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Trade Potential around the Baltic Rim: A Two-Model Experiment

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ABSTRACT: It has been almost ten years since the collapse of the Soviet Union and the rebirth of the independent Baltic nations. The economic growth in most of the former communist countries has rebounded and is gradually starting to approach their Western counterparties. Trade, previously directed to the members of the same communist bloc, has diversified and expanded in line with the economic development. Asymmetric growth between the respective countries is still the norm, but the general trend is upwards and early 90s-style negative growth is not expected in the near future.
At the same time a lot has happened on the Western front. The European Union has been expanded to include Finland, Sweden and Austria. The Nordic EU countries have regained from the severe recessions they suffered during the early part of the current decade, and growth is now expected to continue into the next millennium. Finland has proposed a new strategic concept for Northern Europe, called the Northern Dimension. The implementation of the proposal would further increase the regional co-operation around the Baltic Rim.

This study tries to assess the potential for trade around the Baltic Rim, specifically potential for exports from the EU countries to the Baltics, Poland and North-West Russia. The study is conducted by using two different gravity models explaining trade patterns and is based on the hypotheses made in previous studies. These hypotheses include the assumption that the East European countries will turn into Western Europe - type market economies in the long run. The main findings are that there definitely exists some unused trade potential in the region, the extent of which depending on the method and assumptions used. Baltics and Poland produce the greatest potential in absolute amounts, but percentwise the increase is greatest in Russia. The final implication of the study is to stress the importance of the Russian North-Western regions in trade creation and regional co-operation in Northern Europe.
KEY WORDS: Trade potential, gravity model, Baltic Rim, North-West Russia.

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On kulunut melkein kymmenen vuotta siitä, kun Neuvostoliitto romahti ja maailma näki Baltian alueella jälleen itsenäisiä valtioita. Talouskasvu on monista vastoinkäymisistä huolimatta jatkunut useimmissa entisissä kommunistisissa maissa ja lähestyy vähitellen länsimaisia kumppaneitaan. Kauppa, joka aikaisemmin suuntautui kommunistisen blokin sisälle, on laajentunut ja kasvanut talouskasvun mukana. Valtioiden välinen kasvu on vielä epätasaista, mutta yhdeksänkymmentäluvun alun kaltaisia negatiivisia kasvulukuja ei uskota nähtävän lähitulevaisuudessa. Samaan aikaan kehitystä on tapahtunut myös länsirintamalla; Euroopan Unionia on laajennettu Suomella, Ruotsilla ja Itävallalla. Euroopan Unioniin kuuluvat Pohjoismaat ovat nousseet vuosikymmenen alun kestäneestä syvästä lamasta, ja kasvun odotetaan nyt jatkuvan ensi vuosituhannelle saakka. Suomi on esittänyt uutta Pohjois-Eurooppaa koskevaa strategista konseptia työnimellä Pohjoinen ulottuvuus. Toteutuessaan esitys lisäisi entisestään myös Itämeren alueen yhteistyötä.

Tämän tutkimuksen tarkoituksena on arvioida mahdollista kaupan potentiaalia Itämeren alueella, erityisesti EU-maista itään suuntautuvan kaupan potentiaalia. Tutkimuksessa käytetään kahta erilaista kaupan kehittymistä kuvaavaa painovoimamallia, jotka perustuvat aikaisempiin aiheesta tehtyihin tutkimuksiin. Alkuolettamuksissa painotetaan mm. sitä, että pitkällä tähtäimellä Baltian ja Itä-Euroopan maat muuttuvat rakenteeltaan Länsi-Eurooppalaisten maiden kaltaisiksi. Tärkeimmät tulokset vahvistavat, että alueella on käyttämätöntä kaupan potentiaalia. Potentiaalin suuruus riippuu alkuoletuksista ja käytetyistä metodeista. Baltiasta ja Puolasta löytyvät suurimmat kasvupotentiaalit absoluuttisina lukuina, mutta prosentuaalisesti Luoteis-Venäjä omaa suurimman kasvunvaran. Viimeisenä johtopäätöksenä painotetaan Venäjän Luoteisosien merkitystä Pohjois-Euroopan kaupan lisäämisessä ja alueellisessa yhteistyössä.

AVAINSANAT: Kaupan potentiaali, painovoimamalli, Itämeren alue, Luoteis-Venäjä.

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1 INTRODUCTION

The enlargement of the EU to include the former EFTA-countries Finland and Sweden has pushed the outer boundaries of the union towards north. A new concept called the Northern Dimension is being formed, centering around a separate cooperation zone crossing national boundaries in the Northern Europe. The proposition for the concept of the Northern Dimension has been done by Finland, and its inauguration is pending on the proper decision making process by the relevant political circles in the EU, Baltics and Russia. The possible fulfilling of the Northern Dimension means that both the geographical and economic center of the EU will travel northwards.

