focus of our research on the problems and behavioral patterns of privatised enterprises necessitated the exclusion of fully state-owned enterprises that were never privatised. At the same time our population included ‘mixed’ state-private joint-stock companies even in cases where the controlling share of stock belongs to Federal or Regional authorities.

2.3 Does the Sample Represent the Population of Firms?

Table 2.5 below compares the results of our sample to the official Goskomstat data for industrial enterprises. From this it is quite evident that our quotas for industries led to certain selection biases: some industries with a smaller number of enterprises (Chemicals and Stone & Clay) are ‘over-represented’ relative to others (Machinery Building, Light and Food industries). This is true not only for the number of enterprises but for employment and sales

Table 2.5 Number of Enterprises, Sales, Employment: Sample vs. Goskomstat Data

| | Number of enterprises | | | Sales (mln.Rub) | | | Number of employees (thosands) | | |
|--------------|-----------------------|---------------|------------|--------------------|---------------|------------|-----------------------------------|---------------|------------|
| | <i>Industry</i> | <i>Survey</i> | <i>%</i> | <i>Industry</i> | <i>Survey</i> | <i>%</i> | <i>Industry</i> | <i>Survey</i> | <i>%</i> |
| | <i>total</i> | | | <i>total</i> | | | <i>total</i> | | |
| Chemicals | 7168 | 56 | 0.8 | 105945 | 9053 | 8.5 | 858 | 70 | 8.2 |
| Machinery | 57776 | 108 | 0.2 | 257076 | 8829 | 3.4 | 4856 | 123 | 2.5 |
| Wood | 20323 | 66 | 0.3 | 57109 | 3015 | 5.3 | 1034 | 34 | 3.3 |
| Stone&clay | 9528 | 72 | 0.8 | 54945 | 4189 | 7.6 | 713 | 50 | 7.0 |
| Light | 20784 | 72 | 0.3 | 23522 | 2238 | 9.5 | 888 | 50 | 5.6 |
| Food | 22263 | 63 | 0.3 | 197848 | 12267 | 6.2 | 1396 | 48 | 3.4 |
| Total | 137842 | 437 | 0.3 | 696445 | 40818 | 5.9 | 9745 | 375 | 3.8 |

Source: Goskomstat, Authors' calculations

data as well⁹. As our enterprises are on average much larger than those in the total population, the average levels of employment and sales are naturally much higher.

The most important conclusion comes from comparing the sales to employment ratio for our sample against the population. In general our surveyed enterprises tend to have much higher per capita sales than Russian industrial firms. There are two possible explanations for this: larger enterprises may have higher sales per worker, hence the exclusion of very small firms may have induced a bias in our average, and/or enterprises in our sample tend to be more productive than the average Russian firm in the same industry. Analysis of our data set at the aggregate level revealed a positive and highly significant correlation between the sales to employment ratio and size for all three years of our sample.¹⁰ However, more detailed analysis revealed that while this is true at the aggregate level, it is not true for every industrial sector. Productivity was found to be highly positively correlated with size in the Food and Wood industries; the correlation was positive but insignificant in the case of the Chemicals and Machinery sectors, while there was an insignificant negative correlation in the case of the Stone & Clay and Light industries.

This sectoral heterogeneity suggests that our aggregate bias cannot simply be a function of our size stratification. The results presented in table 2.6 below calculate the profit/sales ratio by industry as a weighted average.

⁹ The low values for the percentage of surveyed enterprises in the total population are mostly due to the fact that we are comparing our sample with the total enterprise population including SME. We are using the total number of firms just to be able to compare employment and sales coverage ratio (as sales and employment data by size groups is unavailable. In Table A1 the number of observations in the sample is compared to number of medium and large firms in respective industries which provides a better assessment.

¹⁰ Using our data set for checking the hypothesis implies that the relationship is the same outside of our 100-5000 employees interval. However, it is not clear that this is true. On the other hand small enterprises in Russia (especially in Food and Light sectors where they can deal with customers in cash) are notorious for being deeply involved into shadow economy and not showing their real output. For 1997 for all industry sales/employment ratio of small enterprises was less than 50% of large and medium sized enterprises.

Table 2.6 Profitability Comparison

| | No. Obs. | 1997 | | 1998 | | 1999 | |
|-----------------------|------------|------------|---------------|------------|---------------|------------|---------------|
| | | GKS (%) | Survey (%) | GKS (%) | Survey (%) | GKS (%) | Survey (%) |
| Chemical | 51 | 2.8 | 3.7 | 7.8 | 9.3 | 12.5 | 17.7 |
| Machinery | 98 | 8.0 | 10.9 | 10.0 | 8.9 | 8.0 | 11.4 |
| Wood | 55 | -5.5 | 9.5 | 5.0 | 14.5 | 11.7 | 21.3 |
| Stone&clay | 64 | 5.6 | 9.1 | 5.2 | 8.4 | 4.3 | 10.2 |
| Light | 68 | -1.5 | 1.1 | 0.9 | 3.9 | 4.5 | 10.9 |
| Food | 53 | 8.4 | 10.9 | 12.8 | 13.0 | 5.0 | 10.4 |
| Total Industry | 389 | | 7.7 | | 10.4 | | 13.4 |

Source: Authors' calculations

From this it can be seen that our bias is generally in favour of more profitable firms. The most prominent differences occur in the Wood & Paper and Stone & Clay sectors. However, the dynamic of the profitability indicator generally corresponds to the national level trend (with the exception of the Stone & Clay sector). Consequently it would appear that while we chose more profitable firms than average in the first instance, their performance trends have been representative of the population.

Nonetheless, transition economies in general, and Russia in particular, are notorious for the poor quality of enterprise profits data, as a result of extensive tax evasion. Similarly we are aware that these same biases are likely to appear in our survey data. As the number of observations in industries is not very high, one mistake may lead to significant bias in means. However, if we merely compare the share of profit and loss makers in the sample with the share in the industrial populations, as in table 2.7 below, we confirm the suggestion of a bias in favor of more profitable enterprises.

Table 2.7 Share of Profit-Making Enterprises

| | 1997 | | 1998 | | 1999 | |
|------------|---------|------------|---------|------------|---------|------------|
| | GKS (%) | Survey (%) | GKS (%) | Survey (%) | GKS (%) | Survey (%) |
| Chemical | na | 79.2 | 51.5 | 75.5 | 67.7 | 86.3 |
| Machinery | na | 71.0 | 53.5 | 72.6 | 64.8 | 81.4 |
| Wood | na | 59.3 | 31.9 | 53.6 | 49.0 | 73.2 |
| Stone&clay | na | 76.2 | 43.1 | 65.6 | 53.1 | 73.8 |
| Light | na | 63.1 | 38.2 | 71.6 | 50.9 | 80.6 |
| Food | na | 91.3 | 56.5 | 77.1 | 63.4 | 87.2 |

Source: Authors' calculations

In 1997 at the aggregate level 76 percent of the sample were profit makers compared with 53 percent for Russian industry. The corresponding numbers for 1998 and 1999 are 74 percent against 51 percent, and 76 percent against 60 percent in 1999 respectively. The dynamic profit-makers share of the indicator generally corresponds to the national level trend with the exception of Stone & Clay.

2.4 Conclusions

From the above discussion we are able to establish several features of our sample:

- On the average the sample is reasonably evenly distributed across size classes and industries. In general the time trend in most cases follow national level patterns.
- The regional distribution of the sample is approximately even across our four macro-zones. However, several regions are underrepresented (Volgograd and Omsk in particular). Consequently any analysis of regional differences should control for this.
- The average size of the surveyed enterprises is larger than industrial average. This appears to be a result of the initial selection bias and sampling strategy (size quotas).
- Our sample over-represents better performing enterprises. This can be partially explained (at least for some industries) by the size structure of sample: bigger enterprises are in general more productive. Nonetheless, this bias probably is due to the well-known fact that badly performing enterprises tend to refuse to be surveyed more often than better performing ones.
- For some industries (Wood & Paper being the most obvious) the sample means and time trends differ significantly with official Goskomstat data.

Table A1 Number of Enterprises: Coverage in terms of Size and Industry*

| GOSKOMSTAT/Survey: Number of enterprises by industry&size | | | | | | | | | | | | | |
|--|------------------|----------------|-----------------|------------------|------------------------|-------------------------|------------------|------------------------|-------------------------|------------------|------------------------|-------------------------|------------------|
| | Industry code | Total GKS** | Total Survey | Survey/ GKS % | Size group1, GKS | Size group1, Surv | Survey/ GKS % | Size group2, GKS | Size group2, Surv | Survey/ GKS % | Size group3, GKS | Size group3, Surv | Survey/ GKS % |
| Total Industry | 10 | 25446 | | | 10772 | | | 2273 | | | 2137 | | |
| <i>Selected industries</i> | | <i>20104</i> | <i>437</i> | <i>2.2</i> | <i>8862</i> | <i>147</i> | <i>1.7</i> | <i>1789</i> | <i>139</i> | <i>7.8</i> | <i>1510</i> | <i>139</i> | <i>9.2</i> |
| Chemicals | 13 | 644 | 56 | 8.7 | 257 | 9 | 3.5 | 68 | 16 | 23.5 | 179 | 31 | 17.3 |
| Machinery | 14 | 6445 | 108 | 1.7 | 2694 | 29 | 1.1 | 661 | 25 | 3.8 | 873 | 54 | 6.2 |
| Wood | 15 | 2702 | 66 | 2.4 | 1188 | 37 | 3.1 | 252 | 16 | 6.3 | 141 | 13 | 9.2 |
| Stone&clay | 16 | 2060 | 72 | 3.5 | 1231 | 24 | 1.9 | 177 | 29 | 16.4 | 50 | 19 | 38.0 |
| Light | 17 | 3038 | 72 | 2.4 | 1071 | 28 | 2.6 | 211 | 33 | 15.6 | 130 | 11 | 8.5 |
| Food | 18 | 5215 | 63 | 1.2 | 2421 | 20 | 0.8 | 420 | 20 | 4.8 | 137 | 23 | 16.8 |

* Size Group 1: =>100 <=500; Size Group 2: > 500 <=1000; Size Group 3 >1000 <=5000

** Goskomstat data refers only to medium and large enterprises

Source: Authors' calculations

3. Ownership, Control, Performance and Restructuring

3.1 Ownership and Control

For most of our analysis, we distinguish between three main categories of owners: insiders, the state (both Federal and Regional government), and outsiders (the remainder). Insiders are further subdivided into workers and managers when this is possible (about two-thirds of cases). Table 3.1 groups firms by majority shareholder group, majority defined as the group accounting for 50 percent or more of shares. At the time of privatisation, 79 percent of firms were under the control of insiders and 9 percent were controlled by outsiders. The small fraction that still had majority state-ownership simply reflects our sampling strategy (majority private ownership only). By the start of 2000, the percentage of firms that were insider-owned had fallen to 60 percent, and the outsider-owned share portion had increased to 31 percent.

Table 3.1 Ownership by Majority Shareholding Group

| | At time of privatization | | At 1.1.00 | |
|----------------------|--------------------------|------------|-----------------|------------|
| | Number of firms | % of firms | Number of firms | % of firms |
| Insider-owned | 279 | 79.3 | 217 | 59.5 |
| Outsider-owned | 31 | 8.8 | 112 | 30.7 |
| State-owned | 25 | 7.1 | 13 | 3.6 |
| No overall ownership | 17 | 4.8 | 23 | 6.3 |
| Total | 352 | 100.0 | 365 | 100.0 |

Source: Author's calculations

The changes in share ownership since the time of privatisation are detailed in table 3.2.

Table 3.2 Change in Share Ownership by Major Category

| | At time of privatization | | At 1.1.00 | | Change | |
|---------------------|--------------------------|-------------|-----------------|-------------|-----------------|-------------|
| | Number of firms | % of shares | Number of firms | % of shares | Number of firms | % of shares |
| Insiders, of which: | 351 | 71.8 | 364 | 62.3 | 339 | -9.5 |
| Managers | 216 | 12.7 | 229 | 17.7 | 201 | 3.8 |
| Workers | 216 | 54.0 | 229 | 34.5 | 201 | -19.9 |
| Outsiders | 351 | 16.0 | 364 | 32.0 | 339 | 16.1 |
| State | 351 | 12.2 | 364 | 5.7 | 339 | -6.6 |

Source: Authors' calculations

Although there has been a decline in shareholdings by insiders overall, this masks a large decline in worker ownership vs. an increase in share ownership by managers. Outsider ownership has doubled since privatisation, and now accounts for about one-third of shares, almost as much as workers and considerably more than managers. About half of the shares owned by outsiders are under the ownership of other Russian firms, with the rest divided between banks and investment companies, foreign firms, and 'others'. Outsider ownership is closely correlated with concentrated ownership: 38 percent of outsider-owned firms had 2-3 shareholders controlling 50 percent or more of the shares, vs. only 7 percent of insider-owned firms. Outsiders tend to hold small stakes in firms that remain insider-controlled; the average outsider shareholding in insider-owned firms is only 11 percent, vs. the 24 percent of shares owned by insiders in outsider-owned firms.

Our survey is unusual in that we have detailed information about the composition of the board in most of the surveyed firms, albeit only for the date of the survey (mid-2000). Table 3.3 groups firms according to which group — managers, workers, state, outsiders — have a majority of seats on the board.

Table 3.3 Control of the Board by Majority Group

| | Number of firms | % of firms |
|---------------------|--------------------|------------|
| Manager-controlled | 129 | 32.8 |
| Worker-controlled | 95 | 24.2 |
| Outsider-controlled | 94 | 23.9 |
| State-controlled | 7 | 1.8 |
| No overall control | 68 | 17.3 |
| Total | 393 | 100.0 |

Source: Authors' calculations

Our results illustrate that majority control is relatively evenly divided amongst firms in the sample, with managers having a majority of seats in one-third of firms, and workers and outsiders each having a majority of seats in about one-quarter of firms.

The relationship between share ownership and size of the firm shows the expected patterns (table 3.4). Outsider ownership is increasing with firm size, as is state ownership. The same pattern is apparent in the relationship between the share of seats on the board and the size of the firm.

Table 3.4 Share Ownership and Board Control by Size of Firm

| | Number of firms | % of shares owned, all firms | % of shares owned, by number of employees | | |
|---------------------|--------------------|------------------------------------|--|----------|-------|
| | | | < 501 | 501-1000 | 1000+ |
| Insiders, of which: | 354 | 62.3 | 71.6 | 62.1 | 52.2 |
| Managers | 225 | 17.5 | 20.9 | 17 | 13.6 |
| Workers | 225 | 34.6 | 37.1 | 36.8 | 28.6 |
| Outsiders | 354 | 31.9 | 25.2 | 31.3 | 40.1 |
| State | 354 | 5.7 | 3.2 | 6.6 | 7.7 |
| | | % of board seats, all firms | % of board seats, by number of employees | | |
| | | | < 501 | 501-1000 | 1000+ |
| Insiders, of which: | 376 | 67.8 | 75.1 | 66.6 | 61.1 |
| Managers | 376 | 38.9 | 40.0 | 40.0 | 36.4 |
| Workers | 376 | 28.9 | 35.0 | 26.6 | 24.6 |
| Outsiders | 376 | 27.0 | 20.9 | 28.8 | 31.7 |
| State | 376 | 5.2 | 4.0 | 4.6 | 7.2 |

Source: Authors' calculations

Finally, table 3.5 presents the relation between ownership and control at the start of 2000. Each row of the table calculate the percentage of firms controlled by insiders, outsiders and the state respectively, for each ownership category. Hence the first row of the table illustrates that more than 89 percent of insider-owned firms were controlled by insiders at board level at the start of 2000. By contrast just over 9 percent of insider-owned firms were controlled by outsiders and almost no insider owned firms were controlled by the state. Interesting we find that more than one-third of firms with majority state ownership were actually controlled by insiders. Possibly the most interesting result relates to the high proportion of outsider-owned

firms that were actually controlled by insiders at board level: while just over 58 percent of outsider-owned firms were also controlled by outsiders, the remaining 41.8 percent were actually controlled by insiders at the start of 2000. The results therefore illustrate that, most probably as a result of the mass privatisation programme, there remained a significant distinction between ownership and control in privatised Russian enterprises at the start of 2000.

Table 3.5 Relation Between Ownership and Control

| Ownership | Control (% of ownership category) | | |
|-----------|-----------------------------------|----------|-------|
| | Insider | Outsider | State |
| Insider | 89.7 | 9.3 | 0.1 |
| Outsider | 41.8 | 58.2 | 0.0 |
| State | 37.5 | 16.7 | 33.3 |

Source: Authors' calculations

3.2 Ownership, Control and Performance

We have calculated the means of a large number of different measures of enterprise performance by category of ownership and control; a selection of these appears in Table 3.6. In all cases we have addressed the problem of extreme values or “outliers” by Winsorizing the upper and lower 2.5 percent of the sample.¹¹

¹¹ Winsorizing is an old-fashioned but robust procedure in which observations in the upper and lower tails are identified, but instead of removing these observations they are assigned the value of the cut-off defining the tail. For example, we have Winsorized at 2.5 percent, so if the cut-off point for the upper 2.5 percent of the distribution is X, then the observations with a value greater than X that make up 2.5 percent of the sample are reassigned a value of X, and similarly for the lower 2.5 percent.

Table 3.6 Performance and Restructuring

| | Performance measures (1) | | | |
|--------------------------|------------------------------|--------------------------------|--------------------------------|---------------------------------------|
| | Value-added per worker, 1999 | Real log sales growth, 2 years | Log employment growth, 2 years | Real log productivity growth, 2 years |
| Total | 65.8 | -8.7 | -7.5 | -3.7 |
| <i>By ownership:</i> | | | | |
| Insider owned | 62.7 | -7.4 | -9.3 | -1.8 |
| Outsider owned | 64.9 | -10.7 | -9.9 | -3.2 |
| State owned | 103.1 | 4.9 | -3.7 | -8.2 |
| No overall ownership | 68.4 | -17.7 | -7.3 | -8.3 |
| <i>By board control:</i> | | | | |
| Manager-controlled | 69.1 | -6.5 | 9.1 | -4.3 |
| Worker-controlled | 59.7 | -12.2 | 9.9 | -2.9 |
| Outsider-controlled | 71.7 | -7.3 | 7.6 | 0.4 |
| State-controlled | 82.4 | -23.3 | 2.7 | -27.5 |
| No overall control | 64.4 | -4.6 | 7.2 | -4.5 |

Note: Real growth rates calculated using the official industrial price deflator (average price level per year): 7.9% (1997), 57.7% (1998). Average price level per year calculated from cumulative monthly price changes.

Source: Authors' calculations

Table 3.6 (continued)

| | Performance measures (2) | | | Average composite restructuring index | |
|--------------------------|--------------------------|-------------|-----------------|---------------------------------------|-------------|
| | Investment rate (I/K) | ROE | Export share, % | Deep | Defensive |
| Total | 7.4 | 16.9 | 4.4 | 61.9 | 49.0 |
| <i>By ownership:</i> | | | | | |
| Insider owned | 6.2 | 17.6 | 4.8 | 62.2 | 49.5 |
| Outsider owned | 7.8 | 9.6 | 4.3 | 61.4 | 55.8 |
| State owned | 4.5 | 22.1 | 7.4 | 58.3 | 58.0 |
| No overall ownership | 6.5 | 15.2 | 2.6 | 54.9 | 51.4 |
| <i>By board control:</i> | | | | | |
| Manager-controlled | 6.5 | 21.6 | 5.2 | 58.6 | 45.1 |
| Worker-controlled | 8.2 | 14.6 | 4.8 | 61.6 | 49.9 |
| Outsider-controlled | 8.1 | 14.0 | 3.9 | 64.6 | 54.9 |
| State-controlled | 5.4 | 20.0 | 9.0 | 57.0 | 52.8 |
| No overall control | 6.7 | 12.7 | 4.1 | 64.1 | 50.6 |

Source: Authors' calculations

In the case of ownership, the small numbers of firms that are state-owned or that have no single group with at least 50 percent ownership entails that the means for these groups should be treated with caution. The more reliable comparison is between the performance of insider-owned vs. outsider-owned firms. The main result that comes from the table is that the differences in performance between these two category of firms are minor; the only exception being profitability, where insider-owned firms are significantly more profitable than outsider-owned firms. This finding is confirmed by more rigorous statistical testing: in the case of both simple pairwise comparisons (correlation of ownership vs. performance) and comparisons of performance between the two ownership categories, controlling for the size, location, and industrial sector of the firm, the only significant difference to be found between

insider- and outsider-owned firms is in the higher profitability of the latter. Productivity levels, sales growth, employment growth, productivity growth, investment rates, and export activity, are all statistically indistinguishable between the two groups. Missing data and the relatively small number of manager-owned firms means we were not able to examine the differences between these two categories of insider-owned firms.

We were, however, able to look at the differences in performance between manager-controlled, worker-controlled, and outsider-controlled firms, where control is defined as a majority of seats on the board. The findings here are essentially the same as for ownership: with the exception of profitability, there are no significant differences between manager-, worker-, and outsider-controlled firms in terms of performance, whether or not characteristics of firms are controlled for (the poorer performance of worker-controlled firms in sales and productivity growth is in fact not statistically significant, because the cross-sectional variation in these measures is very large). Profitability, by contrast, is significantly higher in manager-controlled firms, not only compared to outsider-controlled firms but also compared to worker-controlled firms, and there is no difference between the latter two groups. This pattern is statistically significant, whether or not characteristics such as size, industry and location are controlled for. The positive correlation between profitability and insider ownership/managerial control carries through if we look at the correlation between the proportion of shares owned/board seats held and profitability. However, it doesn't carry through to the subsample of firms for which we have separate manager and employee ownership, where the correlation loses any statistical significance.

