

RE-MAPPING RUSSIA FROM THE VIEWPOINT OF FOREIGN INVESTORS – APPLYING A SELF-ORGANIZING MAP IN THE CONTEXT OF RUSSIAN REGIONS

Jari Jumpponen

Lappeenranta University of
Technology
Northern Dimension Research Centre
P.O.Box 20
FIN-53851 Lappeenranta, Finland
E-mail: jarmo.ilonen@lut.fi

*Corresponding author

Jarmo Ilonen

Lappeenranta University of
Technology
Department of Information Technology
P.O.Box 20
FIN-53851 Lappeenranta, Finland
E-mail: jari.jumpponen@lut.fi

Venla Laakkonen

Lappeenranta University of
Technology
Northern Dimension Research Centre
P.O.Box 20
FIN-53851 Lappeenranta, Finland
E-mail: venla.laakkonen@lut.fi

When a foreign company enters Russia, it has plenty of choices for choosing a favourable location. A country with 17 million square kilometres, 33 cities with more than 0,5 million inhabitants and 89 different administrative regions contains a wide selection of alternatives. Even though these 89 regions have different resources, there are apparent similarities when comparing their socio-economic indicators, which in turn describe the business environment where a company operates.

This paper analyses the regional economic similarities (and dissimilarities) of the 89 Russian regions from the viewpoint of a foreign investor. The aim is to test how Russian regions could be categorized by using the self-organizing map (SOM) method (Kohonen, 1995). The SOM is a hierarchy-preserving non-linear mapping, which can organize similar regions close to each other based on their numerical data. In addition, the SOM has many beneficial properties, such as tolerance of incomplete and missing data, and it has been successfully used in similar tasks, such as in forecasting bankruptcies, future prices, workplace behaviour and energy use (Wong, 1996). The goals of this paper are to find out: 1) what Finnish companies are seeking when investing in Russia (market, resource, efficiency, strategic asset); 2) which are the most decisive external factors affecting the investment decision-making; and 3) whether utilizing self-organizing maps (SOM) are adequate in analyzing the Finnish enterprises' investment decision-making grounds in Russian regions.

In this study we utilize some 50 socio-economic indicators provided by the Russian State Statistics Committee, Goskomstat. Since not all the indicators are of equal weight in the decision-making pro-

cess of a foreign investing company, in this study we conducted a survey among Finnish enterprises in order to find out the reciprocal dynamics of these indicators. On the basis of these results, the Russian regions will be categorized by utilizing the SOM. Thus, in comparison to existing investment potentiality ratings (see for example RA-Expert, 2002), this study provides a unique and valuable insight into Russian regions from the viewpoint of investing Finnish enterprises. This study of Russian regions, applying self-organizing maps, provides a useful insight into the understanding of the uniqueness of Russian regional economic discrepancies.

Keywords: Foreign Direct Investment (FDI), Russian regions, self-organizing map (SOM)

1. Introduction

During the past decades, several theories have been generated aiming to explain the phenomenon of foreign direct investment (FDI). For more than two decades, the eclectic theory combining economic theories of monopolistic competition, location and transaction costs has remained one of the dominant analytical frameworks for a variety of operationally testable economic theories of the determinants of FDI and the foreign activities of multinational enterprises (MNEs). Dunning's eclectic theory is also known as the OLI (Ownership, Location and Internationalization) paradigm. The paradigm sets out to explain the extent, form and pattern of internationalisation production which relies on three distinct sets of advantages. For more information, see, e.g., Dunning (1977, 1980, 1988, 2001). Besides the eclectic theory, studies based on more behavioral approaches have appeared – with a focus on the internationalisation process of the firm (e.g., Johanson and Wiedersheim-Paul, 1975; Johanson and Vahlne 1977; Welch and Luostarinen, 1988).

Following Dunning's eclectic theory, scholars have emphasized the separate factors, i.e. concentrated on ownership determinants in the internationalization process. Respectively, researches emphasizing location-specific aspects have emerged. However, studies with a focus on the location aspect inside the country are rather rare.

