Explaining Russian Manufacturing Export: Firm Characteristics and External Conditions[*]

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Abstract

This paper examines the exporting behaviour of Russian manufacturers by considering the interaction of firm characteristics and external conditions. An important distinction is made between general exporting activity and export to developed countries. Firm features and specific export experience are found to be important in determining the international orientation of manufacturers and the destination of their exports. At the same time, agglomeration effects are relevant in determining the share of transactions directed to more developed markets, indicating that more efficient exporters are agglomerated in regional and industrial clusters. Among external conditions, natural resource dependence does not seem incompatible with a diversified industrial structure, while a lower degree of regulatory capture is found to favour orientation towards more developed markets. A final section takes a specific look at the new enterprise sector, and finds institutional conditions to be an important determinant of its exporting behaviour.

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Introduction

Russia's remarkable growth rates in recent years are widely believed to be heavily reliant on exports of natural resources. Yet, excessive dependence on the extractive sector can damage long term growth prospects, since its counterparts often are feeble development of manufacturing and scarce industrial exports. In this vein Isham et al. (2003) highlight the long term hazards connected with an export structure that is too concentrated on resource extraction. Their analysis of growth performance in ninety developing economies, between 1957 and 1997, reveals that countries whose export structure is dominated by "point source" exports –oil and minerals - are much more exposed to risks of slowdowns.

In the case of Russia, the share of natural resources in total exports has been steadily rising in recent years. For instance, OECD (2004) reports that, between 1997 and 2003, the share of oil has risen from 23% to 40% of the total, while, in the same period, the computed increase in revealed comparative advantage (RCA) for oil has exceeded 15%[1]. Much of the policy debate concerning Russia's future, thus, concerns the need for the Russian economy to diversify and become less reliant upon extractive industries. To contribute to the debate, this study takes a closer look at manufacturing and at its ability to export. The analysis of the exporting behaviour of manufacturers will concentrate on the interaction of firm-level characteristics with features of the Russian environment.

The export literature identifies the main determinant of a firm's export decision in the productivity performance of the firm itself. Empirical analysis, almost invariably, finds support for the so-called self-selection hypothesis, whereby exporters are more productive than other firms operating in the same sector *prior* to engaging in international markets. The causal relationship between firm level productivity and export status may, therefore, offer an immediate explanation for the poor export performance of Russian manufacturers, that is weak productivity resulting in a lack of competitiveness in international markets. These limitations are all the more pronounced in more advanced markets, since these are more demanding in terms of both quality and cost competitiveness of products.

But why are Russians manufacturers not sufficiently competitive internationally? The answer may be provided by a number of peculiar aspects of the Russian environment, which interconnect and concur to shape the circumstances in which Russian manufacturers operate. First, the regional and industrial composition of Russian industry continues to be heavily shaped by decisions made by Soviet central planners. This implies that the distribution of industry, and consequently of export orientation, across the territory of the Federation, as well as its product specialization, are artificial creations destined to succumb to market forces.

Regional heterogeneity in the development of a vibrant business sector may also influence the emergence of internationally competitive manufacturers, through the provision of goods or service inputs in support of exporting. Specialization in resource extraction is another factor, which, in the longer term, may be expected to undermine the growth prospects of manufacturing, as in the Dutch diseases strand of theories. A more immediate effect may be that the quality of the institutional environment, already poor, is further deteriorated by the rents connected with the presence of natural resources. This may be the case, for instance, when resource abundance further encourages an already pervasive condition of institutional subversion for the benefit of powerful lobbies, which may have negative repercussion for the business climate. Such environmental factors directly affect the operation of manufacturing firms, especially smaller or newly established ones, and may, therefore, be interpreted as explicit determinants of firm performance.

This study is organized as follows. Initially, is a brief review of the literature treating the firm-level and environmental determinants of export behaviour. Next, is an account of how peculiar features of the Russian environment may act as a constraint on firm behaviour. A simple theoretical framework for the export decision is then proposed, the results of which are used to justify the empirical specification employed. Following a description of available data, empirical analysis is articulated in several sections. A preliminary

[1] RCA is an empirical indicator of trade specialization and it is computed, for each sector *i*, as:

$$RCA_i = \left(\frac{X_i}{\sum X_k} \frac{M_i}{\sum M_k} \right) \cdot 100$$

task is to investigate the consequences of firm-specific features, agglomeration effects and environmental conditions on the decision to export. Analysis continues with a examination of the determinants of export shares to developed markets. The last empirical part examines the forces that may constrain the propensity to export of the new enterprise sector. A final section proposes some concluding comments.

1. Literature

1.1 Firm Level Productivity and Export Behaviour

A primary determinant of a firm's decision to export is its productivity, which exemplifies its ability to compete in international markets. The literature linking engagement in foreign markets and firm level productivity originated as empirical. Testable hypotheses were then formalized in theoretical models that aim to explain why certain firms successfully enter export markets and why they are more productive than their domestically orientated counterparts. The process by which some firms in a given population self-select into export markets is usually embedded in models of industry dynamics with sunk costs connected with entry, where heterogeneous firms are subject to random shocks to their productivity. Only certain firms are able to withstand these shocks and therefore enter or remain in the exporting sector, others exit.

Most of the empirical evidence indicates that exporters perform better than non exporters, in terms of a wide range of indicators, such as productivity, size, wages paid, length of survival. In order to elucidate the positive correlation between exporting status and performance, the literature proposes two main explanations. One is the self-selection hypothesis, whereby firms which are engaged in foreign markets are more productive *prior* to exporting, and, therefore, self-select into export markets. If entry entails sunk costs, only more efficient firms will find it profitable to enter the export market in the first place. The learning-by-exporting hypothesis, on the other hand, maintains that exporting has a positive impact on firm performance, therefore exporting firms become more productive *subsequent* to their decision to enter international markets. Efficiency enhancements result from knowledge and expertise acquired as a direct consequence of exposure to international markets. A number of empirical studies have been conducted for both developed and developing economies, and they are predominantly favourable to the self-selection hypothesis.

In the context of developed countries, Bernard and Jensen (1999), using manufacturing data for the United States, find robust evidence in favour of the self-selection hypothesis[2]. Bernard and Jensen (1999a) find that exporting is associated with a reallocation of inputs from less efficient to more efficient plants. Aggregating results, this reallocation effect is found to bring a significant contribution to total factor productivity growth in the manufacturing sector. Melitz (2003), while finding a rationale for a causal link between exporting and productivity, also proposes a theoretical argument for the relationship between openness, reallocation effects and aggregate productivity. A general equilibrium model is constructed incorporating heterogeneous productivity across firms. Entry into the export market is costly. As a consequence, firms with higher ex ante productivity self-select into the export market, while those with lower productivity are only active in the domestic market. Falling trade costs induce firm-level reallocations, through the expansion of more productive firms and the contraction or exit of the least productive firms. This leads to an increase in aggregate productivity.

As for the learning-by-exporting hypothesis rather robust evidence for its absence is found in several works. Clerides et al. (1998) analyse manufacturing data for Colombia, Mexico and Morocco and find that a firm's exporting history has no significant impact on current production costs. This paper includes a theoretical model of a firm's decision to diversify in the export market. The entry decision is based on comparison between expected future profits, which depend on current and future productivity, and the sunk cost of entry. Learning-by-exporting is contemplated by having current productivity depend on prior export experience. Simulation results provide some useful insights. Firms that enter or remain in the export market have higher productivity than firms that stop exporting or remain only in the domestic market. These findings imply that

[2] Other studies on developed economies include Girma et al. (2003) for the United Kingdom and Greenaway et al. (2003) for Sweden.

firms self-select into the export market, based on current productivity. Learning-by-exporting widens the gap between exporting and non-exporting firms.

An exception to this general trend is Kraay (1999), who finds support for the learning-by-exporting hypothesis in a panel of Chinese enterprises. A possible explanation for this result is that, while previously mentioned studies utilize a variable for export propensity, created as a dummy for export status in any given year, Kraay employs a variable for export intensity, constructed as share of exports over total sales. This indicates that the positive learning effects on productivity may indeed be present when taking into account export experience measured as past export shares in firm turnover rather than as past export status per se.

Aw et al. (2000), using firm level manufacturing data from the Republic of Korea and Taiwan (China), analyse the link between a producer's total factor productivity and the export decision. The focus is on the relationship between productivity and movements in or out of export markets. Interestingly, only in Taiwan entry and exit from export markets reflects systematic variations in productivity, while in Korea, export experience plays an important role.

Few studies have been conducted with the specific purpose of analysing the destination of exports. In general, it can be expected that better firms are the ones who are able to export to more sophisticated markets, while benefiting from their activity in more challenging contexts. For instance, Barrios et al. (2003), find evidence that Spanish firms benefit from R&D spillovers resulting from exporting to OECD countries.

1.2 The Role of the Environment

Various elements of the environment in which firms operate are likely to influence their export behaviour and can, therefore, be interpreted as determinants of their propensity to export as well as of the destination of their shipments. One such factor could be spillovers from the exporting activity from firms operating in the same industry and region. Such location-specific spillovers could derive from the fact that geographical concentration of exporters may make it feasible to construct specialized transportation infrastructure or may improve access to information on the preferences of foreign customers.

Aitken et al. (1997) explicitly contemplate this possibility in the case of Mexican manufacturing and conclude that the only spillovers having an impact on a firm's exporting decision are those from multinational enterprises and not from general exporting activity. Clerides et al. (1998) and Bernard and Jensen (2004) also find weak support for regional and sectoral spillovers in the case of, respectively, Colombian and U.S. firms. Aw et al. (2000), in order to explain the diverging influence of productivity on export status, identify the determining factor in the absence of a dense network of subcontractors and traders in Korea, as opposed to Taiwan. Such vertical spillovers from subcontractors would lower sunk costs connected with entry into the export market, thus diminishing the importance of firm-specific experience in determining international orientation.

Another element of the environment which could play a role in influencing the performance of manufacturing firms in certain countries is the abundance of natural resources. A flourishing strand of the literature on the resource curse attempts to explain the link between natural resource wealth and economic performance. The Dutch disease strand of theories maintains that, in resource rich economies, the extractive sector causes factors of production to be drained away from manufacturing, thereby impairing its potential productivity and ultimately ensuring the decline of the sector as a whole. Since manufacturing entails positive productivity spillovers, this has harmful repercussions on growth[3]. Real exchange rate appreciation is a frequent consequence of resource dependence, when extractive industries dominate the export structure of a country. This appreciation will increase competitive pressure on domestic exporters in other sectors, notably manufacturing, thus affecting their ability to export. At the same time, the high value of the domestic currency will increase the purchasing power of domestic consumers in terms of foreign goods, thus further increasing the pressure on domestic manufacturers through the channel of import competition.

[3] Seminal models of Dutch Disease are proposed by Bruno and Sachs (1982) and Sachs and Warner (1995).

A persistent condition of poor institutional quality is possibly related to the abundance of natural resources. Several recent studies have established a connection between natural resource abundance and the quality of the institutional environment. In this case, the effect of natural resources on growth would be indirect and operating through institutions. The proposed mechanism implies that rents generated by natural resources lead to rapacious rent-seeking, which diverts resources from productive activities and, as a consequence, hampers long run economic performance[4].

More generally, a deficient institutional environment may affect productivity in a number of ways. First, the risk of expropriation deriving from an arbitrary rule of law and weak protection of property rights is likely to diminish incentives for investment and innovation, which are prime sources of productivity enhancements. Poor institutional quality also implies other collateral effects. External finance, both equity and debt, will not be easily obtained because of the difficulty to enforce the underlying contracts, while foreign investors will be cautious to become engaged[5]. A lack of foreign presence, in turn, leads to inferior knowledge of foreign markets and reduced access to a broader array of financial opportunities to fund investment and innovation. More directly, foreign ownership may be expected to influence efficiency of production by the imposition of novel management practices. By generally affecting firm performance, these environmental influences have repercussions on the international competitiveness of manufacturers.

2. The Russian Context

2.1. Firm Characteristics and Agglomeration Effects

Firm Characteristics influence the export decision and the destination of shipments.