The Baltic Sea is now surrounded by the market economies of the EU, and by the former communist or socialist countries in the East. The old Hansa Trade routes within the confines of the Baltic Sea are gradually re-emerging and rebuilding the old economic and cultural ties. The process is well on its way and is unlikely to slow down considerably, even if the political situation around the eastern fringes of the region deteriorates.

As the new Baltic States, as well as Poland and adjoining areas of Russia, are on their way to build market-based economies, it is forecast that the multilateral trade within the region will increase. Trade barriers still exist, but their degree and significance is expected to diminish as the development process continues. Foreign direct investment into the region has rebounded, and may well increase considerably in the future. Proper capital markets are being formed, while the total market capitalization value of the region's stock exchanges is set to increase.

This process will have profound effects not only to former centrally-planned economies, but also to EU-countries, as their trade will diversify and expand in line with the development of the transition economies. This study attempts to break some ground by estimating the potential trade flows between the regions around the Baltic Sea. The study is based on similar studies conducted previously, and uses gravity models as a vehicle to estimate the potential trade. Some geographical modifications have been made in order to concentrate the analysis towards the Baltic Rim.

This paper is organized in five separate sections, including this introductory section. The second section introduces the gravity model and gives the estimates of the two models used in this study. The third section describes the data and sources used, and sheds some light on statistical problems with the Russian sub-regions. The fourth section produces results in a graphical form. The fifth and final section draws some general conclusions obtained from the study. Appendices and references are found in the end.

Final reminder of the changing world is Russia. At the time of writing the last version of this study, in early September, the Russian economy is in a state of flux. The ruble has plunged to new lows and the subsequent turmoil will affect Russia's medium-term economic prospects. In the context of this study Russia's current situation will most

likely diminish, at least temporarily, the calculated export potential to Russia. However, in the long run the conclusions of this study prevail, if it is assumed that Russia is able to put its economy back in shape and regain the trust assigned upon it.

2 GRAVITY MODEL

The purpose of this study is to evaluate how large the potential eastbound trade within the Baltic Rim could become. Erkkilä-Widgren (1994) state that when evaluating the potential foreign trade level between two countries, one should take into account such factors that are as independent as possible from economic cycles. Such an approach could be analytically conducted via so called gravity model, where the long-run trade equilibrium is reached through an analysis of certain key variables indicating the size of the economy, demand and cost conditions.

Gravity models have by now become a standard method in evaluating potential trade between different countries. Originating from physics, gravity models base their forecast of potential trade on such real variables as distance, population and GNP of particular countries. The arguments behind the use of gravity models are simple: large and wealthy countries should conduct more foreign trade than small and poor ones, while an increased distance should respectively diminish the trade. Although gravity models do not find much backing from the economic theory, they nevertheless perform reasonably well when tested empirically.

Gravity models deal with long-range trade flow equilibrium, and as such are an ideal vehicle when comparing two different trade regimes or two different economic systems. Most of the used gravity equations have been estimated by using either world-wide data or OECD data, or similar models as used in this study on Western European data. The preliminary hypotheses for the CIS and former East European countries is that they gradually approach the capitalistic market economies in their economic conduct and structure as well as in their material well-being. In other words, it is assumed that in the long-run the former socialist countries will resemble the market economies of the EU.

2.1 The Erkkilä-Widgren model

The first approach adopted in the study is a standard Wang-Winters type gravity model of the following composition:

$$X_{ij} = CD_{ij}^{b1} N_i^{b2} N_j^{b3} Y_i^{b4} Y_j^{b5} P_{ij}^{b6} A_{ij}^{b7},$$

where

X_{ij} = the value of exports from country i to country j,

C = constant,

D_{ij} = the distance between the two countries,

N_m = the population in country m (m=i,j),

Y_m = the GNP per capita in country m (m=i,j),

P_{ij} = "block dummy", indicating whether the countries i and j belong to the same regional trade block,

A_{ij} = "cultural dummy", indicating whether the countries i and j belong to the same linguistic group.

For the purposes of estimation it is more useful to convert the model into a logarithmic form, yielding the following additive expression:

$$x_{ij} = c + b_i d_{ij} + b_2 n_i + b_3 n_j + b_4 y_i + b_5 y_j + b_6 p_{ij} + b_7 a_{ij}$$

where the symbols indicate natural logarithms of the variables indicated by capital letters above.

The model above, or its various versions, have already been used in several studies assessing the potential trade flows between different countries, most notably in the original Wang-Winters study (1991), but also in Hamilton-Winters (1992), Baldwin (1993, 1994), Erkkilä-Widgren (1994, 1995b), Kala-Rajasalu (1995) and Kaitila-Widgren (1998). This study relies heavily on the estimated gravity model by Erkkilä-Widgren, and is intended to both expand and update their model and results.