From the Finnish companies' viewpoint, Russian Federation could be regarded as a very attractive target country for investment. Besides the geographical proximity, the country with its vast natural resources and population of 144 million could be assumed to provide various business chances for Finnish companies, which have rather limited home markets of 5 million people. Foreign trade flows between Finland and Russia have been increasing and Russia is the third most important country for Finnish exports with an 8% share. Respectively, almost 14% of imports to Finland originate from Russia (Board of Customs, 2004).

Even though the foreign trade is flourishing, Finnish companies have not actively invested in Russia. According to Goskomstat (2003) there were only some 570 Finnish companies with capital investments operating in Russia in 2002. Respectively, the amount of Finnish direct investment stock in Russia was evaluated to be between 340 million (BOF, 2003) and 1.4 billion (TT, 2003) by the end of 2003. Nevertheless, Russia has received only some 1% of all the foreign direct investment stock of Finnish enterprises. Respectively, the value of all FDI inward stock in Russia in 2002 was some USD 22.6 billion, so only some 2–5% is of Finnish origin (UNCTAD, 2003).

In this study, we aim at combining some elements of the traditional FDI and internationalisation theoretical framework, concentrating with the location-specific factors insi-

de one country. The empirical data are based on a survey conducted among 70 Finnish enterprises operating in Russia. The results of the survey are categorized by utilizing the concept of self-organizing map (SOM), which places the regions close to each other on the basis of their similarities. Thus, the aim is to form "a map of Russian regions from the viewpoint of Finnish international enterprises".

2. Foreign direct investment: Russia in international comparison

During the last two decades the worldwide production and consumption of goods and services has increasingly internationalised. As visible evidences of this accelerating globalisation there have been the increasing trade and investment flows. The foreign direct investment (FDI) has continued to expand rapidly, enlarging the role of international production in the world economy. However, the vast majority (over 90% of FDI world outflows and 75% of FDI inflows) of this investment takes place amongst developed countries.

Among developing countries, China is dominating: by the year-end 2003 China has collected approximately one fifth of all of the foreign direct investment stock invested to developing countries.¹ In spite of her enormous natural resources and vast population, the role of the transition economies in the Baltic Sea region as targets of FDI has been rather modest. For example, Russia has collected FDI some 10 times less than the mainland of China

(and some 15 times less than China including the share of Hong Kong). Even when comparing Russia's FDI stock with some of the Central East European countries (CEEC), one may easily notice that foreign companies have not eagerly invested in Russia². In per capita terms, the FDI stock in Russia is among the smallest in European transition economies.

According to Fabry and Zeghni (2002), there are several characteristics of FDI in Russia. First, investments concentrate on industry (approx. 50%), trade and public catering (approx. 20%), and transport and communication (approx. 10%). Second, foreign capital has flown mainly from USA, Germany and Cyprus, which points out Russia's speciality and refers to capital flight dilemma. Third, FDI is unevenly distributed across regions in Russia, with a heavy concentration on Moscow, Moscow oblast, St. Petersburg and Far Eastern regions. Together these four locations absorb some 80% of the foreign direct investment in Russia.

3. Choosing location inside the country

Dunning (1998) describes the four main driving forces that push corporations to internationalise, i.e. 1) resource seeking, 2) market seeking, 3) efficiency seeking, and 4) strategic asset seeking.

According to Caves (1971), when expanding operations to a specific country, a company has to gain location advantages that support transferring operations abroad. The location-specific variables are the focus of this

¹ By the end of 2003, China received FDI worth of some USD 501 billion, meanwhile the combined FDI stock of all the developing economies was USD 2280 billion. If taken into account the FDI stock of Hong Kong (USD 375 billion), the role of China as a destination of foreign direct investment becomes even more emphasized. (UNCTAD, 2004)

² According to WIR (2004), by the end of year 2003 Russia had received FDI worth of USD 52.5 billion, meanwhile more investment had gone to Poland (47.1 billion) and to The Czech Republic (28.0 billion). When comparing FDI per capita, the Russia's result is even more modest.

study. Each country has its own set of attributes that define the business environment in that given country and affect the location decisions of a company which is about to make an investment abroad. Dunning (1993, 1995) has identified such location-specific advantages to be, among others, 1) market size and growth, 2) natural and created resource endowments and markets, 3) input prices, 4) quality and productivity, 5) international transportation and communication costs, 6) investment incentives and disincentive, 7) artificial trade barriers, 8) language, ideological, and cultural differences, 9) economies of centralisation, 10) economic system and policies of government. Caves (1971) notes that in the services sector these location-specific advantages include also distance to customers.