The preliminary hypothesis to be verified is that in Russia, as in other economies for which studies have been conducted, firm characteristics are an important determinant of export behaviour. In particular, larger and more productive firms should be more inclined to be present in international markets. Furthermore, better firms should be capable of exporting to developed, hence more competitive, markets. The emphasis on export destination is particularly relevant for Russia, given that Russian firms are bound to have a significant presence in markets of the former Soviet space. That the CIS can be considered fairly homogeneous should also contribute to making the penetration of Russian exporters easier, since Russian manufacturers can be expected to have a competitive advantage in those markets descending from their knowledge of local preferences and demand conditions. This implies that exports to other CIS countries cannot be considered on the same level as exports to third, notably developed, markets, where more considerable challenges for exporters are present.

The spatial distribution of industry inherited from Soviet central planning is likely to highlight the spillover effects of agglomeration. This may produce a significant influence on both the decision to export and the destination of shipments.

Local agglomeration effects are explicitly treated in World Bank (2004). It is reported that Russian industry is less locally concentrated than US industry and that agglomeration has been on the rise since 1992. Low initial agglomeration is interpreted as the effect of a strategic design by Soviet central planners, who intentionally distributed standard-sized production facilities across the vast space of the USSR, generating a distribution of industry, which, as outlined by Gaddy and Hill (2003), is likely to differ from the pattern that would have prevailed under market conditions.

[4] See Baland and Francois (2000), Leite and Weidmann (1999), Torvik (2002) for a theoretical framework. Isham et al. (2003), Mehlum et al (2002) and Sala-i-Martin and Subramanian (2003) perform cross-country empirical studies.

[5] This is the case in Russia, where international capital is mostly present in production for the domestic market and in fuel sectors. See Yudaeva et al. (2003).

Given the vast expanses of the Russian territory, as well as the distorted and dispersed location of production units, the consequences for Russian producers in terms of proximity to factors of production, subcontractors and destination markets might be relevant. In particular, more viable firms are likely to prosper in locations and industries which were less artificially located to begin with. This implies that internationally competitive firms are more likely to emerge in agglomerated regional and industrial clusters.

2.2. Economic and Institutional Environment

Given the peculiar features of Russian circumstances, additional, environmental factors are bound to play a significant role in determining the export behaviour of manufacturers.

Regional heterogeneity in business sector development may influence the emergence of internationally competitive manufacturers.

The effects of the diverse paths of reform followed by different Russian regions may be evident in the heterogeneous development of the enterprise sector across the Federation. A thriving small business sector, on its part, may be interpreted as a sign that vertical linkages between exporting firms and various support activities are developing. These support functions may be provided by new enterprises offering manufacturing inputs as well as services, and may be crucial to the appearance of an internationally competitive manufacturing sector.

Resource dependence may hamper the emergence of internationally competitive manufacturers.

An evident feature of Russian circumstances is dependence on natural resources. Symptoms of the related phenomenon of Dutch disease may be found in the lack of international competitiveness of the manufacturing sector. Manufacturers not only face the long term constraints imposed by the drainage of physical, financial and human capital towards the resource sector, but also have to overcome the more transitory difficulties imposed by an appreciating exchange rate.

A side-effect highlighted in the literature is the abnormal expansion of the non-traded sector - notably services, retail trade and construction - which may contribute to the plight of manufacturing by accentuating resource drainage. Such an effect would be caused by the windfall revenues from exports of natural resources being poured into non-traded activities. If this were the case, a large presence of small enterprises would not be a gauge of advanced regional development, as in the previous hypothesis, but of an employment of factors of production which is not functional to manufacturing activity.

Melitz (2003) provides a lens for contemplating a counter-hypothesis to the negative effects of resource dependence. He notes how increased competitive pressure from international trade stimulates intra-industry reallocation of market shares and factors of production. Exchange rate appreciation, which may be ignited by reliance on resource exports, inevitably intensifies competitive pressure on both export and domestic markets. Such an outcome may be interpreted as an increase in the *effective* exposure to trade of the Russian economy, notwithstanding the trade policies actually implemented and the intentions of policymakers. The result of such a process may not be the thwarting of Russian manufacturing in its entirety, but, rather, the acceleration of the weeding out of less competitive firms, via the reallocation of market shares and profits to more efficient players. In the context of exporting, this might be apparent in the effective ranking of firms in the three categories of exporters to developed markets –the best firms-, exporters to the CIS, and non-exporters[6].

[6] Indirect evidence that such industry reallocation may have been at work over the last decade is provided by Ahrend and De Rosa (2005). In a comparative study of Russian and Ukrainian industry, the authors find that Russian industry is considerably more productive in value added terms. Apart from the timing of reforms, an apparent dissimilarity between the two countries is the greater appreciation of the Russian real exchange rate in the course of the 1990s. This may have increased the effective exposure to trade faced by Russian industry contributing to explaining the diverging evolution of productivity in the two countries.

The domestic factor market is identified by Melitz (2003) as an additional channel for the weeding out of less productive firms from export markets. In particular, the increased demand for labour caused by the expansion of more productive firms bids up the real wage, thus forcing their less productive counterparts, who cannot afford higher costs, to exit. Action by policymakers aimed at interfering with the flexibility of factor markets would hinder this beneficial reallocation process and, thus, prevent the economy from reaping the full benefits of increased aggregate productivity accruing from exposure to trade. Heavy subsidisation of vast areas of industry, as well as resistance in the Russian establishment to the rational relocation of industry, may be instances of such harmful policymaking.

Better institutional conditions, notably lower institutional capture, favour the emergence of internationally competitive manufacturers.

The well known institutional pathologies of the Russian environment may be exacerbated by the presence of natural resource rents[7]. As a specific materialization of their influence on institutional circumstances, natural resources may offer incentives for political pressure. Indeed, a situation of institutional subversion may arise as a consequence of the lobbying activity of powerful business interests, which are often, although not exclusively, active in the extractive sector. This means that larger players, who are strongly connected to the government, will attempt to receive privileged legislative treatment and favourable access to scarce budgetary allocations[8]. Less influential players have no comparable leverage on the government and will, therefore, operate in an unfriendly institutional environment.

Some empirical studies consider the wider implications of state capture. These include a series of works[9] based on the two rounds of the Business Environment and Enterprise Performance Survey (BEEPS) conducted in twenty-two transition countries, and Slinko et al. (2004), who analyse the Russian case. These studies find that capture is associated with both substantial benefits for captor firms, and negative externalities for the wider economy. For instance, Slinko et al. (2004) discover that capture impairs the performance of non-influential players, while negatively affecting small business growth, tax capacity of the state, and share of social public expenditure.

Institutional subversion may be directed not only at the promulgation of legislation but also at the enforcement of existing rules. In this light, Glaeser et al. (2003) underline the repercussions of inequality of influence on the judicial system, with powerful actors obtaining court judgements that do not contradict their own interests. The efficiency of the judiciary is thus inversely proportional to the degree of asymmetry in the power of the parties involved: when one of the parties is much more influential than the other, decisions are likely to be biased in its favour. This situation easily evokes a state of affairs in which a limited number of powerful actors, possibly active in resource extraction, dominate the economy.

It follows from the preceding discussion that, in addition to a generalised situation of corruption, the presence of large and influential actors in a particular region may represent an obstacle for the emergence of viable and efficient manufacturers, thus highlighting specific channels for the crowding out mechanism described in the natural resource curse literature. Operating in a high capture environment also implies that less influential players must make considerable efforts to overcome the difficulties deriving from unfriendly regulation. This imposes supplementary costs and may represent a drag on the international competitiveness of firms.

[7] See De Rosa (2004).
[8] In the case of Russia, Slinko et al. (2004) find tax breaks to be the most common form of preferential treatment, followed by subsidized loans from the budget and direct subsidies.
[9] See Hellman, Jones and Kaufmann (2003); Hellman, Jones, Kaufmann and Schankerman (2000); Hellman and Schankerman (2000); Hellman and Kaufmann (2003).

3. A Model of the Export Decision

The decision to export can be modelled as follows[10]. Let

$$\pi_{it}\left(X_{it},Z_t,A_i\right)=p_t\cdot q_{it}^{*}-c_{it}\left(X_{it},Z_t,A_i\left|q_{it}^{*}\right.\right) \tag{1}$$

be the profits derived from exporting activity that a firm receives in any period *t*. Profits in export markets are given by export revenues - with p_t being the exogenous international price for the firm's product and q^{*}_{it} the profit-maximizing export quantity – minus the firm's variable cost of production. This cost depends on a number of features both internal and external to the firm. X_{it} incorporates firm-specific characteristics, such as size, productivity, capital intensity, ownership structure, and spillovers from the activity of neighbouring exporters. Z_t represents a set of exogenous time-dependent market-level variables, such as exchange rates and demand conditions for the firm's product. A_i stands for a number of exogenous firm-specific characteristics that are stable in the short run, such as the firm's sector of operation and structural features of the economic and institutional environment.

The export decision of the firm in any given period will depend on whether export profits for the period, as well as the discounted expected stream of future profits, are non-negative. The export status of firm *i* in period *t*, Y_{it}, will be determined as follows:

$$\begin{aligned} &Y_{it}=1 \text{ if } \pi_{it}\left(X_{it},Z_t,A_i\right)\geq 0 \\ &Y_{it}=0 \text{ if } \pi_{it}\left(X_{it},Z_t,A_i\right)<0 \end{aligned} \tag{2}$$

The single period profit equation (1) can be extended to a multi-period framework. The firm's expected profits become

$$\Pi_{it}\left(X_{it},Z_t,A_i\right)=E_t\left\{\sum_{s=t}^{\infty}\delta^{s-t}\left[p_s\cdot q_{is}^{*}-c_{is}\left(X_{is},Z_s,A_i\left|q_{is}^{*}\right.\right)\right]\right\} \tag{3}$$

If the learning-by-exporting hypothesis holds, it is possible to assume that costs in the current period are positively influenced by the firm's past exporting experience, for instance, if the firm becomes more efficient at making its exported good by virtue of the know-how acquired in the past. Specifically, it can be assumed that

$$c_{it}=c_{it}\left(X_{it},Z_t,A_i,q_{it-1}^{*}\left|q_{it}^{*}\right.\right) \qquad \text{with} \qquad \frac{\partial c_{it}(\cdot)}{\partial\left(q_{it-1}^{*}\right)}<0 \tag{4}$$

Thus, allowing for an influence of past experience on exporting behaviour, the single period profit function becomes:

$$\hat{\pi}_{it}\left(X_{it},Z_t,A_i,q_{it-1}^{*}\right)=p_t\cdot q_{it}^{*}-c_{it}\left(X_{it},Z_t,A_i,q_{it-1}^{*}\left|q_{it}^{*}\right.\right) \tag{5}$$

while the value function in a dynamic framework is given by:

$$V_{it}(\cdot)=\max_{q_{it}^{*}}\left\{\hat{\pi}_{it}\cdot Y_{it}+\delta E_t\left[V_{it+1}(\cdot)\left|q_{it}^{*}\right.\right]\right\} \tag{6}$$

Accordingly, the firm's export decision in period *t* would be based on an assessment of present and expected future profit streams. Therefore, Y_{it}=1 if

[10] See Bernard and Jensen (2001) for a similar approach.

$$\hat{\pi}_{it}+\delta E_t\left[V_{it+1}(\cdot)\middle|q_{it}^*>0\right]>\delta E_t\left[V_{it+1}(\cdot)\middle|q_{it}^*=0\right] \tag{7}$$

A further complication is now contemplated in the model. When a firm enters export markets it is likely to incur sunk costs, associated, for example, with the acquisition of information regarding foreign market conditions or with the establishment of a distribution network. As in Dixit (1989) these costs represent the direct monetary cost of entering a new market. Sunk costs, σ, are assumed to be present in the current period if the firm did not export in the previous period, that is if $Y_{it-1}=0$[11]. The single period profit function with sunk cost of entry will be:

$$\tilde{\pi}_{it}\left(X_{it},Z_t,A_i,q_{it-1}^*\right)=p_t\cdot q_{it}^*-c_{it}\left(X_{it},Z_t,A_i,q_{it-1}^*\middle|q_{it}^*\right)-\sigma\left(1-Y_{it-1}\right) \tag{8}$$

with

$\sigma>0$ if $q_{it-1}^*=0$.