Wang-Winters (WW) used data from 76 market economies around the world, dating from the years 1984-1986. They tried to assess the trade potential for transition economies in the Eastern Europe, and found that the potential was huge, often four or five-fold when compared to the then current level of trade (Meronen 1997). The WW-model used seamiles to measure distances, roughly 5000 observations for trade flows between pairs of countries, and a total of eight different dummy-coefficients to indicate different trade regimes. Erkkilä-Widgren (1995) criticize the WW-study because of the heterogeneity of their data. The data contains both rich and poor nations, and thus the standard deviation of the observations is larger than with models using relatively homogeneous data.

Hamilton-Winters (1992) used the WW-model to estimate trade potential in Eastern Europe. The trade flows they used in their estimation covered roughly 80% of the total world trade in the years 1984-1986. They used 13 dummies to indicate different trade regimes and arrangements, and obtained similar results as Wang-Winters.

Baldwin (1993, 1994) studied trade potential between Eastern European countries and EFTA/EU countries. Baldwin relied on the estimated coefficients provided by the WW-study, but used two different income levels for the Eastern European countries. The two

different scenarios for trade potential showed again that there was unused trade potential in the region.

Kala-Rajasalu (1995) used a model similar to Baldwin in order to get an estimate of the Baltic countries' trade potential to CIS countries. Their study included all trade flows of the Baltic states to Europe and CIS countries, but not trade flows between other European or CIS countries. Their results indicated only partial explanation for the differences in trade flows of the Baltic states, but nevertheless showed that trade relations with the CIS were still more intensive than could have been theoretically predicted by the model.

Erkkilä-Widgren (1994) evaluated Finland's potential trade with the Baltic countries. Their model was an abbreviated version of the WW-approach, and the number of observations was reduced to 300. They also expanded their model to include Central and Eastern European countries, but the differences in the estimated coefficients did not differ markedly from the original model. The general conclusion by Erkkilä-Widgren was that the actual level of trade with the Baltics could increase in the case of Latvia and Lithuania, but with Estonia Finland was already above its potential.

The EW-model was originally estimated using trade statistics from 17 different Western European countries. The flow of potential trade in this study goes from market economies to transition economies, and it could be argued that a better model to estimate the trade potential could be constructed, i.e. a model including trade statistics also from the transition economies. However, in terms of long-run trade potential it is expected that the transition economies gradually converge towards the same economic structure as with the western nations, and in this case the use of only western statistics is considered appropiate. The Erkkilä-Widgren (EW) estimate of a WW-type gravity model uses this kind of reasoning. Their model was estimated using trade flows between a number of Western European countries, and that makes the EW-model more suitable than the other WW-estimates when Europe is considered as a benchmark for the transition economies to follow.

2.2 The model by Meronen

The second approach in this study is to use an alternative model to value potential trade in the region. Meronen (1997) has conducted a similar study using an abbreviated form of a standard gravity model, omitting population variables and including only GDP figures and distance. He argues that this type of a typified, basic model represents more accurately reality and underlying simplistic theory behind the gravity model approach, and thus is a better vehicle compared to the WW-type model.

Meronen compares both the basic model and WW-type model and concludes that the basic model gives superior results despite its simplicity. One of the reasons for this is that in the typified models the population variables are omitted, because according to logarithmic rules there should be no major difference between using either total GDP

figures or separately GDP/capita and population figures. According to Meronen, in the industrial countries population variables and GDP figures are too correlated and the data too homogeneous, and thus when using European data the omission of population variables produces more reliable results.

Meronen also discarded the standard method of evaluating distance as between capitals and ports, and used a weighted average between five biggest cities instead. His method was likely to shift the distance point closer to the 'theoretical' center of the country, but it is unclear whether the results would have changed much. In the Baltics and in most of the Scandinavia the different points to measure distance are quite close to each other anyhow.

It could also be argued that the nonexistence of a cultural/border/trade block -dummy in the Meronen-model is justifiable as none of the countries on the opposite sides of the Baltic Sea belong to the same trade block, and because only Finland and Estonia belong to the same linguistic group.

The following typified model by Meronen is used in this study:

$t_{ij} = \beta_0 + \beta_1 y_1 + \beta_2 y_j + \beta_3 d_{ij} + u_{ij}$,

where the equation is in logarithmic form as with the EW-model and where

t_{ij} = the value of trade between the respective countries,

y_i = the GDP of the exporting country,

y_j = the GDP of the importing country,

d_{ij} = the distance between the two countries,

and where the β's represent the respective coefficients.

