Daniil Manaenkov

WHAT DETERMINES THE REGION OF LOCATION OF AN FDI PROJECT? AN EMPIRICAL ASSESSMENT.

Working Paper # BSP / 00/036 E

This paper originally was prepared as a Master Thesis at NES in 2000 as a part of the research project "Foreign Direct Investment in Russia", which was carried out within the program "Transforming Government in Economies in Transition" generously sponsored by Ford Foundation (Grant Number 950-1503). Financial support from ACE-TACIS Grant No. T95-4115-R and the MacArthur Foundation, which made possible the use of Registry database is gratefully acknowledged. I am deeply indebted to the project leaders Ksenia Yudaeva(RECEP) and Rudiger Ahrend (DELTA and RECEP) for their valuable contribution to this work.. Special thanks to David Brown (SITE) for very useful suggestions and relevant data. Also thanks to Konstantin Kozlov for cooperation and enormous help.

MOSCOW
2000

Манаенков Д.А. Выбор иностранным инвестором региона вложения прямых инвестиций. Эмпирическое исследование. / Препринт # BSP/00/036E. – М.: Российская экономическая школа, 2000. – 61 с. (Англ.)

В данной работе рассматривается проблема выбора иностранным инвестором региона и отрасли вложения средств. В анализе использованы данные по предприятиям и по регионам. В работе одновременно проверяется важность факторов экономической политики, характеристик процесса производства, а также экономических и других характеристик региона. Одним из основных результатов проведенного анализа является существенность мотива захвата большей доли рынка и проникновения на более защищенные рынки. Получены статистически значимые результаты воздействия прогресса экономических реформ на выбор региона иностранным инвестором. Чем существеннее экономические реформы в регионе, тем выше вероятность выбора этого региона инвестором.

Manaenkov D.A. What determines the region of location of an FDI project? An empirical assessment./ Working Paper # BSP/00/036 E. – Moscow, New Economic School, 2000. –61 p. (Engl.)

This paper deals with Foreign Direct Investment in Russia. The question of choice of the region and industry by a foreign entrant is studied using a firm-level panel-data approach. The paper simultaneously tests for significance of the policy variables, features of the production process in different industries and economic and non-economic characteristics of the Russian regions. The major finding of the paper is that, although the methodology employed tends to underestimate the importance of Russian determinants of the Foreign Direct Investment inflow, significant results are obtained for the impact of the economic reform progress on the choice of the region by multinationals. The higher the relative reforms progress in a region, the higher the probability of joint venture locating there. Thus, economic reform progress is an important determinant of FDI inflow into Russian economy. It has also been found that market-power seeking and "tariff-jumping" motives are important in Russia, attracting more multinationals into more protected and monopolized industries.

ISBN 5-8211-0113-1

Contents:

1. Introduction

During the past decades, many countries experienced a transition from one economic system to another. In many cases country authorities emphasized the importance of Foreign Direct Investment (FDI), as an important vehicle for speeding the transition process, and achieving economic growth. The following features of FDI make it so attractive to policymakers:

- Foreign investors have more resources or do have an easier access to international financial markets, thus they can run the projects which are simply unaffordable to local firms due to high initial costs.
- A Joint Venture in an industry might generate positive spillovers in terms of access to new technologies, transfer of new management skills etc.[1]
- Due to better uncertainty diversification possibilities, foreign affiliates will be able to make larger fixed-capital investments, which is an important vehicle for a home-country growth.

Though often being stimulated by generally the same policy measures, the actual volumes of attracted FDI differ significantly across the transition economies. In some East European countries annual inflow of FDI have reached as much as 10% of GDP, while in Russia inflow of FDI in 97 was only 0.8% of GDP, and did not exceed that in other years. In total, during the years of transition inflow of FDI into Russian economy sums up only to approximately 10$ bln (which is only about 12$ per capita average in 92-97). Whereas in 1997 the Ministry of Economy claimed that Russia needs annual inflow of 10-12$ bln. to achieve economic

[1] For excellent review of possible causes of spillovers see Blomstrom et al (1999), For a survey on FDI spillovers in Russia see Ponomareva (2000).

growth and to implement thorough restructuring of productive sector. Despite an overall failure of attracting FDI things are not uniformly bad, there is significant variation in level of FDI inflow across regions (from 10$ per capita up to 200$per capita) and across industries (from 4% of all JVs in chemical industry to 24% in machinery).

In dealing with FDI into transition countries (and, thus, into Russia) it is often claimed that investment climate, quality of FDI legislature, including property rights protection, political instability[2] or, speaking more generally, the speed of economic and legislative reforms have the strongest impact on the volume of FDI inflow. No doubt that the notion of economic transformation is a very important factor in FDI decision, but other important issues, such as market characteristics or production advantages, offered by various sectors to foreign investors, are often given insufficient attention.

This paper is devoted to empirical study of determinants of the choice of the region and the industry of investment placement by the Multinational Enterprises(MNEs). To our knowledge, this paper is the first firm-level attempt to study this issue. The analysis covers Joint Ventures established in 92-97. We study observed cases of new joint ventures creation in a given region and in a specific industry (with primary focus on the non-oil producing sectors, and on the non-Moscow located FDI). We attempt to explain the variation in number of foreign affiliates in terms of characteristics of a region itself (i.e. population, climate, market characteristics etc.) and in terms of industrial characteristics. The characteristics that we use are implied by classic and modern International Trade theories, and by the proximity-concentration trade-off. Lankes and Venables (1996) showed that in the case of transition countries reform progress is one of the most

[2] See Westin(1999) for a descriptive study of FDI into Russia.

important determinants of foreign direct investment. This paper addresses this issue by testing whether reform progress in the region affects FDI. The major drawback of this approach is that it underestimates the importance of many Russia-wide determinants of FDI. For example variation in economic reform progress across regions is much lower than that of the whole Russian economic reform progress during the period at hand, thus any significant effects in this analysis imply that the analyzed factors are even more important on the Russian level.

The major result of the analysis shows that economic reform progress does matter for the question under study. Other basic results suggest that the market features, such as an extent of regional monopolization or a degree of market protection, have an impact on FDI-location decision.

This paper proceeds as follows: In the second part, related theoretical and empirical literature is reviewed. Third part names the sources of data for this study. In the forth part the testable hypotheses are presented. In the fifth section basic econometric specification is given, followed by the results of estimations and conclusions respectively.

2. Related literature.

2.1Common Theories of FDI Determinants.

Explanations of FDI flows can be built within the classic and modern theories of International trade and general theory of Investment decision; theories of FDI, focusing mainly on cross country characteristics; and theories of MNEs as a main source of FDI. We take them in that order, that is the first subsection reviews general economic theories involved in our analysis, than we briefly discuss general theories of FDI, and finally we turn to analysis of multinational enterprise production and investment decisions.

2.1.1 *General theories of Foreign Trade and Investment.*

Let us look first at standard *International trade theory*, in a Heckscher-Ohlin setup (see for example in Helpman and Krugman). In general, it says that joint ventures established in a country are concentrated in industries which produce output intensive on resources, relatively less scarce in a home country than abroad, since relative prices of those resources negatively depend on their relative scarcity. In the context of Russian economy we can think of labor and natural resource endowment being those, relatively less scarce factors. So we can claim that relatively abundant labor will be cheap in Russia relative to investor country. So Russia should have comparative advantage in production of labor-intensive goods. This suggests that the regional capital-to-labor ratio can have a descriptive power with respect to FDI flows.

Modern theory of international trade concerned with factor proportions analysis of MNE activities, with quite opposite implications, can be found in Markusen(1995). It claims that MNEs are more likely to operate in countries with similar resource endowments, rather than in those with significantly different. Thus, probability of establishment of a new FDI project should also respond negatively to any increase in difference of factor endowments.

Another important aspect which International trade theory takes look at is the home-country policy factors. Among all policy factors we are more interested in effects of trade barriers. It has been suggested by many theories and empirical studies that one of the motives for FDI is to jump over trade barriers in order to gain access to protected markets and to extract policy-induced rents generated by these barriers.

Let us now consider one of the most recent developments of the literature on investment theory, not necessarily applied to the case of foreign investment, but very relevant for studies of investment into Central and East European countries including Russia. It is the *Real Option theory of Investment* (see for example in A. Dixit, R. Pindych "Investment under uncertainty"). The idea behind this theory is that each investment decision can be compared in its nature to the purchase by the investor of a financial call option. The investor pays a premium price in order to get the right to buy an asset at some future time at a price (exercise price) predetermined, and eventually different from the spot market price of the asset (strike price) at that particular moment. Analogously, the firm, in its investment decision, pays a price (the cost of setting up the project) which gives her the right to use the capital (exercise price), now or in the future, in return for an asset worth a strike price. Taking into account this approach, the calculus of profitability of each single investment operation cannot be done by simply applying the NPV rule to the future expected cash flows of the project, but has to consider the following aspects of the investment decision:

- future payoffs from investment are uncertain,
- one taking investment decision has also to choose its timing,
- Each investment decision is associated with a sunk cost, or, in other words, it requires partly irreversible expenditures.

The first feature of the investment decision goes from the fact that investors do not have perfect information, so they have to form expectations about future behavior of different variables, which cannot be predicted with certainty. The second point is intrinsic to investment decision; investors might want to delay their investment for some time to gain a new valuable information, reevaluate their expectations and, thus, reduce uncertainty. But postponed investment is associated with opportunity

cost expressed in terms of possibly foregone profits in period ***t+1*** having invested in period ***t***. And the last point of investment comes from the fact that the initial cost of investment is at least partially sunk cost, that is investor cannot recover all of it if he chose to stop project after initial investment has already been made. Thus, the higher the sunk cost of investment, the more important the uncertainty in determination of the net value of investment.

In fact the theory of real options defines in detail an economic model in which the variables directly affecting information set of investor are crucial. In the context of applied analysis, the variables responsible for undertaking of FDI are likely to be those capable of sending a signal from the host country economy, which can reduce the level of perceived uncertainty of investor.

2.1.2 General theories of Foreign Direct Investment.

In this section we review the theories of FDI which essentially stress the following two points: cross-country differences in market characteristics; cross-country differences in production cost in the same industries.

FDI due to cross-country differences in market characteristics

First theory of this type, which is very common in FDI-related empirical literature, is the ***Gravity theory*** of FDI. It was originally designed to account for bilateral trade flows between similar in terms of resource endowment countries, which could not be described by standard International trade theories. This theory claims that FDI flows are proportional to domestic and foreign market size and potential, and are decreasing in distance between markets (obviously the name goes from the analogy to the law of gravitation in physics). Rephrasing this in economic terms, the size of trade flows from country ***i*** to country ***j*** depend on:

- size and potential of the home-country market,
- size and potential of the host-country market,
- factors representing the resistance to trade flows between two countries (distance, trade restrictions).

Adapting this model to our case we can expect FDI into country to depend on:

1. size of the market of the host country
2. potential demand of the local consumers
3. geographical distance among markets

So, the main emphasis of the gravity theory is on market-seeking component of FDI flows. Another important motive of FDI is a ***market-power seeking.*** That is the higher the share of the market foreign-owned entrant obtains the stronger the incentive to make an overseas investment. Surely, this motive is also present in domestic investment, but as it was mentioned earlier, domestic firms in transition economies might simply be resource-constraint to start the project in a sector with potentially high market-power gains. That is why we consider market-power seeking to be an important factor, which attracts foreign investment into transition economies. In this paper we use a variety of concentration ratios, as a measure of available market power[3]. Now we turn to cost-related theories of FDI.