The nature of the causality underlying this correlation between profitability and managerial control/insider ownership is not clear. The impact of the nature of ownership and control on

firm performance is difficult to separate from the impact of performance on ownership and control. We looked at, for example, the correlation between high profitability at the time of the survey and changes in the portions of share ownership belonging to the different groups in question. High profitability is significantly correlated with an increase in share ownership by managers, but not with any other changes in ownership shares. We have also found that the significant and positive correlation between profitability and insider ownership is noticeably reduced if we look at the correlation between current profitability and insider ownership at the time of privatisation. Both findings suggest that insiders, and managers in particular, may be increasing their ownership shares in firms that are, in effect, “worth owning”. Separating this phenomenon from that in which ownership or control determine performance is left for future work.

3.3 Ownership, Control and Restructuring

Restructuring activity is notoriously difficult to measure, but we have attempted to do so nonetheless. Managers were given a long list of restructuring actions, and asked to categorise their firm’s restructuring activity up to 1999: (1) engaged in a specific activity in 1997, 1998, and/or 1999 (separately detailed); (2) didn’t engage in this activity in 1997-99 because it was done prior to 1997; (3) didn’t engage in it because the firm never needed to do it; (4) didn’t engage in it but should have. The responses can be combined into summary measures in a number of ways, but we choose to present here only one measure, based on whether the firm engaged in the restructuring activity at all in 1997-99. Note that firms that did not restructure are a heterogeneous set, composed both of firms that say they did not do so for positive

reasons (they didn't need to or did so already) and of firms that provided a negative reason (they should have but didn't)¹².

Table 3.7 Deep and Defensive Restructuring

| Deep restructuring | Total number of firms | % of firms engaged in restructuring in 1997-99 | Defensive restructuring | Total number of firms | % of firms engaged in restructuring in 1997-99 |
|---|-----------------------|--|---|-----------------------|--|
| Introduction of new products and services | 435 | 54.9 | Liquidation of unprofitable products | 426 | 46.0 |
| Moves to new markets | 423 | 75.7 | Cuts in social provision | 425 | 52.7 |
| Improved marketing | 428 | 71.7 | Shedding excess labour | 431 | 56.1 |
| Energy-saving innovation | 420 | 53.6 | Sale or leasing-out of excess equipment | 431 | 45.0 |
| Labour and material-saving innovation | 425 | 52.0 | Sale or leasing-out of real estate | 428 | 47.7 |
| Quality-raising innovation | 423 | 66.7 | | | |

Source: Authors' calculations

Table 3.7 presents the percentages of firms that engaged in various restructuring measures in 1997-99, grouping measures under the headings of “deep restructuring” (e.g., introducing new products or moving into new markets) and “defensive restructuring” (e.g., labour shedding or liquidating plant or product lines).

¹² We also note that in a subjective question such as this firms responding that they recognised the need to engage in a restructuring measure, but failed to do so, may have positive connotations in that they recognise the

The percentages lie in the range of 45 percent to 75 percent, with deep restructuring measures typically more common than defensive ones. This could reflect a plausible sequencing in restructuring – deep restructuring is more common because defensive restructuring measures have already been done, and indeed by their nature will not be maintained continuously – but it could also reflect excessively optimistic thinking by respondents.

Following Carlin *et al.* (2001), we have condensed these various measures of restructuring into composite deep and defensive restructuring indexes using the method of principal components. In both cases, the eigenvector of the first principal component provides the weights to be applied to the component restructuring indexes when constructing the composite index. The method also allows a check on whether a composite index is sensible, i.e., whether it is measuring some underlying deep or defensive restructuring activity. In the case of the deep restructuring composite index, the first principal component (out of six) explains fully 38 percent of the variance in the six deep restructuring indexes; the next most important component explains less than half that. Similarly, the first principal component for the five defensive restructuring activities explains 36 percent of the variance.

The last two columns of table 3.6 present the means for the two composite restructuring indexes by firm ownership and by board control. The indexes are normalised so that the index takes the value zero if a firm engaged in no restructuring measures in the period 1997-99, and the value 100 if a firm engaged in all possible measures. As was the case with the individual restructuring measures, deep restructuring is more common than defensive restructuring. The two categories of restructuring are positively correlated (the simple correlation coefficient is positive and significant at the 6 percent level). With respect to ownership and control,

need to restructure. Similarly, firms that report that they didn't need to restructure may have failed to appreciate

statistical testing suggests that firms with outside control of the board are significantly more likely than manager-controlled firms to engage in either deep or defensive restructuring, with worker-controlled firms somewhere in between. Ownership group, however, is not significantly correlated with restructuring activity of either sort.

One aspect of the firm that does differ significantly with ownership and control is the nature of the manager. Insider-owned firms tend to have general managers who have held their current post longer (8 years, vs. 5 years for outsider-owned firms) and who have been in the firm longer (20 years, vs. 15 years for outsider-owned firms). The same applies to insider-controlled firms (whether manager- or worker-controlled) vs. outsider-controlled firms. This does not appear to be the result of a greater willingness of outside owners to sack and replace poor managers: the proportion of insider- and outsider-owned firms with general managers who were appointed as replacements for someone who was performing poorly was about 50 percent for both categories of firms. Control of the board, however, is clearly related to managerial turnover: 40 percent of manager-controlled firms replaced their manager because of poor performance, vs. 48 percent of worker-controlled firms, and 53 percent of outsider-controlled firms.

Finally, table 3.8 summarises the obstacles to the conduct of business as perceived by managers. The list includes obstacles originating from a wide range of sources, and only the most commonly cited obstacles are listed here.

the need for restructuring activity to be undertaken.

Table 3.8 The Business Environment

| Administrative or other obstacles to business? | Number of firms | % | By size of firm | | |
|---|-----------------|--------------|-----------------|--------------|--------------|
| | | | <501 1000 | 501- 1000 | 1000+ |
| Yes | 250 | 57.2 | 50.3 | 55.5 | 66.1 |
| of which: | | | | | |
| Excessive and biased activities by inspection bodies (health, tax, environmental) | 100 | 22.0 | 21.8 | 21.9 | 23.6 |
| Difficulty in obtaining licenses for new activities and investment | 88 | 20.1 | 15.0 | 19.7 | 26.0 |
| Limitations of markets by regional governments of other regions | 26 | 6.0 | 8.2 | 2.9 | 4.7 |
| Other | 46 | 9.1 | 5.3 | 11.0 | 11.8 |
| No | 177 | 40.5 | 44.2 | 43.8 | 33.1 |
| Difficult to say | 10 | 2.3 | 5.4 | 0.7 | 0.8 |
| Total | 437 | 100.0 | 100.0 | 100.0 | 100.0 |

Source: Authors' calculations

A surprisingly large portion of firms — over 40 percent of the sample — stated that they saw no such major obstacles to business. Of the firms that did see obstacles, the most commonly cited were excessive and biased activities by government inspection bodies (health, tax, environmental, etc.), cited as the number one obstacle by 22 percent of firms; difficulties in

and costs of obtaining licenses, cited by 20 percent of firms; and regional protectionism, cited by 6 percent of firms. Surprisingly, or perhaps not, pressure from criminal groups was cited as the number one problem by only two firms in the entire survey. An interesting feature of the results in Table 3.8 is that larger firms are more likely than small firms to complain about obstacles to their business activity.

4. Competition, Performance and Restructuring

4.1 Introduction

For most economists, competition is viewed as a fundamental of the market economy, and therefore is expected to improve enterprise performance. However, modelling to establish this result is rare and the analysis is often indeterminate in sign, while the empirical evidence, even for developed market economies, is sparse. For example from a Schumpeterian perspective, less concentration will reduce rents and increase uncertainty, and this might result in a decrease of R & D investment, with negative effects on long run performance. On the other hand, the threat from competition could instead shorten the innovation cycle (Aghion and Carlin, (1996)). Moreover, firms could be forced to improve efficiency as the struggle for survival becomes harder. The latter view rests heavily on the ownership and capital market arrangements; soft budget constraints and the absence of bankruptcy enforcement fundamentally reduce such competitive processes. The same conceptual ambiguity holds with respect to managers' behaviour. It is not clear whether they would react to competition by exerting more effort or would be discouraged by the profit reduction (Willig (1987)). Once again the institutional and policy environment is significant.

As far as transition economies are concerned, an essential aspect of the economic environment is the ownership structure of the enterprise. This is because private ownership as well as competition may provide incentives to pursue a higher efficiency level. Private ownership is expected to be associated with harder budget constraints and a lower likelihood of government bailout in case of bankruptcy. Furthermore, privately-owned firms may be more aggressive and profit oriented than state-owned ones. This raises the issue of substitutability or complementarity of alternate policy regimes, therefore competition verses

privatisation. Competition processes ultimately refer to the rents generated by the enterprise in its product market, whether domestic or international. Increasing attention has been paid in recent years to the impact of trade liberalisation on domestic competitive processes, though, in large regionally dispersed economies like Russia, non-tariff barriers will always also be significant. The debate on the impact of alternative ownership forms has in large part focussed on the ways that such firm-specific rents (as might be available on product markets, whatever their structure) could be dissipated in the absence of effective capital market disciplines into the managerial utility function¹³. At the start of transition, the balance of opinion favoured speedy privatisation, a mechanism to break the state's monopoly of ownership and in effect a precondition to improved performance. More recently, influential analysts such as Joe Stiglitz and Nick Stern have argued that building a more competitive market structure prior to privatisation might have been beneficial to performance. These views are consistent with the hypothesis that market competition and privatisation are substitutes in disciplining firms and generating improved economic performance. In contrast, the disappointing impact of privatisation on performance in much of the former Soviet Union, indicates that they may be complements — privatisation only really works to improve company performance in contexts where product market competition has limited the scope of firm-specific rents.

The empirical evidence on this matter for Russia is scarce. Earle and Estrin's analysis (1998) supports the theory of complementarity between competition and privatisation, although the significance of the former is low. Brown and Earle (2001) highlight the importance of the interplay between ownership and concentration. Their analysis, using a 1992-99 panel of

¹³ For example to lower performance, excessive employment and unnecessary cost.

Russian manufacturing enterprises, shows evidence of a firm-level substitution effect between competition and privatisation.

The theoretical background is therefore too fragmented and ambiguous, and the empirical evidence too scarce to permit us to derive clear testable hypotheses from a complete model of firm behaviour *vis a vis* competition. In our view, the role of competition in enterprise performance requires more careful thought, and more attention should be devoted to understanding it as both a static and dynamic process. However, the aim of this paper is simply to provide an overview of the level and impact of competition in our sample of Russian firms. Hence no formal attempt to model the impact of domestic and foreign competition on enterprise behaviour and performance will be made. Rather, the focus of the present analysis will be a group of key variables, which are likely to be affected differently by varying degrees of competition.

Two possible scenarios are hypothesised. Both of them rest on the assumption that competition hardens the constraints on firms¹⁴. In one case, companies are expected to react to lower profitability by exerting more effort. Thus they will pursue restructuring and increase innovation in order to gain in efficiency and become more productive. According to this scenario, competition will be positively associated with restructuring (especially of the pro-active type), higher investment and innovation. Restructuring, innovation and investments should lead to higher efficiency and productivity.

The alternative hypothesis is that enterprises (especially high-cost ones) do not react in a positive way to the decrease of profitability and of market share implied by tough

competition, leading managerial effort to be reduced. In this case, firms would not engage in restructuring, at least not of the pro-active type¹⁵. No major investment would be undertaken. As a consequence, efficiency and productivity would not increase. The likely impacts of our key variables are illustrated in table 4.1.

Table 4.1 Likely Firm Level Impacts of Competition

| Impact on: | Scenario one: firms react positively to competition | Scenario two: firms react negatively to competition |
|-----------------------------|--|---|
| Restructuring | ↑ (especially of the pro-active type) | $\Delta = 0$ (or engaged mainly in defensive reforms) |
| Investment and innovation | ↑ | $\Delta = 0$ or ↓ |
| Efficiency and productivity | ↑ | $\Delta = 0$ or ↓ |
| Profitability | If there is an initial decrease due to competition, this may be counterbalanced to some extent | The possible initial decrease is likely to remain low |

A further objective of this preliminary exploration is to analyse possible ownership effects which allow for ownership-specific impacts of competition. Hence, state-owned and privately-owned firms are allowed to react differently to the same competition level. This is a direct consequence of the fact that corporate governance affects enterprise objectives and behaviour.

The discussion is organised as follows. The measures of competition used, their drawbacks and strength are discussed in sub-section 2. Sub-section 3 describes how the patterns of competition is distributed across Russian sectors and regions, as well as the size and

¹⁴ Whether emphasis is given to decreased rents and market power, reduced market share and lower demand or narrower profitability margins does not affect the result of the present exercise.

¹⁵ They might still undertake defensive reforms in order to protect their position in the market in the short term without bearing the higher costs of a deep restructuring.

ownership structure of the firm. Sub-section 4 investigates the effects of competition on restructuring and innovation; efficiency and productivity; profitability. Sub-section 5 concludes the analysis.

4.2 Definition

There are several issues in measuring competition in the work that follows. The survey contains firms whose primary market is domestic, i.e. whose proportion of sales either at krai/oblast or national level exceeds 50 percent. In the whole sample only 13 firms out of 437 sell primarily abroad. Two measures of competition are employed: domestic and import competition. The former is defined as high if there are more than 5 competitors in the same market; medium if competing firms are between 2 and 5; low in case of monopoly or duopoly¹⁶. The proportions of firms in the three categories are, respectively, 62.7, 27.5 and 9.7 percent. Thus most firms face a significant degree of competition in their relevant market. Unfortunately, the only measure of foreign competition available is a categorical variable that indicates whether firms face a significant competition from imports. Import competition is perhaps lower than one might have expected; around 37 percent of the sample considered it to be significant.

Table 4.2 Distribution of Firms According to Domestic and Foreign Competition

Categories

| Import competition 1=yes 0=no | Domestic competition | | | |
|----------------------------------|----------------------|------------|-----------|------------|
| | 1 | 2 | 3 | Total |
| 0 | 144 (60%) | 75 (72%) | 28 (75%) | 247 |
| 1 | 103 (40%) | 31 (28%) | 9 (25%) | 143 |
| Total | 247 | 106 | 37 | 390 |

Source: Authors' calculations

Overall, 40 percent of firms with high domestic competition face significant import competition as well, the proportion falling down to 28 percent and 25 percent for firms in medium and low competitive domestic markets. Thus import competition is acting to a modest extent to limit firms in a strong market position domestically. But when there are relatively high entry barriers, these apply equivalently to domestic and foreign firms. The measures of competition employed are qualitative ones, i.e. they reflect the interviewee's opinions on the level of competition faced by the enterprise. The limitation inherent with the use of qualitative indicators lies in their degree of subjectivity, which may blur between-firm comparisons. Technically speaking, it is equivalent to the introduction of a white-noise measurement error, which might have a potential biasing impact. On the other hand, enterprise insiders with their deep knowledge of firm-related matters, are likely to have a better insight of the true competition level faced by the firm. Perhaps they can better identify its main market, and its effective competitors. Market identification is a very complex issue, especially in case of multi-product firms, and this approach may be superior to the use of aggregated sectoral concentration indicators.

¹⁶ Note how the relevant geographical dimension is employed at all times. If a market competes only at krai/oblast level, only its krai/oblast competitors are counted. The same applies for competition at national level.

In this respect, reassurance is provided by a comparison of our indicators with the demand impact of a price change. Respondents are asked what the likely demand impact of a 10 percent price increase of their major product would be. Overall, the price elasticity of demand evaluation appears to be consistent with the perceived competition level.

If we group enterprises into two main categories, high and low competition, 62.2 percent of high-competition firms have a sales drop greater than 10 percent, while the remaining 38.2 percent will have a price elasticity of demand less than 10 percent or null. The equivalent values for low-competition enterprises are 35.5 percent and 64.5 percent.

Using a more marked division, we cluster firms around high (≥ 10 percent) and null elasticity (no sales change), the proportion for the high-competition group are 73 percent and 27 percent, while those for the high-concentration one are 47 percent and 53 percent.

Table 4.3 Interaction Between Competition and Price Elasticity of Demand

Perceptions

| | Hi. dom.+ for. Comp. | Hi. dom. Comp. | Med. dom.+ Comp. | Med. for. Dom. Comp. | Lo. Dom.+ for. Comp. | Lo. Dom. Comp. | Total |
|--------------------------------------|----------------------------|-------------------|------------------------|-------------------------------|----------------------------|-------------------|------------|
| sales | 57 | 57 | 17 | 18 | 1 | 5 | 155 |
| drop: ≥ 10% | | | | | | | |
| sales | 19 | 24 | 2 | 7 | 3 | 5 | 60 |
| drop: ≈ 10% | | | | | | | |
| sales | 10 | 30 | 2 | 24 | 3 | 4 | 73 |
| drop: < 10% | | | | | | | |
| sales will not change | 13 | 43 | 9 | 25 | 1 | 15 | 106 |
| Total | 99 | 154 | 30 | 74 | 8 | 29 | 394 |

Possible groupings:

| | | |
|--------------|--------------|--------------|
| ≥10% | 62.2% | 35.5% |
| <10% | 37.8% | 64.5% |
| +Δ=0 | | |
| Total | 100% | 100% |
| ≥10% | 73% | 47% |
| Δ=0 | 27% | 53% |
| Total | 100% | 100% |

Source: Authors' calculations

In both cases, a clustering of high sales change for very competitive firms and low or no change for highly concentrated enterprises can be clearly noted. This is suggestive of a substantial level of homogeneity in the perspective of the true competition level faced by the

firm, and more importantly, perhaps, that the subjective indicator of competition is related to management's perception of the firm's marginal revenue function.

4.3 Nature of Competition in Russia

Earle and Estrin (1998) and Brown and Earle (2001) argue that competition is linked to location, because firms and industries may not be randomly distributed across regions. Hence, strategic location may favour concentration through high transportation and geographical costs. The following table illustrates the distribution of firms by competition level across region, industry, size and ownership structure.

Commencing with table 4.4, there is little striking in our sample concerning domestic competition. The only region where high levels of domestic competition are significantly more common is Krasroyarsk (assuming we combine St Petersburg city with its region). High levels of domestic concentration are more common in the more isolated industrial or natural resource centres - Samara, Chelyabinsk, and perhaps Perm. The results on import competition also conform with expectations. Rather more firms in Moscow and in the Moscow region than average face significant import competition. Among the regions, only firms in Nizhny Novgorod face stiffer than average import competition. Interestingly, in our sample, the pressures of import competition are below average in St. Petersburg and its region, as well as in the other industrial centres.

Table 4.4 Regional Distribution of Firms by Competition Level

| code of the region | domestic comp 1=hi 2=med 3=lo (if sal>50%ru/obt) | | | | import comp. 1=yes 0=no | | |
|-----------------------|---|-----|----|-------|----------------------------|-----|-------|
| | 1 | 2 | 3 | Total | 0 | 1 | Total |
| | moscow | 24 | 8 | 4 | 36 | 18 | 17 |
| moscow region | 22 | 14 | 3 | 39 | 18 | 22 | 40 |
| st.-petersburg | 14 | 9 | 6 | 29 | 20 | 9 | 29 |
| st.-petersburg region | 8 | 2 | 0 | 10 | 10 | 4 | 14 |
| nizhny novgorod | 41 | 14 | 4 | 59 | 36 | 24 | 60 |
| samara | 22 | 10 | 5 | 37 | 28 | 9 | 37 |
| ekaterinburg | 35 | 11 | 2 | 48 | 26 | 20 | 46 |
| perm | 19 | 14 | 4 | 37 | 32 | 9 | 41 |
| novosibirsk | 24 | 12 | 4 | 40 | 23 | 15 | 38 |
| krasnoyarsk | 30 | 4 | 2 | 36 | 24 | 10 | 34 |
| volgograd | 4 | 5 | 2 | 11 | 7 | 4 | 11 |
| chelyabinsk | 9 | 5 | 3 | 17 | 11 | 7 | 18 |
| omsk | 6 | 5 | 1 | 12 | 9 | 2 | 11 |
| Total | 258 | 113 | 40 | 411 | 262 | 152 | 414 |

Source: Authors' calculations

Table 4.5 Sectoral Distribution of Firms by Competition Level

| 2-digit industry code | domestic comp 1=hi 2=med 3=lo (if sal>50%ru/obt) | | | | import comp. 1=yes 0=no | | |
|-----------------------------|---|-----|----|-------|----------------------------|-----|-------|
| | 1 | 2 | 3 | Total | 0 | 1 | Total |
| | Chemical and oil-chemical | 30 | 16 | 4 | 50 | 29 | 26 |
| Mach. Buil./Metal working | 45 | 42 | 19 | 106 | 70 | 29 | 99 |
| Wood and paper | 43 | 5 | 5 | 53 | 43 | 19 | 62 |
| Stone and clay | 37 | 26 | 7 | 70 | 55 | 11 | 66 |
| Light industry | 48 | 18 | 3 | 69 | 23 | 49 | 72 |
| Food industry | 55 | 6 | 2 | 63 | 42 | 18 | 60 |
| Total | 258 | 113 | 40 | 411 | 262 | 152 | 414 |

Source: Authors' calculations

Table 4.6 Size Distribution of Firms by Competition Level

| Time var. | domestic comp 1=hi 2=med 3=lo | | | | import comp. 1=yes | | |
|-----------------|-------------------------------|-----|----|-------|--------------------|-----|-------|
| | (if sal>50%ru/obt) | | | | 0=no | | |
| employment size | 1 | 2 | 3 | Total | 0 | 1 | Total |
| < 500 | 103 | 26 | 10 | 139 | 88 | 49 | 137 |
| 501 - 1000 | 73 | 45 | 14 | 132 | 83 | 49 | 132 |
| > 1000 | 68 | 35 | 14 | 117 | 73 | 48 | 121 |
| Total | 244 | 106 | 38 | 388 | 244 | 146 | 390 |

Source: Authors' calculations

Table 4.7 Ownership, Distribution of Firms by Competition Level

| | domestic comp 1=hi 2=med 3=lo | | | | import comp. 1=yes | | |
|---------------|-------------------------------|----|----|-------|--------------------|-----|-------|
| | (if sal>50%ru/obt) | | | | 0=no | | |
| sopo | 1 | 2 | 3 | Total | 0 | 1 | Total |
| State owned | 8 | 2 | 1 | 11 | 10 | 3 | 13 |
| Private owned | 205 | 92 | 33 | 330 | 207 | 124 | 331 |
| Total | 215 | 94 | 34 | 343 | 217 | 129 | 346 |

Source: Authors' calculations

There is little relationship between the firm's main sector of activity, at the two-digit level, and perceived domestic competition, though this is not true for import competition. Thus from table 4.5 we can observe that around 10 percent of firms in every two-digit sector indicate low levels of domestic competition, except for the machine building and metal working sector where the proportion is closer to 20 percent. However more firms than average in the wood and paper and the food industries report themselves subject to high domestic competition. In contrast, significant import competition is relatively lower in these

sectors (Stone & Clay and Food), but much higher than average in Light industry and for firms in the Chemical sector.

