

Intra-Industry Trade and Foreign Direct Investment in North-West Russia

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Abstract

In this study we investigate trade patterns of six Northwest Russian regions by applying the intra-industrial trade index (IIT) by Grubel-Lloyd (1975). In addition the study investigates the relationship of foreign direct investments and trade. The results show that the higher rates of IIT appear in more developed regions. Moreover the regressions reveal that FDI has a positive impact on regions trade and confirm the complementarity between FDI and trade in the case of manufacturing industries.

1. Introduction

Neoclassical trade theory explains patterns of regional specialisation in terms of comparative advantages from either difference in production technology as according to Ricardo's (1917) theory or differences in natural endowments between countries and regions as the Heckscher-Ohlin-model (1933, see e.g. Feenestra, 2008) proposes. Neoclassical trade theories presume perfect competition, constant returns to scale and homogeneous goods. The theory also assumes a geographically dispersed structure of industrial production with individual regions specialising in production of goods where they hold a comparative advantage and with factors of production and consumers scattered across regions. As a result, inter-industry specialisation is stimulated. Intra-industry trade on the other hand is based on scale benefits as well as product differentiation, as companies act under the circumstances of oligopolistic trade. There may appear variation in the intensity of intra-industry trade for two reasons: first in certain branches the share of intra-industry trade may vary depending on characteristics of the trading partners and second the factors of demand and supply may affect variation in the intensity of intra-industry trade.

IIT theory predicts a negative relationship between comparative advantage and IIT trade. The more similar the factor endowments of countries or regions, the greater the extent of intra-industry trade and the lower the degree of inter-industry specialisation. The share of IIT is typically high between industrialised countries and low between countries at lower levels of economic development. Earlier the values of IIT were much lower in trade between Eastern European

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transition countries and the EU than in intra-EU trade. As countries of Central and Eastern Europe narrowed their differences in economic structures and income levels, their share of IIT in total trade increased.

Dunning and Narula (1996) were among the pioneers in developing a theoretical model that outlines the relationship between net foreign direct investments (FDI) position of a host country and the country's economic development. In their theory "Investment Development Path", they present how FDI transfers new technologies and capital sustaining the host countries positive economic development. Moreover, the theory of endogenous economic growth (Jones, 1998) presented an explanation of positive role of FDI in economic development through the existence of positive externalities (FDI spillovers).

According to Greenway and Milner (1986) IIT is prevalent between countries with little variation in factor endowments and factor prices. However as Xing (2007) states that along with the global economy intra-industry trade between developing and developed countries has developed together with the intensified foreign direct investments (FDI) and outsourcing activities of multinational companies. According to Xing an increase in the share of IIT indicates growth in product varieties, improved economies of scales in production, and shortened technology gaps with competitors. Moreover Xing states that the effects of FDI in IIT depend largely on country as well as industry specific factors.

Our study aims to investigate the relation of trade and foreign direct investments. The study is divided to two central parts. In the first part the study concentrates on investigating the trade patterns of six Northwest Russian regions by applying the intra-industrial trade index (IIT) by Grubel and Lloyd (1975) to six commodity groups. The regions of the study include the City of St Petersburg, Leningrad, Novgorod, Kaliningrad and Murmansk provinces and the republic on Karelia. The study is based on the project "Economic Monitoring of North-West Russia", which is coordinated by The Centre of Markets in Transition Helsinki School of Economics. In the second part of the study we examine, through estimating an econometric model, foreign direct investments (FDI) and their relation to foreign trade in the above mentioned group of Northwest Russian regions. The paper is structured as follows. In section 2 we will review the resent literature on the subjects of intra-industrial trade and FDI in Russia. In section 3 we will present the main development trends of foreign trade and foreign direct investment in Northwest Russia during 1999-2007. The methodology behind the empirical part of the investigations is presented in chapter 4. In chapter 5 we present the results and in chapter 6 conclude the major findings.

2. Literature review

During the past few years the effects of foreign direct investments in Russia has been studied by an increasing number of researches. Yudaeva, Kozlov, Melentieva and Ponomareva (2003) compare productivity of Russian firms that have foreign direct investments with productivity of fully domestically owned firms and analyse spillovers from foreign-owned firms to domestic firms. According to their findings, foreign firms are more productive compared with the domestic ones, but the productivity of the former is negatively affected by slow progress of reforms in the regions where they operate. Moreover, the authors find positive spillovers from foreign owned firms to domestic firms in the same industry, but negative effects on domestic firms that are vertically related to foreign-owned firms.