FDI due to cross-country differences in production costs.

A general point stated by Factor proportions explanations of FDI claims that firms integrate vertically across borders to take advantage of lower factor prices associated with differences in factor endowments across countries. As emphasized by the international trade theory, since Russia has relatively high endowment of

[3] However, it is important to note that the effect under study can possibly be overestimated in such test, since usually "strategic" industries attract more investment and are highly monopolized, thus the estimated effect actually overvalues pure market-power seeking.

labor, it should have relatively low labor costs. Although the literature has found mixed evidence for the significance of labour costs on the distribution of foreign investments, this hypothesis may be consistent with finding of a relatively important labor-cost minimization component in the FDI flows. Following this argument, the motivation for inclusion of wage differentials across Russian regions into analysis is quite explicit. Also, what matters in FDI project location choice, is not only the availability of labor force, but also its quality. Establishment of a new affiliate of a foreign firm, resting on a modern technology generally requires more skilled laborforce than any other local production enterprise. So, human capital quality can also happen to be an important factor of location choice by foreign investors[4].

2.1.3 *A simple theory of Multinational Production*

An important theory of an overseas investment is a proximity to consumer market versus production concentration trade-off, explicitly modeled in, for example, Brainard (1993a). In fact it incorporates "gravity", through representation of proximity motive, and various production costs via the analysis of benefits of production reallocation to the host country. It represents a choice between locating close to consumer market, expressed in terms its opportunity cost of transportation of home-produced goods to host-country market; and between gains from production concentration, given by plant-level returns-to-scale. Effectively, if transportation costs increase, there are stronger incentives to produce locally, and the higher home plant-level returns-to-scale relative to that of host-country industry, the stronger are the incentives to export or to license technology. This

[4] See an overview of empirical studies for actual effect of this and other variables on FDI decision.

theoretical concept is the basic setup to test the hypotheses in analysis which follows

2.2 **Related empirical studies.**

Here we take them in the same order as in the theoretical part of the literature review:

2.2.1 Factor proportions and tariff-jumping.

The results of assessment of this theory are quite controversial. For example Chunlai (1995) finds that capital-to-labor ratio is a statistically significant determinant of FDI location in China's manufacturing industry, implying more FDI into more labor-endowed (labor-intensive) industries. Whereas Brainard(1993b), in an empirical assessment of Factor proportions theory, finds no support for common factor-proportions implications. The major result there is that the volume of MNE sales increases in similarities in factor endowments, which is exactly the opposite of what is predicted by the classic Factor proportions explanation of FDI. As for the labor-cost minimization motive of FDI, proxied by wage differences, the literature finds mixed evidence for its significance. While Hallward-Dreimeier(1996) for Japanese and Altomonte(1998) for FDI in CEEC find labor-cost minimization to be a significant and important for MNE activities, Smarzynska(1999) finds although significant but negligible influence of labor costs, and Lankes and Venables(1996) find that for local-market supplying FDI projects labor cost is one of the least important issues.

As for the tariff-jumping, most of FDI-related literature does not address the question of empirical testing of connections between different modes of foreign entry: production or export. There are, however a few important exceptions:

Blomstrom et al. (1988) finds evidence of export-production complementarily using industry cross-section data on Swedish and US multinationals; Brainard (1993c) also finds positive effect of tariffs on affiliate sales also using industry-level cross-section data for US Multinational foreign sales; and the negative effect of tariffs is found in Hallward-Dreimer (1996), in a firm-level panel of Japanese overseas investment. So, as we can see, there is a mixed empirical evidence for an issue of a tariff jumping, where the panel specification of the analysis seem to be more appropriate.

2.2.2 Uncertainty

A large number of papers test for importance of uncertainty in FDI decision. One of the most thorough studies of uncertainty and FDI by Hallward-Dreimeier(1996) states the importance of various forms of uncertainty: country credit rating, real and effective exchange rate variability and some others. Studies of FDI in CEEC and Former SU by Smarzynska(1999) and Lankes and Venables(1996) emphasize the importance of economic reform progress indicator.

The uncertainty analysis has valuable implications. One of them is the importance of any information, capable of resolving or helping dealing with uncertainty. Here we can stress the importance of the firm's sole investment experience, and of a general experience of investing into particular country by all multinationals. As indicated by Hallward-Dreimeier (1996b), investment experience can decrease expected uncertainty of investing into specific country. Also worth noting that Smarzynska(1999) finds a significant impact of sole firm investment experience in a region of investment, and no significance of general multinational experience.

2.2.3 Gravity theory

This type of theory is very common in the empirical study. Most papers include variables, stressed by gravity equation, to control for country characteristics and to test some other hypotheses. Most general setup of "gravity" includes measures of market size (GDP or population), market demand (GDP per capita) and market growth (percentage growth of GDP) and of geographical distance between markets. Generally, gravity performs well, showing robust significance (see for example Hallward-Dreimeier(1996)), with one important for us exception: Altomonte(1998) in his study of FDI into CEEC finds that market seeking and growth potential are still very important motives, while market demand, measured as GDP per capita, does not influence FDI pattern in CEECs.

2.2.4 Proximity-Concentration Trade-off.

An empirical literature on this subject is abundant. Here we mention only one by Brainard(1993c), dealing with the question at hand empirically, testing the trade-off in a context of a model developed in Brainard(1993a). According to this model proximity-concentration hypothesis predicts that firms are more likely to expand production horizontally across borders the higher the transportation costs and investment barriers and the lower the plant level returns-to-scale relative to corporate level. In the context of estimation models she used, higher plant level returns-to-scale increase affiliate sales share in total sales and decrease a probability of observing these affiliate sales. Corporate level scale economies increase both. What is more important for our analysis, transportation costs do not affect the probability of observing affiliate sales.

The analysis, which follows is one of the first attempts to analyze the above theories and to test a number of important hypotheses in Russian environment using the unified approach and one dataset.

3. The Data.

This paper is based on the following data sets:

- *Registry of Russian Joint Ventures*. This is the primary source of data for this study. This dataset includes data on economic activities of approximately 7000 Russian production Joint Ventures in 1992-1997. The sources of this data are balances of firms, which are annually self-reported by firms.

- *Registry of Russian firms "Gnosis".* This dataset includes yearly balances and other data on economic activities of almost 47000 Russian enterprises dating from 1980s to 1997. This paper uses this database as a source of data on export-import activities of Russian production enterprises, absent in the next database.

- *RELRD database.* This data set contains data on economic performance of nearly 35000 Russian production enterprises from 1992 to 1997. The sources of this data are the balances of firms, annually self-reported by firms.

- *Regional database*. This dataset contains macroeconomic and social variables for different administrative regions of Russian Federation (i.e. Gross Regional Product, CPI in a region, population, educational distribution within a given region, unemployment level in a region, criminal data and many more useful variables). The source of this data is GOSKOMSTAT.

- *"Consultant" database*. This database includes federal laws and other normative acts, which act now (or at least were active during the period we are covering in our paper). It is the principal source of data on import tariffs.

Thus, combined dataset is a number of variables on economic activities of approximately 42000 production enterprises, located in Russia. The relevant data includes output, employment, date of establishment, foreign-ownership share in capital, country code for investing firm etc. Unfortunately there is no data available on investing firm characteristics, except for country of origin.

Relevant variables are given in "variable description section" before result tables.

See Appendix 1 for some descriptive statistics of the data. Appendix 2 discusses the most important data issues.

4. Testable Hypotheses and estimation samples.

One of the major motives for entrance of a foreign firm is a profit seeking. Every MNC, when taking an investment decision, chooses the best among all available alternatives. The higher the current and expected future profits in Russia the more MNC will choose to locate in Russia. When we study the decision of FDI into Russia, we may treat investments into various regions as different competing investment projects. Thus, higher regional profit opportunities are likely to attract more foreign investors. Also it is clear that high uncertainty in determination of future profits increases the incentive to choose other investment project. So, we assume that investors maximize some concave function of current and future profits:

$$F(\pi_t , \pi_{t+1} , \pi_{t+2,}\ldots) \rightarrow \max$$

$$\pi_t = p_t q_t - c_t$$

or: profit = sales – costs.

We drop out taxes from the analysis. Concavity represents risk aversion, that is the higher the uncertainty, the lower the utility of investor. Thus, we formulate the hypotheses in terms of expected effect on F(•). We present our hypotheses in that order: effect on profits and on uncertainty. Description of all variables and estimation samples are given in "description of variables section"

4.1 Proximity-concentration trade-off

Relocation of production to overseas affiliates generally requires two concepts to be taken into account: potential gains from proximity to consumer markets, and possible efficiency gains/losses from production concentration in the host-country. Thus let us state the hypothesis, being tested with in the concept of proximity-concentration trade-off.

4.1.1 Proximity motive matters?

Proximity motive represents the incentive to locate production close to large markets with strong or potentially strong demand for an output of a firm. In the literature so-called "gravity" variables are usually used to test for this motive. Common set of gravity variables consists of population or real gross domestic product as a measure of the market size; domestic product per capita and growth of these per capita terms, measuring demand and potential demand respectively. Using "country" approach to regions of Russian Federation, and given the robustness of "gravity" variables in the literature, we might expect it to perform relatively well. On the other hand, FDI might be attracted by the whole Russian "gravity" characteristics; thus insignificant results should not be surprising. Hence we will expect that larger (in terms of size and demand) regions will be more attractive to foreign investors.

4.1.2 Concentration motive:

What this motive implies is that higher the returns to scale on the plant level at home relative to those in the host country, the weaker the incentive to reallocate production. In this paper we are able to test this theory only indirectly: we do not have home firm returns-to-scale, either plant or corporate level. But we can expect higher plant-level returns-to-scale in Russia to deter the advantage of home concentration, decreasing production costs in Russia, thus increasing the probability of overseas affiliate establishment. Hence, we test for importance of domestic returns-to-scale and expect them to have a stimulating effect on FDI. Plant-level returns-to-scale are proxied by 4-digit industry specification minimum efficiency scale measure. This variable is the ratio of output of the mean firm to the total industrial output. This is the only variable the data allows as to construct. Its major drawback is the 4-digit specification. Every 4-digit industry code includes many different sub-industries with probably substantially different plant-level returns-to-scale. Also we cannot hope that this test does not capture any other industry-specific effects, other than returns-to-scale. Hence, any result should be interpreted very cautiously.

4.1.3 Transportation costs:

Proximity-concentration includes also the issue of transportation cost: higher the costs of goods shipment to the attractive markets, the more efficient is a host country production will be. In early studies, a geographical distance was used as a measure of transportation costs. Testing for significance of distance in a modern world is to some extent useless, since what is important is not the distance but the transportation cost, significantly depending on the mean of transportation, that is

whether air, water, railway or autotransport is used. However, so far I have failed to construct fairly acceptable measure of transportation cost, leaving it to further studies. Thus here two indirect measures of transportation costs will be used: geographical distance to the home country of foreign investor, and regional railway tariff for freight shipments relative to average Russian level. Applying to these measures general hypothesis about impact of transportation costs, we expect that larger the distance to the home country of investor and higher the freight tariff in a region relative to Russian average, the more profitable to locate affiliate there.