Interestingly, there is little relationship between perceived market power — domestic or against importers — and enterprise size. This is consistent with the view that perceptions of competition by managers relate to the very specific markets upon which their companies operate, ranging from niche activities for small enterprises to broadly defined markets for much larger ones. However, it is reassuring to note from table 4.6 that, though the differences are slight among larger firms (>1000 employees), there is a relatively higher proportion of enterprises facing low domestic competition and no import competition, while the converse is true for the smallest firm category (<500 workers).

Finally we turn to ownership distribution. It has been argued that the state will sell ‘the best firms’ first, which may imply that it would privatise the enterprises with more market power, domestic or international (see Gupta, Ham and Svejnar (2000), Walsh and Whelan (2000)). Our sample contains relatively few state owned firms (around 4 percent) but it can be seen in table 4.7 that this small group contains almost no firms in the low competitive category. This is consistent with the view that the state did privatise firms with significant domestic monopoly power, though import competition does not appear to have entered the calculations.

4.4 Effects of Competition

Competition is likely to affect performance through changes in (1) restructuring and innovation; (2) efficiency and productivity; (3) profitability. Though arbitrary (because of clear overlapping and interconnections) we can use the above division into three groups to explore the effect of competition on Russian firms using a series of key variables. Commencing with restructuring, we will look at magnitude and consistency of a series of reforms undertaken between 1997 and 1999; at the likelihood of having recently made a major investment in fixed capital; and at the vintage of capital. As regards productivity and efficiency, the indices used are labour productivity; value added per worker and proportion of equipment utilisation. Finally, ROE, EBITD over sales and EBITD over fixed assets¹⁷ are the profitability measures employed. Again, levels and rates of change will be looked at.

4.4.1 Restructuring and Innovation

The questionnaire reports information on fifteen possible reforms, asking whether they have been implemented between 1997 and 1999, and, if not, exploring some possible reasons for it.

In order to obtain synthetic measures, they have been grouped into:

- Type of restructuring: pro-active versus defensive reforms.
- Intensity of restructuring:
 - continuous, if the firm has restructured constantly between 1997 and 1999
 - one-off, for firms which have undertaken the various reforms once between 1997 and 1999
 - missed, if reforms were needed but could not be implemented

The indices range between zero and one. Hence, a firm that has undertaken all the pro-active reforms every year between 1997 and 1999 will have the maximum score of one in its “pro-active, continuous” index, and so on.

Table 4.8 Restructuring Indices and Competition

| | Domestic competition | | | Foreign competition | |
|------------------------|-------------------------------------|----------------|----------------|--|----------------|
| | High | Medium | Low | Yes | no |
| Pro-active, continuous | .363 (.319) | .382 (.329) | .286 (.309) | .402 (.318) | .341 (.324) |
| Pro-active, one off | .630 (.285) | .635 (.289) | .564 (.321) | No difference | |
| Pro-active, missed | No difference (overall mean = .160) | | | | |
| Defensive, continuous | .244 (.264) | .220 (.251) | .190 (.207) | .247 (.263) | .230 (.256) |
| Defensive, one off | .488 (.306) | .519 (.287) | .460 (.275) | .518 (.308) | .482 (.291) |
| Defensive, missed | .032 (.089) | .040 (.089) | .040 (.092) | No difference (overall mean = .037) | |

Note: Standard deviations are in parentheses.

Group-specific mean values are reported only when the differences are significant

Source: Authors' calculations

The use of more than one measure is advisable because none of them is devoid of ambiguity. Continuous restructuring might be seen both as a sign of “virtuous behaviour” and a failure to succeed at the first time. Exactly the opposite can be said of the one-off index. The third indicator, instead, might be biased because the incentive not to admit the failure to implement necessary reforms (and to provide wrong information instead) is quite high. Thus this latter

¹⁷ Return on equity is defined as 1999 after-tax profits (losses) divided by capital and reserves. EBITD is pre-tax profits (losses).

measure might simply be a sub-sample of a larger group of firms, whose interviewees refused to answer or gave misleading responses¹⁸.

First of all, the data suggest that firms engage more in deep rather than defensive reforms. As far as the latter is concerned, companies have undertaken less than half of the 5 reforms they were asked about, and less than a quarter of them continuously. The equivalent values for pro-active reforms are all significantly higher. Firms have undertaken 60 percent of them at least once between 1997 and 1999, of which more than one half continuously. This first result is indicative of some widespread attempt to pursue structural changes.

At a more detailed level, there is evidence of a positive association of pro-active restructuring with competition, both domestic and foreign. Firms in highly and medium competitive domestic markets restructure more than those in concentrated environments, both intermittently and continuously. The same applies to firms facing import competition. No significant differences, instead, have been detected in the last category.

Such results are consistent with the hypothesis that competition is positive for firms, as it forces them to be more “virtuous”. However, the magnitude of the differentials for companies in low and highly competitive environments is not very large.

As far as defensive reforms are concerned, it is theoretically unclear whether higher restructuring in more competitive environments is seen as a failure (because of the necessity of recurring to emergency measures, so to speak) or as a success (because firms are responsive to signals from the market).

¹⁸ Alternatives that could be chosen by respondents are: reforms were not implemented because there was no

The data are not clear, either. As regards domestic competition, high-competition firms have more continuous and less one-off restructuring than medium-competition ones (moreover, the significance level is very low). The latter group has undertaken more one-off restructuring than firms in very concentrated markets. Lastly, firms in highly competitive markets have a lower proportion of necessary but not undertaken reforms than the other two groups. Firms subject to foreign competition restructure more.

The small size of mean differentials between competition groups renders further exploration necessary. Such results might in fact be driven purely by some spurious correlation. Controlling for ownership, size, location and ownership structure of the company provides stronger evidence of the existence of a “true” competition effect of restructuring (although the use of regression analysis introduces the further issue of potential endogeneity between the two, which is not addressed here). Moreover, allowing for interactions between state shares and competition dummies will provide some initial evidence of the existence of complementarity or substitutability between privatisation and competition, shedding light on the different objectives and behaviour of state-owned and privately-owned firms.

need to; reform undertaken before 1997; difficult to answer.

Table 4.9 Competition and Restructuring — Regression Analysis — Significant

Coefficients

| | Deep restructuring | | | | | | Defensive restructuring | | | | | |
|------------|--------------------|-----|----|------|---|-----|-------------------------|-----|----|------|---|-----|
| | C | C+I | OF | OF+I | M | M+I | C | C+I | OF | OF+I | M | M+I |
| State | | | | | | | | | | | | + |
| Med dom | | | | | + | + | - | - | | | + | + |
| Lo dom | - | - | - | - | | | - | - | | | | |
| Foreign | | | | | | | | | | | | |
| Med*state | | | | - | | + | | | | | | |
| Lo* state | | | | | | | | | | | | |
| For* state | | | | - | | + | | | + | | | |

Note: C = continuous restructuring

OF = one-off restructuring

M = missed restructuring

I = interactions

The significance is up to the 90% level

Source: Authors' calculations

Table 4.9 shows clearly that the previous results are not due to hidden spurious correlation (at least not with the regressors included in the OLS). Domestic competition is the true driving force, while foreign one is a less significant factor. Firms in highly concentrated markets engage in less deep restructuring (both continuous and one-off) than highly competitive ones, and to some extent in defensive restructuring as well, together with medium competition enterprises. This latter group has more missed reforms. Defensive restructuring is positively correlated with state shares. Some significant interaction of ownership with competition occurs, but there is never any difference in sign between state and private share ownership.

An indirect way to look at the state of restructuring in a firm is to check the proportion of capital by age category, and control for evidence of a relationship between the undertaking of major investments in fixed capital and the level of competition faced by the firm.

If competition shortens the innovation cycle, the lower the concentration, the higher the probability of having recently (since August 1998) undertaken a major investment. A binary variable coded one if such case is observed is regressed on competition level, controlling for size, industry, location and ownership structure of firms. *Ceteris paribus*, firms facing foreign competition are more likely to have undertaken the investment. Moreover, the interaction of import competition dummies with the shares owned by the government shows that such likelihood is higher the larger the privately owned share. Vice versa, within firms subject to import competition, the higher the proportion owned by the state, the lower the probability of having undertaken the investment. This result is quite interesting, as it supports the view that competition affects firms differently according to their ownership structure. Table 4.10 illustrates the main results.

A further indirect measure of restructuring is the age of firm's equipment. The proportion of capital less than 10 years old is regressed on ownership and competition, controlling for size, location and industry. Although some weak negative association between state-owned shares and proportion of "new" equipment is detected (higher state-owned shares correlated with lower proportion of "new" machinery), no competition effect is found.

Table 4.10 Logistic Regressions of Probability of Undertaking Major Investment in Fixed Capital Since August 1998

| Probability of undertaking investment | Basic model | Interactions |
|--|-----------------------------|------------------------------|
| Controls for: | | |
| Size | Some effect | Some effect |
| Region | Not significant | Not significant |
| Industry | Some effect | Some effect |
| State ownership | - (p-value=0.111) | No significant |
| Domestic competition: | | |
| Medium | Not significant | Not significant |
| Low | Not significant | Not significant |
| Foreign competition: | | |
| Yes | .549 (p-value=0.065) | .745 (p-value=0.022) |
| Interaction of state ownership and foreign competition | --- | -.042 (p-value=0.097) |

Source: Authors' calculations

4.4.2 Efficiency and Productivity

Competition and the hardening of budget constraints might be associated with increased efficiency. The proportion of fixed capital used by the enterprise, in levels and first difference, may be an indicator of its efficiency, both in a static and dynamic context. Both measures are regressed on ownership and competition, allowing for interactions between the two, with the usual controls. The same specifications are adopted for the productivity measures used, sales per worker and value added. Region, industry, size and ownership effects are detected (ownership is significant only *vis a vis* the growth of capital utilisation: the higher the state shares, the lower the change in the proportion of capital used), but no competition-specific result is found. Although no major significant effects are detected, a few interesting points can still be made.

As far as capital utilisation is concerned, notice how the dynamic specification performs better than the static one. Moreover, the competition variables, both alone and interacted with ownership, have contrasting effects in the levels and growth equations. To look at the dynamics is potentially quite an interesting exercise. Firms hit by competition may face different initial conditions. In this case, it is the variables' changes, and not only their initial levels, which will be affected.

Table 4.11 Competition, Efficiency and Productivity

| EFFICIENCY | | Basic equation | Interactions | Exceptions |
|----------------------------|------------------|---|--------------|--|
| Capital utilisation | Levels | Competition not statistically significant | | --- |
| | First difference | | | --- |
| PRODUCTIVITY | | Basic equation | Interactions | Exceptions |
| Log-Value added per worker | Levels | Competition not statistically significant | | --- |
| | First difference | | | --- |
| Labour productivity | Levels | | | Low comp. -ve coeff. (p-value=.151) |
| | First difference | | | --- |

Source: Authors' calculations

As regards productivity instead, no major consistent pattern of differences between the statics and dynamics can be detected. Both in the labour productivity and value added regressions, the signs (but not the significance) of the coefficients suggest that enterprises facing higher competition, both foreign and domestic, have also greater productivity levels. Overall, this may suggest the existence of some relationship between competition and the pursuit of higher efficiency.

4.4.3 Profitability

We have so far observed that competition is positively associated with restructuring. Although such effect is not captured by variation in the proportion of capital utilisation, and no major significant differences are detected in the comparison of productivity levels for enterprises facing varying degrees of competition, a successful restructuring is expected to increase productivity and to have an indirect impact on profitability. On the other hand, competition *per se* is likely to reduce profit margins (through a decrease in demand and a reduction in firm-specific rents). Hence, the total (direct plus indirect) effect of competition on profitability cannot easily be predicted *a priori*.

A series of regressions have been performed in order to check for some association between competition and profitability indicators. As usual, size, region, industry and ownership have been controlled for. Moreover, competition dummies have been interacted with shares of state ownership. The dependent variables have been used in both levels and rates of change, in order to capture both dynamic and static effects. A synthetic table with the essential information is reported here.

Apart from a few sporadic results, with a very weak significance level overall it appears that competition plays no direct role in the level and growth of profitability. Medium domestic competition is associated with faster growth of the profit-capital ratio (base category is high competition). Moreover, the same firms' ROE is higher the lower the state shares. Finally, low competition firms' growth of profit/sales is lower the higher the proportion of shares held by the state.

Table 4.12 Competition, Profitability and Productivity

| PROFITABILITY | | Basic equation | Interactions | Exceptions |
|-----------------------------------|------------------|---|--------------|--|
| ROE | Levels | Competition not statistically significant | | (Medium comp*state sh.) -ve coeff. (p-value=.104) |
| | First difference | | | --- |
| Profit/capital (low F statistics) | Levels | | | --- |
| | First difference | | | Medium comp. +ve coeff. (p-value=.102) |
| Profit/sales | Levels | | | --- |
| | First difference | | | (Low comp*state sh.) -ve coeff. (p-value=.106) |
| | | | | |

Note: OLS regressions of the indicator on ownership and domestic and foreign competition, plus interactions, controlling for size, location and industry.

In the value added case, a log-linearised Cobb-Douglas production function with the above controls and ownership and competition effects is estimated.

Omitted category: PO shares; High domestic competition; no foreign competition.

Source: Authors' calculations

Results for the EBITD/capital ratio come from too poor a specification to have any relevance. Comparisons of the overall significance of ownership and competition variables in the remaining two indices shows no consistency. However, from the scarce significant coefficients we can observe that the levels and growth of medium and low competition companies is lower (compared to high competition ones) the higher the proportion of shares owned by the government. This partial result is in line with the findings of the previous sections, and it somehow confirms the importance of the interplay between ownership and competition.

4.5 Conclusions

Overall, our findings are quite interesting. The major effect of competition is undoubtedly on the intensity and the type of restructuring. Low domestic competition is associated with less pro-active reforms, and medium competition with more missed ones. State shareholding is associated with higher levels of defensive restructuring. Competition is a driving force in terms of capital investment, too, although on this occasion it is foreign competition that has the major impact.

Altogether, these results suggest that the likely impact of competition on firm behaviour is consistent with the notion of an increase in effort levels, and the pursuit of efficiency to counter the decrease in rents. However, using direct measurements of efficiency indicators (vintage of capital and two different measures of productivity) do not provide additional compelling evidence. Though the signs of the competition variables are consistent with this scenario- high productivity being generally associated with high competition (also a weakly significant negative effect of low domestic competition on the level of labour productivity). The productivity effect of competition is varied and overall too unclear to be conclusive though again the few (weakly) significant variables are not inconsistent with arguments of positive efficiency effects.

The really interesting findings, however, are the least explored in the present analysis. Two points repeatedly emerge from our research. One is the importance of the impact of competition as a dynamic phenomenon, an issue that clearly deserves much more careful consideration and modelling at the theoretical level. This is shown not only by the signs of the coefficients in the various first difference regressions, but primarily by the link between

competition and restructuring, this latter one being itself a dynamic process, rather than a static concept.

The other is the importance of the interplay between corporate governance and competition. Overall, our investigation suggests that the positive effect of the latter on performance is not a substitute, but a complement to privatisation. More generally, it indicates how ownership affects firm behaviour and objectives, and enterprise responses to the same exogenous shocks.

5. Performance, Restructuring and Finance

5.1 Introduction

The importance of finance for corporate restructuring and performance is one of the most consistent conclusions throughout studies of transition. While privatisation has led to the transfer of ownership from state to private hands, investment in physical capital is fundamental if enterprises are to restructure in a manner that will enable their long-term viability. Unfortunately available evidence suggests that enterprises in transition economies have been subjected to acute financial constraints that have hindered the restructuring process (see e.g., Cornelli, Portes and Schaffer (1996), Commander, Fan and Schaffer (1996), Bevan, Estrin and Schaffer (1999)).

While the financial markets of the transition front-runners have begun to approach those of middle income countries, those in the Former Soviet Union (FSU) generally remain thin and do not constitute an 'enabling environment'. Although the financial environment in Russia may be somewhat more developed than in many of the satellite states, it has been severely weakened by the August 1998 crisis. This has led to a demonetisation of the economy and the emergence of barter — a phenomenon that has been largely confined to the FSU (see Commander and Mumssen (1999)).

This section considers the results of our survey that relate finance, restructuring and performance. We firstly consider the extent to which enterprises are financially constrained and the forms in which these constraints manifest themselves. Sub-section 3 provides more detail by considering the extent to which financial constraints differ according to characteristics of the enterprise such as size, region, area of activity and so on. In order to

ease the analysis we then combine the individual constraints to construct an overall credit constraint, and examine the variation of this constraint across units of observation. Sub-section 4 considers the consequences of aggregate financial constraint in terms of the impact on barter, restructuring and investment activity. The section continues to examine the influence that these factors have over company performance in our sample. Sub-section 5 summarises and draws conclusions.

5.2. Are Companies Financially Constrained and How?

The prevailing conditions in Russia suggest that while commercial credit may be difficult to obtain generally, the majority of lending that does occur is short term in nature — hence more suitable for working capital than longer-term investment projects. This is borne out by the results presented in table 5.1 below. Only 9.4 percent of firms surveyed report that they would find it impossible to obtain short-term commercial bank credit, compared to 23.3 percent who report that they would find it impossible to obtain long-term finance. Moreover while 55.1 percent of our firms report that they would find it very easy or fairly easy to obtain a short-term commercial bank lending, a mere 21.9 percent find it equally easy to obtain long-term bank finance. Nonetheless, short-term commercial credit does not appear to be prohibitively expensive at the aggregate, with the mean interest rate payable on a short-term loan being 34.7 percent.

Table 5.1 Availability of credit on commercial terms (%)

| | Short-term bank credit | Long-term bank credit |
|---------------------|------------------------|-----------------------|
| Very easy | 16.7 | 6.1 |
| Fairly easy | 38.4 | 15.8 |
| Fairly difficult | 23.3 | 28.4 |
| Very difficult | 8.9 | 21.1 |
| Impossible | 9.4 | 23.3 |
| Difficult to answer | 2.8 | 4.8 |
| Refuse to answer | 0.5 | 0.5 |

Source: Authors' calculations

Table 5.2 reinforces the distinction between short and long-term finance, and reveals more detail of the term structure of finance. A striking 57.7 percent of firms report that they would be unable to obtain commercial credit for more than 12 months duration, with only 20.8 percent claiming that they would have access to commercial credit repayable in more than 12 months and only 4.8 percent more than five years¹⁹.

¹⁹ We note that there is some inconsistency between the answers to the questions in the two tables, as fifty of our surveyed firms report that they would find it impossible to obtain any commercial credit in table 5.2, while only forty firms reported that they would find it impossible to obtain both short and long-term finance in table 5.1. Moreover we are aware of the fuzzy nature of the distinction between long and short-term finance differ; one firm stated that it would find it impossible to obtain short-term finance, fairly difficult but not impossible to obtain long-term finance and that the maximum term over which it could obtain a bank loan was 4-6 months. Furthermore it is probable that the reported mean interest rate payable is biased downwards due to the unobservable nature of punitively high interest rates which are censored from the distribution as equilibrium rather than supply rates are observed.

Table 5.2 The longest period any bank would be willing to lend to you (%)

| | |
|--|------|
| Less than one month | 0.7 |
| 1-3 months | 13.5 |
| 4-6 months | 18.3 |
| 7-12 months | 25.2 |
| 1-2 years | 10.3 |
| 3-5 years | 5.7 |
| Greater than 5 years | 4.8 |
| Impossible to get credit on commercial terms | 11.4 |
| Difficult to answer | 9.6 |
| Refuse to answer | 0.5 |

Source: Authors' calculations

Unsurprisingly our results suggest that companies find it even more difficult to obtain equity financing. Table 5.3 reports that 29.8 percent of our sample report that they would find it impossible to obtain equity financing from Russian external investors, and 45.1 percent claim that it would be fairly or very difficult. Evidence suggests that firms find it even more difficult to obtain non-Russian equity financing — 46.1 percent report it impossible to obtain equity financing from foreign sources and 30.3 percent claim that this would be fairly or very difficult.

Table 5.3 Availability of equity financing

| | Russian investors | Foreign investors |
|---------------------|-------------------|-------------------|
| Very easy | 1.2 | 0.9 |
| Fairly easy | 9.1 | 4.8 |
| Fairly difficult | 16.2 | 9.1 |
| Very difficult | 28.9 | 21.2 |
| Impossible | 29.8 | 46.1 |
| Difficult to answer | 12.6 | 16.0 |
| Refuse to answer | 2.2 | 1.9 |

Source: Authors' calculations

Finally we consider whether companies may find it easier to obtain financial assistance from the state. On the surface it appears that this is most certainly not the case, as a resounding 84.4 percent of firms state that they would find it very difficult or impossible to obtain financial assistance from the federal budget. It would appear that it is slightly easier to obtain regional state assistance, as only 59.9 percent of firms report the same at the regional level. However, despite this apparent difficulty of obtaining state assistance, our results suggest that a substantial number of firms are successful. Table 5.4 below presents the results of three constructed variables indicating whether a firm received federal, regional and federal and/or regional assistance. The first two variables are constructed to take a value of one if a firm received any form of federal assistance and regional assistance respectively and zero otherwise; the third variable is then assigned a value of one if a firm received a value of one for either or both the federal and regional variables.