The modified value function, comprising both past experience and the eventuality of sunk costs, in a multi-period framework is given by:

$$W_{it}(\cdot)=\max_{q_{it}^*}\left\{\tilde{\pi}_{it}\cdot Y_{it}+\delta E_t\left[W_{it+1}(\cdot)\middle|q_{it}^*\right]\right\} \tag{9}$$

As before, the firm will decide to export if

$$\tilde{\pi}_{it}+\delta E_t\left[W_{it+1}(\cdot)\middle|q_{it}^*>0\right]>\delta E_t\left[W_{it+1}(\cdot)\middle|q_{it}^*=0\right] \tag{10}$$

Returning to binary formulation, the firm's decision to export in period *t* – production of a non-negative q^*_{it} - will be determined according to the following decision rule:

$$\begin{aligned} &Y_{it}=1 \text{ if } \tilde{\pi}_{it}\left(X_{it},Z_t,A_i,q_{it-1}^*\right)\geq 0 \\ &Y_{it}=0 \text{ if } \tilde{\pi}_{it}\left(X_{it},Z_t,A_i,q_{it-1}^*\right)<0 \end{aligned} \tag{11}$$

where

$$\tilde{\pi}_{it}=\left[p_t\cdot q_{it}^*-c_{it}\left(X_{it},Z_t,A_i,q_{it-1}^*\middle|q_{it}^*\right)-\sigma\left(1-Y_{it-1}\right)\right]+\delta E_t\left[W_{it+1}(\cdot)\middle|q_{it}^*>0\right]-\delta E_t\left[W_{it+1}(\cdot)\middle|q_{it}^*=0\right] \tag{12}$$

is the latent variable underlying the decision to export. The decision rule can also be formulated as follows. Firm *i* will decide to enter the export market in period *t* if

$$p_t\cdot q_{it}^*+\delta\left\{E_t\left[W_{it+1}(\cdot)\middle|q_{it}^*>0\right]-E_t\left[W_{it+1}(\cdot)\middle|q_{it}^*=0\right]\right\}>c_{it}\left(X_{it},Z_t,A_i,q_{it-1}^*\middle|q_{it}^*\right)+\sigma\left(1-Y_{it-1}\right) \tag{13}$$

In other terms, the firm will decide to enter the export market in the current period if this period's export revenues, augmented by a comparison of the discounted future values of entering versus not entering today, exceeds the variable cost of production plus the sunk costs of entry.

Our estimation strategy will focus on the right hand side of (13). Attention will be devoted to the determinants of the variable cost of production, c_{it}, and to sunk costs, σ.

[11] Roberts and Tybout (1997) generalize the modelling of sunk costs by allowing them to depend on the length of absence from the market.

4. Data[12]

The main firm-level dataset used in the analysis is the Goskomstat Russian Enterprise Register Longitudinal Database (RERLD). This was matched with the Russian Customs Export database for the construction of the export-related variables. The focus of this study is manufacturing export. Since it is fairly common practice for Russian firms to engage in the exporting of natural resources, regardless of their field of activity, care was taken in excluding non-manufacturing transactions from the export database before matching it with the RERLD[13] [14]. The RERLD was also enriched with a foreign ownership dummy obtained by matching the RERLD with the Register of Foreign-Owned Firms (RFOF)[15].

Since each firm is identified according to its region of operation, it was possible to insert regional variables from the Yearbook of Russian regions, as well as the Slinko et al. (2004) index of regulatory capture and the Transparency International corruption indicators.[16]

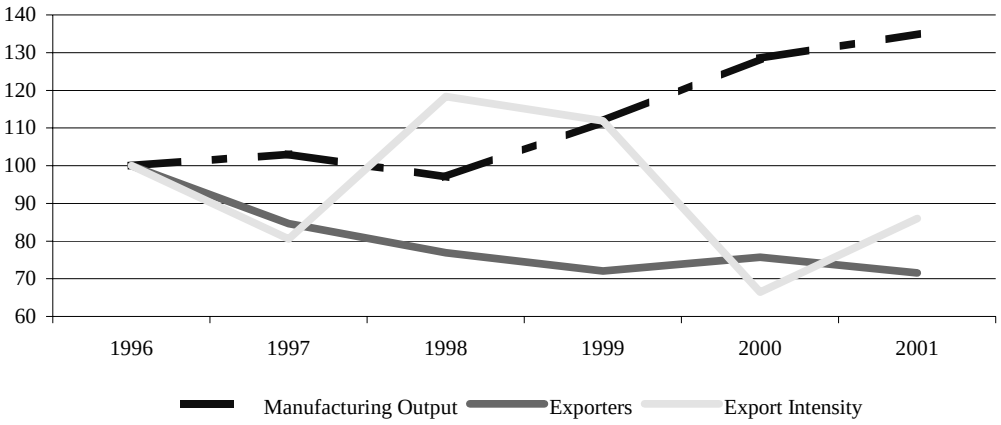
The Goskomstat RERLD is likely to offer a poor representation of the new enterprise sector since newly created firms may have weak incentives to report to Goskomstat. Furthermore, since the census excludes, by design, all the firms that are more than 75% individually owned, it will omit a very large share of start-ups. Appendix B proposes a methodology for obtaining the definition of new firms employed in the remainder of this study. For comparison, the last section of this work takes a specific look at the new enterprise sector by using a different dataset derived from the World Bank Business Environment and Enterprise Performance Survey (BEEPS).

Figure 1 shows how, while manufacturing[17] output displays a significant expansion in the aftermath of the 1998 default, the share of manufacturing exporters shows a sustained declining trend. The diverging paths of industrial production as such and of the share of exporters would indicate that the increase in output which followed the 1998 Rouble devaluation was mainly directed to the domestic market. That export intensity – measured as export turnover over total output – does not display an increasing trend, at least until 2000, would exclude the possibility that the reduction in the percentage of exporters is due to consolidation of exporting firms, which, in itself, would be a sign of restructuring of industrial sectors.

As it is noted in World Bank (2004), the legal entities that emerged as firms after privatization were not integrated multi-plant outlets, as it is often the case in market economies, but simply the standardized production units scattered across the USSR. The fact that no discernible consolidation of these production units has occurred in the exporting sector would indicate that progress still remains to be made in intra-industry rationalization of production.

[12] See Appendix A for further details.
[13] I would like to thank Konstantin Kozlov of CEFIR, Moscow for this insight, as well as for his irreplaceable assistance in cleaning and matching the two databases.
[14] The metallurgy sector includes both firms that are active in the extraction of raw materials and firms that are engaged in their processing. The transactions concerning the former were excluded from the database.
[15] The results of analysis with foreign ownership are included in Appendix C.
[16] See Appendix D for detailed regional institutional indicators.
[17] The index of manufacturing output was constructed on the basis of industry-level data available from Goskomstat. Manufacturing is defined as total industrial output minus the output of power generation and fuel industries.

Figure 1: Manufacturing Output and Exporters
(1996=100)



A general impression regarding the continuity of exporting activity can be obtained from Table 1 and it indicates that approximately one third of exporting firms were continuously present in foreign markets in the six years of the window of time available.

Table 1: Years of Exporting Experience in 1996-2001

	Number of Firms	*Percent*	*Cumulative*
1	3.528	13.24	13.24
2	3.776	14.17	27.41
3	3.564	13.37	40.78
4	3.36	12.61	53.38
5	3.01	11.29	64.68
6	9.414	35.32	100.00
Total	26.652	100.00	

A glance at Table 2 confirms that the basic characteristics of exporters in Russia, relative to non-exporters, are largely in line with what is observed in most countries. Exporters appear to be much larger, in terms of employment, more productive, more capital intensive and with a larger foreign presence. Uninterrupted presence in international markets reinforces this pattern, whereby continuous exporters are significantly larger, as well as more productive, than both intermittent exporters and non-exporters.

Table 2: Basic Characteristics of Manufacturing Exporters and Non-Exporters (1996-2001 averages)

	Continuous Exporters	*Exporters*	*Non-Exporters*
Employment	1885	1226	187
Labour Productivity Index	106	100	58
Capital Intensity Index	150	100	49
Average Wage Index	107	100	78
New Firms (% of total)	6.8	22.5	37.2
Firms with foreign presence over total firms (%)	8.8	9.0	2.3

A dataset from the Customs of the Russian Federation contains details regarding the export transactions effected by Russian firms. A matching exercise with the Goskomstat census allows to link transactions to

various destinations with the characteristics of the enterprises that performed them. The table below indicates that firms who are able to export at least 10% of their export turnover to developed markets are markedly different from both exporters in general and non-exporters. Most notably, they display higher levels of labour productivity. They also show somewhat higher capital intensity and pay higher wages, although they are not larger than other exporters. It is also noteworthy that a higher proportion of these firms than the average for exporters can be defined as de novo and is owned by foreign investors.

Table 3: Basic Characteristics of Exporters to Developed Countries (1998-2001 averages)

	Exports to Developed Countries Exceeding 10% of Export Turnover	*Exporters*	*Non-Exporters*
Employment	998	1175	187
Labour Productivity Index	118	100	49
Capital Intensity Index	108	100	11
Average Wage Index	104	100	72
New Firms (% of total)	35.6	29.1	41.1
Firms with foreign presence over total firms (%)	15.7	10.9	2.6

Table 4 confirms that, while the great majority of transactions to all destinations can be attributed to traditional enterprises, new firms seem to perform a larger share of transactions to more, rather than less, developed markets. Only 19% of transactions to the CIS are effected by new firms, emphasizing the importance of established trade links with traditional markets. The share of new firms' transactions rises substantially when considering developed markets as a whole, to 27%, and to over 30% for the EU15, the US and Canada.

Table 4: Export Destinations – Share of Transactions Originating from New Firms (1998-2001 averages)

CIS	19.25 %
OECD and Other Developed Countries	27.38 %
EU 25	26.33 %
EU 15	30.90 %
United States and Canada	31.22 %
Latin America	15.70 %
East and South Asia	25.84 %

The table below reports the breakdown of export destinations to different regions. The largest share of transactions is directed to developed countries, and the portion pertaining to the CIS slightly declines between 1998 and 2001. The aftermath of the 1998 Rouble devaluation is associated with an increase in the proportion of exports to non-CIS markets and a corresponding decline in the share of CIS transactions. This might be interpreted as evidence of some redirection of trade towards more developed markets due to the more favourable exchange rate conditions. That this effect appears to be fading out after 1999 might seem surprising at first sight, although it will be much less so upon closer inspection. Indeed, after 1998 most Russian firms had plenty of scope to expand their sales in the domestic market, since devaluation rendered most foreign intermediate and final goods unaffordable for domestic customers. This allowed Russian firms to exploit previously untapped domestic demand.

Table 5: Destination of Russian Manufacturing Exports (Share of Total Transactions, %)

	CIS	*OECD and Other Developed*	*EU 25*	*EU 15*	*United States and Canada*	*Latin America*	*East and South Asia*
1998	40.04	46.96	40.04	22.65	2.51	1.16	4.29
1999	34.90	51.04	43.33	24.89	3.20	1.61	5.09
2000	35.22	48.74	40.73	22.30	3.25	2.08	4.61
2001	37.15	45.31	38.56	22.07	2.58	2.27	4.91

The following table contains a synopsis of the degree of industrial specialization of Russian exporters. Machine building and metalworking represents the largest proportion of exporters, indicating that Russian manufacturing export is highly specialized, although it's a trend towards diversification is visible between 1996 and 2001.