Empirical test of the proximity-concentration is conducted for several subsamples:

- Full sample,
- European Community JVs only, to test for the significance of the distance between markets. Since in full sample we cannot capture the mean of transportation, while it is likely that EC partners will use railways as a mean of transportation.
- "Restricted sample": For the aim of better representation of production-oriented FDI we exclude from the analysis all oil and gas-producing firms as well as Moscow or St.Petersburg affiliates.
- "Restricted sample" is further subdivided by the JV-project function[5] to test for proximity-concentration for export-aimed and for local-market supplying joint ventures separately.

Proximity-Concentration setup is the general in the paper, all other hypothesis are tested within this context.

[5] For details on firm differentiation by project function see appendix 2.

4.2 FDI and market structure and protection.

Here we focus on two important points of FDI: in the context of regional and industrial attractiveness we examine the influence the regional market structure and the degree of protection in different industries.

4.2.1 Market-power seeking motive hypothesis.

There are to points about FDI and market structure, extensively examined in the FDI-related industry literature: impact of FDI on market structure, and which markets do attract more FDI: competitive or monopolized. Here we add to the second issue. We do test whether more monopolized regional markets attract foreign investors. Speaking of advantages of investment into industry/region with less severe competition we should emphasize a seek for possible monopoly or oligopoly rents (though higher p_t, p_{t+1}, etc.), increasing profits and helping MNEs to retain their ownership and other peculiar advantages for a longer time, through a lower probability of knowledge and other spillovers to domestic competitors. In a case of local-market supplying JVs, market-power seeking motive might represent a first-mover advantages, gained by first entrants. An index of regional producer concentration is constructed, adjusted for transport infrastructure in a region. This adjustment is made in order to increase the quality of the constructed measure in representation of strength of the competition in a given region and industry. Thus we expect higher degree of monopolization of regional markets to attract foreign investors. However there are two points to be aware of in interpreting the results. Firstly, given that our measure correctly represents competitiveness of the regional market, monopolization of the market might mean that this industry is either considered strategic (and foreign ownership is simply prohibited there), or the

industry is highly protected one. In order to control for the second issue we perform a test of current hypothesis jointly with the next one, considering protection. Nevertheless, both these issues diminish expected positive impact of concentrated industries on attractiveness. Thus if positive significant results are obtained, it would mean that the desired effect is even more strong.

Test of market-power seeking hypothesis is performed in the following three samples:

- Full sample,
- Full "Restricted" sample,
- Two further restricted samples, including local-supplying and exporting JVs in turn.

4.2.2 FDI and market protection.

Another important question to answer is the interdependence of FDI and various forms of domestic market protection. Usually three types of protection are considered: tariff protection, non-tariff barriers and a threat of any previous types of protection. Here we are capable of conducting an empirical test of the first one – tariff protection. It had been shown in the literature that in many countries higher tariff barriers caused increase in FDI inflow. Such phenomenon has been named "tariff-jumping". In this paper we test whether the behavior of foreign investors in Russia can be described using the pattern on tariff-jumping. Since "tariff-jumping" represents cost which firms incur if they choose to export instead of establishment of an affiliate, inclusion of the measure of protection should improve the quality of proximity-concentration analysis. However, there is very important drawback of the approach employed in testing: the hypothesis itself states jumping over tariff and non-tariff barriers, but we do not have the data for non-tariff barriers, thus in

the analysis we implicitly assume that non-tariff barriers are independent of tariff-jumping, which is in fact not a well-justified assumption. One might claim that high import tariff is likely to be associated with low non-tariff protection, and vice-verse, low tariffs might mean high non-tariff barriers. Thus, any results obtained here cannot be convincing enough to claim whether tariff jumping is present in Russia or not. Nevertheless, the hypothesis asserts that the higher the tariffs, that is the higher is the cost of export, the larger the probability of a new JV in the industry at hand. So, it can be expected that an increase in actual tariffs positively affect estimated probability.

The estimation samples are the same as in the market-power seeking hypothesis

4.3 Production costs:

Classic International trade theory predicts that trade and international investment flows respond to differences in factor endowments. It is agreed that Russia has relatively abundant labor and lacks capital. Thus we might expect that, due to cost-minimization motive, Russia will attract investment with relatively labor-intensive production, and in choosing locations these projects will choose more labor-endowed regions. Consequently, we can test for significance for wage differences across Russia.

4.3.2 Labor-costs hypothesis.

This hypothesis is a direct consequence of the Factor proportion theory, which says that a price of a factor is positively correlated with its relative scarcity. In other words, wages in Russia should be low relative to developed world. Thus, if MNEs seek lower labor costs, an increase in the regional wage differential with

respect to average Russian wage should deter probability of FDI location in that region. It is clear that labor-cost minimization motive is likely to be more important for firms, aimed at western markets, thus we might expect this motive to affect the probability of location of a new export-oriented JV in stronger manner than that of the local-market supplying JVs.

Estimations are done in three samples:

- Full "Restricted" sample,
- Further restricted sample to include only export-oriented JVs,
- First sample further restricted to include only local-market supplying JVs.

4.3.3 Human capital quality hypothesis.

It is natural to expect that the quality of human capital is positively correlated with worker payoff (i.e. wages). Thus, possible insignificance of labor-cost minimization might be caused by increase of other costs, associated with low quality of labor, hence we need to control for human capital quality. We use a proxy for human capital quality, which is common in empirical literature: secondary school attainment ratio. One can argue about the quality of this proxy, but, yet again, it is the question of data availability.

Thus, this hypothesis complements the previous one, and they are tested together. As for the sole effect of human capital quality, we expect FDI probability to respond positively to an increase in quality of the labor force.

4.3.4 Climate Matters Hypothesis.

Production incurs a lot of different costs. Many of them depend on the climate. Major ones are as follows: heating expenditures, climate-related construction requirements, availability of cheap water-based transport, possibly higher wages to

workers in more cold areas. Until these variables are available, we simply expect them to increase with winter severity. That is we test for importance of the mean January temperature as a determinant of FDI. Obviously we expect FDI probability to increase in a milder climate, that is the higher the mean January temperature, the higher the estimated probability. This variable is included in every regression specification as a control variable. Significant results would indicate importance of climate-related costs, with further research necessary for explicit interpretation of the results.

4.4 Uncertainty matters

4.4.1 Do the direct measures of Uncertainty affect FDI decision?

Here we test for the effects of investment risk rating of a Region by a Bank of Austria and by "Expert" magazine. Expected effect is clear: higher the risk rating lower the probability of investment. This hypothesis is, in fact, included in every regression specification as a control variable.

4.4.2 Political Factors Matter Hypothesis.

An important constituent of overall uncertainty is the political risk. A number of political variables (election results, Political orientation of a Region) are incorporated into analysis to test for their importance in FDI placement.

Also a number of hypothesis related to variables capable of reducing uncertainty is tested:

4.4.3 Experience Matters Hypothesis.

Two types of general multinational experience are analyzed: experience of investing into specific sector of production by all multinationals and experience of

investment into specific region by MNEs located in European Community. It is expected that both types of experience should have a positive impact on the studied probability. This hypothesis is tested for European community based multinationals, thus three samples are used:

- Full "Restricted" sample with only EC-based foreign partner,
- Further restricted sample to include only export-oriented JVs,
- First sample is further restricted to include only local-market supplying JVs.

4.4.4 Economic Reform Progress Matters Hypothesis.

Empirical literature suggests the significance of an economic reform progress as a determinant of FDI inflow into transition economies. In this paper we test for the significance of economic reform progress relative to Russian level and its impact on FDI placement decision. We can expect FDI to locate in more advanced Regions in terms of transition progress. This hypothesis is tested in a setup of a proximity-concentration hypothesis. To test the importance of reform progress for establishment of JVs with different project function, separation is made for local- and export-oriented projects.

5 Econometric methodology.

As outlined in the introduction, our primary goal is to analyze the principal determinants of FDI variation across regions in Russia. Due to firm-level structure of the data we can take an advantage of firm-level panel data approach to analysis: that is firm-by firm study of incentives to do FDI, primarily focused on Regional and industrial characteristics. To incorporate common theories of FDI into our analysis we treat regions as separate "states", assigning them with all country attributes: GDP (Gross Regional Product), population and so on. The major drawback of this approach is that it ignores aggregate Russian determinants of FDI,

such as inflation rate, Russian GDP growth and so on. Here we implicitly assume that all-Russian variables uniformly affect FDI in all regions.

The proposed econometric model rests on the peculiarities of a database - a firm-level panel data constructed from both FDI and RELRD datasets.

Due to lack of appropriate data, we are unable to use firm characteristics as controls for selection bias in JV establishment analysis. This is the feature of the database available. The thing is that JV database contains the data on all the joint ventures, even the smallest one with employment of 2-3 workers, while the RERLD database under-represents the small business. Hence, in our analysis we cannot use firm variables, such as output or employment, since they would only reflect the nature of the database, with no desired control function. There is also another reason for this inability to use these variables. To perform a control function for a JV selection process, any variable used has to give information on the firm, just before becoming a JV, or at least in the year of creation, but this data is available only for approximately 100 firms out of 7000 JV sample.

Given this, the problem of selection bias in JV establishment becomes even more serious. So, the only feasible way to control for unobserved firm characteristics is to use panel-data approach. Also, incompleteness of the database makes the random-effect specification more appropriate. Moreover, given that the core of the analysis is focused on regional and aggregate industrial variables, we might expect that our independent variables to be uncorrellated with the error term. So we claim that random-effect specification of the panel-data best fits our data. Specific econometric model also reflects the nature of available data: it is not possible to study either aggregate flows of FDI into regions or a ratio of JVs sales to its exports. So, among available specifications, the most general one, allowing the tests of a variety hypotheses, is the study of the probability of observing new JV

registered in a given sector, region, year; i.e. probit regression. Thus panel random-effect probit is estimated with a dependent variable equal to one if the ***ith*** firm in the dataset represents a new JV or a new completely foreign-owned firm, established in year ***t***.

In our probit specification we suppose that Ψ is linear and ν_{it} is an unobservable

$$Y_{it}^{*} = \Psi(X_{it}^{/}\beta) + \nu_{it}, \qquad i = 1,2,..... N; t = 92,..,97$$

$$FDI_{it} = 1 \quad \text{if} \quad Y_{it}^{*} > 0$$

$$FDI_{it} = 0 \quad \text{else}.$$

$$FDI_{it} = 1 \; if \; Y_{it}^{*} = X_{it}^{'}\beta + u_i + \varepsilon_{it} > 0$$

$$FDI_{it} = 0 \; else$$

$$i = 1,.., \; N - firms \quad in \quad the \quad sample$$

$$t = 92 \; ,.., \; 97$$

individual characteristic, distributed uniformly and normally. Thus:

Where u_i – individual time-invariant disturbance and ε_{it} -normally distributed. Also the analysis requires some additional assumption about nature of the variables

$$E[\varepsilon_{it}] = E[u_i] = 0$$

$$E[\varepsilon_{it}^2] = \sigma_\varepsilon^2$$

$$E[u_i^2] = \sigma_u^2$$

$$E[\varepsilon_{it} u_j] = 0, \forall i,t,j$$

$$E[\varepsilon_{it}\varepsilon_{js}] = 0 \; if \; t \neq s \; or \; i \neq j$$

$$E[u_i u_j] = 0 \; if \; i \neq j$$

Usually estimates of β in such systems are given by maximization of log-likelihood function. Due to large number of observations (near 40000) and 5-year time period, these calculations are very time-consuming.