Table 5.4 Receipt of federal, regional and federal and/or regional assistance

| | Federal | Regional | Either or both |
|-----------------|---------|----------|----------------|
| Received | 31.8 | 38.8 | 53.1 |
| Did not receive | 68.2 | 61.2 | 46.9 |

Source: Authors' calculations

As table 5.4 illustrates 31.8 percent of firms received some form of federal state assistance in our sample. The table also illustrates a slight bias towards regional assistance as 38.8 percent of firms reported receiving some form of regional state assistance. Overall, more than half of our sample (53.1 percent) received either or both forms of assistance, with 26.9 percent of these firms receiving only federal assistance, 40.1 percent receiving only regional assistance and 33 percent receiving both.

Of the individual sources of state assistance, the overriding number of cases report assistance through regional tax holidays or restructuring of federal and regional tax debt — 82 of our 437 firms report that they have obtained regional tax holidays, and 88 (69) firms report restructuring of their federal (regional) tax debts.

5.3 How Do These Constraints Differ Across Units of Observation?

5.3.1. Commercial Credit

There are many reasons to consider that the degree to which firms are financially constrained may differ as a result of company size. Studies of corporate financial structure have tended to find that, controlling for additional factors, corporate leverage increases with company size, perhaps as a result of improved access to commercial credit resulting from the fact that the probability of bankruptcy is diminishing with size (see e.g., Rajan and Zingales (1995), Cornelli, Portes and Schaffer (1996), Bevan and Danbolt (2001)). Similarly one may hypothesise that larger firms are more likely to have access to equity finance. These assumptions are, however, questionable in an economy such as the FSU; there is a significant probability that very large firms are monoliths that have undertaken limited reform. Hence we may hypothesise that larger firms are likely to receive better access to state assistance, perhaps because they are more significant with relation to the economy, have better lobbying skills and so on. In this event, if credit markets operate rationally larger firms would be expected to receive less bank and equity finance.

We find some variation across our three size classes regarding the maximum term over which they would expect to be afforded a commercial bank loan. The number of firms reporting that they would find it impossible to obtain any commercial credit diminishes with size (15 percent of our sample of small firms, against 10.1 percent of medium-sized firms and 8 percent of large firms). Among firms that are able to receive commercial bank debt, we find more variation among short-term (defined as less than one year) than long-term debt (one to five years) — 50.3 percent of small firms state that the maximum term over which they get credit would be 12 months or less, compared to 60.4 percent of medium-sized firms and 63.2

percent of large firms. We do not find similar variation in terms of credit of one to five years duration, perhaps due to the fact that long-term credit is less available generally.

Figure 5.1 below cross-cuts the response to the question ‘How easy would it be for your enterprise to obtain a short term bank loan on commercial terms’ with size.

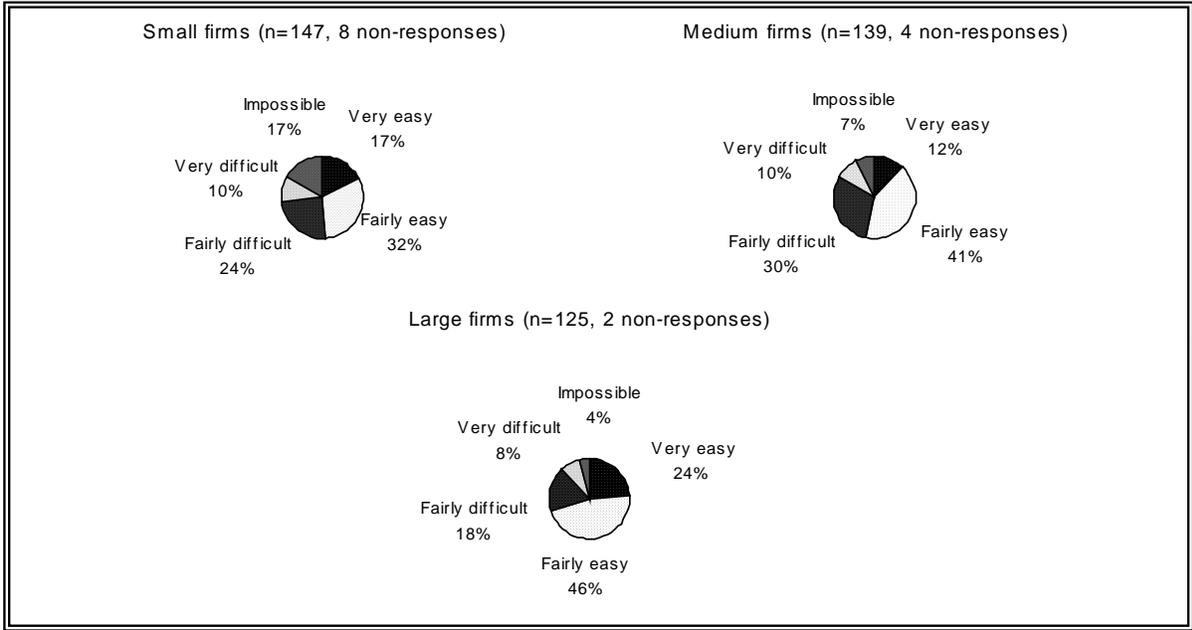


Figure 5.1 - Availability of short term credit by firm size class

We find the percentage of firms reporting that they would find it impossible to obtain short-term credit access is diminishing in size: 17 percent of our small firms, relative to 7 percent of our medium-sized firms and 4 percent of our large firms. Similarly we find 49 percent of small firms report that it would be very easy or fairly easy to obtain short-term commercial credit, compared to 53 percent of medium-sized firms and 70 percent of large firms. We do not find a similar variation in long-term credit access, confirming our prior result.

We also find a strong regional dimension to commercial credit access. While 11.4 percent of all firms report that they would be unable to obtain any commercial credit, several regions report lower percentages: Moscow city or region, where no firms report this to be the case,

6.7 percent (10 percent) of firms in St Petersburg region (city), 7.7 percent in Samara and no firms in Volgograd (although our sample in Volgograd is smaller than the others, with only 10 firms responding to the question).

Once again, however, there are variations between short and long-term credit. Table 5.5 illustrates that of the 57 percent of firms claiming that they would find it very easy or fairly easy to obtain short-term commercial credit, considerably more firms thought so in Moscow city, St Petersburg city, Nizhny Novgorod, Ekaterinburg and Samara. The lowest figures were found in Krasnoyarsk and Omsk, although the latter figure is likely to be biased owing to the small sample size in Omsk.

Table 5.5 Availability of short-term credit

| | Very Easy or Fairly Easy (%) | Impossible (%) | No. obs |
|-----------------------|---------------------------------|----------------|---------|
| Moscow | 73.5 | 0.0 | 34 |
| Moscow region | 58.5 | 4.9 | 41 |
| St. Petersburg | 72.4 | 6.9 | 29 |
| St. Petersburg region | 53.3 | 20.0 | 15 |
| Nizhny Novgorod | 69.8 | 7.9 | 63 |
| Samara | 62.2 | 8.1 | 37 |
| Ekaterinburg | 67.3 | 4.1 | 49 |
| Perm | 51.2 | 22.0 | 41 |
| Novosibirsk | 38.5 | 15.4 | 39 |
| Krasnoyarsk | 36.1 | 13.9 | 36 |
| Volgograd | 54.5 | 0.0 | 11 |
| Chelyabinsk | 41.2 | 5.9 | 17 |
| Omsk | 9.1 | 27.3 | 11 |
| Average | 57.0 | 9.7 | 423 |

Source: Authors' calculations

While long-term credit is generally less available, and hence the number of positive responses are smaller, table 5.6 illustrates that access appears to be easier in Chelyabinsk (although again the sample size is small) and St Petersburg city (which have the highest percentage of firms reporting very easy or fairly easy). By contrast access appears to be most difficult in Perm and Omsk .

Table 5.6 Availability of long-term credit

| | Very Easy or Fairly Easy (%) | Impossible (%) | No. obs |
|-----------------------|------------------------------|----------------|---------|
| Moscow | 34.4 | 12.5 | 32 |
| Moscow region | 17.1 | 34.1 | 41 |
| St. Petersburg | 50.0 | 10.7 | 28 |
| St. Petersburg region | 35.7 | 28.6 | 14 |
| Nizhny Novgorod | 25.8 | 22.6 | 62 |
| Samara | 27.0 | 18.9 | 37 |
| Ekaterinburg | 25.0 | 20.8 | 48 |
| Perm | 10.3 | 38.5 | 39 |
| Novosibirsk | 45.9 | 0.0 | 37 |
| Krasnoyarsk | 14.3 | 28.6 | 35 |
| Volgograd | 25.0 | 16.7 | 12 |
| Chelyabinsk | 61.1 | 0.0 | 18 |
| Omsk | 0.0 | 54.5 | 11 |
| Average | 27.8 | 21.5 | 414 |

Source: Authors' calculations

Interestingly we also find that the interest rate that firms would expect to pay on a short-term loan varies considerably by region. Firms in Krasnoyarsk and Novosibirsk report higher mean expected interest rates than the average (38.45 and 38.3 and percent respectively, against an average of 34.68 percent). Perhaps unsurprisingly the lowest expected interest

rates are reported by firms in St Petersburg and Moscow cities (30.31 and 31.74 percent respectively).

We also find evidence of an important industrial dimension in responses to questions concerning commercial credit availability. The results presented in table 5.7 illustrate that considerably fewer firms than average expected to find it impossible to obtain short-term bank credit in the chemicals sector , and considerably more felt so in the wood and paper, and building materials sectors. Similarly more firms in the chemicals sector and the food industry felt that it would be very easy or fairly easy to obtain short-term bank debt — most likely because these sectors have had the most robust demand and attracted a large share of foreign direct investment. Far fewer firms considered this to be the case in the building materials and light industry sectors, which largely supply the domestic market and have attracted limited foreign interest.

Table 5.7 Availability of short-term credit

| | Very Easy or Fairly Easy (%) | Impossible (%) | No. obs |
|--------------------|---------------------------------|----------------|---------|
| Chemicals | 70.2 | 1.8 | 57 |
| Machinery | 55.8 | 10.6 | 104 |
| Wood and paper | 55.6 | 14.3 | 63 |
| Building materials | 44.9 | 13.0 | 69 |
| Light industry | 49.3 | 8.7 | 69 |
| Food industry | 70.5 | 8.2 | 61 |
| Average | 57.0 | 9.7 | 423 |

Source: Authors' calculations

Once again, there is less variation with respect to long-term credit, although it is notable that a very low number (9.5 percent) of firms in the food industry expected it to be impossible to

obtain long-term credit. Consequently we find little variation between industries in terms of the proportion of firms claiming that they would be able to obtain lending for 12 months or less. As table 5.8 illustrates, the variation occurs in the proportion of firms claiming that it would be impossible to obtain any commercial credit. As expected on the basis of previous results, the building materials sector reports by far the largest percentage of ‘impossibles’, closely followed by the machinery and the wood and paper sectors.

Table 5.8 Longest period that a bank would be willing to lend to you

| | 12 months or less (%) | Impossible (%) | No. obs |
|--------------------|--------------------------|----------------|---------|
| Chemicals | 58.2 | 5.5 | 55 |
| Machinery | 66.7 | 15.6 | 90 |
| Wood and paper | 65.6 | 14.8 | 61 |
| Building materials | 61.5 | 18.5 | 65 |
| Light industry | 70.8 | 12.3 | 65 |
| Food industry | 59.6 | 7.0 | 57 |
| Average | 64.1 | 12.7 | 393 |

Source: Authors' calculations

Overall therefore, our results suggest that access to and the cost of commercial credit will be related to:

- **Size** larger firms report it easier to obtain short-term commercial credit, there is no size variation in long-term credit;
- **Region** easier to obtain short-term credit in Moscow, St Petersburg, Nizhny Novgorod, Ekaterinburg and Samara; long-term in Chelyabinsk and St Petersburg city; higher interest rates charged in Krasnoyarsk and Novosibirsk, lower in St Petersburg and Moscow cities;

- **Industry** most difficult access appears to be in building materials, machinery, and wood and paper sectors.

5.3.2. Equity Financing

Unsurprisingly we find that the ease of obtaining equity finance differs significantly according to the size of the firm in our sample. Figure 5.2 below presents the responses to the question ‘How easy would you find it to obtain equity financing from Russian external investors’. We find that the percentage of firms that report that they would find it very easy or fairly easy increases with the size of the firm — 8 percent of small firms against 13 percent of medium-sized firms against 18 percent of large firms.

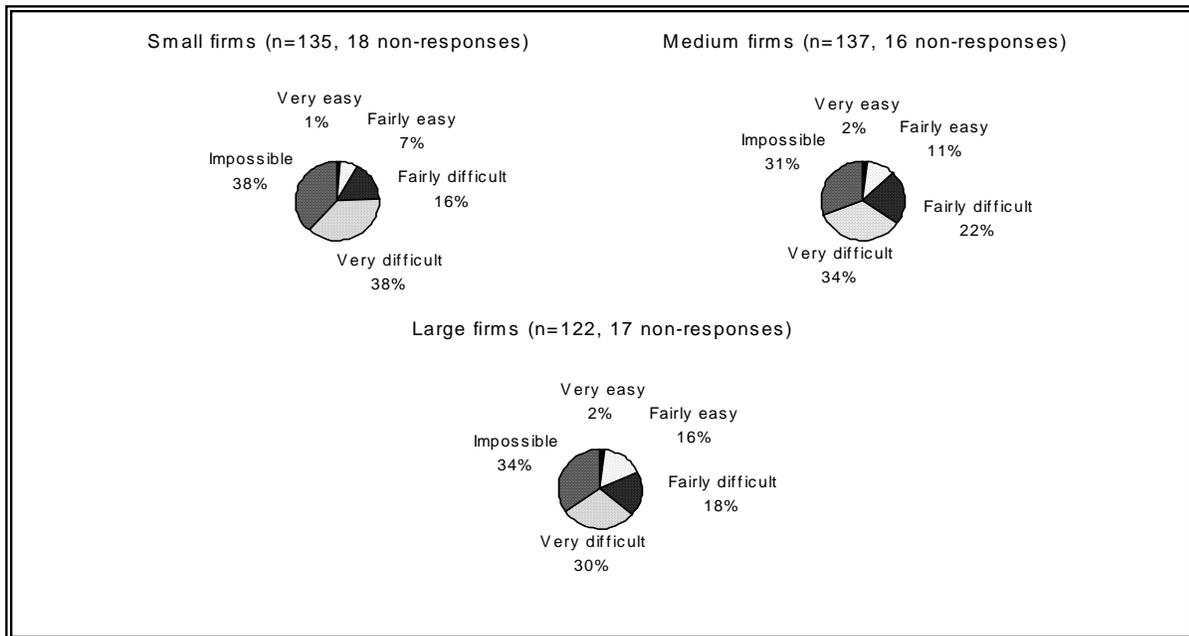


Figure 5.2 - Access to Russian equity finance by firm size class

The picture is less clear however when considering the number of firms reporting that it would be impossible to obtain Russian equity financing: although a smaller percentage of medium and large firms claim that this would be impossible, slightly less medium-sized firms

report so than larger firms. By contrast, the results of the same question with respect to external equity are more clear-cut as illustrated in figure 5.3 below.

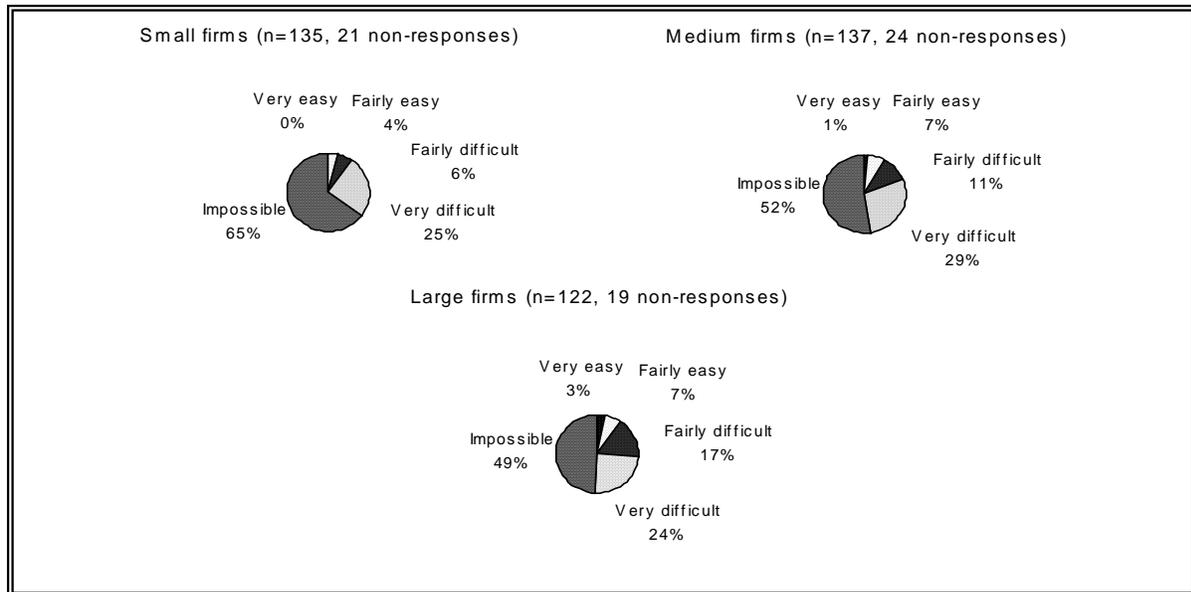


Figure 5.3 - Access to foreign equity finance by firm size class

We note that whilst firms generally report that they would find it more difficult to obtain foreign than Russian equity, there is also a clear size dimension present in the access to foreign equity finance. A greater proportion of firms report that obtaining foreign equity would be very easy or fairly easy as size increases, reinforced by a monotonic decline in the percentage of firms reporting that this would be impossible (and impossible or fairly difficult).

Tables 5.9 and 5.10 present the regional dimension of Russian and Foreign equity financing, respectively.

Table 5.9 Ease of obtaining Russian investors for equity financing

| | Very Easy or Fairly Easy (%) | Impossible (%) | No. obs |
|-----------------------|---------------------------------|----------------|---------|
| Moscow | 15.6 | 34.4 | 32 |
| Moscow region | 10.0 | 50.0 | 40 |
| St. Petersburg | 18.2 | 18.2 | 22 |
| St. Petersburg region | 16.7 | 50.0 | 12 |
| Nizhny Novgorod | 15.2 | 23.9 | 46 |
| Samara | 13.3 | 30.0 | 30 |
| Ekaterinburg | 11.9 | 38.1 | 42 |
| Perm | 6.5 | 41.9 | 31 |
| Novosibirsk | 11.8 | 23.5 | 34 |
| Krasnoyarsk | 8.8 | 41.2 | 34 |
| Volgograd | 14.3 | 28.6 | 7 |
| Chelyabinsk | 13.3 | 33.3 | 15 |
| Omsk | 0.0 | 50.0 | 12 |
| Average | 12.0 | 35.0 | 357 |

Source: Authors' calculations

Table 5.9 illustrates that more firms regarded it as very easy or fairly easy to obtain Russian equity in St. Petersburg city, St Petersburg oblast (although this figure is potentially biased by the low number of responses) Moscow city and Nizhny Novgorod. By contrast a surprising 50 percent of firms in Moscow and St Petersburg oblasts report that they would find it impossible to obtain Russian equity, followed by 41.9 percent of firms in Perm and 41.2 percent in Krasnoyarsk. Table 5.10 provides further evidence that sourcing foreign equity finance is more difficult than Russian equity finance, with the number of firms reporting 'impossible' increasing in all regions. Nonetheless, St Petersburg city has by far the smallest number of impossibles, and largest percentage of firms reporting very or fairly easy, followed by Nizhny Novgorod and Krasnoyarsk.

Table 5.10 Ease of obtaining foreign investors for equity financing

| | Very Easy or Fairly Easy (%) | Impossible (%) | No. obs |
|-----------------------|---------------------------------|----------------|---------|
| Moscow | 3.0 | 54.5 | 33 |
| Moscow region | 5.3 | 60.5 | 38 |
| St. Petersburg | 22.7 | 27.3 | 22 |
| St. Petersburg region | 0.0 | 72.7 | 11 |
| Nizhny Novgorod | 11.6 | 60.5 | 43 |
| Samara | 6.5 | 58.1 | 31 |
| Ekaterinburg | 7.9 | 57.9 | 38 |
| Perm | 0.0 | 58.6 | 29 |
| Novosibirsk | 5.9 | 44.1 | 34 |
| Krasnoyarsk | 12.5 | 56.3 | 32 |
| Volgograd | 0.0 | 40.0 | 5 |
| Chelyabinsk | 0.0 | 75.0 | 16 |
| Omsk | 0.0 | 66.7 | 12 |
| Average | 7.0 | 56.1 | 344 |

Source: Authors' calculations

At the 2 digit industry level, the results of table 5.11 illustrate that the food industry contains by far the largest proportion of firms reporting that they would find it very or fairly easy to obtaining Russian equity financing. The food sector also reports the second lowest number of impossibles, closely following the machinery sector. As table 5.12 illustrates the food industry also appears to be the least constrained sector in terms of foreign equity, with the chemicals industry following at a distance. This result is not entirely surprising as the food industry in most transition countries has typically benefited from more robust demand. Moreover returns to investment have been high due to the nature of the food sector under central planning, and hence the sector has typically been able to attract significant investment (both domestic and foreign).