Table 6: Export Specialization - Exporters by Industry (% of all exporters)

	Ferrous and Non-ferrous Metallurgy	*Chemical and Petrochemical*	*Machine Building and Metalworking*	*Logging, Woodworking, Pulp and Paper*	*Construction Materials*	*Textile, Clothing, Leather, Fur, Footwear*	*Beverages, Tobacco, Meat, Diary, Fish*	*Other Industries*
1996	3.8	7.7	41.0	20.0	5.4	9.6	7.6	4.8
1997	3.7	8.1	41.4	18.8	5.5	9.1	8.8	4.7
1998	3.5	9.3	35.2	21.3	6.4	8.9	9.9	5.6
1999	3.7	9.3	35.4	21.6	6.2	8.8	9.4	5.7
2000	3.7	9.4	36.0	20.1	6.4	9.4	9.6	5.4
2001	3.9	9.7	38.6	18.2	6.7	8.8	8.9	5.3

5. Empirical Specification

This section describes the factors which are postulated to influence both the exporting decision per se, and the degree of orientation towards more developed markets. The latent variable underlying the export decision - the stream of expected profits from exporting activity in (12) - is not observed in the data. Information is only available regarding the export status of the firm in each period, as in (11). Thus, the probability that a firm will decide to become an exporter will be estimated according a binary choice model. The share of exports to developed countries, on the other hand, will be estimated directly.

The determinants of variable cost in (12) and (13) are considered to affect both export status and, in a later section, the share of exports to developed countries. For clarity, equation (14) regroups these influences on export decision or, alternatively, on the share of exports to developed markets -EXPORT- according to their nature. The rearranged explanatory variables relate to firm characteristics; specific exporting experience; agglomeration effects; and environmental conditions, as well as industry and year dummies.

$$EXPORT_{it} = f(FIRM_{it}, EXPERIENCE_{it}, AGGLOMERATION_{it}, ENVIRONMENT_{i}) \quad (14)$$

Firm Characteristics

The first group of variables comprises firm characteristics and performance measures, such as size, productivity, capital intensity and wage levels. These have been found in the literature to be different for exporters and non exporters, with the former generally appearing to be larger, more productive and paying higher wages[18]. Firm size is embodied in the number of employees; labour productivity[19] is calculated as

[18] See, for example, the various works by Bernard and Jensen.

sales per worker; capital intensity is represented by fixed capital per worker; while wage levels are computed as the total wage bill divided by the number of employees. These characteristics are included, in turn, both as lagged logarithms and in the form of lagged percentage deviations from industrial sector averages. The reason for considering deviations is to assess the robustness of firm-level influences, since, given the relatively high level of industrial specialization of Russian manufacturing export discussed in Table 6, the comparative advantage of different industries is likely to be the predominant cause of the decision to export. Hence, the qualities distinguishing exporters from non-exporters may be determined not only by absolute values but by the relative difference of the exporting firm with respect to the typical features of firms in the same sector.

An additional collection of firm features refers to origin and foreign ownership[20]. As a direct control for the legacies of central planning, a binary variable identifies the firm as new or old[21]. A dummy for foreign ownership contemplates the possibility that a foreign investor may have acquired a share in the capital of the firm for re-exporting purposes.

Exporting Experience

Two variables refer to features that are directly related to a firm's direct exporting experience. The first represents the sunk costs associated with entering a new market, and is obtained by including a dummy for lagged export status. Sunk costs may be ascribed to the establishment of a distribution network or to marketing and advertising costs and are one-off expenses incurred at the time of entry. The second variable represents export intensity and is constructed as the share of exports in turnover. This reflects exporting know-how in the sense that familiarity with international markets depends not only on exporting status per se but, crucially, on export volumes.

Agglomeration

In order to capture the combined regional and industrial comparative advantage or, more precisely, the possibility of spillovers deriving from the geographical agglomeration of exporting activity, agglomeration effects are contemplated. This is done by including, alternatively, regional-industrial export propensity and intensity. Export propensity is defined as the share of exporting firms present in the region and operating in a given industrial sector. Export intensity, on the other hand, is constructed as the share of exports in regional-industrial output. As in Bernard and Jensen (2004), export propensity and export intensity regressions include other measures of proximity to neighbouring exporters. These reflect the propensity or intensity of exporting of the firm's sector outside the firm's region, and in the firm's region excluding the firm's sector.

The Environment

A further set of controls is intended to reflect regional economic conditions. Since structural conditions are best interpreted as long run phenomena, analysis of their influence on exporting behaviour is carried out taking 2001 as the reference year and using the averages of past years for environmental variables.

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[19] It is well known that estimates of Soviet era capital stock are unreliable. This is why a simpler measure of productivity, only taking into account the number of employees and the value of sales, was preferred to a more appropriate, but more complex, measure of total factor productivity. The value of fixed capital is nonetheless utilized for the construction of the variable for capital intensity (capital per worker). This is because a less accurate measure of capital intensity is not as critical to the analysis as would be an imprecise measure of TFP, constructed by including the value of fixed capital.

[20] De novo status and foreign ownership are highly correlated. The main body of the analysis uses firm origin while results obtained using foreign ownership are included in Appendix C. The reasons for this are that foreign ownership data cover a shorter time period (1997-2000), and that foreign ownership has been found in other studies to play a limited role in Russian manufacturing. See Kozlov and Manaenkov (2002) and Yudaeva et al. (2003) for discussions of foreign ownership in the Russian context.

[21] See Appendix B for an account of the methodology used to define a firm as "new".

The first environmental variable, reflecting the degree of business development, is constructed as the 1995-2001 average ratio of small enterprises over regional population. The small enterprise per capita variable may capture the dynamism of the region in which the enterprise operates, since the presence of small firms is a good proxy for firm creation. It is conceivable that exposure to a more vibrant business environment may provoke a cascade effect on the entrepreneurial attitude and on the outward inclination of even traditional players. This might, for instance, be possible through linkages with regional suppliers or customers, which may induce a customer or supplier firm to enhance its efficiency. Improved efficiency might, then, have repercussions on the exporting behaviour of the firm itself. A negative interpretation could be derived from the effects of Dutch disease, if the proliferation of small firms were linked to an abnormal expansion of the non-traded sector.

In order to represent the scale of comparative disadvantage that manufacturing may suffer as a consequence of resource dependence, a specification will include the average incidence, over the period 1995-2001, of extractive industries – oil, gas and mining – in gross regional industrial production (GRIP). Regions with a high incidence of extractive activity may not offer - for climatic, economic or historical reasons - an ideal milieu for the development of manufacturing and, even less, for manufacturers that are capable of exporting.

A second group of environmental variables is intended to reflect how propitious the institutional climate is for economic activity and, in particular, for the promotion of efficient exporters. The first institutional variable reflects regional regulatory capture, and was constructed by Slinko et al. (2004) by considering legislative provisions, enacted between 1995 and 2000, and discovered to contain favourable treatment for influential enterprises in various Russian regions. Capture of the legislative environment by influential actors has been found in the literature to have negative repercussions on economic activity. The main channel through which this may occur is the undermining of a level playing field for all economic agents. This inequality of influence on the establishment of the rules of the game would be a drag on new business development and, ultimately, a curse for long term economic performance.

The second institutional variable considers the regional accountability of law enforcement, and is constructed as an index reflecting entrepreneurs' perception of corruption in the judicial process. Given the structure of the judicial Russian system, the evaluation is likely to refer to arbitration courts, the commercial courts that more directly affect the operation of enterprises[22]. More transparent, hence more accountable, law enforcement is an essential ingredient for a thriving business environment and, by implication, for the emergence of firms that are capable of competing in export markets.

Regressions include a variable representing distance from the capital, intended to capture the geographical dispersion of production as well as its remoteness from both the economic and political centre of the country, and western markets. Finally, year and industry dummies are contemplated. The former are mainly aimed at controlling for short run fluctuations in the exchange rate, while the latter are intended to reflect the comparative advantage that is associated with particular industries[23].

6. The Export Decision

The panel structure of the data would warrant the use of fixed or random effects techniques, which would allow to obtain insights from having observations repeated over time for the same unit. Both techniques have some shortcomings. A random effects specification would confront the difficulty of requiring unobserved effects not only to have a random structure but to be uncorrelated with explanatory variables included in the model. This assumption is hardly tenable in the context of exporting activity, since, as discussed in Bernard and Jensen (2004), included firm features are likely to be correlated with such unobserved variables as the production technology available in each particular firm or managerial ability.

[22] This variable was constructed in a survey by Transparency International and was kindly provided by Evgeniy Yakovlev of CEFIR, Moscow. The survey was conducted in 2002. Nonetheless, the assessment on corruption of the judiciary is used as an explanatory variable for previous periods. This is because a similar variable for previous years is not available. Although, strictly speaking, this procedure is incorrect, it is realistic to assume that institutional variables are stable in the short run, and, therefore, posterior values can sensibly be used to proxy the quality of the institutional environment in previous years.

[23] Chapter 2 on Industrial Competitiveness in OECD (2004) contains a detailed breakdown of the revealed comparative advantage computed for various industrial sectors.

Fixed effects estimation, on its part, also involves some drawbacks for our purposes. Notably, most fixed effects specifications produce biased and inconsistent estimates for coefficients on lagged dependent variables[24], which would hinder the estimation of sunk cost - defined as lagged export status - in the export decision model.

In order to surmount this problem, analysis will proceed in three steps. First, a benchmark will be derived by using a pooled linear probability model, with clustering on each firm, which ignores possible firm specific effects. As a second step, a fixed effects specification will address the issue of unobserved heterogeneity. Finally, use will be made of the Arellano and Bond (1991) GMM technique with first differencing of variables. Given the relatively short time dimension of the data (1996-2001), this last model will imply the loss of many observations, but it is nonetheless useful to examine its results in order to directly address the issue of sunk costs.

The regressions below report the influence of various factors on the decision to export of Russian manufacturers, as in (15).

$$\Pr\{EXPORT_{it}=1 \mid FIRM_{it}, EXPER_{it}, AGGL_{it}, ENVIR_{i}, TIME, IND_{i}\} \quad (15)$$

Analysis refers, in turn, to the impact of firm features and firms' direct exporting experience; to the possibility of spillover effects from neighbouring exporters; and to the role of structural economic and institutional factors. The explained variable for export status is binary, assuming a value of one if the firm exports in the reference period. This variable was constructed by matching the Goskomstat enterprise census with the transaction-based register compiled by the Customs Service of the Russian Federation[25].

6.1 Firm Characteristics and Experience

Following the approach to the firm-level determinants of the decision to export employed by Bernard and Jensen (2004), the following Table includes the results of three linear probability specifications, respectively in levels, fixed effects and GMM with first differences. In order to avoid simultaneity between firm features and the export decision, all firm characteristics are lagged by one year.

Most empirical studies find that exporters are larger, more productive, more capital intensive and pay higher wages than other firms prior to engaging in international markets. The coefficients for firm characteristics resulting from alternative estimation methods largely seem to confirm these results. Exporters, appear to be larger and more productive, while they do not seem to pay higher wages. Contrary to the findings of studies pertaining to other countries, the capital intensity variable is not relevant in all specifications, indicating that obsolete capital outlays may be a drag on the international orientation of manufacturers. This should not be surprising, since it is reasonable to expect that the firms that are contemplated in the analysis are mostly inherited from the Soviet past. It would also confirm that many traditional firms are still largely unrestructured, and their status of exporters is more readily attributed to the commercial links they retained with clients from Soviet times, than to the intrinsic characteristics of efficiency that have been revealed to be the principal drivers of the decision to export in most of the related literature.

In both the levels and the GMM specifications, sunk costs have a relevant impact on the decision to export, while export experience, in terms of export volumes, is always significant. The fact that a firm is new does not always have a positive impact on the export decision. The following section, explicitly contemplating exports to more competitive developed markets, will shed further light on this issue.

[24] See Bernard and Jensen (2004) and references therein.
[25] See Appendix A for details regarding the two datasets.