Implicit from of likelihood function can be calculated with additional assumption that conditional on X_{it}'s the distribution of u_i is normal– IN(0,σ^2_u), and independent of ε_{it} и X_{it}. Consequently the correlation between successive error terms is given by:

$$\rho = corr(v_{it}, v_{it-1}) = \frac{\sigma_\varepsilon^2}{\sigma_\varepsilon^2 + \sigma_u^2}$$

As it is shown in Heckman (1981), given that distributions of Y^*_{it}, conditional on u_i, are independent and normal, we get:

$$\Pr(FDI_{it} = 1 \mid u_i, X_{it}) = \Pr\left(\frac{\varepsilon_{it}}{\sigma_\varepsilon} > \frac{-X_{it}'\beta - u_i}{\sigma_\varepsilon}\right) = \Phi(z_{it})$$

$$where \;\; z_{it} = -\left(\frac{X_{it}'\beta + u_i}{\sigma_\varepsilon}\right)$$

Where Φ – normal distribution function, thus, likelihood function of the estimated model is given by:

$$\prod_i \left\{ \int_{-\infty}^{\infty} \prod_{t=1}^{T} \left[1 - \Phi\left(X_{it}'\beta^* + \sqrt{\frac{\rho}{1-\rho}}u^*\right)\right]^{1-FDI_{it}} \left[\Phi\left(X_{it}'\beta^* + \sqrt{\frac{\rho}{1-\rho}}u^*\right)\right]^{FDI_{it}} \phi(u^*)du^* \right\}$$

$$where \;\; \beta^* = \beta/\sigma_\varepsilon \quad and \quad u^* = u/\sigma_u$$

Statistical software used (Econometric STATA 6.0), returns estimates of β^* and ρ. It can be seen that these estimates are normalized to σ_ε.

But these estimates β^* are not informative. In the analysis of simple univariate probits it is conventional to give results either in terms of marginal effects or in terms of elasticities, calculated at the sample mean. The latter are of most interest for us, they enable simple interpretation of the results: 1% increase in the value of X_{jit} leads to growth of expected rate of entrance FDI_{it} on Σ percent.

Marginal effect:

$$\frac{\partial[\Pr(FDI_{it}=1\mid X_{it})]}{\partial X_{jit}}=\frac{\partial[E(FDI_{it})]}{\partial X_{jit}}=\frac{\partial\left[\Phi\left(X_{it}'\beta\right)\right]}{\partial X_{jit}}=\phi\left(X_{it}'\beta\right)\beta_j \qquad j=1,\ldots,K$$

K – number of regressors

Elasticity:

$$\Sigma_{X_{jit}}^{FDI_{it}}=\frac{\partial[\Pr(FDI_{it}=1\mid X_{it})]}{\partial X_{jit}}\frac{\overline{X}_{jit}}{E(FDI_{it})}$$

Here β – is the estimate of the coefficient, obtained in simple pooling probit, ignoring correlation structure. Let us derive necessary transformations, for calculation of appropriate marginal effects and elasticities[6] in case of probit analysis, taking into account correlation structure assumed.

Robinson (1982) has shown that ignoring the correlation structure in pooled probit allows to obtain unbiased parameter estimates, but the binary nature of the data does not allow us to estimate the values of normalization parameters σ_ε, σ_u. What is possible to obtain is the ratio β/σ_v. Hence, the estimates of parameters in pooled probit-regression will coincide with panel random-effect probit-regression estimates only in case of $\sigma_u=0$, in every other case unbiased estimates of the pooled probit-regression will be different due to different normalization. Simple

[6] Here we extensively use the results obtained in Aurlampalam (1996).

calculations show that the following transformation converts one estimates into the other:

$$\beta/\sigma_\nu = \beta/\sigma_\varepsilon \sqrt{1-\hat{\rho}}, \qquad where\ \hat{\rho} - estimate\ of\ \rho\ from\ random-effect\ regression$$

This transformation permits making valid comparisons not only between random-effect probit-regression and simple pooling probit-regression, but also between common elements of different estimations of β, obtained with different sets of regressors X_{it} in random-effect probit-regressions. This transformation makes the calculation of appropriate marginal effects and elasticities possible with the available software.

The following formula gives correct marginal effects matrix

$$\frac{\partial[\Pr(FDI_{it}=1 \mid X_{it})]}{\partial X_{jit}} = \phi\left(X_{it}'\beta\right)(\beta_j) = \phi\left(X_{it}'\beta^*\sqrt{1-\rho}\right)\left(\sqrt{1-\rho}\,\beta_j^*\right)$$

Where β^*, ρ and Ω are returned by statistic software.

Reestimation of covariance matrix is also needed for construction of proper confidence intervals for estimated marginal effects. For basic probit, see derivation of asymptotic covariance for ex. in Green (1997).

$$Asy.Var\left[\phi\left(x'\hat{\beta}\right)\hat{\beta}\right] = Asy.Var[\hat{\gamma}] = \left[\frac{\partial\hat{\gamma}}{\partial\hat{\beta}}\right] V \left[\frac{\partial\hat{\gamma}}{\partial\hat{\beta}}\right]'$$

$where\ V = Asy.Var\left[\hat{\beta}\right] and\ ma\ rginal\ \ effects$
$are\, calculated\ \ on\ \ means,\ thus$
$\phi\left(x'\hat{\beta}\right) = \hat{\phi} - scalar$
$\left[\frac{\partial\hat{\gamma}}{\partial\hat{\beta}}\right] = \hat{\phi}\, I - \hat{\phi}\left(\hat{\beta}\, x'\right),$
$I - -k - di\, mentioned\ \ unit\ \ matrix$

Consequently, correct covariance matrix, given the correlation structure is accounted for ,is given by the following formula:

$$Asy.Var[\hat{\gamma}] = \left[\frac{\partial\hat{\gamma}}{\partial\hat{\beta}}\right] \mathrm{A}\Omega\mathrm{A}' \left[\frac{\partial\hat{\gamma}}{\partial\hat{\beta}}\right]'$$

Thus, we obtain correct matrix of marginal effects and its covariance matrix. In order to conduct these transformations of the standard estimation output, the program for Stata 6.0 was written.

6 Results.

Regression results are given in tables 1-6 of the tables section. The joint test will be calculated only for the hypothesis, performing well it a stand-alone setup. Thus, at first we study our hypothesis separately. First, proximity concentration has been examined, than all other hypothesis were tested in its context.

Each table contains a column with predicted sign, and presents the results for different samples, as outlined in the hypothesis section. The quantitative results are

presented in terms of elasticity, except for a "Red Belt" dummy, for which the marginal effect is of interest, reflecting a change in studied probability occurring in a red-belt region, other factors being equal. Here we interpret the major findings, and compare the impact of different determinants.

Proximity-concentration

Proximity:

In Table 1 regression results for all specifications are given. Z-values in parenthesis give the significance of an estimates, usually indicating a 5% significance if exceed 1,9. Results show that motive performs well until we exclude Moscow, which, in fact, represents a huge outlayer in terms of population, per capita income and growth. And when we switch to analysis of the "restricted" sample, gravity variables (responsible for proximity motive in our analysis) loose significance or even change the sign to the opposite.[7] The most suggestive are the results of the last specification: local-market supplying FDIs. All "gravity" variables are insignificant, instead of the strongest impact, as might have been expected. So, the results show that the proximity motive can hardly be implemented in describing the pattern of location distribution of FDI in Russia (at least at the regional level).

Concentration:

Robust significance of the returns-to-scale measure, though with a very small quantitative effect on elasticity, suggests that the studied trade-off might be involved in making a studied decision. Since we test proximity-concentration only indirectly, and many restrictive assumptions were made, even the results obtained can be interpreted as a successful assessment of hypothesis at hand.

[7] Surely except for the distance, for obvious reasons.

Transportation Cost:

Negative effect of distance on attractiveness of a region, combined with positive and significant impact of higher relative railway freight tariff on attractiveness of a region for local-market aimed JVs implies that MNCs are likely to take transportation costs into account, when choosing the region of investment. Given that transport costs are likely to be independent of other costs, we can say that MNCs minimize transport costs.

FDI and market structure and protection

Market-power seeking hypothesis:

Table 2 gives the assessment of this hypothesis. The results here are very suggestive: Market-power motive is highly significant even in the most general specification, and, as expected, the impact even increases with special sample selection: for JVs aimed at local market serving, the quantitative effect is more than twice stronger. Thus, we can claim the market-power seeking motive to be an important issue for FDI placement decision.

"Tariff-jumping" hypothesis

Table 2 presents the performance of this hypothesis in Russian environment. Estimations here are robust for all specifications, with high values of Z-statistics, stressing the importance of "tariff-jumping" as a market-penetration process, under the assumption of independence of tariffs and non-tariff protection. So, any far-reaching interpretation of these result should be left until the analysis includes data on non-tariff barriers.

Quantitative effects are statistically indistinguishable across different subsamples, thus we expect tariff barriers to influence JVs with different project functions uniformly. This is due to the fact that in our case tariffs just represent an

opportunity cost of exporting output instead of its local production (and do not reflect costs of possible import or intermediary products, essential for specific production processes).

So, the analysis suggests that from all market-related hypotheses, market-power seeking is the one, which had the strongest support in our data.

Production costs:

Labor-costs assessment

Table 3 presents relevant estimations. The result obtained here is quite the opposite to what one might expect on the basis of International trade theory. Even with human capital quality included, estimation results show the opposite sign to the expected one. Thus we can say that, in our setup and given the assumption we make, labor-costs minimization is not the motive for FDI location decision.

Human capital quality hypothesis:

The results of this hypothesis test were conducted in the factor-proportions setup (Table 3), though incorporating it into any other specification yield very similar results: Secondary school attainment ratio strongly influences the issue of FDI placement. Thus, even a simplest measure of human resource quality, has highly significant positive impact. Also we can claim that for exporting JVs quality of regional laborforce is is much more important than for local-serving JVs. This is readily explained by the fact that exporters are likely to face tighter competition at the world markets, and thus need better workers.

Climate Matters Hypothesis.

The estimation output is also in the table 3. The result here is very stable, and highly significant. Quantitative effect is also very strong. This suggest that, under the assumption that climate-related cost increase with lower mean January

temperature, MNCs seek lower climate-based costs in their location decision. The qualitative result is fairly robust in different samples, implying equal impact on all foreign investors.

Uncertainty matters hypotheses.

Two first measures are included in every regression in the paper, and here we comment on the average performance of these variables. Here we implicitly hypothesize that uncertainty measures are independent of different market and production process characteristics, and between each other. The last two are unlikely to satisfy the above assumption, hence tested in a separate regression.

Do the direct measures of Uncertainty affect FDI decision?