Meronen estimated his model by using 1996 data from 14 different European nations and produced a total of 182 observations. He tried to assess the openness of the Baltic countries by comparing the Baltics' actual and potential trade with the European Union. His general conclusions were that the Baltics' trade with most of the EU countries has already reached its potential level. The EU's exports to the Baltic countries were, however, more problematic and showed that there existed unused export potential from most of the EU countries. Distance between nations seemed to be the deciding factor, the outermost regions having the most export potential to the Baltics.

2.3 Estimates and comparison between the models

The following table shows the estimated coefficients for the two models:

Table 1: The values of coefficients

	Erkkilä-Widgren		Meronen	
	coefficients	t-values	**coefficients**	t-values
constant	**-15.2**	16.6	**5.54**	16.8
y_i	**1.08**	20.5	**0.8**	18.8
y_j	**0.95**	18	**0.82**	19.3
n_i	**0.79**	20.9		
n_j	**0.84**	22.2		
p_{ij}	**0.67**	5.7		
a_{ij}	**1.19**	8.5		
d_{ij}	**-0.25**	7.1	**-1.06**	-13.7
RR	**0.87**		**0.87**	

The figures above represent the values of the estimated coefficients obtained from the original studies by Erkkilä-Widgren and Meronen. The estimated coefficients differ markedly due to the construction of the models, although both the models have an almost equal correlation coefficient, explaining roughly 87% of results. As the EW-model contains population variables, whereas the Meronen-model does not, it is understandable that the estimated coefficients are not directly comparable.

The major difference between the models, however, seems to be the importance of the distance coefficient. In the Meronen-model the distance coefficient receives a four times greater value than with the EW-model, and partly helps to explain Meronen's conclusions in his study. The large distance coefficient with the Meronen-model could possible indicate that within a relatively confined geographical area, and with all the other variables held ceteris paribus, the Meronen-model could produce larger values when compared to the standard EW-model.

Despite the differences, both models have t-values which are statistically significant. The values range from 5.7 to 22.2 with the EW-model, and from -13.7 to 19.3 with the Meronen-model. The obtained t-values indicate that both the models are robust and could be used as such without further modifications.

3 TRADE POTENTIAL

The both types of gravity models are now used to estimate the potential trade flows between a select number of countries around the Baltic Rim. The two models prescribed earlier are used as such, i.e. the values of their coefficients will not be estimated again. Specifically, the models are used to evaluate export potential from EU-countries to transition economies and to their subregions, i.e. exports from Finland, Sweden, Denmark and Germany to Poland, Lithuania, Latvia, Estonia, St.Petersburg, Leningrad Oblast, Novgorod and Pskov. The breakdown between smaller geographical regions within a unified nation, i.e.Russia, is done in order to separate purely Baltic Rim oriented trade from that particular country's total trade.

3.1 Data used

The major coefficients in estimating the future trade potential are population, distance between countries, and the GNP/GDP-levels in respective countries. Population figures have been taken from the IMF's World Development Report 1997, excluding Germany and North-West Russia, whose figures are from their national statistics. Distances between capitals and major ports have been taken from Map 2 by Sweden's Kungliga Sjökarteverket. As the distances in the map were quoted in nautical miles they had to be converted to kilometers in order to fit in to the EW-model, which uses kilometers. In the case of Russia, train/road transportation has been added to cover distance from the port of St.Petersburg. In all other countries, the major port or a coastal capital has been used as a point of entry. The GNP figures used in the EW-model have been obtained from the IMF's World Development Report, and the GDP figures used in the Meronen model were found from the OECD's Main Economic Indicators 12/96. The GDP figures for the Baltic countries were taken from the EIU's Country Report, January 1998. If necessary, exchange rate conversions from national currency to dollars or ECUs have been done using exchange rates prevailing at the time in question. Year 1995 figures were used in all the calculations, because that year was the last year where comparative figures were available from all the regions.

3.2 Current exchange rates and PPP-levels

The Baltic countries as well as North-West Russia have just recently discarded communism/socialism and are on their way towards market economy. At this stage of their development it is somewhat misleading to rely on statistics calculated purely by using current exchange rates. Similarly, the market volatility may have distorted the comparativity of national statistics even amongst the EU countries. To correct this possible misrepresentation of the actual situation, the results of both the EW-model and the Meronen-model have been recalculated by using purchasing power parity (PPP) - corrected levels. The figures have been obtained from the IMF's World Development

Report. The Russian GNP/GDP levels are from Goskomstat Rossii Nacionalinye Sceta, and have been transformed to PPP-corrected levels by applying the conversion rate found from the IMF report. The GDP for Poland has been estimated using the same conversion rate as with the Polish GNP figures.