Table 7: Export Decision (1996-2001)- Firm Characteristics and Experience

Dependent Variable: Export Status

	LPM Levels		**LPM Fixed Effects**		**GMM First Differences**	
	(1)	(2)	(3)	(4)	(5)	(6)
FIRM CHARACTERISTICS						
new94	0.024***	-0.005**			0.004	0.006**
	[0.002]	[0.002]			[0.003]	[0.003]
Lagged log employment	0.041***		0.051***		0.035***	
	[0.001]		[0.003]		[0.004]	
Lagged log labour productivity	0.018***		0.012***		0.019***	
	[0.001]		[0.002]		[0.002]	
Lagged log fixed capital per worker	0		0.008***		0.003	
	[0.001]		[0.002]		[0.003]	
Lagged log average wage	0.001		0.005*		-0.002	
	[0.002]		[0.003]		[0.003]	
Lagged deviation of employment from industry average		0.012***		0.010***		0
		[0.000]		[0.001]		[0.001]
Lagged deviation of labour productivity from industry average		0.000*		0		0
		[0.000]		[0.000]		[0.000]
Lagged deviation of capital intensity from industry average		0		0		-0.001***
		[0.000]		[0.000]		[0.000]
Lagged deviation of average wage from industry average		0.001***		0		0
		[0.000]		[0.000]		[0.000]
EXPERIENCE						
Lagged export status	0.550***	0.596***	-0.026***	-0.020***	0.249***	0.246***
	[0.003]	[0.003]	[0.004]	[0.004]	[0.007]	[0.007]
Lagged export intensity	0.388***	0.387***	0.201***	0.201***	1.196***	1.200***
	[0.010]	[0.011]	[0.017]	[0.017]	[0.020]	[0.020]
Year Dummies	YES	YES	YES	YES	YES	YES
Industry Dummies	YES	YES			YES	YES
distance from Moscow	-0.000***	-0.000***	0	0	0.000***	0.000**
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Constant	-0.299***	0.029***	-0.226***	0.205***	0.003	-0.008**
	[0.010]	[0.003]	[0.029]	[0.002]	[0.003]	[0.003]
Observations	91797	91797	91797	91797	61425	61425
Adjusted R-squared	0.557	0.544				
Number of firms	91797	91797	27192	27192	21487	21487

Standard errors of pooled regressions, adjusted for clustering on firm ID, in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

6.2 Agglomeration Effects

The following regressions consider the role of spillover effects from neighbouring exporting activity by employing the GMM technique discussed above. As mentioned, two alternative definitions of geographical and sectoral proximity are considered in turn. The first refers to export propensity, defined as the share of exporters in total firms in the relevant sector, region and regional-industrial cluster. The second measure refers to export intensity, and reflects the share of exports in total sectoral, regional and regional-industrial turnover.

Table 8: Export Decision (1996-2001) - Agglomeration Effects - GMM First Differences
Dependent Variable: Export Status

	(1)	(2)
	Export Propensity	**Export Intensity**
AGGLOMERATION EFFECTS		
Regional-industrial	0.088***	-0.058***
	[0.011]	[0.010]
Sectoral (outside the region)	0.182	0.065
	[0.208]	[0.049]
Regional (excluding sector)	-0.090***	-0.005
	[0.015]	[0.011]
FIRM CHARACTERISTICS		
new94	0.004	0.004
	[0.003]	[0.003]
log employment	0.034***	0.034***
	[0.004]	[0.004]
log labour productivity	0.019***	0.019***
	[0.002]	[0.002]
log capital intensity	0.003	0.003
	[0.003]	[0.003]
log of average wage	-0.002	-0.001
	[0.003]	[0.003]
EXPERIENCE		
lagged export status	0.262***	0.245***
	[0.007]	[0.007]
export intensity	1.199***	1.200***
	[0.021]	[0.020]
Year Dummies	YES	YES
Industry Dummies	YES	YES
Distance from Moscow	0.000***	0.000***
	[0.000]	[0.000]
Constant	-0.011	-0.008**
	[0.012]	[0.004]
Observations	61425	61253
Number of firms	21487	21481

Standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

When considering the possibility of spillovers, the effects of firm level features and direct export experience remain essentially unchanged with respect to a specification that only contemplates these features. Among

the various measures of agglomeration, only regional-industrial export propensity seems relevant, providing some confirmation of the results contained in previous studies - by Aitken et al (1997), Clerides et al. (1998) and Bernard and Jensen (2004) - of the irrelevance of spillovers for the export decision. In order to control for the fact that Russian exports to developed countries are intrinsically different, this result will be examined again in the following section.

6.3 The Role of the Environment

The following table considers the effects of broad economic and institutional circumstances on the decision to export in 2001. All institutional conditions seem irrelevant in determining a firm's presence in foreign markets. Among regional economic conditions, high resource dependence is significant and displays the expected negative sign, indicating that regional dependence on extractive industries hampers the emergence of export oriented manufacturers. Nonetheless, the magnitude of this effect on the probability of export participation is virtually nil. As for small business development, a gauge of general regional development, it displays a significantly negative sign and a large marginal impact only in one of the two specifications in which it is contemplated. The negative effect on general exporting activity, including export to all destinations, may provide broad-brush evidence that small business development is of the vicious kind implied by the Dutch disease story of an abnormally large non-traded sector, rather than of the virtuous variety of support activities for internationally oriented manufacturers. As for the agglomeration effects considered above, specific consideration of export to developed markets may shed further light on environmental influences.

Table 9: Probit Results - Determinants of the Export Decision in 2001: The Role of the Environment

Dependent Variable: Export Status in 2001

	Economic Environment		**Institutional Environment**	
	(1)	(2)	(3)	(4)
ENVIRONMENT				
Small enterprises per capita in the region, 1995-2001 average	-0.845**	-0.391		
	[0.404]	[0.366]		
Share of extraction industries in GRIP, 1995-2001 average	-0.000*	-0.000**		
	[0.000]	[0.000]		
Index of Regulatory Capture, 1995-2000 average			-0.01	-0.02
			[0.019]	[0.019]
Corruption of judicial process (entrepreneurs' perception)			-0.002	-0.011
			[0.056]	[0.056]
AGGLOMERATION EFFECTS				
1996-2001 average of regional-industrial export	0.178***	0.032	0.137***	0.023
	[0.028]	[0.029]	[0.040]	[0.040]
1996-2001 Regional export (outside sector)	-0.023	-0.024	-0.061	-0.095*
	[0.042]	[0.033]	[0.054]	[0.049]
FIRM CHARACTERISTICS				
new94	0.002	0.002	-0.003	-0.002
	[0.004]	[0.004]	[0.006]	[0.006]
1995-2001 average log employment	0.032***	0.033***	0.035***	0.035***
	[0.002]	[0.002]	[0.002]	[0.002]
1995-2001 average log labour productivity	0.033***	0.033***	0.037***	0.038***
	[0.003]	[0.003]	[0.003]	[0.003]
1995-2001 average log capital intensity	0	0	0.002	0.002
	[0.001]	[0.001]	[0.002]	[0.002]
1995-2001 average log average wage	-0.013***	-0.012***	-0.015***	-0.015***
	[0.004]	[0.004]	[0.005]	[0.005]
EXPERIENCE				
lagged export status	0.372***	0.388***	0.399***	0.404***
	[0.014]	[0.014]	[0.017]	[0.017]
1996-2001 average of export intensity	0.453***	0.483***	0.525***	0.549***
	[0.046]	[0.048]	[0.060]	[0.061]
Industry Dummies	YES	YES	YES	YES
distance from Moscow	0.000**	0	0	0
	[0.000]	[0.000]	[0.000]	[0.000]
Observations	19189	19189	12957	12957

* significant at 10%; ** significant at 5%; *** significant at 1%

Robust standard errors, adjusted for clustering on firm id, in brackets

Coefficients represent changes in probability for an infinitesimal change in each dependent variable

(1) and (3) Export Propensity. (2) and (4) Export Intensity

7. The Destination of Russian Exports

Supplementary insights may be provided by consideration of the determinants of the destination of Russian exports. Indeed these determinants may be different for exports to developed countries and the CIS. Markets in developed countries can be expected to be more challenging, both in the terms of higher quality and cost competitiveness of products. These characteristics are likely to be associated with more efficient firms, as well as with an incentive structure, both within the firm and in its environment, which rewards innovation and efficiency. The importance of agglomeration effects, whereby better firms self-select in regional-industrial clusters less irrationally located to begin with, may also become apparent at this stage. CIS markets, on their part, are relatively underdeveloped and offer export opportunities even for less efficient Russian manufacturers. Furthermore, many trade links with CIS countries are bound to be inherited from Soviet times. These considerations imply that exporting to these markets is less demanding for Russian firms.

Some caveats regarding the estimation methodology discussed for the export decision also apply for the share of exports to developed countries. In particular, a random effects specification is deemed inappropriate, given the importance of firm heterogeneity in determining a firm's ability to export. Estimation will proceed in two steps. First, a benchmark pooled regression with clustering on each firm is proposed, then, in order to account for unobserved heterogeneity, a fixed effects procedure is employed[26] to estimate the following equation:

$$EXPORT\_SHARE\_DEVELOPED_{it} = f\{FIRM_{it}, EXPER_{it}, AGGL_{it}, ENVIR_i, TIME, IND_i\} \quad (16)$$

The following regressions mirror the analysis conducted above by considering, in turn, the effects of firm characteristics and experience; agglomeration effects; and economic and institutional conditions. The factors influencing the destination of exports parallel those employed for the explanation of export status. The explained variable represents the share of exports to developed markets in total enterprise turnover. It is constructed by matching enterprise characteristics from the Goskomstat census, with detailed data on the destination of individual shipments.

7.1 Firm Characteristics and Experience

In accordance with the outcomes observed in the analysis of the determinants of export status, firm level characteristics seem to have an impact which is increasing in the proportion of export to developed markets. In particular labour productivity, size, and, in some specifications, average wage, are positively related to a larger share of exports to developed countries. Positive wage effects might imply that labour of higher quality, as proxied by higher average wage, is attracted to better firms. Perhaps surprisingly, the capital intensity variable is still insignificant in determining a higher share of exports to developed countries, as it was for the export decision per se. This might indicate that the capital stock employed is still largely obsolete across the board, and that the competitive advantage of exporters to developed countries lies elsewhere. The status of new –or more appropriately- transformed firm presents a consistently positive, association with exports to developed markets. This would indicate that new firms that are export oriented tend to have a larger proportion of their shipments directed to developed markets.

The relevance of sunk costs seems to be increasing in the share of transactions with more developed countries, indicating that firms face important initial barriers to entry into more advanced markets. Past export intensity is also important in determining a larger share of transactions to developed countries.

[26] Given that estimation is directed at export shares and not at export status as such, the issue concerning the estimation of sunk cost is considered less critical to the results. Furthermore, given the limited time span available (1998-2001), a GMM methodology with first differences would entail the loss of too much information.

Table 10: Export to Developed Countries (1998-2001) - Firm Characteristics and Experience

Dependent Variable: Share of Exports to Developed Countries

	Levels		**Fixed Effects**	
	(1)	(2)	(3)	(4)
FIRM CHARACTERISTICS				
new94	0.015***	0.010***		
	[0.002]	[0.002]		
lagged log employment	0.003***		0.016***	
	[0.001]		[0.003]	
lagged log labour productivity	0.007***		0.003**	
	[0.001]		[0.002]	
lagged log fixed capital per worker	0.001		0.002	
	[0.001]		[0.002]	
lagged log average wage	0.011***		0	
	[0.001]		[0.002]	
lagged deviation of employment from industry average		0.001**		0.003***
		[0.000]		[0.001]
lagged deviation of labour productivity from industry average		0		0
		[0.000]		[0.000]
lagged deviation of capital intensity from industry average		0		0
		[0.000]		[0.000]
lagged deviation of average wage from industry average		0.014***		-0.002
		[0.001]		[0.002]
EXPERIENCE				
lagged export status	0.151***	0.158***	-0.043***	-0.041***
	[0.003]	[0.002]	[0.004]	[0.004]
lagged export intensity	0.599***	0.600***	0.139***	0.139***
	[0.009]	[0.009]	[0.015]	[0.015]
Year Dummies	YES	YES	YES	YES
Industry Dummies	YES	YES		
distance from Moscow	[0.000]	[0.000]	[0.000]	[0.000]
	-0.000***	-0.000***	0	0
Constant	-0.150***	0.011***	-0.071***	0.049***
	[0.009]	[0.003]	[0.026]	[0.002]
Observations	71464	71464	71464	71464
Adjusted R-squared	0.237	0.237		
Number of firms	71464	71464	24322	24322

Standard errors of pooled regressions, adjusted for clustering on firm ID, in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

7.2 Agglomeration Effects

Geographical and sectoral agglomeration was previously interpreted as a sign that more competitive firms are beginning to overcome the irrational location decision made by central planners, and that their success might be reflected in their ability to export to more developed markets. The present section will re-examine the ambiguous result previously obtained for the export decision per se, by considering the share of exports to developed markets, and by assuming that better firms tend to export more to these markets.