Two direct measures of uncertainty were studied in this paper: risk rating of a region by the Bank of Austria, and investment risk rating by "Expert" magazine. The latter was insignificant in all specification, while the first had the strongest impact on FDI in subsamples with JVs aimed at serving the local market. Each table includes the estimation of significance of this variable, and in the majority of them it is significant and negative, that is as expected the higher the risk the lower the probability of investment into a region.

Political Factors Matter Hypothesis.

A number of political variables were studied.[8] All of them performed poorly, with a rare significance, very vulnerable to model specification; with one important exception: a "Red Belt" dummy. This characteristic of a region was consistently robust, showing a very substantial negative impact on the probability of a new

foreign investment. Mean of observed probability varies across specifications within 0.5 to 0.9 percent bounds, whereas estimated marginal effect of a red belt region reaches 0.4% in some specifications, thus probability of foreign entrance is sometimes twice lower in a "red-belt" region.

Experience Matters Hypothesis

Table 4 is the relevant one. The results are straightforward: as expected, even general investment experience of multinationals matters much. Especially the experience of investment into specific industry. The regional experience also affects FDI decision, though with somewhat smaller quantitative effect.

Economic Reform Progress Matters Hypothesis:

Table 5 includes the test for the significance of the reform progress and institutional efficiency. Both estimated effects are significant and positive. We can claim that MNEs choose the region with more reforms implemented and relatively more efficient institutions. Moreover, our result goes in line with that of Lankes and Venables(1996), implying greater importance of transition indicator for exporting affiliates establishment.

Joint test of all significant hypothesis:

Combined test of all the significant hypothesis (table 6) again shows the significance of the market-power and protection-jumping motives of a region selection. Economic reform progress is still significant determinant, while proximity-concentration trade-off becomes powerless in describing the pattern of

[8] Such as Presidential and "Duma" Elections results, Political Stability indexes of a Region, Index of Relations to Center.

regional distribution of FDI. Major qualitative result (protection-jumping, market-power seeking, economic reform progress) are much alike separate test, thus we can say that tested hypothesis are more-or-less independent, and each of the motives studied can be treated as separate determinant of FDI location choice.

So, summarizing the main findings it can be said that, within the studied setup and given the numerous assumptions we make, the majority of hypotheses tested found at least some support in the data. On the basis of the estimations it can be concluded that the "fundamental" factors (i.e. tariff protection, market structure, human capital quality, climate) describe a considerable part of variation in the regional FDI inflow. "Red" orientation of a region is a strong argument against investment into region, probably reflecting higher uncertainty. Although underestimated, economic reforms are still significant determinant of FDI distribution. Good regional government, proxied by efficiency of institutions, also likely to attracts FDI to a region.

7 Conclusions

This paper provides an empirical study of determinants of the choice of the region and the industry of investment placement by the multinational enterprises. The firm-level panel approach was used.

The major finding of this paper is that the economic reform progress and the efficiency of institutions does influence FDI placement: the relatively high progress of economic reforms are more likely to attract new investments. Since we study only cross-regional variation in economic reform progress, we generally underestimate the importance of global Russian economic reform progress. Hence,

given the positive and significant effect obtained for regional economic reforms, we can expect the Russian economic reform progress to be at least as important as the regional is. Thus, economic reformation should be one of the important policy issues for either Federal or Regional government aimed at attracting more foreign investors.

It has also been found that the "tariff-jumping" and the market-power seeking motives strongly influence the distribution of Joint Ventures across regions and industries, however "tariff-jumping" probably has to be re-examined setup including non-tariff protection. Qualitative results suggests that multinationals tend to invest into more tariff-protected industries, and choose the region with high local degree of market monopolization. In the literature, the presence of this motive is often used as an argument against FDI, since it generally means smaller probability of positive spillovers, or even negative host-country spillovers due to crowding out of local firms. Here we can assert that this argument does not apply to Russia[9], since the motive to decrease the probability of spillovers is clearly present, but the spillovers, as found in Ponomareva (2000), are still highly positive.

Implications of three theories with respect to cross-country FDI were tested for the relevance in Russian economic environment. The estimation results show that proximity concept of FDI, measured by "Gravity" variables, emphasizing importance of the size of the market, performs well only with inclusion of Moscow into analysis, and completely fails to describe FDI pattern in the rest of the regions. The analysis rejects any importance of labor-costs in location decision. Although indirect, evidence in support of modern theory of International Trade was found: a test of the proximity-concentration trade-off was performed, implying importance of returns-to-scale for investment decision.

[9] Or it is not so serious as one might expect.

Among the other findings, it is worth stressing that the availability of the skilled labor proved to be an important determinant of inflow of FDI. Another important finding is that among available political characteristics of the region, only its belonging to a red belt had a significant, and occasionally very strong, impact on FDI decision.

Although, the analysis conducted offers an insight into the region and industry selection by multinationals, in further research, more careful tests of the proximity-concentration trade-off, tariff jumping and other studied hypotheses will be made using the analysis of the shares of exports in Joint Venture's sales. This analysis should enable a more informative tests of the concept of complementarity between foreign trade and investment flows, implied by the two issues above. More over, shares analysis should have more direct policy implications, since the policy questions primary those of the volume of FDI inflow, but of the number of new Joint Ventures.

REFERENCES

Altomonte C., "FDI in the CEEC's and the Theory of Real Options: An Empirical Assessment", Katholieke Universiteit Leuven Discussion Paper 76/1998.

Arulampalam, W., "A note on estimated coefficients in random-effects probit models", University of Warwick Working Paper, 1996.

Blomstrom M., Globerman S., Kokko A., "The determinants of host country spillovers from foreign direct investment: review and synthesis of the literature", SSE/EFI Working Paper №239, 1999.

Blomstrom, M. Lipsey, R. and Kulchycky K., "US and Swedish Direct Investment and Export" In Baldwin, Robert E., ed., Trade Policy Issues and Empirical Analysis. Chicago: University of Chicago Press, 1988.

Brainard, S. Lael, "A Simple Theory of Multinational Corporations and Trade with a Trade-off between Proximity and Concentration." NBER Working Paper №4269, 1993a.

Brainard, S. Lael, "An Empirical Assessment of the Factor Proportions Explanation of Multinationals Sales" NBER Working Paper №4580, 1993b.

Brainard, S. Lael, "An Empirical Assessment of the Proximity-Concentration Trade-off between Multinational Sales and Trade." NBER Working Paper №4583, 1993c.

Chunlai Ch., "The Composition and Location Determinants of Foreign Direct Investment in China's Manufacturing", University of Adelaide Working Paper, 1997.

Dixit A., Pindych R., "Investment Under Uncertainty", Princeton University Press, 1994.

Green W.H., "Econometric Analysis", Prentice-Hall International Inc., 1997.

Hallward-Driemeier M., "Understanding Foreign Direct Investment by Firms: Market Pull, Cost Push and Knowledge Accumulation", MIT, mimeo 1996a.

Hallward-Driemeier M., "Uncertainty and Foreign Direct Investment", MIT, mimeo 1996b.

Heckman J.J., "Statistical models for discrete panel data", in Structural Analysis of Discrete Data with Econometric Applications, ed. C.F. Manski and D. McFadden, 114-178, Cambridge:MIT Press, 1981.

Helpman E., Krugman P., "Market Structure and Foreign Trade", The MIT Press, 1985.

Lankes H.-P. and Venables A.J., "Foreign direct investment in economic transition: the changing pattern of investments", Economics of Transition, Volume 4(2), 1996.

Markusen, James R., "The Boundaries of Multinational Enterprises and the Theory of International Trade", Journal of Economic Perspectives, 9(2), 1995.

Ponomareva N., "Is there positive or negative spillovers from foreign-owned to domestic firms? ", NES Master Thesis, 2000.

Robinson P.M., "On the asymptotic properties of estimators of models containing limited dependent variables", Econometrica, 50(1), 1982.

Smarzynska B., "Composition of Foreign Direct Investment and Protection of Intellectual Property Rights in Transition Economies", CEPR/CEU WP, 1999.

Westin P., "FDI in Russia", Russian Economic Trends, March 1999.

Description of Variables.

Dependent Variable:

FDI$_{ij}$ – equals 1 if **i**$_{th}$ firm in a sample is a Joint Venture, registered in a year **j**, 0 otherwise.

Market characteristics:

Real GRP – Real Gross Regional Product, taken from Regional database for 1994-1997, approximated on the basis of industrial output for 1992,1993.

Real GRP per capita – Real Gross Regional Product per capita. Calculated using the previous variable and population of a region from Regional database.

Growth of RGRP – Growth in Real GRP in percent to previous year, calculated using the previous variable.

Population – Present population in a Region, comes from Regional database.

Distance – distance between investor home country (European Community - Brussels) and host region's center. Measured geographically.

Concentration ratio – weighted average of regional and Russian concentration ratios (share of output of 3 largest firms), calculated using 4-digit[10] industry codes, weights depending on transportation infrastructure[11] in a region, and a share of consumption goods in industry output.

Average Industrial Import Tariff – average tariff for all goods imported by firms belonging to specific 4-digit industry. Constructed using Gnosis data for imports of Russian production enterprises and "Consultant" data base, as a source of import tariffs.

Production Costs:

Wage difference – difference between average wage in a region and Russian average wage, by 4-digit industry. Constructed using RERLD database.

[10] 4-digit codes are used since almost 70% of the data has 4 defined digits in the industry code, while 5-digit codes are available only for 20% of the sample.

[11] This variable is compiled by the Institute for Advanced Studies for 1998, and was provided by D. Brown.

Relative Capital-to-Labor ratio – Ratio of fixed assets in industrial production to labor force in a region relative to Russian average. Constructed on the basis of Regional database

Minimum Efficiency scale – a proxy for returns-to-scale. A ratio of the output of the median firm to the total output of the industry, 4-digit industry code is used. Constructed using the RERLD database.

Human Capital Quality - Secondary School attainment ratio is used as a proxy for skilled labor availability in a Region. Comes from the Regional database.

Relative Freight Tariff – An average Regional tariff for freight shipments, relative to the Russian average. Constructed using the Regional database.

Other Variables:

Mean January Temperature - comes from the Regional database.

Red Belt – dummy for a Red Belt Region. Regional database.

Moscow, Peterburg – dummies for Moscow, Moscow region, St.Peterburg and Leningradskaya oblast.

Bank of Austria Risk Rating - risk rating of a region by bank of Austria, regional database.

Institution Efficiency index – an index constructed on the basis of Regional database, an unweighted sum of:

- Tax collection per capita,
- Ratio of tax collection to budget expenditures,
- Budget expenditures per capita.

The index components are given in relative to Russian average terms.

Economic reform progress index- an index constructed on the basis of Regional database, weighted sum of relative to Russian average regional characteristics:

- growth in number of enterprises,
- share of private enterprises in trade,
- proportion of goods and services with regulated prices,
- degree of regulation of food prices,

- number of small business per capita,
- Share of private, federal and regional investment in total.

Where weights are either +1 or –1, depending on the effect on reforms the increase in a corresponding variable has.

Industrial Experience of MNEs – a share of industry output, generated with participation of a foreign capital. 4-digit industry codes used. Constructed on the basis of RERLD and JV databases.