Ledyeva and Linden (2006) study the relation of foreign direct investments and economic growth in Russia during the years 1996-2003. According Ledyeva and Linden during the last 15 years Russia has not managed to attract significant amounts of FDI. This is partly due to investment risks, which are so high in the country that only large profits in export oriented extractive industries (e.g. fuel industry) have attracted foreign investors. According to Kaitila (2003) the Russian oil sector is well-financed thanks to export revenue, but financial capital does not flow to other sectors of the economy because of a weak and underdeveloped banking sector. Without foreign direct investment the duality of the Russian economy is likely to accentuate. In the case of Northwest Russia Kaitila emphasises the importance of economic reforms coupled with increasing competition where the presence of foreign companies through trade and investment would be beneficial.

The importance of foreign direct investment proved valid in a study by Rutherford and Tarr (2006) who investigated Russia's accession to the WTO by using a general equilibrium model of the regions of the country. According to their findings the average gain in welfare as a percentage of the accession for the country as a whole is 4.3 percent, while the Northwest Russia will gain 6.2 percent and St. Petersburg 5.7 percent. The positive results are due to the fact that these regions are expected to attract more foreign direct investment than Russia on average.

Rutherford and Tarr's (2006) result differ from Kaitila's (2007) calculations, according to which the North-western areas would benefit slightly less than the whole Russia on average from WTO accession. According to Kaitila export intensive sectors, such as ferrous metals, non-ferrous metals, chemicals and timber, wood, pulp and paper products are the sectors that will expand the most as a result of WTO accession. On the other hand sectors that do little exporting and are relatively highly protected are likely to lose. Moreover, Kaitila concludes in his analyses that foreign direct investment or the availability of foreign expertise is necessary to have foreign firms compete in key business services.

The subject of Finnish and Russian trade and investments, including those of the character of foreign direct investment, has been studied on a country level by Kotilainen (2007). According to Kotilainen, there is a relation between exports and FDI especially at the sectoral level. When measured by the Grubel-Lloyd index, which investigates the intra-industry trade, less than three per cent of Finnish-Russian trade occurred inside the same industry in 2004. Furthermore this percentage has even declined slightly during the period studied. Kotilainen poses a question, whether Finnish FDI to Russia and exports there are substitutes or complements. The author finds low correlations between changes in FDI stocks and exports. However, these figures change over time indicating that in the long run exports and FDI have not been in a conflict with each other. In addition Xing (2007) argues that domestic market oriented FDI usually function as substitutes of exports from FDI source to host countries.

Moreover Algieri (2004) investigates the trade specialisation dynamic changes of Russia's intra-industry trade in Russia during the transition period by using different indices to measure intra-industry trade (IIT) including Grubel and Lloyd and Aquino indices. IIT characterises simultaneous imports and exports of goods under same industry classifications. The findings of the author are consistent with the modern trade theories suggesting that the inter-industry trade will increase along the trade liberalisation.

3. Foreign trade and foreign direct investments in Northwest Russia

Devaluation of the ruble after the crisis in 1998 weakened the imports but at the same time boosted the exports in Russia. The development of exports and imports in the six Northwest Russian regions is presented in Table 1. As one can see, the volumes of foreign trade differ quite a lot between the regions but the general trend in all regions positive and thus growing. The less prosperous regions, namely, the Republic of Karelia, Murmansk and Novgorod Provinces have recorded notably smaller foreign trade figures compared to Leningrad and Saint Petersburg. This is partly explained by the rapid increase in price of oil, which has been one of the key elements boosting Russian foreign trade after the crisis in 1998. The last mentioned regions have important harbours, through which the Russian oil and gas products are exported. Thus, even though there isn't any actual drilling in the region the exports in the oil and energy group are included to the foreign trade statistics. Kaliningrad Province has increased its imports steadily. The region is specialized in assembling activities and imports foreign components, which are then processed further to various goods.