Table 5.11 Ease of obtaining Russian investors for equity financing

| | Very Easy or Fairly Easy (%) | Impossible (%) | No. obs |
|--------------------|---------------------------------|----------------|---------|
| Chemicals | 12.8 | 34.0 | 47 |
| Machinery | 12.6 | 31.0 | 87 |
| Wood and paper | 7.5 | 39.6 | 53 |
| Building materials | 5.1 | 35.6 | 59 |
| Light industry | 5.2 | 43.1 | 58 |
| Food industry | 33.3 | 31.3 | 48 |
| Average | 12.2 | 35.5 | 352 |

Source: Authors' calculations

Table 5.12 Ease of obtaining foreign investors for equity financing

| | Very Easy or Fairly Easy (%) | Impossible (%) | No. obs |
|--------------------|---------------------------------|----------------|---------|
| Chemicals | 10.9 | 50.0 | 46 |
| Machinery | 6.0 | 54.2 | 83 |
| Wood and paper | 1.9 | 62.3 | 53 |
| Building materials | 3.3 | 62.3 | 61 |
| Light industry | 1.9 | 59.3 | 54 |
| Food industry | 21.3 | 46.8 | 47 |
| Average | 7.0 | 56.1 | 344 |

Source: Authors' calculations

5.3.3. State Assistance

Perhaps surprisingly our results suggest that, in our sample, the likelihood of receiving state assistance does not vary greatly according to company size. The results in figures 5.4 and 5.5 show that medium-sized firms are slightly more likely to obtain either federal or regional state assistance, although we do observe that the level of difficulty expected in obtaining federal assistance is consistently greater than that for regional state assistance.

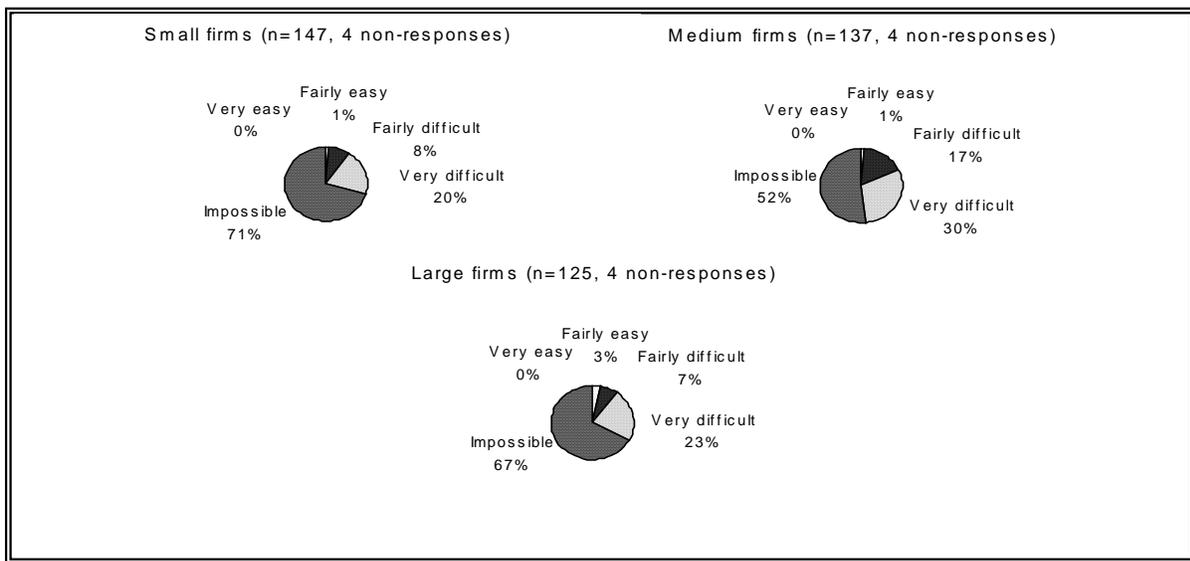


Figure 5.4 - Ease of obtaining federal assistance by firm size class

The underlying results suggest that this result is largely driven by the fact that obtaining a tax holiday appears to be considerably easier at the regional level and is easier for larger firms. However we surmise that the small variations present are less discernible the higher the level of aggregation.

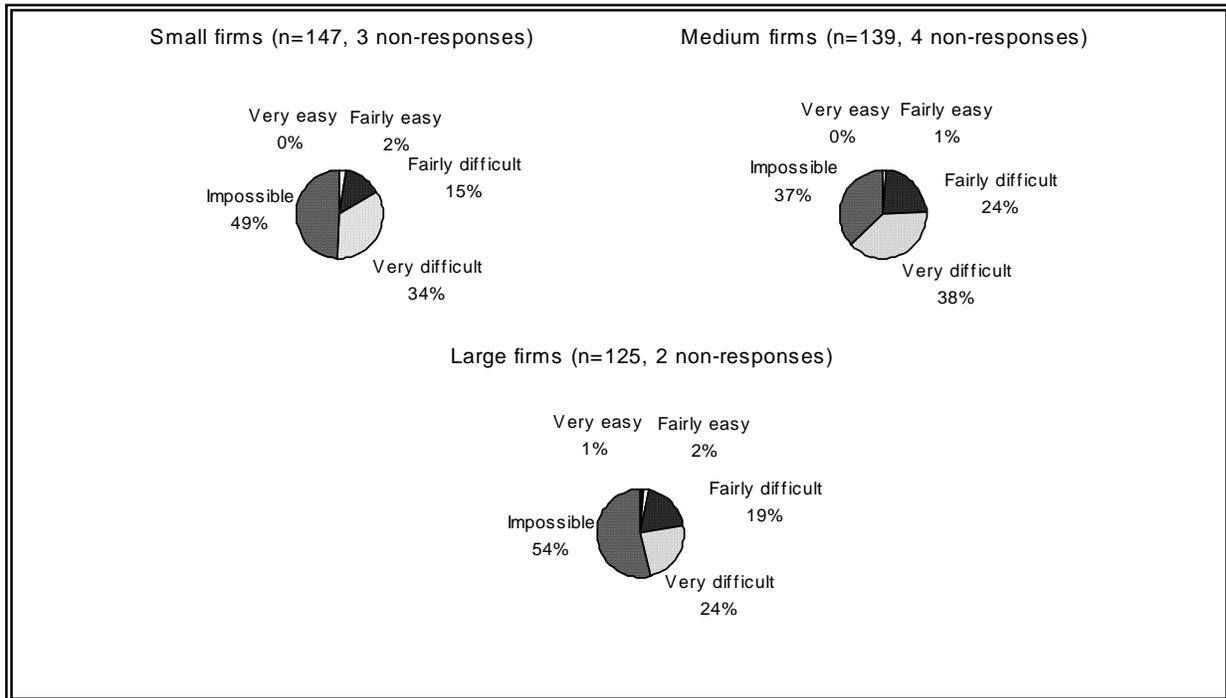


Figure 5.5 - Ease of obtaining regional assistance by firm size class

Table 5.13 Has company received federal assistance?

| | Yes (%) | No (%) | No. obs |
|-----------------------|---------|--------|---------|
| Moscow | 31.4 | 68.6 | 35 |
| Moscow region | 37.5 | 62.5 | 40 |
| St. Petersburg | 28.6 | 71.4 | 28 |
| St. Petersburg region | 21.4 | 78.6 | 14 |
| Nizhny Novgorod | 49.2 | 50.8 | 59 |
| Samara | 35.9 | 64.1 | 39 |
| Ekaterinburg | 29.5 | 70.5 | 44 |
| Perm | 25.0 | 75.0 | 40 |
| Novosibirsk | 12.9 | 87.1 | 31 |
| Krasnoyarsk | 28.6 | 71.4 | 28 |
| Volgograd | 27.3 | 72.7 | 11 |
| Chelyabinsk | 22.2 | 77.8 | 18 |
| Omsk | 41.7 | 58.3 | 12 |
| Average | 31.8 | 68.2 | 399 |

Source: Authors' calculations

At the regional level the results presented in table 5.13 show that firms in Nizhny Novgorod, Omsk, Moscow (city and region) and Samara have generally obtained federal assistance more frequently than elsewhere, where the opposite holds for Novosibirsk, Chelyabinsk, the St Petersburg region and for Omsk. Table 5.14 illustrates that although there is less variation in the receipt of regional state assistance firms in Samara and Chelyabinsk appear to have received less, with the largest proportions of firms receiving assistance being in the St Petersburg region (although the sample contains only 14 firms), Nizhny Novgorod and Moscow city.

Table 5.14 Has company received regional assistance?

| | Yes (%) | No (%) | No. obs |
|-----------------------|---------|--------|---------|
| Moscow | 51.4 | 48.6 | 35 |
| Moscow region | 42.5 | 57.5 | 40 |
| St. Petersburg | 34.5 | 65.5 | 28 |
| St. Petersburg region | 57.1 | 42.9 | 14 |
| Nizhny Novgorod | 55.9 | 44.1 | 59 |
| Samara | 23.1 | 76.9 | 39 |
| Ekaterinburg | 27.3 | 72.7 | 44 |
| Perm | 35.0 | 65.0 | 40 |
| Novosibirsk | 38.7 | 61.3 | 31 |
| Krasnoyarsk | 35.7 | 64.3 | 28 |
| Volgograd | 36.4 | 63.6 | 11 |
| Chelyabinsk | 22.2 | 77.8 | 18 |
| Omsk | 41.7 | 58.3 | 12 |
| Average | 38.8 | 61.2 | 399 |

Source: Authors' calculations

The highest proportion of firms reporting that they would find it impossible to obtain federal state assistance are found to be in Ekaterinburg, Chelyabinsk and Samara (75.51 percent, 72.22 percent and 68.42 percent respectively against an average of 60.38 percent). One firm in Volgograd reports that it would find it very easy to obtain federal state assistance. At the regional level two firms in Volgograd claim that they would find it very easy to obtain regional state assistance (one of which is the firm that reported that it would find it very easy to obtain federal state assistance) while two firms report that they would find this fairly easy in Moscow city and region, and one firm reports the same in Ekaterinburg and Krasnoyarsk.

Finally we note that there is some consistent evidence of an industrial dimension to the pattern of firms receiving federal and regional state assistance in our sample as illustrated in tables 5.15 and 5.16 below.

Table 5.15 Has company received federal assistance?

| | Yes | No | No. obs |
|--------------------|------|------|---------|
| Chemicals | 31.5 | 68.5 | 54 |
| Machinery | 30.2 | 69.8 | 96 |
| Wood and paper | 36.7 | 63.3 | 60 |
| Building materials | 27.7 | 72.3 | 65 |
| Light industry | 35.3 | 64.7 | 68 |
| Food industry | 30.4 | 69.6 | 56 |
| Average | 31.8 | 68.2 | 399 |

Source: Authors' calculations

Table 5.16 Has company received regional assistance?

| | Yes (%) | No (%) | No. obs |
|--------------------|---------|--------|---------|
| Chemicals | 37.0 | 63.0 | 54 |
| Machinery | 38.5 | 61.5 | 96 |
| Wood and paper | 40.0 | 60.0 | 60 |
| Building materials | 32.3 | 67.7 | 65 |
| Light industry | 48.5 | 51.5 | 68 |
| Food industry | 35.7 | 64.3 | 56 |
| Average | 38.8 | 61.2 | 399 |

Source: Authors' calculations

The wood and paper, and light industry sectors receive more assistance than the average at both the federal and regional level, a result that appears to be driven by a larger proportion of firms in these industries receiving direct state credits. The fewest incidences of federal and regional assistance both occur in the building materials sector.

5.3.4 Indicators of Overall Financial Constraint

In order to be able to assess how financial constraints influence enterprise behaviour more clearly, we derive an aggregate financial constraint indicator as a composite of responses to the six questions on the ease of obtaining credit that were examined in detail above: short term and long term commercial credit; federal and regional state assistance, and Russian and foreign equity. As explained previously, each of these indicators is assessed on a 1 (very easy) to 5 (impossible) scale. Rather than arbitrarily weighting these individual indicators, the overall measure is simply the arithmetic average of the six individual indicators. This average is then used to divide firms into three classes reflecting the degree to which they are financially constrained relative to other firms in the sample. The cut-off points for the classes were chosen in order to obtain a reasonably even distribution of firms between the three classes. Relatively unconstrained firms are therefore defined as those with an average score of 1 (very easy) to $10/3$ (slightly above fairly difficult); partially constrained firms are those with an average score from $10/3$ to 4 (very difficult), and relatively constrained firms have an average score from 4 to 5 (impossible). This leads to 30.3 percent (132 firms) of our firms being classified as relatively financially unconstrained, 35.8 percent (156 firms) are classified as partially constrained and 33.9 percent (148 firms) are considered relatively constrained.

The results of an ordered logit analysis of the distribution of this indicator by size, region and industry are presented in table 5.17 below. By including size, region and industry dummies as independent variables in this analysis we are able to establish the influence of each factor while controlling for the other factors e.g. the influence of size, controlling for industry and region.

In order to avoid perfect collinearity the omitted case is that of a large firm in the food industry in St Petersburg city. The estimated coefficients allow us to establish that:

- **Size** controlling for industry and region, small firms are more financially constrained than medium and large firms;
- **Region** controlling for size and industry, firms in Moscow city, St Petersburg city and oblast, Nizhny Novgorod, Volgograd are least financially constrained. Firms in Omsk, Moscow oblast and Krasnoyarsk appear to be the most financially constrained;
- **Industry** controlling for size and region, firms in Stone & Clay are most financially constrained, followed by Machinery Building, Light industry and Wood & Paper. Firms in the Food industry (the omitted category) and Chemicals are least subject to financial constraint.

Table 5.17 Ordered Logit Analysis of Overall Financial Constraint

| | |
|-----------------------|----------------|
| | Food industry |
| Chemicals | 0.54 |
| Machinery | 1.12*** |
| Wood and paper | 1.00*** |
| Building materials | 1.55*** |
| Light industry | 1.10*** |
| | Large firm |
| Small | 0.65** |
| Medium | 0.03 |
| | St. Petersburg |
| Moscow | 0.80 |
| Moscow region | 1.48** |
| St. Petersburg region | 0.98 |
| Nizhny Novgorod | 0.89 |
| Samara | 1.04* |
| Ekaterinburg | 1.30** |
| Perm | 1.22** |
| Novosibirsk | 1.13** |
| Krasnoyarsk | 1.34** |
| Volgograd | 1.09 |
| Chelyabinsk | 1.22* |
| Omsk | 3.13*** |

*, ** and *** illustrate significance at the 10, 5 and 1 percent level respectively

Source: Authors' calculations

Having established an overall indicator of financial constraint and examined the underlying distribution relative to the key firm characteristics, the next section examines the implications of financial constraint.

5.4 Consequences of Financial Constraint

We consider the consequences of financial constraints in three key areas: barter, restructuring and investment activity and financing.

5.4.1 Barter

Our survey contains two questions which allow us to obtain detailed information on the method of settlement that the firms in our sample use and accept. In these two questions firms were asked to report the share of their purchases from suppliers (and sales to customers) that were ultimately settled by cash or bank transfer, bills of exchange, debt swaps or offsets and exchange of goods for goods. The responses to these questions are presented in table 5.18 below.

The first notable factor in table 5.18 is the similarity of method of settlement in the case of both purchases from suppliers or sales to customers. Secondly we note that cash or bank transfer is by far the largest individual category of settlement in both purchases and sales. By contrast our firms report that a relatively small proportion of activity is settled with bills of exchange (veksels). Finally we find the use of debt swaps or offsets and pure exchange of goods for goods to be significant — together they account for more than 36 percent of settlements. We regard these two components as what has become known as barter (see e.g. Commander and Mumssen (1999)) and hence conclude that the use of barter is significant in our sample.

Table 5.18 Method of Settlement of Purchases from Suppliers and Sales to Customers (%)

| Form | Mean (Median) | No. obs |
|------------------------------|--------------------------|----------------|
| <i>Purchases settled by:</i> | | |
| Cash/bank transfer | 54.6 (60.0) | 421 |
| Bills of Exchange | 6.3 (0.0) | 421 |
| Debt swaps or offsets | 20.6 (14.0) | 402 |
| Exchange of goods for goods | 17.3 (10.0) | 423 |
| Other | 0.6 (0.0) | 421 |
| <i>Sales settled by:</i> | | |
| Cash/bank transfer | 57 (60.0) | 421 |
| Bills of Exchange | 6.0 (0.0) | 421 |
| Debt swaps or offsets | 20.4 (15.0) | 406 |
| Exchange of goods for goods | 15.6 (8.0) | 406 |
| Other | 0.3 (0.0) | 423 |

Source: Authors' calculations

Table 5.19 Settlement Options by Overall Financial Constraint (mean (%), median (%), no. obs)

| Form | Unconstrained | P. Constrained | Constrained |
|-------------------------------------|-------------------------|-------------------------|-------------------------|
| <i>Purchases settled by:</i> | | | |
| Cash or bank transfer | 67.67 (75.00) 131 | 54.83 (60.00) 151 | 41.70 (30.00) 138 |
| Bills of exchange | 5.84 (0.50) 131 | 5.91 (3.00) 151 | 7.36 (0.00) 138 |
| Debt swaps or offsets | 14.76 (10.00) 125 | 20.48 (15.00) 141 | 26.23 (20.00) 135 |
| Goods for goods | 10.77 (3.00) 125 | 17.50 (10.00) 141 | 23.33 (15.00) 135 |
| <i>Sales settled by:</i> | | | |
| Cash or bank transfer | 71.59 (80.00) 130 | 57.47 (60.00) 152 | 42.53 (35.00) 138 |
| Bills of exchange | 5.25 (0.00) 130 | 5.90 (0.50) 152 | 6.99 (0.00) 138 |
| Debt swaps or offsets | 13.48 (10.00) 126 | 19.09 (11.00) 144 | 28.27 (20.00) 135 |
| Goods for goods | 8.31 (2.50) 126 | 16.28 (9.50) 144 | 21.83 (10.00) 135 |

Source: Authors' calculations

In order to consider whether firms engage in barter as a reaction to being credit constrained, tables 5.19 disaggregates the settlement data in table 5.18 according to our overall financial constraint indicator.

In each case we find that the proportion of settlement in cash or bank transfer declines monotonically as the severity of the credit constraint increases. Settlement in barter increases monotonically with the severity of the credit constraint, as do both barter sub-components. Finally, although use of settlement in veksels is limited in our sample, we also find this to be increasing monotonically with the degree to which firms are credit constrained.

Table 5.20 Settlement by size class (mean (%), median (%), no. obs)

| Form | <500 | 501-1000 | >1000 |
|-------------------------------------|-----------------------|-----------------------|-----------------------|
| <i>Purchases settled by:</i> | | | |
| Cash or bank transfer | 54.0 (60.0) 144 | 54.3 (60.0) 131 | 53.7 (60.0) 123 |
| Bills of exchange | 6.0 (0.0) 144 | 6.1 (0.0) 131 | 7.7 (5.0) 123 |
| Debt swaps or offsets | 20.2 (15.0) 141 | 20.8 (10.0) 125 | 21.6 (14.0) 115 |
| Goods for goods | 19.3 (10.0) 141 | 17.2 (10.0) 125 | 15.5 (5.0) 115 |
| <i>Sales settled by:</i> | | | |
| Cash or bank transfer | 55.8 (60.0) 144 | 57.4 (65.0) 132 | 55.2 (60.0) 122 |
| Bills of exchange | 5.3 (0.0) 144 | 5.9 (0.0) 132 | 7.6 (2.0) 122 |
| Debt swaps or offsets | 20.3 (15.0) 141 | 20.8 (14.0) 127 | 21.8 (15.0) 116 |
| Goods for goods | 18.3 (10.0) 141 | 14.8 (8.0) 127 | 14.1 (4.5) 116 |

Source: Authors' calculations

Given that the preceding analysis has illustrated that our credit constraint variable differs by enterprise size, sector and region, it is unsurprising that we find these patterns to be replicated in our settlement data. What is surprising, however, is that we find the differences are not consistently observed across individual settlement options in the data presented in table 5.20.

Our results illustrate that while there is no significant difference in the degree to which cash is used as settlement of purchases between different enterprise size categories, there is a marked difference in the form of non-monetary settlement. We find that larger firms consistently tend to make more use of bills of exchange and debt swaps, while smaller firms make more use of goods for goods settlement. It seems likely that this can be explained by the fact that larger firms have more bargaining power, particularly when transacting with utilities, than smaller firms.

At the regional level we unsurprisingly find that use of non-monetary settlement is lowest in the relatively least financially constrained regions Moscow, St Petersburg, Nizhny Novgorod and Samara, as illustrated by figures 5.6 and 5.7 below.

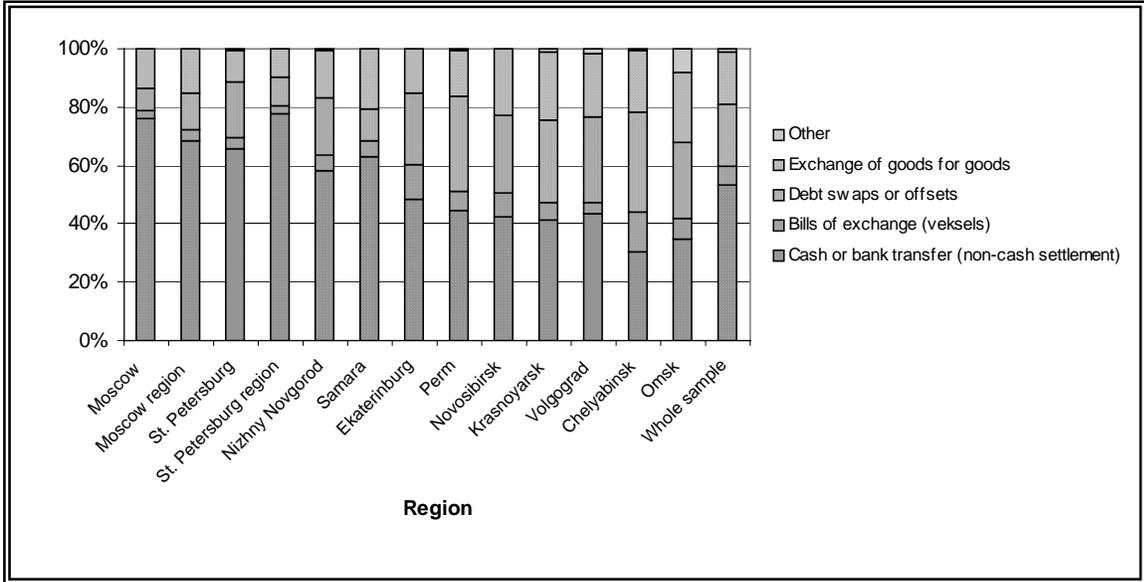


Figure 5.6 - Settlement of purchases by region

Conversely the highest instances of barter are reported in Chelyabinsk, Krasnoyarsk and Volgograd. Interestingly, however, we find that while in most instances use of debt swaps or offsets exceeds use of exchange of goods for goods, the reverse is true in Moscow (city and region), St Petersburg region and Samara. In the case of Nizhny and Samara this may be due to a large number of smaller firms being contained in the regional sample. However, our samples in Moscow and St Petersburg contain a relatively high proportion of large firms, and hence this results cannot be solely attributed to size.