Billington (1999) has combined both country-level and region-level aspects in his analysis on FDI determinants in seven countries and among 11 regions of the UK. According to Billington (1999), at country level the significant determinants of location were 1) market size variables (income and growth), 2) unemployment, 3) level of host country imports, and 4) certain policy variables (corporate tax and interest rates). Respectively, at regional level the most influential factors were 1) population density, 2) unit labour costs, and 3) unemployment.

Most of the studies with a concentration on the region-level approach have been conducted among developed countries. However, developing economies and their regional differences have gradually become a more frequent research topic. Distribution of FDI within a country has been studied in the case of China by, e.g., Head and Ries (1996), Kinoshita (1997), Branstetter and Feenstra (1999) and Sun et al. (2002). Zhao & Zhu (2000) have pointed out that while the market poten-

tial, cost factors, and infrastructure adequacy affect FDI location preference, foreign investors do reveal divergent sensitivity to a set of location variables. However, responses to location-specific factors vary significantly among foreign investors with different countries of origin.

4. Russian regional differences and Finnish companies

In Russia, it is customary to speak of the Russian Federation as consisting of 89 'federal subjects'. To convey something of the reality of Russia's administrative regions, however, one must begin by emphasizing that these are 89 units of equal status, nor is there comparable information on all of them. According to general opinion, the 10 autonomous okrugs (AOks) and one autonomous oblast (AO) are, for most purposes, of lesser status than the 20 autonomous republics, 55 oblasts (regions) and krais (provinces) and two federal cities (Moscow and St. Petersburg). In 2000, Russian President Vladimir Putin pushed through a package of reforms intended to bring the regions more firmly back under federal control. At first Putin divided Russia's regions into seven federal districts (Central, North-West, South, Volga, Urals, Siberia, Far East), to be overseen by his plenipotentiary representatives.

Differences across the regions are rather significant, as one might expect. Most of the population (some 70%) live in the western regions (located west from the Ural mountains) and approximately two thirds of the Russian GDP is formed in these western parts of the country. Fedorov (2002) has noticed that while inequality and polarization in Russia increased rapidly during 1991–1996, it has levelled off (and even reversed) in the late 1990s. Besi-

des, Fedorov (2002) remarks that the main dimension of the polarization is not so much the “West–East” but factors such as export shares of regions or the relative sizes of their capitals.

The Russian GDP grew by nearly 7% in 2003, and GDP growth was the second highest in Russia’s recent economic history (topped only by the 10% growth rate in the year 2000). Since the 1998 financial crisis its GDP has expanded by more than 35%. Both private consumption and real household incomes have continued to expand as well. However, the foreign direct investments (FDI) have remained rather modest, totalling some 22.6 billion USD by the end of 2002 (WIR, 2003). This indicates that from the viewpoint of a foreign investor, the Russian market continues to contain uncertainties, which hamper business activities in contemporary Russia.

Some remarks should be made with respect to the sectoral as well as geographical distribution of FDI in Russia. First of all, trade and catering as well as the food industry have received the most notable investment shares, indicating that foreign companies operating in these business fields have entered Russia with most remarkable investments. Second, by geographical comparison the city of Moscow dominates, accommodating some 40% of all foreign direct investment, which is not surprising. However, the regions following Moscow, Krasnodar (with 10.8% of all investments in Russia) and Sakhalin (8.5%) imply that the geographic distribution of foreign investments is not unambiguous (Goskomstat, 2003).

According to the Bank of Finland (BOF, 2004) the value of Finnish direct investments in Russia was 342 million euros. The actual figure, however, might be closer to 1.4 billion euros if the investments made by Finnish companies’ foreign subsidiaries and the Finnish

subsidiaries of foreign companies are included in the estimate (TT, 2003). However, the Finnish investments to Russia have been rather minor.