	1999		2002		2005		2007	
	Export	Import	Export	Import	Export	Import	Export	Import
Republic of Karelia	442	126	522	132	998	183	1223	338
Kaliningrad Province	286	761	394	1577	860	3796	598	7858
Leningrad Province	1116	374	2194	981	6049	3187	8275	6536
Murmansk Province	602	255	472	91	1196	203	2122	372
Novgorod Province	261	112	366	136	764	299	930	316
St. Petersburg	2135	2421	1723	4935	4918	10054	17799	19979

Table 1: Development of exports and imports in Northwest Russia in selected years, mil. USD

Source: Rosstat

Significant part, around 20 % of the total foreign investments in Northwest Russia is comprised of foreign direct investments. The development of foreign direct investments in Northwest Russia is presented in Figure 1. The total amount of foreign direct investments in the 11 regions of Northwest Russia is depicted on the left axis while the individual regions are presented on the right axis. As the figure shows the development of the investments has been quite modest till the year 2004 after which the amounts have increased notably especially in Saint Petersburg and in Leningrad. In 2006 Kaliningrad Province renewed its status as a special economic zone that shows as a peak in its development curve. Also Novgorod Province has demonstrated steady development in its FDI. At the same time Republic of Karelia, and Murmansk Provinces have lacked behind the rest of the Northwest Russian regions.

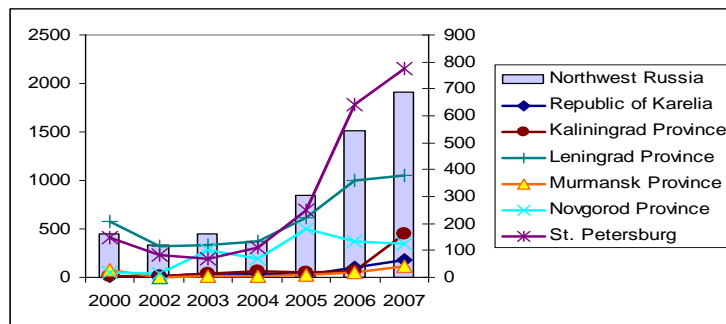


Figure 1: Development of foreign direct investments in Northwest Russia 2000-2007

Source: Rosstat

Note: Northwest Russia on the left axis, individual regions on the right axis

The branch structure of FDI also varies between regions. In this study we concentrate on foreign direct investments to manufacturing sector. In Saint Pe-

tersburg foreign direct investments have been directed to raw materials sector, especially to food sector, to petrochemical and wood industries. In Leningrad mechanical engineering and related products group has been one of the biggest receivers of FDI. This is somewhat true also in Murmansk and Kaliningrad Provinces, while in Novgorod Province and in the Republic of Karelia the industries specialized in wood and related products have been the leading sectors in terms of FDI.

When dealing with foreign investments its imports to remember that a significant part of foreign investments directed to Russia are actually Russian origin, which are invested through certain foreign banks due to more beneficial tax regimes. Thus the real amount of foreign total and direct investments is thus smaller than the share indicated by the statistics.

4. Empirical methodology and data

a. Intra industry trade

We use a panel of data set at sectoral level for Northwest Russian exports and imports in the period 1999-2006. The data are divided to six industrial groups:

- 1- Food and raw materials
- 2- Oil and energy
- 3- Petrochemicals and related materials
- 4- Wood and related materials
- 5- Black and non-ferrous metals
- 6- Mechanical engineering and related materials

The model is specified in the following equations.

Analysing the evolution of intra-industry trade of the above-mentioned six Northwest Russian regions we have used the Grubel and Lloyd index (1975), in which the index of IIT across industries or production groups is defined as a weighted average intra-industry index:

$$IIT_i = \frac{\sum(X_i+M_i) - \sum|X_i+M_i|}{\sum(X_i+M_i)} \times 100 \quad (1)$$

, where X_i and M_i represent exports and imports in the industry respectively. The value of the index varies between 0 and 100, where 0 indicates complete inter-industry trade (comparative advantage) and 100 complete intra-industry trade. What is characteristic of the GL index is that the selection criterion

used in its calculation is the difference between exports and imports of each good. Under this criterion, the exporting or importing of a good is regarded as having been induced by the force of comparative advantage unless the difference between exports and imports of a certain good is zero. The GL index measures the extent of overlapped trade between trading partners as opposed to that of unilateral trade.

b. FDI and trade

In equations (2) and (3), we estimate the impact of FDI inflows on the regional exports and imports in the case of manufacturing industries. For estimation, we use three econometric models: the Fixed Effects, the Random Effects and the Least Squares Method. Results of these regressions are presented in Appendix in Tables 4 and 5 respectively.

$$\ln Xport_{it} = \alpha + \beta_1 \ln FDI_{it} + \beta_2 \ln GDPW_t + \beta_3 \ln REER_t + u_{it} \quad (2)$$

$$\ln Mport_{it} = \alpha + \beta_1 \ln FDI_{it} + \beta_2 \ln GDPW_t + \beta_3 \ln REER_t + u_{it} \quad (3)$$

With $i = 1, \dots, 6, t = 2000, \dots, 2006$

And where u_{it} refers to the disturbance term for the industry i at time (year) t .