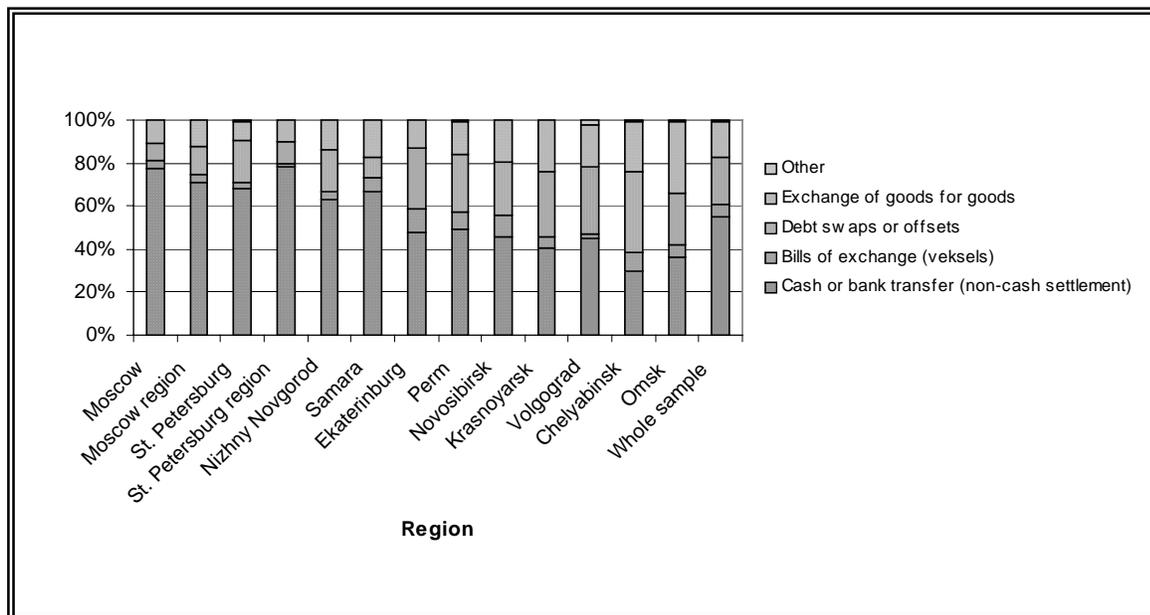


Figure 5.7 - Settlement of sales by region

Finally we note that at the industrial level the building materials sector appears to engage in the most barter, both in respect of purchases and sales. By contrast the lowest incidences are reported in the food industry where more than 75 percent of sales and purchases are settled in cash or bank transfer. These results illustrate, however, that use of debt swaps or offsets exceeds that of exchange of goods for goods in all cases, save for settlement of purchases in the light industry sector.

5.4.2 Restructuring

Previously we have examined evidence of restructuring activity undertaken by firms. Within these indicators we categorised firms into examples of good firms, which undertook the restructuring activity in at least one of our three sample years, and bad firms which acknowledged that they would have liked to undertake the activity but did not. We found that of our 15 individual restructuring indicators, by far the largest proportion of firms have moved their products to new markets, changing suppliers, increased marketing of products and the implementation of new technologies for improving the quality of goods. In this subsection we subdivide within these categories according to the degree to which the firms are subject to financial constraint, in order to establish the relation between restructuring and finance. Table 5.21 below presents the results of this process. For each restructuring measure we have divided the total number of good firms according to our three financial constraint indicators, and have done the same with the total number of bad firms. Therefore, within the row for each type of restructuring, the sum of the different levels of constraints is 100 percent for each of the groups of 'good' and 'bad' firms. At the simplest level we would expect that evidence of a negative correlation between financial constraint and restructuring would manifest itself in high numbers of good, unconstrained firms and bad constrained firms.

Interestingly, we find limited evidence to support the notion that unconstrained firms are better in their undertaking of restructuring measures, where there is insufficient variation to draw conclusions. However, in the case of firms categorised as 'bad', financially constrained firms are more frequent, especially in activities that would be regarded as defensive restructuring activities such as labour shedding. Furthermore they appear to be less efficient

in adapting to new market conditions through the launch of new products, a change of suppliers, the sale or lease of land or the restructuring of debt.

We therefore interpret these findings as suggesting that the causality in these cases runs from undertaking the restructuring activity to financial constraint, rather than the reverse. Good firms are not strongly differentiated by financial constraint, hence implying that financial constraint does not preclude restructuring. By contrast more firms that did not restructure tend to be financially constrained, hence implying that a failure to restructure seems to lead to financial constraint.

Table 5.21 Restructuring Activity by Financial Constraint (%)

| Activity | Very Good or Good | Bad |
|--|---|---|
| | (Unconstrained Partially Constrained Constrained) | (Unconstrained Partially Constrained Constrained) |
| Launching of new products and services | 33.1 | 10.4 |
| | 36.8 | 31.3 |
| | 30.1 | 58.3 |
| Liquidation of unprofitable products | 26.5 | 35.7 |
| | 42.3 | 21.4 |
| | 31.2 | 42.9 |
| Cuts in expenditures for social infrastructure | 33.6 | 28.0 |
| | 32.8 | 28.0 |
| | 33.6 | 44.0 |
| Firing of the excess labor-force | 25.3 | 41.7 |
| | 38.2 | 8.3 |
| | 36.5 | 50.0 |
| Moves to new markets of your products | 32.9 | 26.3 |
| | 36.7 | 26.3 |
| | 30.4 | 47.4 |

| | | |
|---|------|------|
| Increased marketing of your products | 31.3 | 12.8 |
| | 39.4 | 31.9 |
| | 29.3 | 55.3 |
| Reorganization of management | 31.9 | 35.7 |
| | 35.8 | 28.6 |
| | 32.3 | 35.7 |
| Implementation of new technologies for reducing fuel and energy consumption | 32.6 | 27.0 |
| | 34.8 | 36.5 |
| | 32.6 | 36.5 |
| Implementation of new technologies for reducing material and labor costs | 34.0 | 24.7 |
| | 35.7 | 31.7 |
| | 30.3 | 43.6 |
| Implementation of new technologies for improving the quality of goods | 35.1 | 17.6 |
| | 38.3 | 33.8 |
| | 26.6 | 48.6 |
| Liquidation (closing-down) of unprofitable workshops | 23.3 | 25.0 |
| | 37.2 | 50.0 |
| | 39.5 | 25.0 |
| Sales (leasing-out) of the excess equipment | 27.8 | 23.0 |
| | 35.6 | 30.8 |
| | 36.6 | 46.2 |
| Sales (leasing-out) of real estate or land | 30.4 | 7.2 |
| | 36.8 | 35.7 |
| | 32.8 | 57.1 |
| Changing the suppliers | 28.8 | 12.5 |
| | 38.0 | 37.5 |
| | 33.2 | 50.0 |
| Restructuring of debt | 26.3 | 16.1 |
| | 38.4 | 30.4 |
| | 35.3 | 53.5 |

Source: Authors' calculations

5.4.3 Investment Activity and Financing

A mere 28.4 percent of the firms in our sample report undertaking a significant investment project since the August 1998 crisis. This group report a mean level of investment as a proportion of the capital stock of 0.12 in 1999, as compared to 0.04 for firms which did not undertake a significant investment project.

Consequently, this distinction is reflected in the age profile of the capital stock of our enterprises. Table 5.22 below illustrates that the majority of the capital stock of the average firm in our sample is more than 15 years old, and just over 8 percent is less than five years old, and that the degree of financial constraint strongly influences the vintage of the capital stock.²⁰

Table 5.22 Age profile of capital stock by credit constraint (% of total capital)

| | Unconstrained | Partially constrained | Constrained |
|-------------|---------------|--------------------------|-------------|
| <5 years | 10.7 | 9.9 | 4.5 |
| 5-10 years | 17.0 | 16.2 | 11.5 |
| 10-15 years | 23.0 | 24.9 | 27.0 |
| >15 years | 49.3 | 49.0 | 57.0 |

Source: Authors' calculations

²⁰ This result is consistent with the finding that firms which reported undertaking a significant investment project since August 1998 have a considerably lower proportion of their capital stock in the upper age categories. Moreover, the mean percentage of equipment less than five years is three times larger for firms which report having undertaken a project than those which do not.

As figure 5.8 illustrates, investment levels are generally increasing over our sample period, from a mean of 0.031 in 1997 to 0.036 in 1998 and a sharp increase to 0.066 in 1999. This aggregate results is reflected by the rightwards shift in the distribution of gross investment during the study period: fewer firms report undertaking no investment, and the upper level of investment increases.

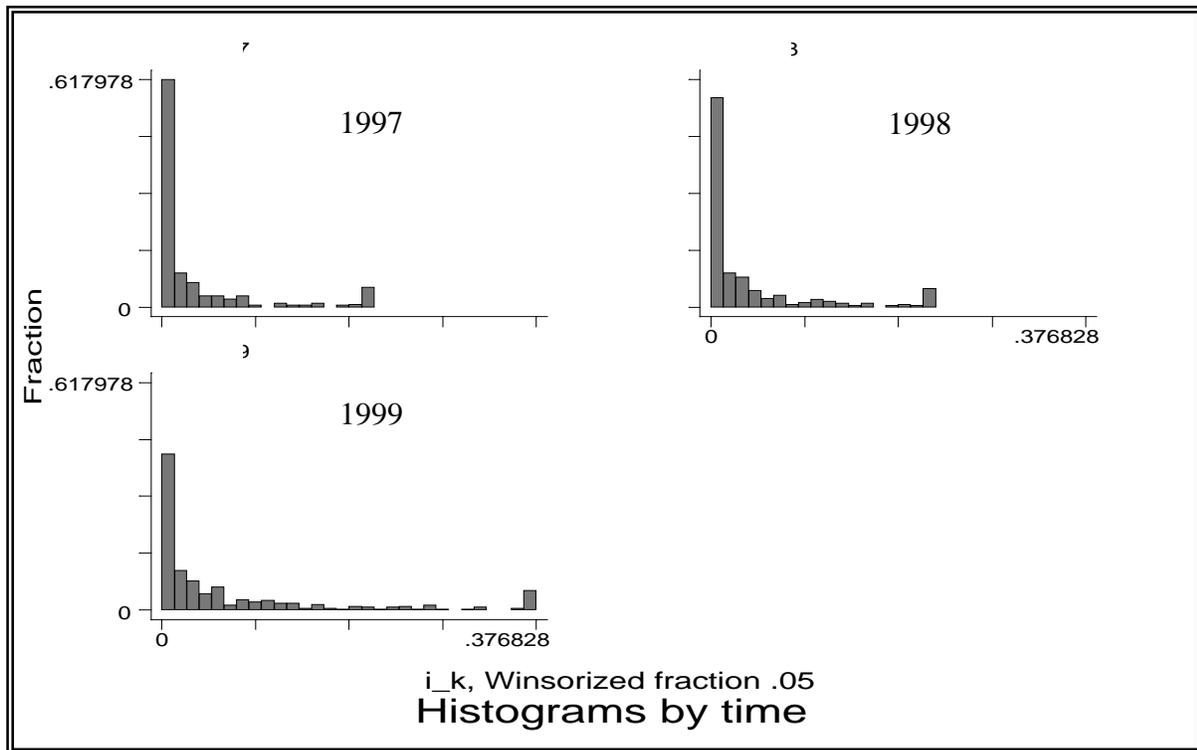


Figure 5.8 - Investment to capital ratio over time

Interestingly this general result does not differ significantly between industries. Although the food industry consistently undertakes more investment as a proportion of the capital stock than any other sector, all sectors increase their average level of investment over the sample horizon. Similarly although initial tests indicated that the investment ratio was positively correlated with company size, there is no apparent correlation between size and investment after controlling for the food industry. Finally we note that there does appear to be some regional dimension to investment levels, with St Petersburg (city and region), Nizhny

Novgorod and Volgograd undertaking consistently more investment than other regions. Although its investment rate was fourth lowest in 1997, Omsk appears to suffer through our sample period as its investment rate declines considerably in 1998 such that its investment ratio was the lowest of all regions in 1998 and 1999.

In response to the ‘What were the sources of your fixed investments (% of total)’ we find that 75 percent of firms in each time period report investment to be entirely financed by retained earnings. Consequently these results suggest that the average firm that carried out an investment project since August 1998 financed more than 80 percent of the investment cost internally. In order to get a clearer picture of the proportions of alternative forms of investment finance, table 5.23 presents the results of the same question after excluding those firms that fully internally financed.

Table 5.23 Financing of investment of those who did not fully internally finance

| | 1997 | 1998 | 1999 |
|--------------------|------|------|------|
| Internal | 43.4 | 43.2 | 51.6 |
| Emission of shares | 4.3 | 0.07 | 0.03 |
| Bank credits | 35.4 | 36.4 | 28.3 |
| Federal budget | 3.3 | 3.4 | 0 |
| Regional budget | 3.9 | 0 | 2.5 |
| Russian sources | 4.2 | 11.0 | 12.4 |

These results illustrate that, even for firms that did not fully internally finance, use of internal funds remains the dominant financing choice, closely followed by bank credits. While bank-based funding increased slightly in 1998, the considerable decline in 1999 is most likely due to the impact of the August 1998 crisis. This may also explain the dramatic decline in financing via share emission in 1998 and 1999, and the decline in the use of foreign sources.

Russian sources have increased considerably over the sample period and firms increased their reliance on internal funds as a consequence in 1999, to more than half the value of investment at the mean.

According to the pecking order of corporate finance, one would expect firms firstly to utilise internal funds before raising finance from external sources. Hence at one level, the strong reliance on internal finance in our sample may simply reflect corporate choice. This, however, fails to consider whether the supply of external funds is constrained; their use therefore being imposed upon firms rather than chosen by firms. Moreover, if internal funds are limited, investment itself may be constrained. In order to assess the extent to which this is the case, table 5.24 below disaggregates the investment ratio according to our overall financial constraint indicator²¹.

Table 5.24 Investment Ratio by Overall Financial Constraint (mean, median, nobs)

| | 1999 |
|-----------------------|-------------------------|
| Unconstrained | 0.097 (0.043) 110 |
| Partially constrained | 0.072 (0.026) 140 |
| Constrained | 0.034 (0.003) 129 |

²¹ Although we have investment data for each period of our survey, our financial constraint indicator is time-invariant. Hence, given the timing of our survey, we only cross-cut our 1999 investment data with our financial constraint.

5.4.4 Barter, Investment and Performance

Having found a negative correlation between investment and the degree to which the enterprise is credit constrained, we firstly test the correlation between overall credit constraints and various additional indicators of enterprise performance. The results presented in table 5.25 below illustrate the strong negative correlation that exists between the overall credit constraint and our various performance measures.

Table 5.25 Overall credit constraint to all performance measures other than investment (indexed)

| | Mark-up | ROE | Π/K | Prod. |
|-----------------|---------|------|---------|-------|
| Unconstrained | 100 | 100 | 100 | 100 |
| Partially cons. | 76.4 | 70.0 | 69.0 | 87.2 |
| Constrained | 41.5 | 34.1 | 38.0 | 55.2 |

Source: Authors' calculations

We note, however, one caveat on these results, in that they should not be interpreted as reflecting causality. While on the one hand it may be that being credit constrained determines performance, it could be argued that performance may equally determine credit access. This may occur through state assistance to poorly performing firms, although this is less likely given that our firms are privatised and state financing has been found to be limited in our sample. Alternatively, given the nature of the banking sector and the short credit history of the firms in our sample, it may be that currently poorly performing firms suffer from limited access to bank finance. Nonetheless, at a simple level our results permit us to establish a negative correlation between financial constraints and performance.

We have previously, however, determined that firms that are more financially constrained tend to engage in more barter settlement and that they undertake less investment²². Consequently in the next stage of our analysis we examine the correlation between barter and performance (including investment) and investment and performance

Table 5.26 Barter and Performance (1999)

| | Mark-up | ROE | Π/K | Productivity | I/K |
|-------------------------------------|---------|--------|--------|--------------|--------|
| <i>Purchases settled by:</i> | | | | | |
| Debt Swaps or Offsets | -ve* | -ve** | -ve*** | -ve*** | -ve** |
| Exchange of Goods for Goods | -ve** | -ve*** | -ve*** | -ve*** | -ve*** |
| <i>Sales settled by:</i> | | | | | |
| Debt Swaps or Offsets | 0 (-ve) | -ve*** | -ve*** | -ve*** | -ve** |
| Exchange of Goods for Goods | -ve*** | -ve*** | -ve*** | -ve*** | -ve*** |

*, ** and *** illustrate significance at the 10, 5 and 1 percent level respectively

Mark-up represents profits after tax divided by total sales, ROE represents return on equity, Π/K represents return on assets, productivity is sales per employee and productivity growth is the natural logarithm of the ratio of current period productivity to previous period productivity.

Source: Authors' calculations

Table 5.26 therefore presents the sign and significance of the barter coefficients obtained from a series of OLS regressions in which barter, size, region and industry are regressed against several various alternative measures of performance

The first four columns of table 5.26 illustrate the strength of the negative correlation between barter and performance. While the direction of causality is constant, as even those correlations reported as insignificant are of a negative sign, the results are slightly stronger in the case of exchange of goods for goods. The final column provides support for the hypothesis that firms engaging in barter tend to undertake less investment activity. Moreover this results is slightly stronger in the case of firms engaging in pure goods for goods barter than debt swaps or offsets. Given that our prior results indicate the engaging in barter tends to be a reaction to financial constraint, this therefore suggests that causality may run from financial constraint to barter to investment.

In this light we consider the relation between investment and performance. As in the case of barter we control for size, region and industry, and regress these together with a one period lag investment of the investment to capital ratio against our performance measures. The sign and significance of the coefficient on lagged investment are reported in table 5.27 below.

5.27 Investment and performance (1999)

| | Mark-up | ROE | Π/K | Productivity |
|--------------------------------|---------|--------|---------|--------------|
| Investment to Capital ratio | +ve*** | +ve*** | +ve*** | +ve*** |

*, ** and *** illustrate significance at the 10, 5 and 1 percent level respectively

²² Consequently, we find that firms that engage in more barter tend to have a larger proportion of relatively old capital stock.

Mark-up represents profits after tax divided by total sales, ROE represents return on equity, Π/K represents return on assets, productivity is sales per employee and productivity growth is the natural logarithm of the ratio of current period productivity to previous period productivity.

Source: Authors' calculations

We find investment to be consistently positively correlated with each of our performance measures at less than the one percent level. However, although we lag investment in a simple attempt to reduce endogeneity tests with alternative lag structures revealed that our investment data is fairly autoregressive. Hence we suggest that one should be cautious when attributing causality to this relationship. Nonetheless, we maintain that our results suggest that financial constraints are associated with restricted investment activity, which is in turn highly correlated with poorer performance.

6. A Portrait of Successful Russian Industrial Enterprise

This section is a very straightforward attempt to answer the question ‘What characterises a successful industrial enterprise in the Russian economy?’. We start by presuming that we know how a good enterprise should perform, and hence divide our sample into ‘good’ (successful) and not so good enterprises. We then compare several different indicators — some of which reflect performance — between these groups and examine in what way our groups are different. In so doing, we aim to synthesise the preceding sections and so develop a better understand of what makes a firm good and successful. The concluding sub-section tests several hypotheses that may explain the relative success of a certain group of enterprises and failures of another.

6.1 What Constitutes a Successful Industrial Enterprise In Russia?

The first step, and probably the most complicated one, is to define what we mean by ‘successful’. We have several options including using flow measures such as profits or stock measures related to accumulated assets or capital, or controlling for industry specifics — for example, by measuring relative performance in comparison to industrial averages. However, at the simplest level we suggest.

Criteria 1. A good enterprise should generate positive value added.

Obviously, this definition of a ‘good’ firm is arbitrary and debatable. However, at least it is based on a relatively clear-cut concept and does not include a lot of arbitrary threshold coefficients. Moreover, this criteria was included because there is a great deal of speculation that Russian industry is populated by enterprises that produce negative value added and only remain afloat due to soft budget constraints — state direct and indirect subsidies, non-

payments, and so on. Analysis showed that our sample contains very few such enterprises (14 enterprises or 4 percent of the sample in 1997, and no such enterprises in 1998 and 1999). To some extent this may be due to the aforementioned biases in our sampling, and may also reflect crude measurement of value added itself, which we calculate as sales minus material costs. Nonetheless, this criteria was included to ensure that we drop such enterprises from the ‘good’ group.²³

Criteria 2. A good enterprise generates positive profits.

While this seems a natural supposition, there are certain factors which cause us to question this criteria. Firstly, losses may be temporal and due to exogenous factors out of the control of enterprise. Secondly, hiding profits is a common and a well-known practice for firms in transition economies — and is not exclusive to firms in transition economies. Hence solid, productive enterprises may simply show losses and transfer their profits elsewhere. We find that the first counter-argument can be disregarded (at least for our sample) as 75 percent of our sampled enterprises managed to generate positive profits even in the 1998 (more than 80 percent in 1999). By contrast we cannot deal directly with the second argument; instead we propose to consider a firm to be good only if it is to some extent ‘honest’ and does not hide all generated profits.

Criteria 3. A good enterprise is always profitable.