Regional Experience of MNEs – a share of Regional output, generated on Joint Ventures with owners in European Community. 4-digit industry codes used. Constructed on the basis of RERLD and JV databases.

Table 1:Full sample summary statistics

Variable	***Obs***	***Units***	***Mean***	***Std. Dev.***	***Min***	***Max***
JV creation dummy	249912	0/1	.0194228	.138006	0	1
Populations	246402	Thous. People	2883.9	2128.597	197	8881
Real Gross regional product per capita	246270	Roubles per capita in 1994 prices	3995.527	2209.917	657.1467	19065.22
Growth of real gross regional product per capita	205203	Percentage growth	-.0538032	.1572576	-.4874787	.6117842
Distance to Europe	249912	Thous kilometers	5.114361	3.264388	1.597986	16.97059
Concentration ration	210965	Percent	48.35615	23.15695	03.27584	100
Mean Industrial import tariff	248886	Percent	10.15441	3.10439	1.16667	23.00024
Plant-level Returns-to-scale	202273	Unitless	.0068957	.0477888	.0001242	1
Relative Freight Tariff	249912	Unitless	1.026865	.6406037	.0631743	5.420141
Capital-To-Labor Ratio	246402	Unitless	.9808883	.9209425	.1108916	7.508149
Wage differential	234087	real wage in terms of 92 wages	-.0009962	.061093	-1.243763	2.295079
Secondary school attainment	249912	Percent	65.41366	6.50589	53.3	81.2
Efficiency of Institutions	246402	Index	3.228657	1.246697	.787953	8.448365
Economic Reform Progress	246155	Index	-.2425478	2.172466	-10.63252	8.244534
Industrial Experience of MNEs	206645	Percent	4.25657	6.8139	0	74.04062
Regional Experience of MNEs	207066	Percent	2.34907	3.27044	0	25.43417
Risk Rating by Bank of Austria	246402	Unitless	29.52017	22.53132	1	85
Mean January Temperature	246402	Degrees	-12.82474	6.582332	-35.1	-1.6
A «Red Belt» Dummy	246402	0/1	.2455987	.4304425	0	1

Table 2:Restricted sample (with-out Moscow, moscow region and St.Petersburg)

Variable	*Obs*	*Units*	*Mean*	*Std. Dev.*	*Min*	*Max*
JV creation dummy	209256	0/1	.0123772	.138006	0	1
Populations	206430	Thous. People	2250.532	2128.597	197	5070
Real Gross regional product per capita	206300	Roubles per capita in 1994 prices	3725.259	2209.917	657.1467	19065.22
Growth of real gross regional product per capita	171895	Percentage growth	-.0732544	.1572576	-.4874787	.6117842
Distance to Europe	209256	Thous kilometers	5.431188	3.264388	1.597986	16.97059
Concentration ration	175909	Percent	51.19444	23.15695	6.35611	100
Mean Industrial import tariff	208638	Percent	10.11432	3.10439	1.16667	23.00024
Plant-level Returns-to-scale	169884	Unitless	.0069225	.0477888	.0001242	1
Relative Freight Tariff	209256	Unitless	1.004413	.6406037	.0631743	5.420141
Capital-To-Labor Ratio	206430	Unitless	.9344659	.9209425	.1108916	7.508149
Wage differential	195971	real wage in terms of 92 wages	-.0034499	.061093	-1.243763	2.119078
Secondary school attainment	209256	Percent	63.55158	6.50589	53.3	81.2
Efficiency of Institutions	206430	Index	2.945933	1.246697	.787953	8.448365
Economic Reform Progress	206184	Index	-.4344621	2.172466	-10.63252	8.244534
Industrial Experience of MNEs	172070	Percent	3.93416	6.8139	0	74.04062
Regional Experience of MNEs	172404	Percent	1.91425	3.27044	0	25.43417
Risk Rating by Bank of Austria	206430	Unitless	33.92216	22.53132	4	85
Mean January Temperature	206430	Degrees	-13.60364	6.582332	-35.1	-1.6
A «Red Belt» Dummy	206430	0/1	.2880395	.4304425	0	1

Table 3: Domestic firms and EC-origin joint ventures

Variable	*Obs*	*Units*	*Mean*	*Std. Dev.*	*Min*	*Max*
JV creation dummy	231024	0/1	.0098778	.0988951	0	1
Populations	229122	Thous. People	2807.45	2025.185	197	8881
Real Gross regional product per capita	229012	Roubles per capita in 1994 prices	3933.491	2170.252	657.1467	19065.22
Growth of real gross regional product per capita	190825	Percentage growth	-.0572806	.155341	-.4874787	.6117842
Distance to Europe	231024	Thous kilometers	5.055746	3.149073	1.597986	16.97059
Concentration ration	196977	Percent	48.43223	23.08919	3.27584	100
Mean Industrial import tariff	230244	Percent	10.12904	3.0934	1.16667	23.00024
Plant-level Returns-to-scale	190426	Unitless	.0068667	.0482003	.0001242	1
Relative Freight Tariff	231024	Unitless	1.021429	.6471028	.0631743	5.420141
Capital-To-Labor Ratio	229122	Unitless	.9713209	.9219978	.1108916	7.508149
Wage differential	218300	real wage in terms of 92 wages	-.0018481	.0590724	-1.243763	2.295079
Secondary school attainment	231024	Percent	65.03298	6.185745	53.3	81.2
Efficiency of Institutions	229122	Index	3.171738	1.183626	.787953	8.448365
Economic Reform Progress	228893	Index	-.2722709	2.16458	-10.63252	8.244534
Industrial Experience of MNEs	193142	Percent	3.98142	6.41589	0	74.04062
Regional Experience of MNEs	193554	Percent	2.27675	3.23098	0	25.43417
Risk Rating by Bank of Austria	229122	Unitless	30.06033	22.52343	1	85
Mean January Temperature	229122	Degrees	-12.89246	6.568213	-35.1	-1.6
A «Red Belt» Dummy	229122	0/1	.253437	.4349799	0	1

Table 4: Restricted sample (with-out Moscow, moscow region and St.Petersburg) with only local -market serving JVs included.

Variable	*Obs*	*Units*	*Mean*	*Std. Dev.*	*Min*	*Max*
JV creation dummy	238632	0/1	.0140425	.1176665	0	1
Populations	235518	Thous. People	2867.268	2094.068	197	8881
Real Gross regional product per capita	235388	Roubles per capita in 1994 prices	3953.466	2185.478	657.1467	19065.22
Growth of real gross regional product per capita	196135	Percentage growth	-.0551603	.1565665	-.4874787	.6117842
Distance to Europe	238632	Thous kilometers	5.072744	3.188893	1.597986	16.97059
Concentration ration	201485	Percent	48.59885	23.12486	3.27584	100
Mean Industrial import tariff	237708	Percent	10.14198	3.10502	1.16667	23.00024
Plant-level Returns-to-scale	195466	Unitless	.0068778	.0480512	.0001242	1
Relative Freight Tariff	238632	Unitless	1.023266	.643487	.0631743	5.420141
Capital-To-Labor Ratio	235518	Unitless	.9722068	.9110976	.1108916	7.508149
Wage differential	223689	real wage in terms of 92 wages	-.0015077	.058628	-1.243763	2.295079
Secondary school attainment	238632	Percent	65.22453	6.363838	53.3	81.2
Efficiency of Institutions	235518	Index	3.200686	1.227252	.787953	8.448365
Economic Reform Progress	235272	Index	-.2661876	2.17014	-10.63252	8.244534
Industrial Experience of MNEs	199373	Percent	3.99484	6.50412	0	74.04062
Regional Experience of MNEs	199788	Percent	2.29866	3.23636	0	25.43417
Risk Rating by Bank of Austria	235518	Unitless	29.83915	22.60048	1	85
Mean January Temperature	235518	Degrees	-12.82111	6.566292	-35.1	-1.6
A «Red Belt» Dummy	235518	0/1	.2533055	.4349053	0	1

Table 5:Restricted sample (with-out Moscow, moscow region and St.Petersburg) with only export-aimed JV s.

Variable	*Obs*	*Units*	*Mean*	*Std. Dev.*	*Min*	*Max*
JV creation dummy	224646	0/1	.006922	.0829103	0	1
Populations	223332	Thous. People	2710.497	1919.278	197	8881
Real Gross regional product per capita	223220	Roubles per capita in 1994 prices	3900.803	2152.849	657.1467	19065.22
Growth of real gross regional product per capita	185998	Percentage growth	-.0600347	.1544118	-.4874787	.6117842
Distance to Europe	224646	Thous kilometers	5.187857	3.265405	1.597986	16.97059
Concentration ration	192633	Percent	48.47077	23.08341	3.27584	100
Mean Industrial import tariff	224004	Percent	10.10979	3.09306	1.16667	23.00024
Plant-level Returns-to-scale	185418	Unitless	.0069021	.0490391	.0001242	1
Relative Freight Tariff	224646	Unitless	1.022765	.6530911	.0631743	5.420141
Capital-To-Labor Ratio	223332	Unitless	.967834	.9316233	.1108916	7.508149
Wage differential	213229	real wage in terms of 92 wages	-.001935	.0598954	-1.243763	2.295079
Secondary school attainment	224646	Percent	64.78402	5.889628	53.3	81.2
Efficiency of Institutions	223332	Index	3.131108	1.123053	.787953	8.448365
Economic Reform Progress	223102	Index	-.3047671	2.163354	-10.63252	8.244534
Industrial Experience of MNEs	186773	Percent	3.95275	.0637948	0	74.04062
Regional Experience of MNEs	187182	Percent	2.20064	.031968	0	25.43417
Risk Rating by Bank of Austria	223332	Unitless	30.59865	22.39091	1	85
Mean January Temperature	223332	Degrees	-13.04969	6.614764	-35.1	-1.6
A «Red Belt» Dummy	223332	0/1	.2551717	.4359586	0	1

Tables

.Table 1: A Test of Proximity-Concentration trade-off.

Variables:	***Expected sign***	***Dependent variable: observed facts of a new JV creation***									
		Full sample		**EC-based JVs**		**«Restricted» sample**		**«Restricted», EC JVs**		**«Restricted», Local suppliers**	
		Elasticity	*Z-stat*	*Elasticity*	***Z****-stat*	*Elasticity*	***Z****-stat*	*Elasticity*	***Z****-stat*	*Elasticity*	***Z****-stat*
Population	+	***0,3***	*(5,7)*	***0,2***	*(1,9)*	***-0,5***	*(-6,0)*	***-0,7***	*(5,2)*	***0,03***	*(0,5)*
RealGRPpc	+	***0,7***	*(11,0)*	***0,7***	*(13,0)*	***0,04***	*(0,6)*	***0,4***	*(3,7)*	***0,05***	*(0,4)*
RealGRP growth	+	***0,02***	*(2,2)*	***0,02***	*(1,1)*	***-0,01***	*(-0,4)*	***-0,04***	*(-1,3)*	***-0,01***	*(-0,4)*
Distance to EC	−	●	●	***-0.6***	*(-9,0)*	●	●	***-0,8***	*(-7,1)*	●	●
Relative Freight Tariff	**+/?**	***0,02***	*(0,7)*	***0,04***	*(1,7)*	***0,05***	*(1,3)*	***0,05***	*(1,1)*	***0,1***	*(2,0)*
Plant-level Returns-to-scale	+	***0,07***	*(1,8)*	***0,05***	*(1,5)*	***0,1***	*(3,8)*	***0,1***	*(2,8)*	***0,01***	*(2,7)*
Risk Rating by Bank of Austria	−	***-0.003***	*(-0,1)*	***-0.2***	*(-1,5)*	***-0.5***	*(-6,1)*	***-0,6***	*(-4,6)*	***-0,3***	*(-3,6)*
*A «Red Belt» Dummy**	−	***-0.004***	*(-13,7)*	***-0.003***	*(-11,8)*	***-0.003***	*(-6,7)*	***-0,002***	*(-6,6)*	***-0,001***	*(-3,5)*

Note: *-Marginal Effect for a change from 0 to 1. Also, each Regression includes Year dummies.