The dependant variables are:

(2) $Xport_{it}$: exports of a particular Northwest Russian region by industry i at time t .

(3) $Mport_{it}$: imports of a particular Northwest Russian region by industry i at time t .

The independent variables are:

FDI_{it} : Foreign direct investment inflows to the particular region by industry i at time t ;

$GDPW_t$: Gross Domestic Product of the world in real terms at time t ;

$REER_t$: Effective exchange rate of the Russian ruble at time t .

For investigating the dynamics of individual industries, we then utilize aggregate Northwest Russian figures to perform a sectoral OLS regression. For OLS, we are using the export equation (2) above. Results are summarized in Appendix, Table 6.

All the data has come from Rosstat (Statistics of Russia). In the calculations of IIT we utilize the regional yearly data of six above mentioned Northwest Russian regions in the period of 1999-2006. For the FDI calculations our time span covers the years 1999-2007 for the overall investigation of FDI and Export/Import and years 2000-2006 when investigating the dynamics in individual industries. Our time span is short because most of the export and import

statistics divided by commodity groups are only available starting from the year of 1999. Moreover data on foreign direct investments by manufacturing sectors is only available from the year 2000.

Next, we present the obtained estimation results, first for intra industry trade and then for the effect of FDI inflows on foreign trade.

5. Estimation results

a. Intra industry trade

When examining the industrial characteristics of IIT, sectoral IIT indexes were computed for six manufacturing industries: food and raw materials (products groups 1-24), oil and energy (group 27), petrochemicals and related products (groups 28-35 and 37-40), wood and related products (groups 44, 47, 48), black and nonferrous metals (groups 72-81) and mechanical engineering and related products (groups 84-90). Table 3 (Appendix) summarises the results. The variation between the regions is as one could assume, quite substantial.

Russian federation and the total figure of Northwest federal district are included to the calculations. When investigating the table it is evident, that the values of IIT for the oil and energy group are very low for both Russian federation and Northwest federal district. For Russian federation the values vary around one and five, excluding the year 2003, which has a value 13.43. The similar result applies to Northwest federal district. Being one of the world's main gas and oil producers it is only natural that IIT values in this group are quite small for Russia. In 2006 its exports in this group were over 100 times larger than its imports. By contrary, large values of IIT are recorded for Russia and Northwest Russia in the mechanical engineering group. However their share has diminished from 1999 to 2006 as the share of imports in this category has grown quite steadily.

In the Republic of Karelia very low IIT values are recorded in the oil and energy product group. On the contrary to Russia in general, the low IIT values in this group in the Republic of Karelia are explained by the fact that the Republic does not export nor import hardly any energy related commodities. Karelian exports (and its whole economy in general) are based on wood and related products (including paper), that is evident in its IIT values in this group, which range from around 3 and 15, excluding the year 1999, when the value was 25.14. The IIT values reflect the strong development of export and low value of imports in this group.

Kaliningrad Province functions as a logistic hub exporting oil products from the Russian mainland to Europe. This is evident in the statistics and also

reflected in the region's IIT values. Moreover, as stated in the previous chapter, the region is specialized in assembling foreign components, which are then processed further to various goods. This is also reflected in its high values of imports over exports in the mechanical engineering group and as a result in the region's IIT values, which come out low (between 8 and 46). Moreover, in the black and non-ferrous metals group the IIT values have decreased quite steadily (from 86 in 1999 to 29 in 2006) along with the growing imports.

Leningrad Province has also important harbours, through which the Russian oil and gas products are exported. The region's exports in this group exceed the imports over 400 times (in 2006) and as a result its IIT comes out very small. Leningrad Province has witnessed growing IIT values in petrochemicals and related materials group as well as in wood and black and non-ferrous metals and their related products' groups. The amounts of imports and exports are the most homogeneous in the petrochemicals and related materials group (in 2006). Moreover the total amounts in both exports and imports have developed quite steadily and totalled around 400 million dollars in 2006. For the black and non-ferrous metals group the amount of exports has been growing steadily and exceeded the same in imports which is reflected in large IIT values.