3.3 Russia - A world apart?

Russian statistics are a troublesome issue. Regional data is hard to obtain and is often erratic or misleading. Goskomstat, the Russian central statistical office, produces nowadays some key figures for the major Oblasts, or administrative regions, but most of the information is only available nationwide. The variables used in the two models for potential trade in this study, GNP/GDP figures, population and distance, were obtained from Goskomstat, but the actual trade figures had to be estimated. Goskomstat publishes export and import figures vis-a-vis other countries only on a national level, and it is thus hard to say e.g. what is St.Petersburg's share of total Russian imports from Denmark.

However, some data is available indicating the region's share of total Russian foreign trade. Assuming that the North-Western regions posses a similar geographical structure in their foreign trade as the whole of Russia, it is possible to estimate the amount and geographical distribution of the said regions' foreign trade by multiplying their share of the Russian total by the total amount of Russian trade with a particular country. Numerically, if for example Russia imports 404 million dollars' worth of goods from Denmark, and if St.Petersburg's share of total Russian foreign trade is 4 percent, then logically St.Petersburg imports 16.17 million dollars worth of goods from Denmark.

The problem with this method is obvious and potentially distorts the results. It is not at all certain that the North-Western regions are oriented in the similar way in their foreign trade as the rest of Russia. It could be or is almost certain, that the Central and Eastern regions of Russia that form part of the national average are distorting the geographical distribution of the trade structure towards the regions they are oriented in their exports, e.g. gas and oil to Western Europe. Similarly, it is more than likely that St.Petersburg and the adjoining Oblasts are naturally more inclined to trade with the nearby Baltic Sea countries (as the trade potential model suggests) than countries farther away, and thus it is possible that the estimated actual trade figures could be slightly undervalued.

Another method to obtain a reasonable estimate of the regions' share in Russian total is to use some other indicative figure of the region's importance in the Russian economy, like the share of total production or tax receipts. Using this method produces markedly larger percentage shares for the North-Western region than using merely published trade figures. It is thus reasonable to use both methods simultaneously to obtain a "theoretical" upper and lower bounds for the regions' actual trade with the countries specified here.

The actual export figures from the EU -countries to the Baltic countries and to the whole of Russia are reproduced in the Table 2 below. The estimates for the Russian subregions

are taken as the average of OECD figures and Goskomsstat's own figures. Two different versions for the North-Western regions' share of the Russian total foreign trade are used. The first one gives the share using actual import figures from the years 1992 and 1993 as indicated by the Goskomsstat, and assuming that the same import structure applies in the future years as well. The second method uses percentage shares of tax receipts to give an estimate of the region's share of total foreign trade. As can be seen, there is on average a five-fold difference between the two methods, the actual figure most likely falling somewhere in between.

Table 2: The values of exports

In Mio ECUs	EXPORTS FROM:				
	Finland	Denmark	Germany	Sweden	Source
TO:					
World	30846.88	36041.95	399905.96	59110.4	OECD
Estonia	716.89	47.11	189.51	181.01	OECD
Latvia	168.62	45.79	303.58	140.00	OECD
Lithuania	87.65	98.18	393.67	90.47	OECD
Poland	386.91	485.64	6589.49	708.49	OECD
Russia	1463.67	439.76	5373.95	509.35	OECD
Russia	1558.02	368.70	4989.31	417.56	Goskomstat
Average=	1510.84	404.23	5181.63	463.46	=Average
TO the Russian subregions:					Implied Percentages
Shares by import figures:	12.09	3.23	41.45	3.71	0.80
St.Petersburg	3.78	1.01	12.95	1.16	0.25
Leningrad Oblast	3.02	0.81	10.36	0.93	0.20
Novgorod Pskov	3.02	0.81	10.36	0.93	0.20
Shares by tax receipts:[1]	60.43	16.17	207.27	18.54	4.00
St.Petersburg	22.66	6.06	77.72	6.95	1.50
Leningrad Oblast	15.11	4.04	51.82	4.63	1.00
Novgorod Pskov	15.11	4.04	51.82	4.63	1.00