According to UNCTAD (2004), Finnish companies have not been extremely active to invest abroad – the FDI outward stock of Finnish companies at the end of 2003 was USD 68.7 billion, when the respective figure for Sweden was USD 189 billion. According to BOF (2003), manufacturing companies account for almost 70% of the total, main investors being companies in the metal, engineering and forest industries. Most Finnish outward direct investments have been made in industrialised countries (with 93% of the total in Europe and the USA), with the most important host country being Sweden, which covers almost 30% of all Finnish FDI (BOF, 2003). In the end of 2003 Finnish companies had some 334.000 employees abroad, out of which some 14.000 in Russia. Thus, the share of personnel working for Finnish companies in Russia is rather high in comparison with the Finnish FDI stock there (BOF 2003; TT 2003).

Regionally speaking, the Finnish investments in Russia have been concentrated in St. Petersburg and the rest of Northwest Russia. Other popular regions among the Finnish companies include Moscow, Moscow oblast, Nizhny Novgorod and Perm (Finpro 2004).

Table 1 indicates how many companies with Finnish capital there are operating and what their share of the total number of companies with foreign capital is in each of the federal districts. It seems that the geographical proximity is an important factor for Finnish companies, since over half of the Finnish companies operating in Russia operate in the Northwest FD. Companies from other countries have obviously become interested in the Northwest FD as well, as the Finnish companies’ share of the

Table 1. Companies with Finnish capital in different Russian regions

Federal District	1998		2000		2002	
	Finnish	Finnish of total (%)	Finnish	Finnish of total (%)	Finnish	Finnish of total (%)
Central	138	2,1	122	1,9	95	1,3
Northwest	310	18,7	448	16,1	429	13,5
Southern	8	1,3	9	1,1	9	1,1
Volga	19	2,6	14	1,9	15	2,1
Ural	8	1,8	9	2,1	9	1,9
Siberian	5	1,0	6	1,1	7	1,2
Far East	4	0,7	4	0,6	5	0,7
<i>Total</i>	<i>492</i>	<i>4,4</i>	<i>612</i>	<i>4,9</i>	<i>569</i>	<i>4,1</i>

Source: Goskomstat (2003).

total number of companies with foreign capital has decreased. The number of companies with Finnish capital has started to decrease in the Central Federal District, maybe as a consequence of the increasing Russian and foreign competition. In other federal districts, no dramatic changes have taken place when it comes to Finnish companies' activities.

5. Survey data and results

In order to find out which of the location-specific factors are the most decisive to Finnish companies when selecting a region for their operations in Russia, researchers conducted a survey in July–September 2004. The survey was made in co-operation with the Finnish–Russian Chamber of Commerce, and the questionnaire was sent to 464 member companies of the Chamber of Commerce.

The questionnaire was based on previous literature on the topic of location factors of foreign direct investments inside a country. Company-related internal factors affecting the decision (such as business relations and the company's know-how) were excluded from the study. The aim was to choose an extensive set of factors that could be presented to the com-

panies in the questionnaire. The total number of factors included in the questionnaire was 23. In addition, respondents were given the opportunity to mention three other significant factors affecting their decision-making. The factors in the questionnaire were divided into seven subgroups. Respondents were then asked to divide 100 points between the seven main factors (market potential, infrastructure, cost factors, resources, risks, general economic indicators, other factors). Besides, these seven main factors included all various subfactors that defined the main categories. The respondents were asked to divide 100 points among these subfactors as well (see Picture 1 for illustration of the questionnaire form). Thus, as a result we got the relative importance of each of the factors in the companies' decision making.

The total number of disposable answers was 74, including 44 companies with FDI in Russia and 30 companies operating there by utilizing other modes. The breakup of the respondent companies into different branches of economy is illustrated in Table 2.