As it comes to Murmansk Province it seems that largely fluctuating IIT values are characteristic for the region almost in every commodity group and there doesn't seem to be any pattern of diminishing or growing IIT values. In the Petrochemicals and related materials group the values vary between 3 to 6 (1999, 2003, 2005, 2006) and almost 80 (2002) while in the mechanical engineering group they seem to peak every now and then to over 90 and after that they return to more moderate values. The economic growth in Murmansk Province has stagnated for several years in a row. It can be seen that this is also reflected in its foreign trade statistics, that don't show any clear trend to any direction but vary between somewhat low values between different sectors. The most important export articles for the region are different types of metals and minerals, which are reflected in the low IIT values in the Black and non-ferrous metals group.

For the Food and raw materials group the largest IIT values were recorded for Novgorod indicating a large intra-industry trade. However, its' total exports are on a quite low level compared for example to other regions such as Leningrad and Saint Petersburg. The development of foreign trade and especially imports can be seen as an indicator of the standard of living in general in all the regions. As the regional level of income increases, the demand for imports increases accordingly. For the less developed regions such as Novgorod and Murmansk Province as well as the Republic of Karelia the general level of imports is quite low compared to exports.

When investigating the situation of IIT in the above mentioned regions, it is possible to conclude that in general the lowest rates appear in all regions and

Russia as a whole in Oil and energy products group. This is coherent result with the general literature on IIT, which states that IIT in low value added, primary sector goods is usually lower compared to more skill-intensive sectors. Moreover, according to OECD report (2002) the IIT has risen significantly since the 1980s in most (OECD) countries. During 1999-2006 IIT rates have increased in Northwest Russia in Food and raw materials group (from 12.20 to 20.99) in wood and related products group (from 22.11 to 48.08) and in black and non ferrous metals group (from 19.50 to 43.89). However, straightforward comparison of Russian regions to OECD countries and their trade structures is however misleading as one has to keep in mind the differences in economic development. Even though the foreign trade is developing all the time to more versatile direction in Russia many regions are still, in many terms, notably behind the OECD countries. This is reflected for example in the absence of imports in many product groups in regions.

According to OECD report (2002) IIT values are particularly high for sophisticated manufactured products (chemicals, machinery, transport equipment, electrical equipment, and electronics, which are based on product differentiation and fragmentation). This is also evident in our results. For the whole Northwest Russian federal district large value are recorded for mechanical engineering (from 40 to 98) and petrochemical groups (from 60 to 99). However as a contrary to OECD results the values have been decreasing instead of increasing during the period in question, 1999-2006.

It is also evident that IIT that values in all the groups excluding the Food and raw materials group are in general notably larger in Saint Petersburg compared to the values recorded in the less prosperous regions. Thus the previous results of trade studies indicating lower IIT in trade between less developed countries is consistent with our analysis suggesting lower IIT value for the less developed regions of Northwest Russia. One has to keep in mind that in many areas the IIT values come out strong even though the actual amounts of exports and imports are low, as for example in the case of Novgorod Province. Therefore high IIT values cannot be taken directly as an indicator of a highly developed, open economy with a large foreign trade without exploring the total amount of trade in a particular economy.

b. FDI and trade

Foreign direct investments can be divided into two main categories, that is, vertical and horizontal investments. Vertical FDI takes place when the foreign company fragments the production process internationally, locating each stage of production in the country where it can be done at the least cost. Horizontal FDI occurs when the foreign company undertakes the same production activities in multiple countries. FDI can either lead to an increase in domestic production or it can hamper it. All types of FDI can affect host economy in both ways

(Kotilainen, 2007). In the case of horizontal FDI, a positive outcome is possible through the strengthening of the market position of the firm. A negative impact occurs if production shifts abroad due to cost or market reasons. Vertical FDI can strengthen domestic output if production of components abroad leads to lower costs. This enables more sales domestically as well as abroad, albeit domestic output of components naturally decreases in the beginning. If the increased competitiveness fails to be used, the final outcome can be in fact negative.

Classification stated by Feenster and Taylor (2008, pp.20-21), suggests that horizontal FDI is a substitute for exports towards that specific host country (i.e. imports), while the vertical FDI would boost the exports from that country. Next, change in FDI inflows is compared with export and import changes for each of the Russian North-West regions from years 1998-2005, and the correlation coefficients are presented in the Table 2.