A firm may generate positive profits occasionally while being a loss-maker on average. It is possible to calculate a 3-year average profit measure from our dataset but we do not have sufficiently reliable deflators to permit us to accurately compare profits from different time periods. Instead, for the sake of this analysis, we presume that a good firm generates positive profits for all three years of our sample (1997-1999). This of course may be a significant constraint if we take into the account that 1998 was a crisis year, and hence an enterprise

²³ Accounting practice sometimes allows enterprises with negative VA to be profitable.

needed either a high level of profitability or good management not to post losses during the general financial chaos. However, in fact a large proportion of firms in our sample meet the requirement: around 70 percent of our sampled enterprises — 282 out of the 400 enterprises for which we have data for all three years — meet the criteria, which is almost the same number as the average profit-makers each year.

We do recognize the fact that we may lose some good firms that posted losses in 1998 as a result of hard-currency credits that they received in the previous years — for modernization or other objectives — becoming very expensive due to the devaluation. We interpret such a situation as indicating that managers/owners of these firms failed to evaluate the associated risks properly and were insufficiently cautious. Hence whereas in selecting profitable firms we were biased in favour of ‘honest’ ones, in this case we are conscious of inducing what could be interpreted as a bias in favour of ‘clever’ firms²⁴.

Criteria 4. A good firm's output should not be too volatile.

If the management is good and reacts quickly to the changing economic environment, a firm can be profitable by squeezing the volume of output — and costs. We want our good firm's performance to be stable not only in terms of profits but also in terms of output. In principle we could demand no fall in output in constant prices. That would mean (a) having price indexes for each enterprise or some proxy — difficult but not unimaginable — and (b) losing a lot of good firms due to instability in 1998 prices. In order to not be too tough on the enterprises we instead formulated a soft criteria: ‘a good firm should have no decline in nominal output’. Nonetheless it was surprising that this ‘soft’ requirement appeared to be

²⁴ Actually the check on those firms that were profitable in 1997 but became loss-makers in 1998 showed that most of their performance characteristics (i.e. mark-up, return on equity, etc.) in 1997 were very close to ‘bad’ group means and distinctly different from other groups. Thus, we lost some “good” but unlucky guys but not many.

much harder to meet than requiring the enterprises to make profits in every year of the sample. Only 48.6 percent — 195 enterprises — of enterprises met the criteria.

Criteria 5. A good firm thinks about the future and invests into fixed assets.

Despite this tough criteria, finding that 48.6 percent of our firms can be regarded as good seems a lot, at least for the Russian economy. We therefore introduced the last criteria in order to select leaders from the good group, to establish a group of what could be called ‘very good’ firms. The criteria is based on an indicator of the investment activity of the firm. This choice is not an obvious one, and is somewhat contentious. For instance, a firm may not invest because it has spare capacity and does not need invest. Alternatively it may not invest into fixed assets every year, but instead accumulates money for big a investment project and makes financial investments or purchases other firms’ equity. Moreover, to measure investment activity over time one should control for prices, etc., and we do not have sufficiently detailed deflators to permit this.

Instead we simply set a threshold to separate firms on the basis of their investment activity: namely that total net investment for the three year period — the sum of total investment for the three years of our sample less the sum of fixed capital depreciation charged to costs in the same period — should be positive. An obvious reason for choosing this threshold is that it allows us to separate firms that compensate for the losses of their fixed capital by investing depreciation money into modernization and/or buying new equipment and facilities.

This is, however, actually a very ‘soft’ constraint for the Russian firms, as the assets of industrial enterprises — especially installed more than ten years ago — are usually undervalued, and generally badly measured. Moreover depreciation tends to be smaller than

the cost of renewing capacities lost due to wear-and-tear of equipment. On the other hand, firms with newer and better equipment — for example, imported recently — would find it harder to meet this requirement than firms with outdated fixed assets. In our sample 123 enterprise (more than 30 percent of our sample) had accumulated investments that exceeded accumulated depreciation charges.

One can of course consider a variety of other criteria. For example, profits may be, and often are, generated nominally through barter transactions with little cash inflows; thus, liquidity may be a good indicator for selecting good enterprises. The level of indebtedness may also convey a lot of information about the financial situation of the enterprise. Nevertheless, for the obvious reason of wishing to have statistically significant groups we regard the above criteria as sufficient for our purposes.

It is easy to see that the third criteria — positive profits for three years — includes the first two criteria as subsets. Thus in effect we have three significant constraints on good enterprises: (i) profitability for three years; (ii) non-decreasing nominal output, and (iii) investment activity. Consequently for this analysis we constructed three groups of enterprises that do not overlap. The first group consists of enterprises that are neither constant profit-makers (a) nor have non-decreasing sales — i.e. firms that do not meet criteria (i) or (ii). For the sake of comparison we consider these firms as ‘bad’, but with understanding that they are not actually bad, just that their performance according to our criteria is worse than our other groups. The second group of enterprises meet requirements (i) and (ii) but not the investment activity criteria (iii). We regard these firms as relatively ‘good’. The last group includes enterprises that meet all our requirements, and we regard these as ‘very good’. We also note

that between these groups investment activity has little to do with profitability criteria, as almost half of firms actively investing are in the ‘bad’ group.

Table 6.1 Firms distribution by groups (percent)²⁵

| Groups | Freq. | Percent | Cum. |
|------------------|------------|---------------|-------|
| 1 Bad | 245 | 60.9 | 60.9 |
| 2 Good | 91 | 22.6 | 83.6 |
| 3 Very good | 66 | 16.4 | 100.0 |
| <i>Total</i> | <i>402</i> | <i>100.00</i> | |

Source: Authors' calculations

6.2 How Do Good Firms Differ from Bad Firms?

We find that the concentration of our good and bad groups differ by industry and region, but there is little evidence of a size effect. As table 6.2 below illustrates, unsurprisingly, good and bad enterprises are not evenly distributed by industries. Our very good enterprises tend to be concentrated in the Chemical and Food industries.

²⁵ Number of firms less than the sample due to missing values in data.

Table 6.2 Distribution by Industry (percent)

| Industry | Bad | Good | Very good | Total |
|--------------------|-------------|-------------|-------------|------------|
| Chemicals | 62.3 | 11.3 | 26.4 | 100 |
| Machinery | 62.4 | 24.7 | 12.9 | 100 |
| Wood and paper | 67.2 | 20.7 | 12.1 | 100 |
| Building materials | 63.6 | 24.2 | 12.1 | 100 |
| Light industry | 65.7 | 22.9 | 11.4 | 100 |
| Food industry | 40.7 | 29.6 | 29.6 | 100 |
| <i>Total</i> | <i>60.9</i> | <i>22.6</i> | <i>16.4</i> | <i>100</i> |

Source: Authors' calculations

At the regional level, table 6.3 below illustrates that the share of good and very good firms generally falls when we move from West to East. The exception is the Moscow region where this share is lower than in the Volga macro-zone.

Table 6.3 Distribution by Region (percent)

| Macro-Zones | Bad | Good | Very good | Total |
|--------------|-------------|-------------|-------------|------------|
| North-West | 38.5 | 28.2 | 33.3 | 100 |
| Central | 58.9 | 26.0 | 15.1 | 100 |
| Volga | 51.9 | 28.3 | 19.8 | 100 |
| Ural | 67.3 | 17.8 | 14.9 | 100 |
| Siberia | 77.1 | 15.7 | 7.2 | 100 |
| <i>Total</i> | <i>60.9</i> | <i>22.6</i> | <i>16.4</i> | <i>100</i> |

Source: Authors' calculations

In terms of size however, we find that the average number of employees in bad and good enterprises does not differ significantly (table 6.4 below). In the very good group in 1999 enterprises are on average 25 percent larger mostly due to a sharp decrease in employment in

the bad enterprises in 1998 and 1999 (in 1997 the difference was 12 percent). Moreover, all the groups are similarly distributed and include relatively small, medium and large-size firms.

Table 6.4 Distribution by Size

| Average number of employees | 1997 | 1998 | 1999 |
|-----------------------------|------------|------------|------------|
| Bad | 964 | 893 | 850 |
| Good | 909 | 874 | 869 |
| Very good | 1083 | 1062 | 1066 |
| Sample mean | 969 | 920 | 891 |

Source: Authors' calculations

There are, however, several significant differences between the groups and some cases where *a priori* expected differences were not found to be significant, and we summarise these below. Some of these results have more or less obvious explanations, while others have ambiguous interpretations. We examine each of these six features in turn.

6.2.1 Performance

By definition our good and very good firms perform better than bad ones. Nevertheless, it is interesting to see how much better, and whether the differences between groups increase over time. Table 6.5 below presents various performance measures by groups.

Table 6.5. Performance Indicators by Groups

| Variable/Group | 1997 | | | 1998 | | | 1999 | | |
|-----------------|-------|-------|-----------|-------|-------|-----------|--------|--------|-----------|
| | bad | good | very good | bad | good | very good | bad | good | very good |
| Mark-Up | 0.06 | 0.15 | 0.17 | 0.03 | 0.15 | 0.18 | 0.05 | 0.14 | 0.19 |
| ROE | 0.05 | 0.09 | 0.20 | 0.00 | 0.13 | 0.19 | 0.09 | 0.23 | 0.35 |
| Π/K | 0.17 | 0.22 | 0.40 | 0.12 | 0.32 | 0.51 | 0.24 | 0.57 | 0.83 |
| VA | 38.73 | 30.97 | 55.34 | 33.38 | 44.33 | 70.49 | 52.61 | 68.02 | 110.58 |
| Sales/worker | 83.01 | 72.89 | 121.04 | 72.51 | 91.30 | 147.68 | 119.07 | 153.41 | 262.63 |
| Δ Sales/worker | na | na | na | -0.09 | 0.27 | 0.26 | 0.47 | 0.52 | 0.57 |
| Δ Sales | na | na | na | -0.18 | 0.25 | 0.27 | 0.39 | 0.54 | 0.59 |
| Δ Employment | na | na | na | -0.08 | 0.00 | 0.00 | -0.06 | 0.02 | 0.01 |
| Δ2 Sales/worker | na | na | na | na | na | na | 0.37 | 0.80 | 0.83 |
| Δ2 Sales | na | na | na | na | na | na | 0.21 | 0.78 | 0.86 |
| Δ2 Employment | na | na | na | na | na | na | -0.14 | 0.02 | 0.02 |
| Inv/sales | 0.02 | 0.01 | 0.05 | 0.02 | 0.01 | 0.04 | 0.02 | 0.01 | 0.06 |
| Inv/K | 0.02 | 0.01 | 0.10 | 0.03 | 0.03 | 0.10 | 0.05 | 0.04 | 0.20 |
| M_cost | 0.55 | 0.54 | 0.61 | 0.53 | 0.55 | 0.61 | 0.56 | 0.60 | 0.67 |
| K/Labour | 1.03 | 0.76 | 0.89 | 0.99 | 0.75 | 0.92 | 1.00 | 0.71 | 1.03 |

Source: Authors' calculations

The first finding concerns the difference between good and very good groups. Our very good group includes much better performers than good group, but unexpectedly good firms were less productive than bad enterprises before 1999, both in terms of sales/employees and per capita value added indicators. Our very good firms only became significantly better in this sense in 1999, an issue that we return to below.

There are, however, several more or less obvious results from the comparison of our three groups:

- The level of capacity utilization is significantly higher in the good group and even more so in the very good group;
- The equipment vintage is much better in better groups;
- Better groups have less excess labour. In particular no firm in the very good group has more than 10 percent of excess labour;
- Better firms pay considerably higher wages and the difference between groups increases through time;
- The share of exports is higher for better groups. This result is however driven by the fact that a larger number of firms in the better groups engage in export activity. The average share of exports among firms engaged in export sales does not differ by groups. In other words if you are an exporter you have more chances to be good.²⁶

6.2.2 Financing

We find that good enterprises receive a significantly higher proportion of revenues from their customers in money and settle a higher proportion of their purchases from suppliers in money. Firms in our bad and good groups deal slightly more in surrogates with suppliers than with customers. The share of barter received from customers is almost identical to that used to settle purchases from suppliers in very good firms

²⁶ One more conclusion may be of some interest because it contradicts the common view that being an exporter in Russia makes a firm profitable. The share of exporters in the bad group was 40 percent in 1997, rising to 44 percent in 1999. The good group have a stable share of exporting firms of 51 percent, while the very good group also have a stable share of 57 percent.

Rather surprisingly we find that the average interest rate enterprises expect to pay for short-term bank credit does not differ much by groups (36, 36 and 32 percent for bad, good and very good firms respectively). On the other hand both short and even more so long-term credits are more readily available to better performing enterprises. Forty-five percent of bad firms report that they find it easy or fairly easy to obtain short-term credit, relative to 65 percent of good firms and 75 percent of very good firms; the equivalent proportions long-term credit are 15, 30 and 38 percent respectively.

Equity financing is almost non-existent in all groups but there are certain differences in the level of optimism: only 3 percent of bad firms believe that it would be easy or fairly easy to sell newly emitted shares to foreign investors, 9 percent of the good and 11 percent of very good firms are optimistic. Interestingly, around half of the optimists in the good group believe it to be very easy whereas no firms in the very good group believe this to be the case. Eight percent of firms in the first group believe it easy to sell equity to Russian investor, against 10 and 21 percent for good and very good groups respectively. Again the proportion of 'radical' optimists — reporting that it would be very easy — is much higher among the managers of the good group (50 percent) against less than 8 percent among the very good group. This fact is worth remembering when we discuss management.

Finally, we find that levels of debt are naturally lower at better firms when measured relative to either sales, profits or to capital. At the same time the overdue debt to overall debt ratio while lower in the second and the third group is still rather high.

6.2.3 Relations with State and State Policy

We find that Federal and Regional authorities do not show any biases towards any group. Tax holidays are more frequently granted to good enterprises (most likely as profit tax holidays which bad firms can't have as they are loss-makers by definition). By contrast restructuring of debt is more usual for bad firms. Direct subsidies are so rare that while 4 percent of bad enterprise report receiving them relative to 1.5 percent in very good group, the numbers reporting form too small a sample for definite conclusions.

There appears to be no difference in firms' expectations of receiving state assistance. Although our good group is on average very slightly more optimistic about the possibility of getting state assistance, the difference is insignificant. Sixty percent rate the opportunity of getting assistance from the Federal authorities as impossible in all groups, while 45 percent in each group report that they would find it impossible to get assistance from the Regional government.

The share of enterprises complaining of problems caused by administrative barriers is almost the same across groups. Better firms, being more active, report encountering problems with licensing and permits slightly more frequently. Better firms also report being more concerned about social charges and profit taxes for obvious reasons.

6.2.4 Ownership and Corporate Governance

The structure of ownership at the time of privatisation is almost identical for the three groups. At the beginning of 2000 our groups do not differ very significantly, but such differences as are present are peculiar: bad and very good firms have more or less the same ownership

structure with about 60 percent of shares belonging to insiders, 35 percent to outsiders and 5 percent to the state. Surprisingly, as table 6.6 illustrates, the good group has a significantly lower share of outsiders (25 percent) with a correspondingly higher share of insiders (68 percent) and state (7 percent). Analysis of the board composition confirms the same picture with a higher share of insiders on the board in the second group.

In terms of the distribution of control, the picture is even more clear: 35 percent of our bad group of firms are outsider controlled (defined as the position where outsiders own more than 50 percent of the stock), 33 percent are outsider controlled in the very good category but the good group has only 19 percent of outsider controlled firms.

There are too few firms with foreign investors (5 percent in the bad group and about 10 percent in the two others) to make any statistically valid conclusions. Nevertheless, one significant feature is that the average shareholding of foreigners (if they are present among the shareholders) increases with the quality of the firm: 28 percent in the bad group, 37 percent in the good group, 65 percent in the very good group.

Table 6.6 Ownership Structure by Groups (percent)

| | Bad | Good | Very Good |
|--|-------|-------|-----------|
| <i>At time of privatisation</i> | | | |
| Insiders (Managers & Workers) | 71.3 | 73.3 | 74.2 |
| State | 11.4 | 13.3 | 13.0 |
| Outsiders | 17.3 | 13.4 | 12.9 |
| Total | 100.0 | 100.0 | 100.0 |
| Managers (where possible) | 13.3 | 14.5 | 8.9 |
| <i>At 01.01.2001</i> | | | |
| Insiders (Managers & Workers) | 61.1 | 67.9 | 59.2 |
| State | 5.4 | 7.0 | 5.0 |
| Outsiders | 33.5 | 25.1 | 35.8 |
| Total | 100.0 | 100.0 | 100.0 |
| Managers (where possible) | 16.6 | 21.1 | 12.8 |
| <i>Change from time of privatisation to 01.01.2001</i> | | | |
| Insiders (Managers & Workers) | -10.2 | -5.4 | -15.0 |
| State | -6.1 | -6.3 | -8.0 |
| Outsiders | 16.2 | 11.7 | 23.0 |
| Managers (where possible) | 3.2 | 6.6 | 3.9 |

Source: Authors' calculations

Finally, we note that ownership tends to be more concentrated in the bad and very good group than in the good category. More than 30 percent of firms in the bad and very good groups have either a single block-holder (a single owner with more than 25 percent of the total stock of the firm) or have 1 to 3 owners controlling more than 50 percent of the stock. In the middle group only 20 percent have concentrated ownership.

6.2.5 Management

The only significant difference between groups is the lower rotation of management in the good group compared with bad one. This corresponds with domination of insider-controlled firms in the group and higher share of management ownership. In addition, two other features of this group are suggestive if not significant: managers in the good group less frequently report education in economics, and have a higher share of insiders entering into the position of General Manager.

6.2.6 Restructuring

In general the better enterprise, the more active it is in restructuring activity. At the same time we find the same patten as above in several specific indicators of restructuring, where the good group differ from two others, while the bad and very good are similar (see table 6.7 below).

Table 6.7 Some Restructuring Activity Indicators by Groups (percent of each group reporting having undertaken reform in last 3 years)

| Activity/Group | Bad | Good | Very Good |
|---|-----|------|-----------|
| Liquidation of unprofitable products | 1.1 | 1.1 | 1.3 |
| Moves to new markets of your products | 1.7 | 1.7 | 2.1 |
| Reorganization of management | 1.4 | 1.3 | 1.6 |
| Implementation of new technologies for reducing material and labour costs | 1.1 | 1.1 | 1.5 |
| Sales (leasing-out) of the excess equipment | 1.2 | 0.8 | 1.0 |

Source: Authors' calculations

6.3 What is Different about Good Firms?

It should be stressed that in many cases we do not have a large enough sample in each group for any statistically valid conclusions. Nonetheless, it is possible to make some tentative judgements of the ways in which firms in our three groups differ from one another.

Our first finding is that there are significant differences between our good and very good groups of firms, although in some cases this difference is more prominent than that between the bad and very good groups. By definition our good and very good categories were separated on the basis of their investment activity. The good group contains firms that were profitable but did not invest, while firms in the very good group were profitable by do invest. Hence by construction investment, which is an extremely important indicator in terms of ability to restructure, reflects basic differences between types of enterprises in our sample.

The good group is predominantly insider-owned with a higher management share in ownership. Firms in this group were typically less productive in 1997 and 1998 but significantly increased their labour productivity in 1999. The ownership here is less concentrated and while trends are the same, changes in ownership are slower. Management rotation in this group is also less intensive than in the two other groups, hence accordingly they are less active in reorganization of management as a restructuring activity. In terms of other restructuring activity good firms are also inclined to be less active on their markets (less active in dropping unprofitable products, and movement to new markets) and less concerned about costs (less implementation of technology for labour and material cost reduction, less sales of equipment). A lot of other minor details also contribute to the impression that these firms are quite satisfied with themselves and do not wish (or do not need) to change much.

6.3.1 What Makes Them Tick?

Hypothesis 1. Good firms were initially good.

One possible explanation for these findings is that simply some firms were lucky enough to find themselves in a better position at the time of mass privatisation, and kept their advantages through the 1990s. To check this supposition table 6.8 displays the results of calculations of the profits (losses) to output ratio for each group of firms using data from Goskomstat. The data does not display any significant patterns by group until 1995²⁷. Consequently we can conclude that there were no significant difference in initial performance between groups.

We propose two possible factors to explain the difference that emerge from 1995. Firstly, 1995 was the year when financial stabilization in Russia started: inflation fell and the exchange rate stabilised. Moreover volatility in the structure of prices ended in 1994 — including energy and natural monopolies tariffs — and hence it may be that the new price structure polarised the differences between good and bad firms in the new market economy. A second explanation may be that the differentiation between groups is a product of new owners' policy and decisions following the completion of the mass privatisation programme in 1994.

²⁷ The check with return on capital (profits to capital) and cost per ruble of output gives a similar results.

Table 6.8 Retrospective Performance by Groups

| | | Bad | Good | Very Good |
|------|----------------|--------|-------|-----------|
| 1990 | No. Obs. | 123 | 58 | 36 |
| | Proftiabiity | 0.14 | 0.17 | 0.16 |
| | ROE | 0.24 | 0.34 | 0.29 |
| | Cost/sales (%) | na | na | na |
| 1991 | No. Obs. | 165 | 69 | 48 |
| | Proftiabiity | 0.21 | 0.23 | 0.24 |
| | ROE | 0.62 | 0.84 | 0.84 |
| | Cost/sales (%) | na | na | na |
| 1992 | No. Obs. | 197 | 79 | 52 |
| | Proftiabiity | 0.23 | 0.27 | 0.27 |
| | ROE | 0.40 | 0.56 | 0.57 |
| | Cost/sales (%) | 73.43 | 74.54 | 71.76 |
| 1993 | No. Obs. | 211 | 83 | 56 |
| | Proftiabiity | 0.23 | 0.27 | 0.25 |
| | ROE | 1.47 | 2.17 | 1.86 |
| | Cost/sales (%) | 75.80 | 71.27 | 72.18 |
| 1994 | No. Obs. | 216 | 80 | 58 |
| | Proftiabiity | 0.27 | 0.26 | 0.29 |
| | ROE | 0.26 | 0.38 | 0.50 |
| | Cost/sales (%) | 86.13 | 79.79 | 77.06 |
| 1995 | No. Obs. | 235 | 90 | 63 |
| | Proftiabiity | 0.14 | 0.20 | 0.23 |
| | ROE | na | na | na |
| | Cost/sales (%) | 84.95 | 80.88 | 77.71 |
| 1996 | No. Obs. | 241 | 91 | 66 |
| | Proftiabiity | 0.02 | 0.11 | 0.13 |
| | ROE | na | na | na |
| | Cost/sales (%) | 100.23 | 90.43 | 86.11 |

Source: Authors' calculations

Hypothesis 2. Good enterprises became private earlier.