Table 11: Export to Developed Countries (1998-2001) - Agglomeration Effects

Dependent Variable: Share of Exports to Developed Countries

	Export Propensity		**Export Intensity**	
	Fixed Effects	Levels	Fixed Effects	Levels
	(1)	(2)	(3)	(4)
AGGLOMERATION EFFECTS				
Regional-industrial	0.287***	0.209***	0.022**	0.067***
	[0.021]	[0.015]	[0.009]	[0.010]
Sectoral (outside the region)	-0.197*	-0.237*	-0.033	-0.025
	[0.111]	[0.126]	[0.023]	[0.024]
Regional (excluding sector)	0.065	0.140***	0.034**	0.079***
	[0.052]	[0.021]	[0.016]	[0.011]
FIRM CHARACTERISTICS				
new94		0.014***		0.015***
		[0.002]		[0.002]
lagged log employment	0.016***	0.002**	0.015***	0.003***
	[0.003]	[0.001]	[0.003]	[0.001]
lagged log labour productivity	0.003*	0.006***	0.004**	0.007***
	[0.002]	[0.001]	[0.002]	[0.001]
lagged log capital intensity	0.002	0.001	0.001	0.001
	[0.002]	[0.001]	[0.002]	[0.001]
lagged log of average wage	0	0.005***	0	0.009***
	[0.002]	[0.002]	[0.002]	[0.002]
EXPERIENCE				
lagged export status	-0.042***	0.141***	-0.042***	0.151***
	[0.004]	[0.005]	[0.004]	[0.005]
lagged export intensity	0.136***	0.571***	0.144***	0.577***
	[0.015]	[0.024]	[0.015]	[0.025]
Year Dummies	YES	YES	YES	YES
Industry Dummies		YES		YES
Distance from Moscow		-0.000***		-0.000***
		[0.000]		[0.000]
Constant	-0.083***	-0.124***	-0.062**	-0.147***
	[0.030]	[0.012]	[0.026]	[0.011]
Observations	71464	71464	70733	70733
Number of firms	24322	71464	24157	70733
adjusted R-square		0.248		0.236

Robust standard errors of pooled regressions, adjusted for clustering on firm ID, in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

The share of exports to developed countries seems significantly determined by the industrial sector and region in which the enterprise operates, while, within regional-industrial clusters, the marginal impact of enterprise-level characteristics is comparatively smaller and in line with previous results obtained by including only firm features. Exporters would indeed seem to be clustered in specific regions and industries. As mentioned, this result should be interpreted in light of the fact that Russian industry in general is still far less geographically concentrated than it would if its spatial distribution had been determined solely by market forces. Notwithstanding the generally low agglomeration of industry, clustering of the best exporters could well be an early reflection of the fact that market mechanisms are beginning to overcome the irrational location decision made by central planners.

7.3 The Role of the Environment

Controls for the economic and institutional climate are contemplated in turn. Within economic conditions, a smaller incidence of natural resources in regional output is expected to be better suited to foster the emergence of manufacturers able to participate in more developed markets. A large presence of small enterprises in the region has a double interpretation. On the one hand, it may reflect the presence of upstream and downstream linkages between exporters and regional suppliers and customers. At the same time, it could be seen as a symptom of the presence of Dutch disease, since the windfall revenues from resource exports may be associated with the expansion of the non-tradable sector. Regarding institutional conditions, a lower degree of regulatory capture by influential regional players and a less corrupt judiciary are believed to be important factors in stimulating the competitiveness of firms and their consequent ability to export to developed markets.

Table 12: Determinants of Export to Developed Countries in 2001: The Role of the Environment (OLS)

Dependent Variable: Share of Exports to Developed Countries in 2001

	Economic Environment		**Institutional Environment**	
	(1)	(2)	(3)	(4)
ENVIRONMENT				
Small enterprises per capita in the region, 1995-2001 average	0.081	1.529***		
	[0.460]	[0.431]		
Share of extraction industries in GRIP, 1995-2001 average	-0.000***	-0.000**		
	[0.000]	[0.000]		
Index of Regulatory Capture, 1995-2000 average			-0.037***	-0.041***
			[0.012]	[0.014]
Corruption of judicial process (entrepreneurs' perception)			-0.067*	-0.032
			[0.038]	[0.038]
AGGLOMERATION EFFECTS				
1996-2001 average of regional-industrial export	0.095***	0.056*	0.078**	0.116***
	[0.027]	[0.030]	[0.037]	[0.039]
1996-2001 Regional export (outside sector)	0	0	0	0
	[0.000]	[0.000]	[0.000]	[0.000]
1996-2001 Industrial export (outside region)	0.133***	0.118***	0.139***	0.061*
	[0.034]	[0.024]	[0.047]	[0.032]
FIRM CHARACTERISTICS				
new94	0.013***	0.012***	0.018***	0.019***
	[0.003]	[0.003]	[0.004]	[0.004]
1995-2001 average log employment	-0.002	-0.002	-0.002	-0.002
	[0.001]	[0.001]	[0.002]	[0.002]
1995-2001 average log labour productivity	0.007***	0.008***	0.008***	0.009***
	[0.002]	[0.002]	[0.002]	[0.002]
1995-2001 average log capital intensity	0.001	0.001	0.003***	0.003***
	[0.001]	[0.001]	[0.001]	[0.001]
1995-2001 average log average wage	0.004	0.003	0.006	0.007**
	[0.003]	[0.003]	[0.004]	[0.004]
EXPERIENCE				
lagged export status	0.372***	0.388***	0.399***	0.404***
	[0.014]	[0.014]	[0.017]	[0.017]
1996-2001 average of export intensity	0.453***	0.483***	0.525***	0.549***
	[0.046]	[0.048]	[0.060]	[0.061]
Industry Dummies	YES	YES	YES	YES
Distance from Moscow	0	-0.000**	0	-0.000**
	[0.000]	[0.000]	[0.000]	[0.000]
Constant	-0.108***	-0.104***	-0.104***	-0.124***
	[0.017]	[0.017]	[0.032]	[0.031]
Observations	19189	19189	12957	12957
Adjusted R-squared	0.293	0.292	0.266	0.265

* significant at 10%; ** significant at 5%; *** significant at 1%

Robust standard errors, adjusted for clustering on firm ID, in brackets

(1) and (3) Export Propensity. (2) and (4) Export Intensity.

The impact of regional conditions mostly confirms expectations. The share of manufacturing exports to developed markets is significantly associated, in one specification, with a thriving small enterprise sector. This may be interpreted as indicating the presence of upstream and downstream linkages in support of exporting activity. The effects of the incidence of extraction industries are statistically significant, although negligible in magnitude. They also point towards the expected outcome, with better manufacturers – those capable of competing in developed markets- more easily emerging in regions with a lower dependence on natural resources.

A law making process stifled by the regulatory capture of influential players bodes ill for the emergence of enterprises capable of competing in advanced export markets. Exporters to advanced economies are associated with a low-capture regulatory environment. At the level of law enforcement, perceived judicial corruption is less significantly, but still negatively associated with larger export shares to developed countries.

8. A Different Perspective: The New Enterprise Sector

The Goskomstat enterprise census is likely to contain a distorted reflection of authentically de novo enterprises since it is likely to include a large proportion of transformed traditional concerns. In order to partially overcome these difficulties and obtain an impression –albeit incomplete- of the export behaviour of new firms, use will be made of the second round of the Business Environment and Enterprise Performance Survey (BEEPS), jointly performed by the World Bank and the European Bank for Reconstruction and Development in 2002 and covering 22 transition countries, including Russia.

The main interest in using the survey is that it offers a more realistic snapshot of the composition of the Russian enterprise sector, by giving ample representation to firms that were formed after 1991. Since the survey was not specifically designed to cover exporting behaviour, the available information for the purposes of this study is limited. Nonetheless, insights into critical enterprise characteristics, behaviour and performance can be obtained.

The survey covers 487 Russian firms. Among these, 300, or 62%, have been private since their start-up and can therefore be defined as new enterprises, while 61% are majority owned by individuals, thus overcoming another shortcoming of the Goskomstat census. Regarding export status, 25% of traditional firms and 13% of new firms have had some involvement, either directly or through distributors, with foreign markets, and can therefore be classified as exporters. As for sectoral composition of the survey sample, only 30% of the firms claim to have a certain percentage of their turnover derived from manufacturing[27]. This need not be a reason for excluding non-manufacturing firms from the sample, since it is quite common practice in Russia for manufacturers not to export directly but via commercial entities which are created ad hoc. This is why the entire sample is considered, provided that the firm has had some involvement with exporting. Of course, these export measures are less than perfect but this is preferable to excluding a large proportion of the sample from estimation[28].

The following results refer to the determination of both export propensity, measures as export status, and export intensity, given by the share of exports in firms' turnover.

[27] Since the focus of analysis is manufacturing export, a potential bias regarding export behaviour could be caused by the pre-eminence of natural resources. This is not the case, since only 7 firms in the sample declare some involvement in extractive industries. These firms are excluded from estimation.

[28] Results obtained by including only manufacturing firms are not substantially different from the ones reported and they are available upon request.

Table 13: Determinants of Exporting Behaviour - BEEPS

	Export Propensity	Export Intensity
	(Probit)	(OLS)
largest shareholder is foreign	0.13	0.8
	[0.114]	[2.721]
originally private from start up	-0.177**	-4.926***
	[0.071]	[1.835]
by what margin (%) sales price exceeds operating costs (material inputs and wages)	-0.001	0.053
	[0.004]	[0.079]
firm holding more than 5% of domestic mkt	0.175**	7.199**
	[0.089]	[3.335]
expenditures on marketing/advertising as % of total sales	0.014**	0.194
	[0.007]	[0.198]
influence of dominant firms/conglomerates in key sectors on enacted laws/regulations	0.052**	1.346*
	[0.021]	[0.689]
did your firm seek to influence the content of laws/regulations in 2001	0.234**	2.343
	[0.103]	[2.847]
Constant		2.36
		[2.247]
Observations	210	207
Adjusted R-squared		0.101

Robust standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Probit coefficients represent changes in probability for an infinitesimal change in each independent variable.

Firm size, represented by a domestic market share in excess of 5%, is a relevant factor in determining both export propensity and intensity[29]. Combined with the strong and negative impact of de novo status, this would indicate that export is dominated by traditional enterprises, since new firms may take time to achieve a significant presence in their sector. The presence of foreign owners, on the other hand, is insignificant in determining both export propensity and intensity, confirming that foreign direct investment is not usually intended for exporting purposes. Marketing expenditures are only relevant for export propensity, but have a small marginal impact. This might support the conjecture that a substantial proportion of exporting activity is due to inherited commercial ties, which do not require large marketing outlays. The variable for profit margin, used as a proxy for firm productivity, has no impact on either export propensity or intensity.

The two variables representing interaction with the state certainly have some influence in determining a firm's exporting behaviour. This points in the direction of an institutional environment heavily characterized by attempts on the part of dominant players to influence the content of laws and regulations. Firms appear to have a great need to engage in lobbying activity. This might be interpreted as a rational survival strategy, since, especially for less connected players, obtaining favourable treatment from the state may be a matter of life and death, including in relation to their exporting activity. This is so because unfavourable regulations may easily be used by government officials and competitors to shut them down[30].

[29] A variable for employment is available and it yields similar results. Market share was deemed to be a more appropriate indicator of firm size because it directly measures the relative weight of firms in their industry.

[30] Anecdotal evidence abounds of heavy government interference aimed at extracting rents from profitable firms or at harassing them for the benefit of influential competitors. Tax or safety and health inspections are the instruments of choice for such practices.