	Correlation	
	EXP-FDI	IMP-FDI
Russian Federation	0.922	0.849
N-W Russia	0.785	0.681
The Republic of Karelia	0.259	-0.082
Kaliningrad	0.771	0.838
Leningrad	-0.131	0.565
Murmansk	0.255	-0.638
Novgorod	0.321	0.293
Saint Petersburg	0.889	0.527

Table 2: Correlation coefficients of regions separately

Source: Authors' calculations based on regional statistical information

As can be noted from Table 2, positive correlation between export change and FDI is very high in Russian Federation on average. Saint Petersburg has a correlation coefficient higher than the average in North-West Russia (0.889 and 0.785 respectively). An increase in FDI inflows has had a quite strong positive effect on Saint Petersburg's exports. Also the correlation between foreign direct investments and imports has been positive. Contrary to the majority of the regions, in Murmansk there is a negative correlation between imports and FDI. The level of FDI has been on such a low level in Murmansk Province and an individual (small) construction project can comprise the total amount of the foreign investments for the whole year. As a result to this, the correlation figures are somewhat misleading. Similar situation applies to some extent also to the Republic of Karelia. It is also worth mentioning that the correlation between FDI and foreign trade is quite insignificant also in Novgorod and Leningrad Provinces. In Novgorod Province the yearly FDI (even though the total amounts have generally been quite high) has fluctuated heavily, while its exports and

imports have been growing quite steadily. In Leningrad Province foreign trade rocketed in 2004, while in FDI the significant growth was recorded only in 2005. This could suggest that the effect of FDI on trade might appear only a few years after the investment project has been carried out.

Results of our regressions (equations (2) and (3), in chapter 4) are summarized in Table 4 for exports and Table 5 for imports in Appendix. In addition, we present the goodness of fit variable (R²) and the Hausman test –statistic to determine if the Fixed Effects Model is preferred to the Random Effects Model. Based on our results, we can conclude that both Fixed Effects and Random Effects Models are consistent (with both export and import equations) and we can not prefer one over the other.

As the result suggest, FDI can be seen to boost both export and import in Northwest Russia. Effect is for both import and export positive and statistically significant. This is equivalent to the results of Table 2 presented above. Also the coefficients of GDPW are consistently positive and statistically significant for both equations (2) and (3); hence the growth of world's GDP enhances overall foreign trade in the region. For exports, the effect of the effective exchange rate is negative (and statistically significant at the 0.1 level of significance only in Fixed Effects Model). This result can be explained the macroeconomic situation Russia has gone through until recently. Country has turned out to fall victim to the Dutch Disease, as the observed steady appreciation of the Russian rouble is been largely associated with the high surge in oil prices of many years' (Ivanova, 2007). The increase in oil prices increases export revenues, which in turn increases domestic demand, also for non-traded goods. This raises inflation, and the domestic currency appreciates in real terms. For imports, the coefficient of the explanatory variable REER is positive and not statistically significant. This result indicates that the real exchange rate of the Russian rouble (valuation of the rouble) has a positive effect on Northwest Russian imports.

As for the impacts of FDI on exports studied separately for each manufacturing sector, the results are more variant but in general statistically insignificant. Results are summarized in Table 6 in Appendix. Industry 2 (Oil and Energy) was forced to be left out because of insufficient data. Oil and Energy belong to the so called strategic sectors of the Russian economy. Foreign access to these sectors is limited by federal laws, and as a result the amounts of foreign investments in these sectors come out very low or non-existent.

For Industry 1 (Food and raw materials), FDI inflows and the development of world's GDP have a positive impact on industry's export activities. Exchange rate variable has a negative coefficient (but is statistically insignificant) indicating that the export of raw materials is influenced negatively by the depreciation of the Russian rouble. Petrochemical industry's exports (Industry 3) also benefit from FDI inflows, and moreover that positive impact is statistically significant. Their export activity is however negatively affected by the

development of world's GDP and exchange rate increases (both statistically insignificant).

With the estimations of Industry 4 (Wood and related materials) and Industry 6 (Mechanical engineering), all variables have a positive coefficient, although they are all statistically insignificant. FDI inflows, growth of GDP and effective exchange rate are all boosting industries' exports. Finally, for all the studied industrial groups, only metal industry's export activities (Industry 5) are negatively affected by foreign direct investment flows. This would indicate that foreign direct inflows are substituting exports from that sector. Also world's GDP growth and the development of real exchange rate have negative impacts on metal industry's exports.

6. Conclusions

In this paper our aim is to investigate the trade patterns as well as the relationship between foreign direct investment inflows and foreign trade in the Northwest Russian regions.

During the past few years, researchers have increasingly been interested in studying impacts of foreign direct investments in Russia. Our aim and contribution is to concentrate solely on the Northwest regions (the City of St Petersburg, Leningrad, Novgorod, Kaliningrad and Murmansk Provinces and the Republic of Karelia), and examine the trade patterns of six manufacturing industries in the regions by using the intra-industrial trade index (IIT). Furthermore we focus on the impact of foreign direct investment inflows on regions' foreign trade by conducting a regression using three different econometric models; the fixed effect, the random effect and the ordinary least squares method.