As table 6.9 illustrates, a quick check on the date of privatisation by group showed that while there are slightly more ‘late-comers’ among the bad group, and more early privatised firms among the very good group, there is no difference between first two groups. Hence the evidence does not appear to support this hypothesis.

Table 6.9 Date of Privatisation by Groups

| | Before 1993 | | 1993 | | 1994 | | After 1994 | | Total | |
|-----------|-------------|------|------|------|------|------|------------|-----|-------|-----|
| | No. | % | No. | % | No. | % | No. | % | No. | % |
| | Obs | | Obs | | Obs | | Obs | | Obs | |
| Bad | 116 | 48.9 | 67 | 28.3 | 31 | 13.1 | 12 | 5.1 | 226 | 100 |
| Good | 45 | 52.9 | 24 | 28.2 | 6 | 7.1 | 5 | 5.9 | 80 | 100 |
| Very Good | 34 | 57.6 | 18 | 30.5 | 2 | 3.4 | 2 | 3.4 | 56 | 100 |
| Total | 195 | 51.2 | 109 | 28.6 | 39 | 10.2 | 19 | 5.0 | 362 | 100 |

Source: Authors' calculations

Hypothesis 3. Good enterprises get profits due to imperfect competition.

Two indicators were used to check this assumption: the competition level on the domestic markets and the degree of competition from imported goods.

As table 6.10 illustrates, a significantly lower share of firms in the very good category reported that they have less than 2 competitors on the regional market. By contrast a slightly higher proportion of good firms than bad firms report this to be the case. The same is true, although to a slightly lesser extent, with respect to competition on the Russian market, although the number of observations for monopolists is too small to make any strong

conclusions. Thus, we suggest that at least some of the well-being of the good group is due to weak competition (as discussed in section 4 above).

Table 6.10 Competition on the Regional and Domestic Russian Markets by Groups (number of competitors)

| <i>Regional Market Competition</i> | | | | | | | | | |
|-------------------------------------|------------|------------|-------|-----------|------------|-------|-----------|------------|-------|
| | Bad | | | Good | | | Very good | | |
| | No. | % | Cum. | No. | % | Cum. | No. | % | Cum. |
| | Obs | | % | Obs | | % | Obs | | % |
| no comp. | 84 | 34.71 | 34.71 | 33 | 36.26 | 36.26 | 20 | 30.77 | 30.77 |
| 1 firm | 24 | 9.92 | 44.63 | 10 | 10.99 | 47.25 | 3 | 4.62 | 35.38 |
| 2-5 firms | 68 | 28.10 | 72.73 | 21 | 23.08 | 70.33 | 23 | 35.38 | 70.77 |
| >5 firms | 66 | 27.27 | 100 | 27 | 29.67 | 100 | 19 | 29.23 | 100 |
| <i>Total</i> | <i>242</i> | <i>100</i> | | <i>91</i> | <i>100</i> | | <i>65</i> | <i>100</i> | |
| <i>Domestic Russian competition</i> | | | | | | | | | |
| | Bad | | | Good | | | Very good | | |
| | No. | % | Cum. | No. | % | Cum. | No. | % | Cum. |
| | Obs | | % | Obs | | % | Obs | | % |
| no comp. | 6 | 2.67 | 2.67 | 6 | 6.90 | 6.90 | 3 | 4.84 | 4.84 |
| 1 firm | 9 | 4.00 | 6.67 | 5 | 5.75 | 12.64 | 2 | 3.23 | 8.06 |
| 2-5 firms | 64 | 28.44 | 35.11 | 20 | 22.99 | 35.63 | 17 | 27.42 | 35.48 |
| >5 firms | 146 | 64.89 | 100 | 56 | 64.37 | 100 | 40 | 64.52 | 100 |
| <i>Total</i> | <i>225</i> | <i>100</i> | | <i>87</i> | <i>100</i> | | <i>62</i> | <i>100</i> | |

Source: Authors' calculations

Secondly we try to evaluate the competitive pressure on each enterprise by calculating the following indicator:

$$Comp_{in}=r_{mshr}*comp_r + d_{mshr}*comp_d \quad (6.1)$$

where:

r_mshr represents the share of the enterprise's sales to the regional market;

d_mshr represents the share of the enterprise's sales to the domestic Russian market (i.e. outside of the region the enterprise is located in);

comp_r is a dummy variable equal to zero if there less than 2 competitors on the regional market for the enterprise and one otherwise;

comp_d is an identically formed dummy for activity on the Russian market.

Hence this indicator represents the strength of competition faced by the firm by weighting the competition dummy variables for the regional and domestic Russian markets according to the shares of the relative markets in sales.

The group means of this indicator are: bad group 0.72, good 0.67 and very good 0.69, reflecting the slightly higher level of monopoly and duopoly in the good group. The percentage of firms reporting that they face significant import competition is lower in the good and very good groups, though not significantly (37 percent in the bad group relative to 34 percent in the good group and 32 percent in the very good group.%). Within this, it is interesting to note the low number of firms reporting that they face any significant competition from imports.

Hypothesis 4. Good enterprises are 'honest' ones that show profit.

We had no questions directly aimed at measuring shadow activity of the firms. So, two very crude proxy indicators were constructed to try to capture different shadow economy effects.

Firstly, we tried to capture transfer of profits from the enterprise through transfer pricing. To do that we need prices (or at least price indexes) for each enterprise. In other words we need output dynamic in constant and nominal prices. We use the following very simple indicator:

$$PIndex = \frac{\Delta Sales}{(\Delta K_U \times \Delta F_A)} \quad (6.2)$$

where:

PIndex is the computed price index;

ΔSales represents an index of the growth rate of sales in nominal prices, i.e $Sales^{t+1}/S^t$;

ΔK_U represents a capacity utilization index;

ΔF_A represents an index for fixed assets in the balance sheet.

We acknowledge that there are several, quite restrictive, assumptions underlying this indicator. For example, we have assumed that the change in capacity utilization should be associated with a proportional increase in output, that the change in fixed assets is reflected by a change in capacity, and we fail to control for any revaluation of fixed assets due to inflation, depreciation and so on. Nonetheless, the indicator provides an interesting comparison between our three groups, as illustrated in table 6.11.

Table 6.11 Capacity Utilisation, Fixed Assets and Prices

| | 1999/1998 | | | 1999/1997 | | |
|--------------------------------|-----------------|-------------|----------------|-----------------|-------------|----------------|
| | <i>No. Obs.</i> | <i>Mean</i> | <i>St. dev</i> | <i>No. Obs.</i> | <i>Mean</i> | <i>St. dev</i> |
| <i>Bad</i> | | | | | | |
| ΔK_U | 240 | 1.19 | 0.40 | 237 | 1.34 | 1.06 |
| ΔF_A | 240 | 0.98 | 0.28 | 234 | 0.92 | 0.66 |
| $\Delta Sales$ | 243 | 1.65 | 0.80 | 239 | 1.51 | 1.39 |
| $\Delta Sales$ (const. prices) | 236 | 1.16 | 0.50 | 228 | 1.22 | 1.71 |
| PIndex | 235 | 1.56 | 0.79 | 226 | 1.62 | 1.10 |
| <i>Good</i> | | | | | | |
| ΔK_U | 90 | 1.15 | 0.29 | 90 | 1.29 | 0.46 |
| ΔF_A | 88 | 0.99 | 0.33 | 81 | 0.93 | 0.40 |
| $\Delta Sales$ | 91 | 1.77 | 0.49 | 84 | 2.34 | 1.03 |
| $\Delta Sales$ (const. prices) | 87 | 1.15 | 0.50 | 80 | 1.22 | 0.74 |
| PIndex | 87 | 1.75 | 0.88 | 80 | 2.24 | 1.18 |
| <i>Very good</i> | | | | | | |
| ΔK_U | 66 | 1.15 | 0.25 | 65 | 1.31 | 0.78 |
| ΔF_A | 66 | 1.16 | 0.30 | 65 | 1.35 | 0.72 |
| $\Delta Sales$ | 66 | 1.88 | 0.54 | 66 | 2.64 | 1.66 |
| $\Delta Sales$ (const. prices) | 66 | 1.33 | 0.46 | 64 | 1.67 | 1.07 |
| PIndex | 66 | 1.53 | 0.59 | 64 | 1.87 | 1.28 |

Source: Authors' calculations

The resulting numbers are not at all as expected. The good group shows higher price growth than the bad and very good groups for both 99/98 and for 99/97 periods; surprisingly, the very good and the bad groups report very similar levels of price growth. It is also interesting to note how differently our groups reacted to the crises. All groups report increased output in constant prices, however, the bad and good groups increased output by about 20 percent between 1997 and 1999, while the very good group increased output by almost 70 percent in

the same period. Moreover, the indicators illustrate that while output growth in the very good group was based on expanding capacities — as capacity utilization increased less than output — firms in the good and bad group on average increased output less than capacity utilisation.

The second proxy to measure shadow activity was calculated by comparing two answers for the same question: “What is an average wage in your enterprise?” In the interview with the top-manager of the firm was asked to report the average monthly wage of employees at the enterprise. On the other hand we can calculate the average wage from other data by using the balance sheet information collected separately in the accounting department. The results of these question need not coincide if we assume that the enterprise is paying shadow wages out of ‘black-cash’ revenues to save on taxes and social charges. If this is the case, there is a good chance that when asked the general manager would name the real figure as he probably does know how much he had to pay to his workers but may not know the ratio between “white” and “black” cash payments. In this case the difference between the manager’s answer and that based on the wages and salaries reported in the balance sheet data may serve as a measure of the shadow activity. The results of this calculation are shown in the table 6.12 below.

Table 6.12 Deviation in Average Wage by Groups

| | 1998 | | 1999 | |
|-----------|------|-----------|------|-----------|
| | Mean | Std. Dev. | Mean | Std. Dev. |
| Bad | 1.12 | 0.20 | 1.13 | 0.25 |
| Good | 1.11 | 0.19 | 1.14 | 0.23 |
| Very good | 1.08 | 0.18 | 1.04 | 0.16 |

Source: Authors’ calculations

It is encouraging that the very good group has much smaller differential between the manager's answer and accountants' figures in 1999, but more careful analysis is needed before any interpretation could be provided. Preliminary analysis showed that this deviation — if it is meaningful at all — does not correlate with performance variables. It is, however, highly significantly correlated with the size of enterprise and is much higher in the Food industry than any other.

7. Conclusions and Meta-Analysis

In this paper, we have used the findings from the first large scale random sample conducted in Russian since the mid-1990s on enterprise restructuring to focus on the constraints on micro-economic performance in the period after the 1998 financial crisis. Several key findings emerge from this study. Restructuring in Russian firms remains modest, even nearly a decade after the start of economic reforms. Productivity has continued to fall and remains low, while investment levels are low and restructuring efforts modest. It is, however, encouraging that the bulk of firms are engaged in deep rather than purely defensive restructuring. Under the fairly modest criteria for a “good” firm laid out in section 6 (positive value added and profits and fairly stable output less than 50% of Russian firms in our sample are “good”, and only 16% “very good” in the sense they had also undertaken positive net investment. The good and very good firms were characterised by higher capacity utilisation, a younger vintage of capital, less labour hoarding and higher wages and exports.

When we attempt to understand the reasons underlying the wide variation in performance across firms, our results do not confirm standard theoretical hypotheses. As has been found in numerous other studies of the former Soviet Union (see e.g. Estrin and Wright (1999) or Djankov and Murrell (2000)) ownership and performance are not well correlated in Russia. In particular, there is no strong evidence that outsider ownership leads to better performance or higher levels of restructuring activity than insider ownership. Conventional explanations point to capital market imperfections, and governance deficiencies (see Nellis (2000)). Our findings are consistent with this in indicating only limited correlation between ownership and perceived control over enterprise decision-making. While insiders are perceived as having control over most insider owned firms, insiders are also perceived to control nearly half of

outsider owned firms, and more than a third of state owned firms. This is perhaps a consequence of the high levels of dispersion of outsider ownership in Russia (see Djankov and Murrell (2000)).

The findings on competition are slightly more encouraging, in that they confirm a positive association between restructuring activity and the competitiveness of the market environment in which firms operate. Domestic competition spurs more deep restructuring, and to some extent more defensive restructuring as well. Foreign competition is still a relatively insignificant factor in improving enterprise performance in Russia, though it plays more of a role in stimulating investment. However, the results do not yet carry over from qualitative indicators to augmented production functions.

On the financial side, our study indicates that company size is a relevant factor in obtaining short but not long term credit, while equity financing is equally rare for all firm types in Russia. Overall, most Russian firms (almost 70%) have quite serious financial constraints because of a combination of limited access to credit, poorly developed capital markets and weak cash flow. Financial constraints appear to be highly correlated with corporate performance and behaviour. However the causality is complex, and given the limited possibility of recourse to external financing from any source runs in large part from restructuring to financial performance rather than the other way round. Investment is also inversely related to the degree of financial constraint.

The relationship between the various exogenous variables specifying the factor and product market environment and the internal incentive structures of firms on the one hand, and enterprise performance on the other, are likely to be complex. For example, whether state

owned forms perform worse than private ones will depend on both the measure of performance used (profitability as against total factor productivity for example) and the market structure (state owned firms operating in highly competitive markets may appear to perform relatively better than privately owned firms because bankruptcy constraints bind for the latter but not the former category). Similarly, financial constraints may be more binding for private than state owned firms, especially those operating in competitive markets.

To address these issues fully would require another paper. However, here we can usefully bring together the material presented previously by making a first attempt to explore the potential interactions between the independent variables. Rather than use any formal framework, our approach is to estimate equations cross-sectionally for 1999, using the five main measures of company performance employed in this paper; mark-up, return on equity (ROE) return on fixed assets, sales per worker and investment (as a share of fixed assets). We employ as explanatory variables for performance the three main categories of determinant at the heart of this paper – ownership, competition and financial constraints – as well as controls for industry, region and size. The ownership dummy variables are outsider and state (majority) owned firms, and firms with no majority owner, with insider owned firms omitted. The competition dummy variables are medium domestic competition and domestic monopoly (with low competition omitted) and high import competition (low import competition excluded). The financial dummy variables represent partial and serious financial constraints (with the group of firms facing low financial constraints excluded). This yields a total of ten possible interactions, and the results for the five performance measures are reported in Table 7.1.

The equations confirm the view that the factors influencing company performance need to be considered together. We observe some clear significant size effects on performance, notably with respect to mark up, ROE and productivity. The equations refute the view that small firms perform better in the Russian context. The broad results from the previous sections of this paper also come through clearly in this more sophisticated framework. Thus taken together we find domestic monopoly power, financial constraints and to a limited extent state ownership lead to inferior company performance across a wide range of measures. However, we can also add some interesting conclusions from the interactions. Most strikingly, there are clear interactions between state ownership and market structure. State ownership leads to improved performance across a number of measures when there is moderate domestic competition or import competition. It reduces it when there is domestic monopoly power. Hence we can confirm market structure effects are more pronounced when we simultaneously control for ownership. Financial constraints also depend on the ownership structure to some extent. Thus, financial constraints reduce performance across a variety of measures relative to what would pertain in insider owned firms. Clearly, more work is needed on these interactive effects, but Table 7.1 indicates strong complementarities between the various factors influencing improved company performance, namely between ownership structure, financial constraints and monopoly power.

Table 7.1 Performance on Size, Ownership and Financing Constraints with Interactions

| | Mark-up | Return on Equity | Return on Fixed Assets | Sales Per Worker | Investment / Fixed assets |
|------------------------------------|-----------------------|------------------------|------------------------|--------------------------|---------------------------|
| Medium Firms | 0.0506** (0.0219) | 0.0595* (0.0344) | 0.0577 (0.0704) | 8.8289 (14.8023) | 0.0104 (0.0174) |
| Large Firms | 0.0694*** (0.0225) | 0.0590* (0.0310) | 0.0568 (0.0712) | 40.5450** (15.8802) | 0.01622 (0.0166) |
| Outside Owned | 0.0023 (0.0397) | -0.0375 (0.0591) | 0.1030 (0.1679) | -1.1472 (29.5799) | 0.0258 (0.0425) |
| State Owned | 0.0113 (0.0483) | 0.0394 (0.0807) | 0.6433 (0.5237) | 48.1440 (83.2535) | -0.0966*** (0.0343) |
| Med.Dom. Comp. | 0.0166 (0.0281) | 0.0107 (0.0351) | -0.0230 (0.0698) | -8.7056 (16.2156) | 0.0311 (0.0219) |
| Dom.Monop. | -0.0099 (0.0215) | -0.0096 (0.0967) | -0.1551* (0.0865) | -38.0353*** (14.5836) | -0.0449** (0.0188) |
| Imp.Comp. | 0.0042 (0.0235) | 0.0566* (0.0332) | 0.0686 (0.6778) | 15.1693 (17.0536) | 0.0318* (0.0186) |
| Part. Fin. Const. | -0.0080 (0.0215) | -0.0694 (0.0489) | -0.0966 (0.0875) | 6.4662 (18.8450) | -0.0357 (0.0249) |
| Fin.Const. | -0.0632** (0.0282) | -0.1384*** (0.0453) | -0.2612*** (0.0838) | -46.7091** (18.8050) | -0.0736*** (0.0239) |
| Outside ownership interacted with: | | | | | |
| Med.Dom. Comp. | 0.0002 (0.0476) | 0.0058 (0.0630) | 0.1591 (0.1520) | 14.4245 (25.5738) | -0.0477 (0.0335) |
| Dom.Monop. | 0.0657 (0.0444) | 0.0116 (0.1095) | 0.3913 (0.2665) | 25.3134 (26.7948) | 0.1204* (0.0662) |
| Imp.Comp. | -0.0005 (0.0430) | -0.0712 (0.0546) | -0.0267 (0.1377) | -28.3582 (25.0633) | -0.0160 (0.0311) |

| | | | | | |
|----------------------------------|------------|-----------|------------|--------------|-----------|
| Part. Fin. Const. | -0.0721* | -0.1173* | -0.4763*** | -53.7726* | -0.0432 |
| | (0.0367) | (0.0610) | (0.1779) | (31.3683) | (0.0470) |
| Fin.Const. | -0.0447 | 0.0090 | -0.1391 | -5.1743 | -0.0166 |
| | (0.0501) | (0.0685) | (0.1948) | (28.4980) | (0.0454) |
| State ownership interacted with: | | | | | |
| Med.Dom. Comp. | 0.1577** | 0.6315*** | 1.1969*** | 93.4328* | 0.0643 |
| | (0.0680) | (0.2362) | (0.4128) | (54.7674) | (0.0592) |
| Dom.Monop. | -0.4458*** | -0.1504 | -0.3326 | -2.9652 | 0.0299 |
| | (0.1059) | (0.1555) | (0.2859) | (75.7156) | (0.0417) |
| Imp.Comp. | -0.0467 | 0.0777 | 0.7731*** | 238.2931*** | 0.0234 |
| | (0.0763) | (0.1295) | (0.2816) | (74.4625) | (0.0471) |
| Part. Fin. Const. | 0.0350 | -0.0931 | -0.8289 | -105.6797 | 0.0593 |
| | (0.0821) | (0.1326) | (0.5808) | (104.2506) | (0.0488) |
| Fin.Const. | -0.0310 | -0.6206** | -2.2900*** | -397.5274*** | -0.0185 |
| | (0.1235) | (0.2929) | (0.8175) | (131.6609) | (0.0932) |
| No majority ownership | -0.0036 | -0.0335 | -0.1089 | -19.0423 | -0.0060 |
| | (0.0340) | (0.0463) | (0.8581) | (20.6286) | (0.0310) |
| Constant | 0.0839** | 0.2867*** | 0.6236*** | 387.0141 | 0.1599*** |
| | (0.0362) | (0.0777) | (0.1544) | (37.0041) | (0.0403) |
| Regional Controls | Yes | Yes | Yes | Yes | Yes |
| Industry Controls | Yes | Yes | Yes | Yes | Yes |
| No. obs | 306 | 291 | 300 | 310 | 293 |
| R-squared | 0.2209 | 0.2118 | 0.2361 | 0.4891 | 0.2108 |
| F | 43.94*** | 15.95*** | 28.99*** | 148.64*** | 4.6*** |

*, ** and *** indicate significance at the 10, 5 and 1 percent levels respectively

Source: Authors' calculations

Overall our research therefore suggests three major policy conclusions. Firstly, this study — in accordance with other studies — demonstrates that Russian enterprises tend to concentrate their activity on the local and regional markets. Though the problem of administrative barriers which limit the ability of enterprises to enter other regional markets is not as acute as might have been expected, many enterprises — in particular those in the food industry — still complain about such barriers. In this regard, we suggest that the state should consider additional measures limiting regional administrative barriers.

Secondly, our results show that further state policy facilitating the development of competition in the Russian industrial markets is a necessity. It appears to be potentially important to lower non-economic barriers to import and barriers to entry for foreign firms, in view of strong tendencies of integration and cross-ownership in Russian industry.

Finally, we have uncovered strong evidence that self-financing of investments is not a feasible choice for the majority of Russian enterprises due to relatively small profit margins; moreover the inefficiency of banking sector precludes access to alternative appropriate external funding. While equity financing could become an alternative in the future, its development will require more transparent and efficient corporate governance. Currently the average board composition of our sampled enterprises does not appropriately reflect the ownership structure, and does not correspond to standards from other countries: employees, especially management and sometimes regional authorities are over-represented while other groups of stock and stake holders are underrepresented. Hence we suggest that the Government of Russia should enact policy to establish modern corporate governance

legislation and practice, if it wishes to contribute to the development of a robust private sector in the Russian Federation.

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