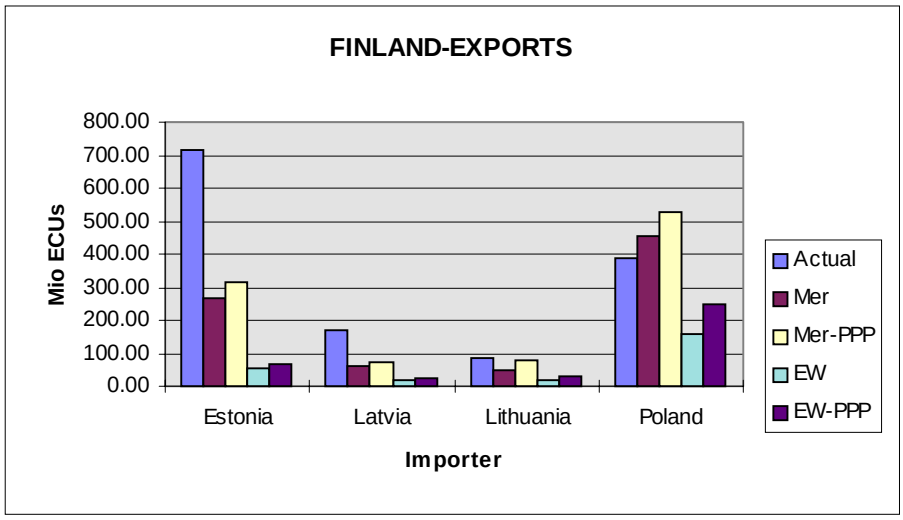
[1] The figures for tax receipts indicate required tax receipts. However, even with some arrears in collection, their implication to the region's share of the nation's total economic activity should not diminish.

4 THE RESULTS

The two models used in this study give slightly different results of the potential trade around the Baltic Rim. The numerical values of the results are shown in the appendix 2, while the graphical representations are expressed here. The current and PPP-corrected values are shown with both the Erkkilä-Widgren and Meronen-model. The comparison between the actual trade and potential trade for the Russian subregions is dealt with separately. In case of Russia, two different values for the actual trade are included, as indicated in the previous section. Country-by-country comparisons are as follows:

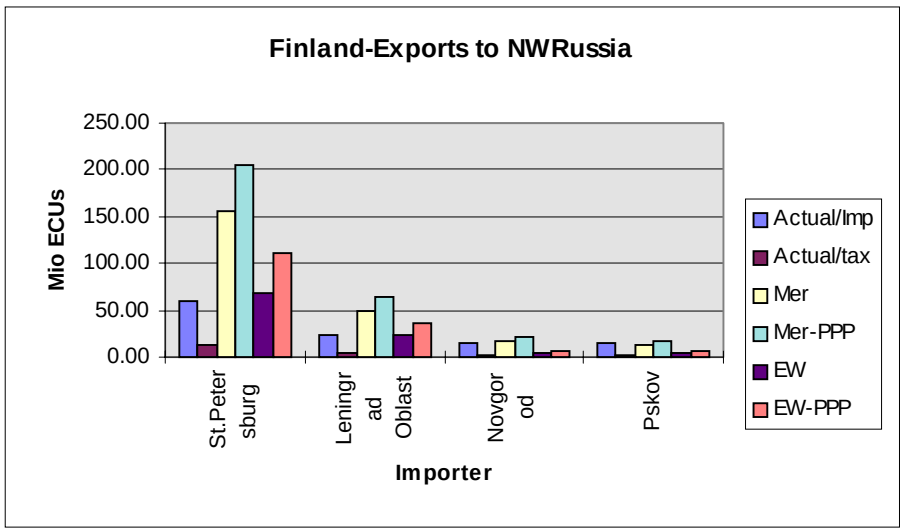
4.1 FINLAND

Figure 1. Finland's trade potential to Baltics and Poland



The figure above shows both the actual trade values from the year 1995, as well as the potential trade values using the current and PPP-corrected values by both the Meronen- and EW-model. As indicated by the previous studies, Finland continues to surpass its long-run trade potential with Estonia. The actual trade exceeds its potential by almost three-fold according to the Meronen-model, and almost 10-fold according to EW-model. PPP-estimates for all countries are a bit higher than the estimates using current values, as was expected. Latvia and Lithuania are more in line with their potential, although even their actual trade slightly exceeds their potential. The Meronen-model shows some unused trade potential with Poland, although the EW-model does not support this finding. Nevertheless, Poland seems to be the country with the most export potential from Finland.

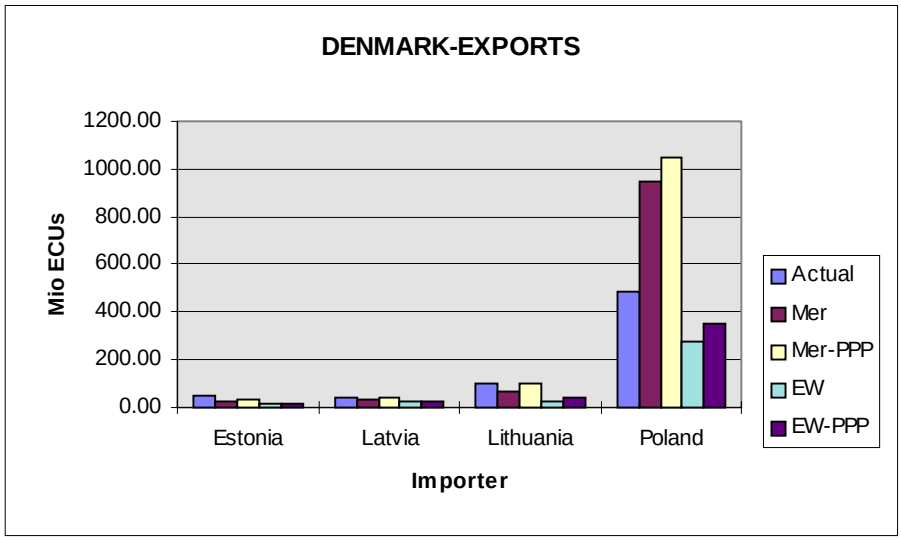
Figure 2. Finland's trade potential to North-West Russia