Studying trade patterns of the six Northwest Russian regions and the IIT-index for the six manufacturing industries we found, quite naturally, substantial variation. Coherently to the existing theory, we found that the lowest rates of IIT appear in the less developed regions of Northwest Russia, as well as with the low value added, primary sector goods producing industries. Largest values of IIT are thus recorded for mechanical engineering and petrochemical industries, as well as in general for the City of St. Petersburg.

We notice that the overall correlation of foreign direct investments to Northwest Russia's foreign trade is positive and statistically significant. Results indicate that a high degree of FDI has been export boosting, vertical FDI. Thus we can conclude that foreign direct investments are complements to foreign trade in the case of manufacturing industries in Northwest Russia.

From our regression analysis, we find out that alongside with a positive coefficient of the FDI explanatory variable, also the growth of world's GDP enhances overall foreign trade in the region. However, an important finding is

the negative impact of the real effective exchange rate on export activity. This result is congruent with the statement that Russia has come a victim of the Dutch Disease, with higher export revenues (due to surging oil prices) increasing overall domestic demand, raising thus inflation and domestic currency valuation. Finally, at the sectoral level, there is a strong variation in impacts of FDI to foreign trade due to sectoral specificities.

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APPENDIX

	years	Russian Federation	N-W Russia	The Republic of Karelia	Kaliningrad	Leningrad	Murmansk	Novgorod	Saint Petersburg
Goods and raw materials (groups 1-24)	1999	39,76	12,20	51,61	22,34	11,76	88,08	17,78	4,15
	2000	35,67	18,09	63,81	21,32	17,21	71,13	96,00	8,63
	2001	33,13	15,42	96,47	26,72	14,04	55,94	88,05	6,66
	2002	36,25	13,98	74,36	19,58	20,31	64,72	89,02	6,39
	2003	38,44	16,57	91,24	16,27	25,90	60,96	98,28	8,43
	2004	32,56	17,87	80,00	14,97	17,98	74,96	94,59	12,39
	2005	38,70	20,93	86,18	19,73	23,53	62,62	91,46	14,21
Oil and energy (group 27)	2006	40,67	20,99	66,27	16,15	11,29	31,15	80,80	16,70
	1999	4,75	5,30	0,00	39,51	0,83	13,33	8,00	81,53
	2000	5,17	1,57	0,00	14,39	0,14	17,50	0,00	10,17
	2001	3,75	1,98	0,00	17,59	0,38	27,85	0,00	41,41
	2002	3,53	4,92	0,00	37,23	0,70	11,06	0,00	64,60
	2003	13,43	74,50	0,00	60,03	24,75	23,59	4,63	48,34
	2004	2,81	4,45	22,22	11,31	0,63	0,00	0,00	80,99
Petrochemicals and related products (groups 28-35 ,37-40)	2005	2,13	3,28	0,00	3,21	0,30	14,36	18,18	40,34
	2006	1,87	2,18	0,00	2,57	0,47	28,57	50,00	3,47
	1999	90,05	97,75	13,38	67,68	64,19	2,59	15,93	73,84
	2000	90,60	84,10	8,00	68,99	57,58	19,51	20,20	69,13
	2001	98,97	99,10	12,85	63,01	79,21	37,11	27,84	43,98
	2002	95,90	88,44	21,94	34,82	74,70	79,39	29,27	28,90
	2003	76,83	77,52	28,81	86,15	71,47	3,80	5,95	74,73
Wood and related products (groups 44, 47, 48)	2004	97,40	83,93	32,41	23,35	83,71	31,06	27,00	23,66
	2005	92,52	77,66	33,54	14,47	94,18	5,82	21,23	16,74
	2006	86,71	69,54	46,48	12,83	95,52	5,84	20,89	18,41
	1999	41,92	22,11	25,14	98,37	13,10	42,42	8,24	75,17
	2000	39,52	20,14	5,60	71,88	16,34	32,26	19,11	80,27
	2001	48,70	27,89	4,76	90,73	26,47	28,57	33,65	94,42
	2002	48,41	35,48	14,24	93,17	34,01	26,67	56,12	94,23
Black and non-ferrous metals (groups 72-81)	2003	58,55	38,03	15,83	95,47	40,54	20,41	68,86	92,93
	2004	49,69	38,23	4,14	86,80	45,97	16,00	51,08	99,85
	2005	54,91	42,70	2,47	71,54	48,26	80,00	46,54	95,73
	2006	58,70	48,08	3,78	53,86	51,40	56,72	41,79	85,27
	1999	25,86	19,50	5,08	85,82	34,98	8,41	47,62	38,24
	2000	26,32	17,35	8,08	94,23	66,14	9,83	90,32	27,31
	2001	31,82	31,13	8,36	60,31	69,04	11,61	59,38	52,64
Mechanical engineering (groups 84-90)	2002	27,52	37,17	11,64	47,04	69,47	2,43	93,23	67,03
	2003	30,86	32,84	9,79	49,02	79,31	1,02	43,48	48,21
	2004	27,45	25,01	6,38	38,37	86,48	0,83	60,44	34,66
	2005	34,24	38,60	8,54	27,28	87,07	1,61	24,50	62,21
	2006	39,80	43,89	7,77	29,27	88,51	0,54	15,94	68,93
	1999	86,43	95,56	30,22	26,74	51,19	19,66	51,03	66,81
	2000	92,48	98,49	37,32	46,17	42,40	96,62	77,40	72,13
Mechanical engineering (groups 84-90)	2001	84,59	71,60	75,81	28,68	38,59	96,96	53,11	84,80
	2002	75,29	55,11	56,43	16,60	56,09	40,97	80,35	69,95
	2003	71,06	59,89	33,98	12,39	31,63	15,28	76,23	88,52
	2004	60,44	51,10	35,54	15,65	19,04	95,88	71,63	75,64
	2005	46,10	46,18	33,31	8,33	22,52	15,40	34,70	71,36
	2006	42,03	40,22	65,56	17,53	14,34	49,83	49,01	51,19