Out of the 74 usable answers, over one third came from companies operating in manufacturing field. Service companies were the se-

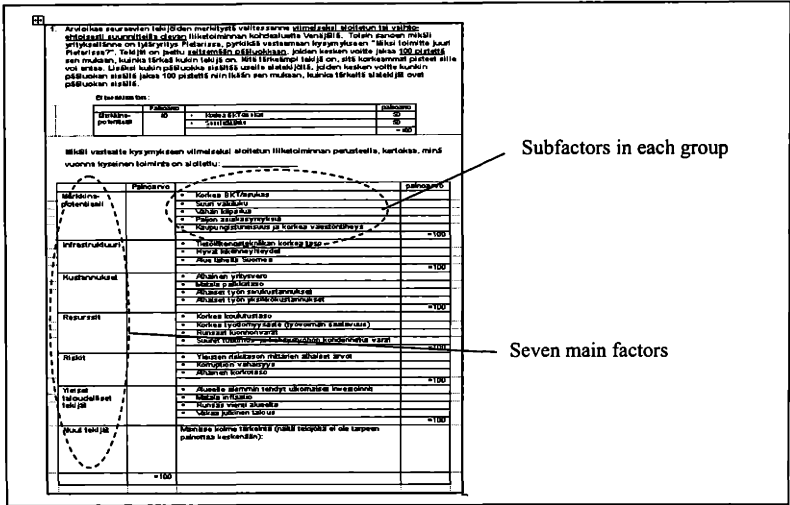


Figure 1. Questionnaire

cond largest respondent group, their share of all responses being 28%. 18% of the respondents operated in the construction sector and 16% in retailing. When it comes to the respondents' operations in Russia, the distribution is more even. Every fourth respondent (26%) mentioned manufacturing as their primary line of business in Russia, 26% were en-

gaged in services, 24% in retailing and 19% in construction.

Following Dunning's (1998) four categories in companies' internationalisation, the respondents were asked to name the primary motive for their operations in Russia. These primary motives are presented in Table 3. The distribution of motives is presented here for all the

Table 2. Survey respondents and their branches of economy

	Total				Respondents with FDI in Russia			
	Company operation field		Operation field in Russia		Company operation field		Operation field in Russia	
Manufacturing	27	36 %	19	26 %	17	39 %	14	32 %
Services	21	28 %	19	26 %	9	20 %	8	18 %
Retail	12	16 %	18	24 %	8	18 %	11	25 %
Construction	13	18 %	14	19 %	10	23 %	11	25 %
Unknown	1	1 %	4	5 %	0	0 %	0	0 %
Total	74	100%	74	100 %	44	100 %	44	100 %

Table 3. Survey respondents and their motives to operate in Russia

Primary motive for FDI	Total		Respondents with FDI in Russia	
	Number of companies	Share of companies (%)	Number of companies	Share of companies (%)
Market seeking	50	68	33	75
Resource seeking	1	1	1	2
Efficiency seeking	7	9	5	11
Strategic asset seeking	6	8	4	9
Other	5	7	1	2
Unknown	5	7	0	0
Total	74	100	44	100

Table 4. Main external factors affecting on regional investment decision in Russia

	Manufacturing	Services	Retail	Construction
Market potential	38 %	34 %	36 %	42 %
Infrastructure	11 %	14 %	14 %	14 %
Cost factors	15 %	14 %	13 %	9 %
Resources	12 %	16 %	13 %	11 %
Risks	9 %	9 %	6 %	7 %
General economic indicators	7 %	5 %	8 %	12 %
Other factors	8 %	8 %	10 %	5 %
Total	100 %	100 %	100 %	100 %

respondents as well as separately for the companies with FDI in Russia.

The majority (68%) of the respondents have been attracted to Russia by its markets. Resources have been the primary reason for operating in Russia in only 1% of the companies, while cost efficiency and strategic asset seeking each acted as main motivators in roughly one tenth of the companies. 7% of the companies referred to other reasons as their primary motive and another 7% did not answer the question.

Within the survey, the respondents were asked to divide 100 points between seven main factors affecting their location selection for investment in Russia. On the basis of the ans-

wers, Finnish companies (irrespective of their branch of economy) with FDI in Russia give biggest weight on market potential when deciding on the region for their operations (see Table 4).

Besides market potential, respondents give a high value to resources. In this survey, we defined resources as including both natural and human resources (high educational level, high availability of labour force, notable natural resources and high activity of resource and development). These resources were the second most important criteria for location selection in the services sector (weight 16% out of 100%). Cost factors were most decisive for Finnish manufacturing companies (15%), follo-

with the largest population will have 1. The procedure is repeated for all different parameters, so all of them will have a scale from 0 to 1. In this way, all the parameters will have an equal importance for the organization of the regions.