Finland's exports to North-West Russia are dominated by St.Petersburg, as would be expected. In Russia's case it is more enlightning to use both the imports share and tax receipts methods to indicate the value of actual trade, as outlined in the previous chapter. The practice of using two different estimates of the actual trade figures distorts the picture only slightly, as both the Meronen-model and the EW-model show some unused export potential. The minimum export potential by using imports-induced actual trade figures and current-value EW-model is around 50 mio ECUs, or around twice its actual value. The maximum amount by using actual trade figures calculated from the share of tax receipts and the PPP-version of Meronen-model is around 190 mio ECUs, or around 17 times the actual value. The other regions show similar structures, the trade potential exceeding the actual trade in Leningrad Oblast, and being roughly in line with the actual trade in the regions of Novgorod and Pskov.

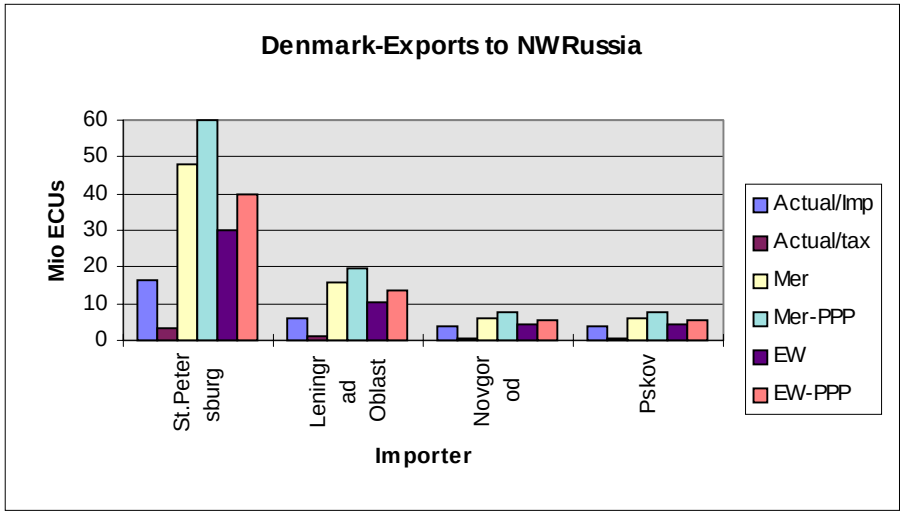
4.2 DENMARK

Figure 3. Denmark's trade potential to Baltics and Poland



In Denmark's case the potential trade and the actual trade with the Baltics seems to be roughly at its correct level. With Poland the actual trade is slightly higher than potential trade suggested by the EW-model, but significantly lower than the potential trade suggested by the Meronen-model. The maximum trade potential amounts to over 500 mio ECUs, using the PPP-corrected values.