Table 3: IIT of selected manufacturing sectors in Russia and Northwest regions

Source: Authors' own calculations based on Regiony Rossii 1999-2006

	<i>Fixed Effects Model</i>	<i>Random Effects Model</i>	<i>OLS Model</i>
<i>Constant</i>	-24.89*** (8.03)	-24.51*** (8.11)	-22.40 (14.99)
<i>FDI</i>	0.179** (0.977)	0.218*** (0.732)	0.44*** (0.065)
<i>GDPW</i>	2.11*** (0.373)	2.041*** (0.374)	1.638** (0.656)
<i>REER</i>	-1.689* (0.961)	-1.467 (0.959)	-0.22 (1.64)
<i>R2</i>	0.524	0.557	0.62
<i>Hausman test</i>	2.48		

Table 4: Estimation of Exports Equation (2) for a panel of six Northwest Russian regions

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
Standard errors in parantheses

	<i>Fixed Effects Model</i>	<i>Random Effects Model</i>	<i>OLS Model</i>
<i>Constant</i>	-39.97*** (10.066)	-39.77*** (10.08)	-36.57 (27.68)
<i>FDI</i>	0.2157** (0.097)	0.237** (0.094)	0.568*** (0.119)
<i>GDPW</i>	2.499*** (0.468)	2.459*** (0.466)	1.847 (1.21)
<i>REER</i>	0.627 (1.205)	0.747 (1.199)	2.63 (3.032)
<i>R2</i>	0.3146	0.327	0.39
<i>Hausman test</i>	0.99		

Table 5: Estimation of Imports Equation (3) for a panel of six Northwest Russian regions

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
Standard errors in parantheses

	Industry 1 Food and raw materials	Industry 3 Chemicals and related materials	Industry 4 Wood and related materials	Industry 5 Black and non-ferrous metals	Industry 6 Mechanical engineering and related products
<i>Constant</i>	-74.79* (-38.11)	68.120 (-63.37)	-62.530 (-49.71)	822.400 (-378.1)	-35.510 (-78.07)
<i>FDI</i>	0.095 (-0.0696)	0.731** (-0.303)	0.130 (0.113)	-0.128 (-0.368)	0.162 (-0.115)
<i>GDPW</i>	4.747** (-1.847)	-3.123 (-2.972)	3.387 (-2.388)	-38.110 (-18.42)	2.201 (-3.742)
<i>REER</i>	-1.231 (-2.972)	-2.849 (-5.186)	2.572 (-4.052)	-46.740 (-20.98)	0.503 (-6.712)
<i>Observations</i>	28	15	28	6	25
<i>R2</i>	0.321	0.371	0.164	0.723	0.114

Table 6: OLS Estimation of sectoral effects of Exports Equation (2) in Northwest Russia

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
Standard errors in parantheses