Conclusions

Much of the policy debate in recent years has hinged upon the vital need for the Russian economy, particularly its export structure, to diversify away from natural resource dependence. The upshot of diversification should be the creation of a thriving manufacturing sector, able to compete in international markets. In this light, the results of this paper reiterate the policy imperative to accelerate the pace of institutional reform and not to interfere with the rational relocation of industry.

Enterprise-level analysis suggests that, while firm-level characteristics play a role in influencing the export status of Russian manufacturers, an important influence on exporting behaviour is exerted by the wider circumstances in which firms operate. This finding may be attributed to some specific features of the Russian environment. First, is the still profound legacy of the industrial policy choices made in Soviet times. Despite the fact that manufacturers who are competitive in developed markets have been able to overcome the irrational location constraints imposed on them by central planners, the majority of industry is still too dispersed by the standards of market economies. The Soviet legacy still seems difficult to overcome.

Regarding broader regional conditions, the impact of general business development is not always significant. Therefore, no definite conclusions may be drawn on whether its nature is of the virtuous, or vicious and resource-driven type. The well-known dependence of the Russian economy on natural resources also appears to be negatively associated with the emergence of export oriented manufacturers. Yet its marginal impact is almost negligible, implying that resource driven growth is not incompatible with a competitive manufacturing sector.

On the other hand, the increased effective exposure to trade, ignited by exchange rate appreciation related to natural resource dependence, may be a driving force in the emerging distribution of manufacturing industry along a spectrum going from the best firms, those with larger exports to developed countries, through those who export predominantly to the CIS, to non-exporters.

An environmental obstacle, which is certainly important for the international competitiveness of manufacturing, lies in institutional pathologies, notably legislative capture and accountability of law enforcement in courts. While their effects seem inconsequential for the export decision itself, their relevance for the destination of Russian exports is substantial. This is especially true for the subversion of law making, which is negatively associated with orientation towards more advanced markets.

In the final section, attention was devoted to inspecting the behaviour of newly established enterprises. The main findings are that operating in a high capture environment has a heavy influence on exporting behaviour, and that direct involvement in lobbying is an essential feature of a firm's survival strategy.

In order to overcome the still cumbersome legacy of central planning, a crucial aim of policy should be to let industry relocate more rationally across regions and sectors. Energetic action should also be taken to loosen the grip of powerful actors, both within and outside the state, on the enactment of legislation. This obstacle seems very relevant, particularly for the orientation of Russian exports and for the operation of new firms, whose continued and more vigorous expansion is the best long term insurance against the hazards associated with past legacies and dependence on natural resources.

References

Ahrend, Rudiger and Donato De Rosa. 2005. "What Difference Does Natural Resource Abundance Make for Industrial Competitiveness in Russia and Ukraine?" *OECD, Forthcoming.*

Aitken, Brian, Gordon Hanson and Ann Harrison. 1997. "Spillovers, Foreign Investment, and Export Behaviour." *Journal of International Economics*, 43(1-2), 103-132.

Arellano, Manuel, and Stephen Bond. 1991. "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations." *Review of Economic Studies*, 58, 277-297.

Aw Bee Y., Sukkyun Chung and Marc J. Roberts. 2000. "Productivity and Turnover in the Export Market: Micro-Level Evidence from the Republic of Korea and Taiwan (China)." *The World Bank Economic Review* 14(1), 65-90.

Baland, Jean-Marie, and Patrick Francois. 2000. "Rent-Seeking and Resource Booms." *Journal of Development Economics*, 61, pp. 527-42.

Barrios, Salvador, Holger Görg and Eric Strobl. 2003. "Explaining Firms' Export Behaviour: R&D, Spillovers and the Destination Market." *Oxford Bulletin of Economic and Statistics*, 65, 4, pp. 475-96.

Bernard Andrew B. and J. Bradford Jensen. 1999. "Exceptional Exporter Performance: Cause, Effect, or Both." *Journal of International Economics* 47, 1-25.

Bernard Andrew B. and J. Bradford Jensen. 1999a. "Exporting and Productivity." *NBER Working Paper No. 7135*.

Bernard, Andrew B. and J. Bradford Jensen. 2001. "Why Some Firms Export" *NBER Working Paper* No. 8349.

Bernard, Andrew B. and J. Bradford Jensen. 2004. "Why Some Firms Export" *The Review of Economics and Statistics*, 86, 2, pp. 561-569.

Bessonova, Evguenia, Konstantin Kozlov and Ksenia Yudaeva. 2003. "Trade Liberalization, Foreign Direct Investment, and Productivity of Russian Firms." CEFIR, Moscow.

Brown Annette N. and J. David Brown. 1999. "The Transition of Market Structure in Russia: Economic Lessons and Implications for Competition." *SITE Staff Paper No.99/01*.

Bruno, Michael and Jeffrey Sachs. 1982. "Energy and Resource Allocation: A Dynamic Model of the 'Dutch Disease.'" *Review of Economic Studies*, 49, 5, pp. 845-59.

Clerides Sofronis K., Saul Lach and James R. Tybout. 1999. "Is 'Learning-by-Exporting' Important? Micro-Dynamics Evidence from Colombia, Mexico and Morocco." *Quarterly Journal of Economics* 113, 903-47.

De Rosa, Donato. 2004. "Natural Resources and Institutional Subversion: Evidence from Russia." Mimeo, PSE, Paris.

Dixit, Avinash. 1989. "Entry and Exit Decisions Under Uncertainty." *Journal of Political Economy*, 97, 3, pp. 620-38.

Gaddy, Clifford G. and Fiona Hill. 2003. *Siberian Curse: How Communist Planners Left Russia Out in the Cold*. Washington DC: The Brookings Institution

Girma Sourafel, David Greenaway, and Richard Kneller. 2003 "Entry to Export Markets and Productivity: A Microeconometric Analysis of Matched Firms." Forthcoming *Review of International Economics*.

Glaeser, Edward, Jose Scheinkman, and Andrei Shleifer. 2003. "The Injustice of Inequality." *Journal of Monetary Economics: Carnegie Rochester Series on Public Policy*, 114, 1, pp. 83-116.

Greenaway David, Joakim Gullstrand, and Richard Kneller. 2003. "Exporting May not always Boost Firm level productivity." *Leverhulme Centre Research Paper No.2003/26*.

Hellman, Joel S., Geraint Jones, and Daniel Kaufmann. 2003. "Seize the State, Seize the Day: State Capture, Corruption and Influence in Transition" *Journal of Comparative Economics*, 31, 4, pp. 751-773.

Hellman, Joel S., Geraint Jones, Daniel Kaufmann, and Mark Schankerman. 2000. "Measuring Governance, Corruption, and State Capture in Transition Economies." *World Bank Policy Research Working Paper* No. 2312.

Hellman, Joel S., and Daniel Kaufmann. 2003. "The Inequality of Influence" *mimeo, The World Bank*.

Hellman, Joel S., and Mark Schankerman. 2000. "Intervention, Corruption and Capture" *Economics of Transition*, 8, 3, pp. 545-76.

Isham, Jonathan, Michael Woolcock, Lant Pritchett and Gwen Busby. 2003. “The Varieties of Resource Experience: How Natural Resource Export Structures Affect the Political Economy of Economic Growth.” Middlebury College Economics Discussion Paper No. 03-08.

Kozlov, Konstantin and Daniil Manaenkov. 2002. “Firms with Foreign Participation and their Influence on Export Activity in Russia.” CEFIR, Moscow.

Kraay Aart. 1999. “Exports and Economic Performance: Evidence from a Panel of Chinese Enterprises.” World Bank, Mimeo. Published as “Exportations et Performances Economiques: Etude d’un Panel d’Entreprises Chinoises.” *Revue d’Economie du Développement* 1-2 (1999), 183-207.

Leite, Carlos, and Jens Weidmann. 1999. “Does Mother Nature Corrupt? Natural Resources, Corruption and Economic Growth.” IMF Working Paper WP/99/85.

Mehlum, Halvor, Karl Moene and Ragnar Torvik. 2002. “Institutions and the Resource Course.” mimeo.

Melitz, Marc J. 2003. “The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity.” *Econometrica* 71, 6, 1695-1725.

OECD. 2004. *OECD Economic Surveys: Russian Federation Volume 2004 Issue 11*. OECD, Paris.

Roberts, Mark J. and James R. Tybout. 1997. “The Decision to Export in Colombia: An Empirical Model of Entry with Sunk Costs.” *The American Economic Review*, 87, 4, pp. 545-64.

Sachs, Jeffrey D. and Andrew M. Warner. 1995. “Natural Resource Abundance and Economic Growth.” National Bureau of Economic Research Working Paper No. 5398.

Sala-i-Martin, Xavier, and Arvind Subramanian. 2003. “Addressing the Natural Resource Curse: An Illustration from Nigeria.” National Bureau of Economic Research Working Paper No. 9804.

Slinko, Irina, Evgeny Yakovlev and Ekaterina Zhuravskaya. 2004. “Laws for Sale: An Empirical Study of the Effects of Regulatory Capture.” CEFIR, Moscow.

Torvik, Ragnar. 2002. “Natural Resources, Rent Seeking and Welfare.” *Journal of Development Economics*, 67, pp. 455-70.

World Bank. 2004. *From Transition to Development: A Country Economic Memorandum of the Russian Federation.* World Bank, Moscow.

Yudaeva, K., Kozlov, K., Melentieva, N. and N. Ponomareva. 2003. “Does Foreign Ownership Matter? Russian Experience.” *Economics of Transition*, 11, 3, pp. 383-409.

Appendix A: Data Sources

Regional level datasets

Goskomstat Yearbook of Russian Regions (1970-2001)
It contains many economic and social regional indicators. In the present study use is made of the yearbook for the construction of region-specific variables, such as SME per capita and incidence of extractive industries in Gross Regional Industrial Production.

Transparency International: Regional Corruption Indices (2002)
The survey was conducted by Transparency International. The corruption indices have been built on the basis of a sociological survey embracing 5666 individuals and 1838 entrepreneurs representing small and medium sized businesses in 40 Russia's regions. The authors aimed to present a three-dimensional picture of corruption in Russia, embracing both everyday and business corruption, both estimation characteristics and the indicators characterizing corruption practices, as well as present indicators generalizing different dimensions of corruption and allowing to compare overall situation across regions. The survey was used for the variable describing entrepreneurs' perception of corruption in the judicial process. The survey results were kindly provided by Evgeniy Yakovlev.

Index of Regulatory Capture (1995-2000)
This index is constructed by Slinko et al. (2004) for 73 Russian regions. It is computed by considering regional laws containing preferential treatment for the five largest non-state firms and the larger SOEs on a regional basis. The index is directly used in the analysis and was kindly provided by Ekaterina Zhuravskaya.

Firm level datasets

RERLD (1995-2001)
The Russian Enterprise Registry Longitudinal Database (RERLD) is an annual enterprise census conducted by Goskomstat, the Russian statistical agency. It contains, among other variables, balance sheet information on, sales, total cost, number of employees, wages, book value of capital, subsidies and 2, 3 and 5 digit industry codes. It includes all Russian industrial firms with over one hundred employees, all state-owned enterprises, and non-state firms with fewer than one hundred employees that are up to 75% individually owned. For a detailed description of the RERLD see Brown and Brown (1999). The census is utilized for the construction of firm-specific variables and their deviations from sectoral means: employment, output per worker, capital intensity, average wage. The output and capital five-digit industry deflators were incorporated in the database and kindly provided by Evguenia Bessonova.

RFOF (1997-2000)
The Registry of Foreign Owned Firms (RFOF) is an annual enterprise census, which includes all fully or partially foreign owned firms operating in the Russian Federation. It contains, among other variables, detailed information on foreign ownership, such as shareholding and country of the investor. It can be partly matched with the RERLD by employing unique firm identifiers. For a detailed description of the RERLD see Yudaeva et al. (2003). The RFOF was used to construct and match the dummy variable for foreign ownership.

Customs Export Database (1996-2001)
It contains all transactions, specifying commodity, value, firm and country of destination. It can be matched with RERLD and RFOF by way of a unique firm identifier. It was employed to identify exporting firms and the total value of their export in each year. This database was kindly provided by Konstantin Kozlov who also provided irreplaceable assistance for its cleaning and matching with the main database.