Clearly, all characteristics of the regions are not equally important when considering which regions are interesting for different types of industries. The parameters are weighed to overcome their equal importance. Weighing the parameters is achieved by linear scaling; if, for example, the weight of the parameter 'population' is 2, the population values will be scaled from 0 to 2. In this case the weights have been established by questioning Finnish companies about how they see the importance of different parameters of regions for their industry.

The colouring of the map is based on the difference between the neighbouring elements on the map. The dark colour indicates a large difference between the elements and, conversely, a light colour indicates a small difference (see Picture 2).

In the corner of this picture is Moscow, which could be characterized as the cornerstone of the Russian economy. The dark colours surrounding it describe the relative distance to all the other regions. However, the distance between regions includes not so interesting information compared to the aspect which regions are close to each other. On the basis of the company answers, these regions should be attractive to companies in similar ways. Furthermore, in an ideal position, a company operating in Nizhnyi Novgorod should confront similar possibilities and/or challenges when operating in Rostov, because these two regions are very similar to each other according to the SOM method. However, this map illustrates only expectations of the companies,

not experiences. Thus, making any further conclusions might be rather hypothetical.

6. Discussion

The goals of this paper were to find out: 1) what Finnish companies are seeking when investing in Russia (market, resource, efficiency, strategic asset); 2) which are the most decisive external factors affecting the investment decision-making; and 3) whether utilizing self-organizing maps (SOM) is adequate in analyzing the Finnish enterprises' investment decision-making grounds in Russian regions.

The results of the survey among Finnish companies operating in Russia indicate that selecting a region for operations certainly is rather challenging and requires utilising various background information. On the basis of this study, it seems that the importance of external indicators is rather similar for Finnish companies in this decision making process: manufacturing, retail, construction and services companies all agree that the market potential is the most decisive factor when deciding where to go in Russia.

On the basis of the investment statistics, it is rather interesting to notice that Finnish companies seem to foster their operations in the regions that have a close geographical proximity to Finland, i.e. in Northwest Russia. It is evident that due to the intensifying and fierce-

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² According to WIR (2004), by the end of year 2003 Russia had received FDI worth of USD 52.5 billion, meanwhile more investment had gone to Poland (47.1 billion) and to The Czech Republic (28.0 billion). When comparing FDI per capita, the Russia's result is even more modest.

ning competition in traditional targets of FDI (Moscow, St. Petersburg), also Finnish companies have to be more careful and more open-minded in their regional selection process. For this purpose, utilising the self-organizing map

or other respective methods might be helpful. They may not bring direct answers to the question where to operate in Russia, but they may alleviate a new approach and a new attitude to the Russian regions.

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**RUSIJOS REGIONAVIMAS UŽSIENIO INVESTUOTOJŲ POŽIŪRIU:
BESIFORMUOJANČIO ŽEMĖLAPIO PRITAIKYMAS RUSIJOS REGIONŲ ERDVĖJE**

Jari Jumpponen, Jarmo Ilonen, Venla Laakkonen

Santrauka

Straipsnyje analizuojami 89 Rusijos regionų ekonominiai panašumai ir skirtumai žvelgiant iš užsienio investuotojų pozicijų. Tyrimo metu buvo siekiama suskirstyti Rusijos regionus į kategorijas naudojant saviorganizacijos žemėlapių metodą pagal Kohonen (1995), kuris leidžia suskirstyti panašius regionus į kategorijas hierarchijos tvarka pagal skaitmeninius duomenis nelinejiniu būdu. Siekiant suskirstyti regionus į kategorijas, naudojama apie

50 Rusijos socialinių ir ekonominių rodiklių, kurie išankstinio tyrimo, atlikto tarp potencialių Suomijos investuotojų, metu buvo įvertinti indeksais pagal jų svarbą investuotojams. Rusijos regionų suskirstymas į kategorijas pagal panašias savybes leidžia lengviau priimti sprendimus įmonėms, nusprendusioms investuoti Rusijos rinkoje, bei atlikti detalią analizę ne tik šalies, bet ir regionų lygmeniu.

Įteikta 2004 m. liepos mėn.