Table 2: Market structure and protecrion Hypotheses

Variables:	***Expected sign***	***Dependent variable: observed facts of a new JV creation***							
		Full sample		**«Restricted» sample**		**«Restricted», Export-aimed JVs**		**«Restricted», Local suppliers**	
		Elasticity	*Z-stat*	*Elasticity*	***Z**-stat*	*Elasticity*	***Z**-stat*	*Elasticity*	***Z**-stat*
Population	+	***0,35***	*(4,5)*	***-0,2***	*(-4,2)*	***-0,8***	*(4,2)*	***-0,01***	*(-0,7)*
RealGRPpc	+	***0,6***	*(9,0)*	***0,02***	*(0,3)*	***0,4***	*(2,9)*	***0,1***	*(1,1)*
RealGRP growth	+	***0,03***	*(3,1)*	***-0,02***	*(-0,7)*	***-0,01***	*(-0,9)*	***-0,03***	*(-0,2)*
Concentration Ratio	+	**0.25**	(4,8)	**0.27**	(4,0)	**0,2**	(3,0)	**0,75**	(8,7)
Mean Industrial import tariff	+	**1,4**	(8,4)	**1,55**	(6,7)	**2,2**	(7,0)	**1,4**	(4,9)
Relative Freight Tariff	**+/?**	***0,02***	*(0,9)*	***0,05***	*(1,4)*	***0,04***	*(1,2)*	***0,12***	*(2,2)*
Plant-level Returns-to-scale	+	***0,03***	*(1,4)*	***0,08***	*(2,8)*	***0,1***	*(1,7)*	***0,02***	*(2,3)*
Risk Rating by Bank of Austria	−	***0.001***	*(0,2)*	***-0.5***	*(-3,1)*	***-0,6***	*(-4,0)*	***-0,3***	*(-3,8)*
*A «Red Belt» Dummy**	−	***-0.004***	*(-10,0)*	***-0.003***	*(-6,1)*	***-0,002***	*(-6,3)*	***-0,001***	*(-3,6)*

Note: *-Marginal Effect for a change from 0 to 1. Also, each Regression includes Year dummies.

Table 3: Labor, Human Capitaland climate-related costs.

Variables:	***Expected sign***	***Dependent variable: observed facts of a new JV creation***					
		«Restricted» sample		**«Restricted», Export-aimed JVs**		**«Restricted», Local suppliers**	
		Elasticity	**Z**-stat	Elasticity	**Z**-stat	Elasticity	**Z**-stat
Population	+	***-0,05***	*(-0,2)*	***-0,2***	*(1,2)*	***-0,03***	*(-0,9)*
RealGRPpc	+	***0,2***	*(1,3)*	***0,4***	*(1,9)*	***0,05***	*(0,7)*
RealGRP growth	+	***-0,7***	*(-1,1)*	***-0,01***	*(-0,1)*	***-0,03***	*(-0,2)*
Relative Freight Tariff	**+/?**	***0,1***	*(2,4)*	***0,04***	*(1,2)*	***0,02***	*(0,9)*
Plant-level Returns-to-scale	+	***0,1***	*(3,5)*	***0,2***	*(1,9)*	***0,04***	*(2,7)*
Wage differential	+	**0,004**	(3,7)	**0,03**	(1,3)	**0,006**	(4,7)
Human Capital Quality	+	**4,0**	(11,7)	**6,0**	(9,8)	**3,4**	(7,3)
January Temperature	+	**0.5**	(9,3)	**0,4**	(4,0)	**0,6**	(9,0)
Risk Rating by Bank of Austria	–	***-0.1***	*(-2,2)*	***-0,07***	*(-0,9)*	***-0,2***	*(-2,8)*
*A «Red Belt» Dummy**	–	***-0.005***	*(-9,0)*	***-0,003***	*(-9,6)*	***-0,002***	*(-5,0)*

Note: *-Marginal Effect for a change from 0 to 1. Also, each Regression includes Year dummies.

Table 4: Experience Matter Hypothesis.

Variables:	***Expected sign***	***Dependent variable: observed facts of a new JV creation***					
		«Restricted» sample		**«Restricted», Export-aimed JVs**		**«Restricted», Local suppliers**	
		Elasticity	***Z**-stat*	*Elasticity*	***Z**-stat*	*Elasticity*	***Z**-stat*
Population	+	***-0,05***	*(-0,2)*	***-0,2***	*(1,2)*	***-0,03***	*(-0,9)*
RealGRPpc	+	***0,2***	*(1,3)*	***0,4***	*(1,9)*	***0,05***	*(0,7)*
RealGRP growth	+	***-0,7***	*(-1,1)*	***-0,01***	*(-0,1)*	***-0,03***	*(-0,2)*
Relative Freight Tariff	**+/?**	***0,1***	*(2,4)*	***0,04***	*(1,2)*	***0,02***	*(0,9)*
Plant-level Returns-to-scale	+	***0,1***	*(3,5)*	***0,2***	*(1,9)*	***0,04***	*(2,7)*
Industrial Experience of MNEs	**+**	**0,3**	**(17,0)**	**0,5**	**(18,7)**	**0,16**	**(7,3)**
Regional Experience of MNEs	**+**	**0,1**	**(3,8)**	**0,17**	**(3,2)**	**0,1**	**(2,7)**
Risk Rating by Bank of Austria	–	***-0.1***	*(-2,2)*	***-0,07***	*(-0,9)*	***-0,2***	*(-2,8)*
*A «Red Belt» Dummy**	–	***-0.005***	*(-9,0)*	***-0,003***	*(-9,6)*	***-0,002***	*(-5,0)*

Note: *-Marginal Effect for a change from 0 to 1.Also, each Regression includes Year dummies.

Table 5: Proximity-Concentration and Economic Reform matter Hypothesis.

Variables:	***Expected sign***	***Dependent variable: observed facts of a new JV creation***					
		«Restricted» sample		**«Restricted» sample, Local suppliers**		**«Restricted» sample, Export-oriented**	
		Elasticity	*Z-stat*	*Elasticity*	*Z-stat*	*Elasticity*	*Z-stat*
Population	+	***-0,05***	*(-0,2)*	***-0,03***	*(-0,9)*	***-0,2***	*(1,2)*
RealGRPpc	+	***0,2***	*(1,3)*	***0,05***	*(0,7)*	***0,4***	*(1,9)*
RealGRP growth	+	***-0,7***	*(-1,1)*	***-0,03***	*(-0,2)*	***-0,01***	*(-0,1)*
Efficiency of Institutions	**+**	**0,9**	(5,8)	**0,8**	(4,0)	**1,4**	(5,0)
Economic Reform Progress	**+**	**0,03**	(4,6)	**0,02**	(3,0)	**0,05**	(3,9)
Relative Freight Tariff	**+/?**	***0,05***	*(1,3)*	***0,1***	*(2,0)*	***-0,05***	*(-0,5)*
Plant-level Returns-to-scale	**+**	***0,1***	*(3,8)*	***0,01***	*(2,7)*	***0,01***	*(3,0)*
Risk Rating by Bank of Austria	–	***-0.01***	*(-0,15)*	***-0,04***	*(-0,6)*	***-0,1***	*(-1,3)*
*A «Red Belt» Dummy**	–	***-0.002***	*(-5,0)*	***-0,001***	*(-3,2)*	***-0,001***	*(-5,3)*

Note: *-Marginal Effect for a change from 0 to 1. Also, each Regression includes Year dummies.

Table 6: A Joint test.

Variables:	***Expected sign***	***Dependent variable: observed facts of a new JV creation***							
		Full sample		**«Restricted» sample**		**«Restricted», Exporting JVs**		**«Restricted», Local suppliers**	
		Elasticity	*Z-stat*	*Elasticity*	*Z-stat*	*Elasticity*	*Z-stat*	*Elasticity*	*Z-stat*
Relative Freight Tariff	+	***0,001***	*(0,04)*	***0,001***	*(0,2)*	***-0,001***	*(-0,2)*	***0,02***	*(0,5)*
Plant-level Returns-to-scale	+	***<0,001***	*(0,2)*	***0,006***	*(2,2)*	***<0,001***	*(0,01)*	***0,01***	*(1,4)*
Concentration ration	+	***0,3***	*(5,5)*	***0,4***	*(5,8)*	***0,3***	*(2,8)*	***0,6***	*(5,6)*
Mean Industrial import tariff	+	***0,5***	*(1,4)*	***0,6***	*(2,0)*	***0,5***	*(1,6)*	***0,7***	*(2,4)*
Economic Reform Progress	+	***0,02***	*(5,1)*	***0,05***	*(4,0)*	***0,05***	*(2,8)*	***0,01***	*(3,1)*
Efficiency of Institutions	+	***0,6***	*(7,5)*	***0,7***	*(3,4)*	***0,7***	*(3,2)*	***0,5***	*(2,2)*
Human Capital Quality	+	***1,8***	*(7,4)*	***1,2***	*(3,3)*	***1,8***	*(2,7)*	***1,0***	*(3,7)*
Industrial Experience of MNEs	+	***0,7***	*(22,9)*	***1,7***	*(18,4)*	***1,2***	*(21,5)*	***0,1***	*(6,7)*
Regional Experience of MNEs	+	***0,01***	*(1,8)*	***0,001***	*(0,3)*	***0,06***	*(1,2)*	***-0,01***	*(-0,4)*
A «Red Belt» Dummy*	+	***-0,002***	*(-3,6)*	***-0,002***	*(-4,2)*	***-0,007***	*(-4,3)*	***-0,001***	*(-2,5)*
Mean January Temperature	−	***0,5***	*(6,5)*	***0,6***	*(6,4)*	***0,05***	*(3,2)*	***0,7***	*(5,8)*
Risk Rating by Bank of Austria	−	***-0.001***	*(-2,8)*	***-0.02***	*(-0,4)*	***<0,001***	*(0,9)*	***-0,01***	*(-1,0)*

Note: *-Marginal Effect for a change from 0 to 1. Also, this Regression includes Year dummies and "Gravity" variables, to control for proximity motive.

Appendices

Appendix 1: Some descriptive characteristics of the data.