Business Environment and Enterprise Performance Survey (BEEPS) (2002)
The second round of the survey was jointly performed by the World Bank and the European Bank for Reconstruction and Development in 2002 and covers 22 transition countries, including Russia. The survey

treats various aspects of enterprise operation and performance. Its focus is on the interaction of enterprises in transition with their institutional environment. Information about the survey methodology and questionnaire, as well as the data itself is available at http://info.worldbank.org/governance/beeps2002/.

Appendix B: Definition of "New" Firms

A cut-off point to define an enterprise as new may be identified in 1991, the year in which the Soviet Union officially ceased to exist. The table below shows the average size of new entrants in the census in 1992, 1993 and 1994 to be at odds with the fact that they are new firms, since these are likely to be small at the outset. This might mean that most new entrants are not new firms but simply old Soviet concerns that, for some reason, are being reclassified with a new identifier. A smaller average size of new entries can thus offer a guiding principle to spot a more appropriate cut-off point. A sharp drop in the average employment of new admissions to the database can be observed in 1995. This might suggest 1994 as a more suitable discontinuity, coinciding with the year in which the first wave of voucher privatisation was implemented. Rather than by the inclusion of new firms, the sharp drop in average size could, admittedly, be generated by the restructuring that may have occurred after the formal transfer of ownership into private hands. Another possible explanation could be the inclusion of spin-offs of traditional enterprises. Nonetheless, even accounting for the evident built in defects in the data, 1994 appears as a more appropriate cut-off point to obtain an approximate impression of the behaviour of new private firms.

Table B1: Size of Firms in the Census

Year of inclusion	Number of Firms	Percent	Cum.	Average Employment of new entrants
1985	132636	36.11	36.11	505
1986	245	0.07	36.18	395
1987	266	0.07	36.25	625
1988	91	0.02	36.28	241
1989	91	0.02	36.30	469
1990	728	0.20	36.50	1133
1991	19453	5.30	41.80	513
1992	3059	8.33	50.13	1280
1993	24178	6.58	56.71	595
1994	22589	6.15	62.86	320
1995	35651	9.71	72.57	150
1996	14098	3.84	76.41	169
1997	24969	6.80	83.20	180
1998	16898	4.60	87.81	195
1999	17486	4.76	92.57	217
2000	15918	4.33	96.90	204
2001	11382	3.10	100.00	152

Overall, given the scarce incentives that authentically de novo firms may have to report to Goskomstat, our definition of "new" firms is best interpreted with caution, and as including, for the most part, traditional firms, or at least their human and physical assets, that underwent transformation in the aftermath of voucher privatisation. Nonetheless, in a less conventional sense, these firms may be considered as non-traditional, in that they are more likely to have experienced a profound transformation of sorts, involving, perhaps, restructuring of industrial operations and a novel stance towards market conditions.

The following table reports the share of new firms, defined according to the 1994 cut-off year, in the Goskomstat census. Their proportion increases from one quarter in 1996 to just under one half in 2001.

Table B2: The New Private Sector

	Number of New Firms	*Share of New Firms(%)*
1996	6,806	24.74
1997	7,642	27.91
1998	9,098	34.24
1999	11,727	41.43
2000	9,023	37.45
2001	11,225	44.42

The distinction between old and new firms shows that, relative to the total in each category, a much larger proportion of the former is engaged in exporting.

Table A3: Share of Exporters in Manufacturing

	Entire Sample	Traditional Firms	New Firms
1996	20.61%	23.88%	11.53%
1997	17.44%	21.11%	8.05%
1998	15.85%	18.48%	10.85%
1999	14.86%	18.07%	10.50%
2000	15.60%	17.19%	12.97%
2001	14.74%	16.90%	12.13%

Even accounting for the imperfection of our definition of new firms, this is not surprising, since it is obvious to expect that newly established firms will not immediately be capable of engaging in international markets. Nonetheless, the proportion of exporters among new firms increases from a minimum of around 8% in 1997 –with 1996 seeming to be an awkward year, possibly due to flaws in the data- to over 12% in 2000 and 2001. In parallel, the share of exporters among traditional firms is constantly declining, indicating that the composition of exporters has shifted towards inclusion of proportionately more new firms.

Appendix C: The Role of Foreign Ownership

As it was mentioned, foreign ownership has a limited role in the Russian enterprise sector (Yudaeva et al., 2003). This appendix provides the results of the regressions contained in the main text, with the inclusion of a foreign ownership dummy, instead of the dummy for a "new" firm discussed above. The reason for contemplating de novo status and foreign ownership separately is that most foreign direct investment has occurred in new establishments, implying that these two variables are highly collinear.

Table C1: Export Decision - Firm Characteristics and Experience, the role of foreign ownership (1997-2000)
Dependent Variable: Export Status

	LPM Levels		**LPM Fixed Effects**		**GMM First Differences**	
	(1)	(2)	(3)	(4)	(5)	(6)
FIRM CHARACTERISTICS						
Foreign Ownership	0.075***	0.084***	0.005	0.008	-0.016*	-0.014*
	[0.007]	[0.007]	[0.014]	[0.014]	[0.008]	[0.008]
lagged log employment	0.040***		0.054***		0.040***	
	[0.001]		[0.004]		[0.005]	
lagged log labour productivity	0.018***		0.013***		0.017***	
	[0.001]		[0.002]		[0.002]	
lagged log fixed capital per worker	-0.002***		0.007***		0.004	
	[0.001]		[0.002]		[0.003]	
lagged log average wage	0.001		0.007**		0.003	
	[0.002]		[0.003]		[0.004]	
lagged deviation of employment from industry average		0.013***		0.008***		0
		[0.000]		[0.001]		[0.001]
lagged deviation of labour productivity from industry average		0		0		0
		[0.000]		[0.000]		[0.000]
lagged deviation of capital intensity from industry average		0		0		-0.002***
		[0.000]		[0.000]		[0.000]
lagged deviation of average wage from industry average		0.001**		0		0
		[0.000]		[0.000]		[0.000]
EXPERIENCE						
lagged export status	0.539***	0.585***	-0.091***	-0.085***	0.255***	0.253***
	[0.003]	[0.003]	[0.004]	[0.004]	[0.008]	[0.008]
lagged export intensity	0.393***	0.387***	0.187***	0.189***	1.168***	1.173***
	[0.011]	[0.012]	[0.018]	[0.018]	[0.022]	[0.022]
Year Dummies	YES	YES	YES	YES	YES	YES
Industry Dummies	YES	YES			YES	YES
distance from Moscow	-0.000***	-0.000***	0	0	0.000**	0
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Constant	-0.286***	0.020***	-0.291***	0.160***	-0.006*	-0.010***
	[0.011]	[0.003]	[0.033]	[0.002]	[0.003]	[0.003]
Observations	79144	79144	79144	79144	49531	49531
Adjusted R-squared	0.55	0.538				
Number of firms	79144	79144	26918	26918	21125	21125

Standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Table C2: Export to Developed Countries - Firm Characteristics and Entry Costs, the role of foreign ownership (1997-2000)

Dependent Variable: Share of Exports to Developed Countries

	Levels		**Fixed Effects**	
	(1)	(2)	(3)	(4)
FIRM CHARACTERISTICS				
Foreign Ownership	0.089***	0.084***	0.014	0.015
	[0.005]	[0.005]	[0.014]	[0.014]
lagged log employment	0.003***		0.016***	
	[0.001]		[0.004]	
lagged log labour productivity	0.006***		0.003*	
	[0.001]		[0.002]	
lagged log fixed capital per worker	-0.001		0.001	
	[0.001]		[0.002]	
lagged log average wage	0.010***		0.004	
	[0.002]		[0.003]	
lagged deviation of employment from industry average		0		0.002*
		[0.000]		[0.001]
lagged deviation of labour productivity from industry average		0		0
		[0.000]		[0.000]
lagged deviation of capital intensity from industry average		0		0
		[0.000]		[0.000]
lagged deviation of average wage from industry average		0.013***		0
		[0.001]		[0.002]
EXPERIENCE				
lagged export status	0.149***	0.156***	-0.076***	-0.074***
	[0.003]	[0.003]	[0.004]	[0.004]
lagged export intensity	0.585***	0.586***	0.116***	0.117***
	[0.010]	[0.010]	[0.017]	[0.017]
Year Dummies	YES	YES	YES	YES
Industry Dummies	YES	YES		
distance from Moscow	-0.000***	-0.000***	0	0
	[0.000]	[0.000]	[0.000]	[0.000]
Constant	-0.131***	0.013***	-0.073**	0.072***
	[0.009]	[0.003]	[0.032]	[0.001]
Observations	58811	58811	58811	58811
Adjusted R-squared	0.238	0.237		
Number of firms	58811	58811	23979	23979

Standard errors of pooled regressions, adjusted for clustering on firm ID, in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Among other firm characteristics the presence of foreign ownership has a small and not always significant marginal effect on the decision to export, confirming that most foreign direct investment in Russia is not export oriented.

Appendix D: Indicators of Institutional Quality

	Index of Regulatory Capture (Slinko et al., 2004)	*Entrepreneurs' perception of Judicial Corruption (Transparency International)*
Altai krai	-.026	.606
Krasnodar krai	.053	.677
Krasnoyarsk krai	.024	.595
Primorskii krai	-.071	.573
Stavropol krai	.064	.608
Khabarovsk krai	-.097	.663
Amur oblast	.036	.585
Arkhangelsk oblast	-.306	.486
Astrakhan oblast	-.101	
Belgorod oblast	-.087	.567
Bryansk oblast	.093	
Vladimir oblast	.122	
Volgograd oblast	.016	.623
Vologda oblast	.134	
Voronezh oblast	-.088	.601
Nizhny Novgorod oblast	-.006	.546
Ivanovo oblast	-.125	
Irkutsk oblast	-.306	
Ingush republic		
Kaliningrad oblast	-.013	
Tver oblast	-.002	.658
Kaluga oblast	-.141	
Kamchatka oblast	-.236	
Kemerovo oblast	-.002	.611
Kirov oblast	.079	
Kostroma oblast	.002	
Samara oblast	-.046	.58
Kurgan oblast	.189	.555
Kursk oblast	.163	
St. Petersburg city	-.195	.592
Leningrad oblast		.651
Lipetsk oblast	-.002	
Magadan oblast	.189	
Moscow city	.073	.637
Moscow oblast	.039	.62
Murmansk oblast	.189	
Novgorod oblast	-.071	
Novosibirsk oblast	-.15	.614
Omsk oblast	.135	.587
Orenburg oblast	.178	
Oryol oblast	-.154	
Penza oblast	.037	
Perm oblast	.001	.629
Pskov oblast	-.071	.501
Rostov oblast	.012	.622
Ryazan oblast	-.167	.613
Saratov oblast	-.015	.589
Sakhalin oblast	-.12	
Sverdlovsk oblast	-.005	.611
Smolensk oblast	-.098	
Tambov oblast	-.137	.559
Tomsk oblast	.14	.669
Tula oblast	.042	.63
Tyumen oblast	.069	.564
o/w Yamalo-Nenets autonomous okrug		

Ulyanovsk oblast	-.126	.502
Chelyabinsk oblast	.416	.554
Chita oblast	-.026	
Chukotka autonomous okrug		
Yaroslavl oblast	-.114	.519
Adygeya republic	-.003	
Bashkortostan republic	0	.564
Buryat republic		
Dagestan republic	.01	
Kabardino-Balkar republic	.137	
Altai republic	.053	
Kalmyk republic		
Karelia republic	-.032	.575
Komi republic	.403	
Mari-El republic	.024	
Mordovia republic	.042	
North Osetiya republic		
Karachaevo-Cherkess republic	-.167	
Tatarstan republic	.213	.629
Tuva republic		
Udmurtia Republic	.258	.6
Khakasia republic	.024	
Chechnya republic		
Chuvash republic	-.195	
Sakha (Yakutia) republic	.058	
Evrei autonomous oblast	-.071	