Table 1: Comparison of available data and Goskomstat agregate data on joint ventures

	1992		1993		1994	
	GKS	**Data**	**GKS**	**Data**	**GKS**	**Data**
Number of JVs	2533	3208	6359	7770	11131	12082
Employment there	195	325	304	449	344	471
Total wage bill	21	41	329	427	1301	1572
Output in current prices*	449	759	4912	5434	13146	17036
Investment in current prices			664	332	1885	1549
	1995		**1996**		**1997**	
	GKS	**Data**	**GKS**	**Data**	**GKS**	**Data**
Number of JVs	14550	13868	16079	12776	14434	4990
Employment there	426	532	537	491	739	305
Total wage bill	3431	4698	7419	7400	10706	6277
Output in current prices *	46023	51828	72076	57092	113514	62026
Investment in current prices	7284	5656	11440	11032	16265	

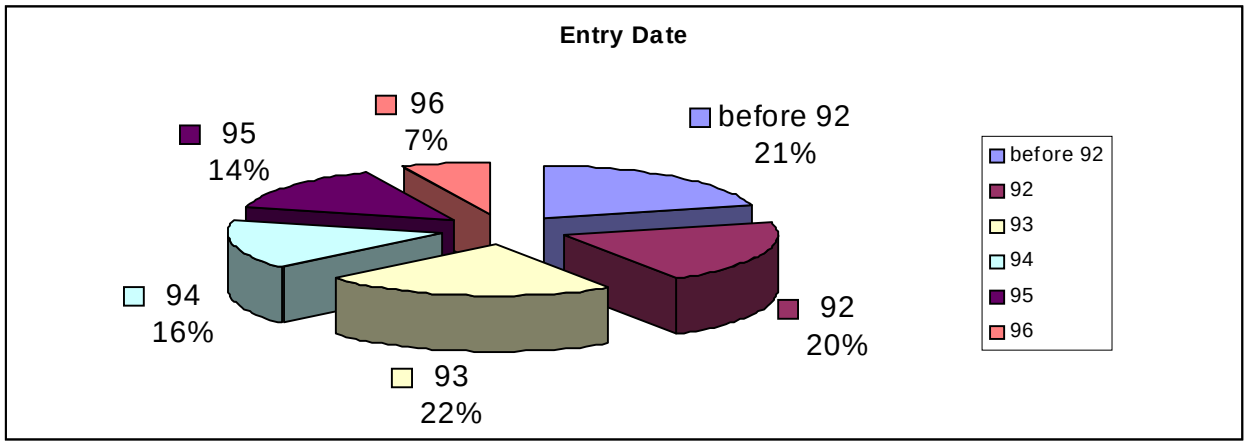
Notes: GKS data includes only functioning joint ventures

Table gives the number of JVs in production and in non-producing industries.

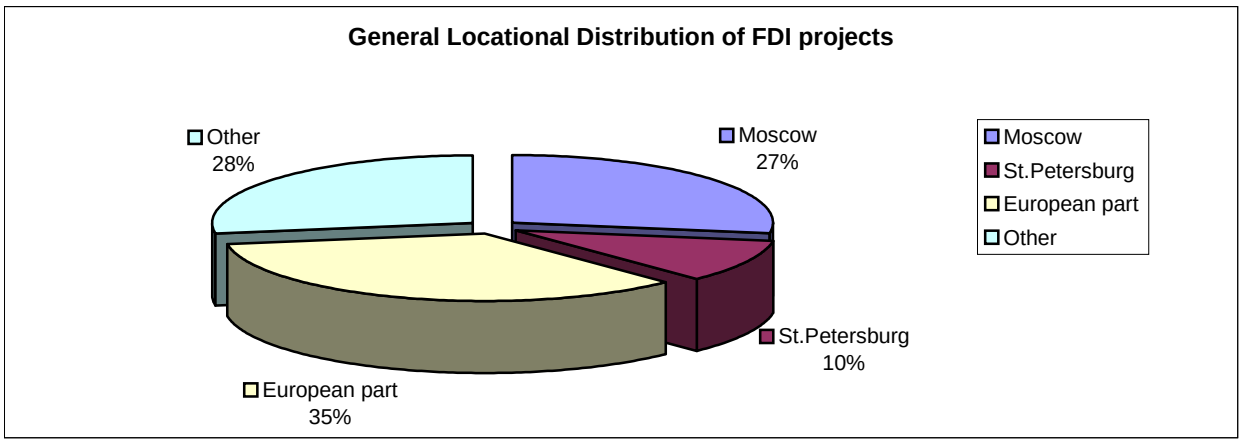
** GKS data includes VAT and excises.*

As it can be seen from the table 1, for all years except 1997, available database contains somewhat more data on FDI activity in Russia than that of Goskomstat. But the size of this excess allows as to claim that our database is fairly representative in 1992-1996. The quality of the data for 1997 is an open issue, thus all analysis is carried out for 1992-1996 and for 1992-1997 to test for stability of the results.

In fact there were no significant variation in the qualitative pattern of results.



Graph 1: Distribution of JVs by the year of Entry.



Graph 2: Distribution of JVs by location.

Table 2: Locational distribution of JVs by output.

Year\Location	Moscow	St.Petersburg	European Part	Other
92	**20%**	**7%**	**44%**	**29%**
97	**25%**	**13%**	**39%**	**23%**

Graph 3: Distribution of JVs by industry.

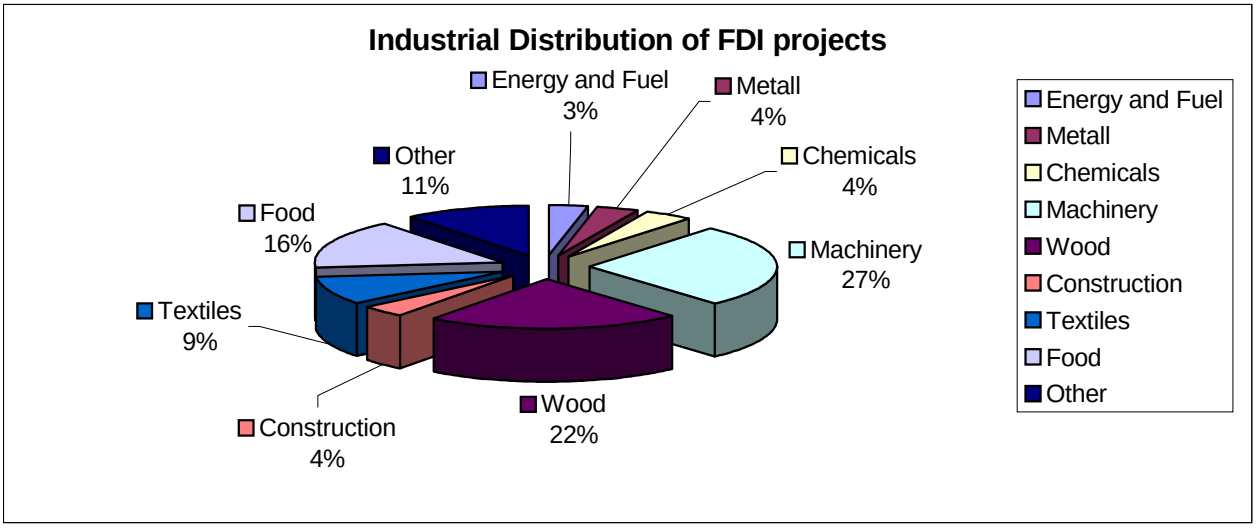


Table 3: Industrial Distribution of JVs output.

Industry:	*Energy&Fuel*	*Metall*	*Chemicals*	*Machinery*	*Wood*	*Construction*	*Textiles*	*Food*	*Other*
92	24%	16%	10%	19%	8%	1%	6%	10%	2%
97	24%	8%	7%	14%	6%	3%	2%	28%	4%

Table 4: Home-country distribution of JVs by output.

Source Region	European Community	United States	Other
92	**64%**	**10%**	**26%**
97	**56%**	**26%**	**18%**

Table 4: Output distribution of JVs by project function.

FDI project Function:	***Export-Oriented Joint Ventures***	***Local-Market Supplying JVs***
92	55%	45%
97	47%	53%

Appendix 2: Data problems

This passage is devoted to problems with the data, mainly with FDI and RERLD database. In these datasets there is a number of thing to deal with in conducting econometric analysis, which are common almost to all Russian databases on economic activities.

- Prior to 1995 all values were generally reported in thousands of rubles, and in 1995 most firms have switched to millions in their balance sheets, but not all, and exact identification of units of measure of variables in dataset is not always possible;
- Database contains a lot of missing values, which by itself is a serious issue but, more importantly, not all missing values can be exactly identified, that is when there is no data available for some variable a missing value can be present in a database as well as zero instead of a missing value. But when we see a zero we

cannot know for sure whether it represents a missing value or does it mean that a variable is identified and negligibly small;

- Data available does not represent actual values of the variables in many cases. This is a feature of data acquisition process. The data is formed on the basis of balance sheets of enterprises, which they hand in to fiscal authorities. Thus, knowing the scope of tax evasions in Russian economy we cannot claim that our database correctly represents current state of affairs. But if we make some simplifying assumptions, for example that all firms, local and foreign owned evade from taxes in the same manner, we are able to conduct an empirical investigations, claiming that our qualitative results are not affected by this sort of data features;
- It is unclear what data is reported when a Joint Venture is established in Moscow or St.Petersburg and has affiliates in regions. Another important aspect of Foreign-owned head office is that affiliates are likely to report their activities as if they were domestic rather than foreign-owned firms. This implies that the proportion of actual JVs in the sample is understated,
- However, we also can claim that the proportion of JVs is overestimated since the data on JVs includes even smallest firms with foreign capital, whereas RERLD database lacks data on Russian small enterprises. Thus we might expect that this two last effects, which work in opposite directions would cancel out each other, and would not affect consistency of econometric estimates.
- Date of registering of the Joint Venture is not always available. The construction, based on the first appearance of the output and/or employment in the firm's data record, was made. But this construction can inward some bias due to significant decrease in a lag between the date of registering and actual start of production, which happen in 92-97. Typical firm, registered in 1992,

started producing only in 1993, and majority of firms, which had entered in 1996, started producing the same year. Thus the construction of the date of entrance for those firms, with no data on that date available, might provide a biased estimate of the entrance-date.

So, given this, very serious, data problems the only available line of analysis is to concentrate on industrial and regional aggregate characteristics. In this approach, the only thing that matters is the total number of JVs and domestic enterprises in an industry or a region, claiming that aggregation resolves the problems 1, 2 and 3 and hoping 4^{th} and 5^{th} to cancel each other out. The last problem deals with an issue of decision making process. Firstly, there is a lag between the decision to invest and actual run of a new JV; thus some backward bias of the date of entrance does not worsen the analysis. Secondly, the majority of JVs in the sample had entered before 1995; thus we can make a construction based on the early pattern of entrance, with very small disturbances to the analysis.

Appendix 3: Division of Firms by project function.

Where possible, firm characteristics are taken into account: if firms export in all years exceed 50% of output than this firm is considered as a export-oriented FDI project; if firms export in all years are smaller than 50% output than the firm is believed to be a local-market supplier. Where direct division is impossible, generalization, based on the industrial characteristics with respect to export, is made: Export volume of a whole industry is compared to the total domestic output. If export exceeds 30% the industry is labeled "export-oriented" as well as all FDI firms, belonging to this industry, with no data on firms export activities.

The "export-oriented" industries therefore include: *gas and oil; coal; non-ferrous metallurgy; rare metals, basic chemicals, wood, paper and pulp, fish, furs*.