Figure 4. Denmark's trade potential to North-West Russia

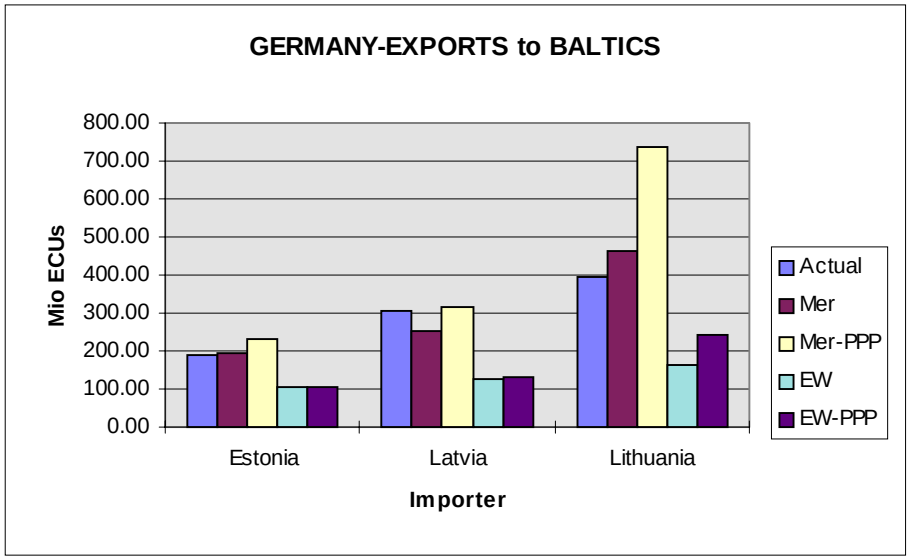


All the estimates for Denmark show unused export potential to North-West Russia. St.Petersburg again dominates, the minimum potential increase being around 15 mio

ECUs, and the maximum around 55 mio ECUs with Meronen PPP-values and tax-receipts induced actual trade figures. The potential increase is slightly smaller with the Leningrad Oblast, and shrinks to almost negligible in case of Novgorod and Pskov. However, the total conclusion suggests that North-Western Russia is still somewhat neglected destination for the Danish exporters.

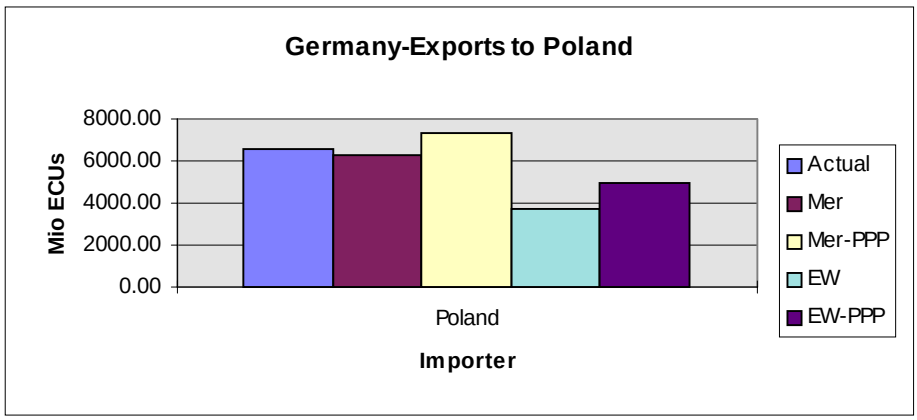
4.3 GERMANY

Figure 5. Germany's trade potential to Baltics



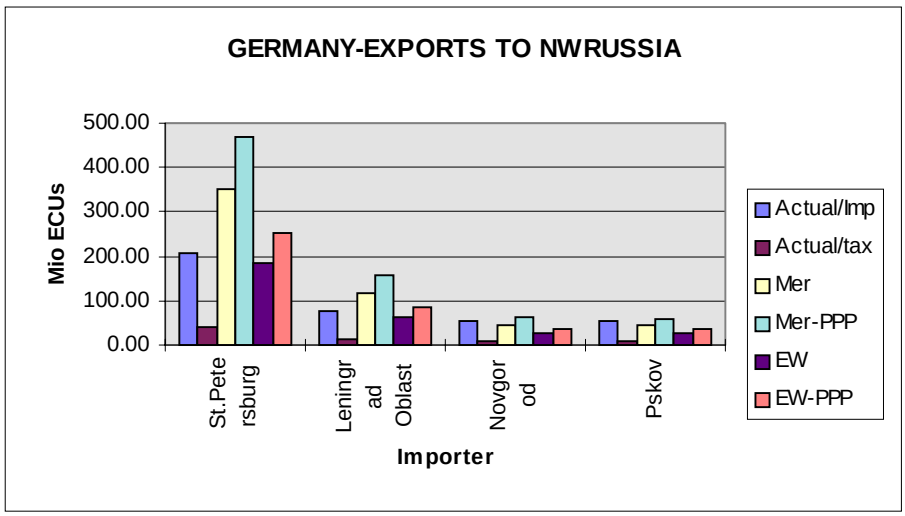
Germany's trade with the Baltic nations reveals that Lithuania is by far its most important trading partner, both in actual trade figures and with trade potential. The EW-model suggests consistently that the potential is roughly half of the actual value, but the Meronen-model gives on par estimates for Estonia and Latvia, and a possible maximum increase of 340 mio ECUs for Lithuania. The hypotheses is greatly affected by using the PPP-corrected values.

Figure 6. Germany's trade potential to Poland



Germany's exports to Poland are shown separately due to their high level. Nevertheless, the export potential again is roughly in line with values given by the Meronen-model, although the EW-model does not show any export potential at all. The PPP-maximum potential is close to 900 mio ECUs, or around 14% of the actual trade.

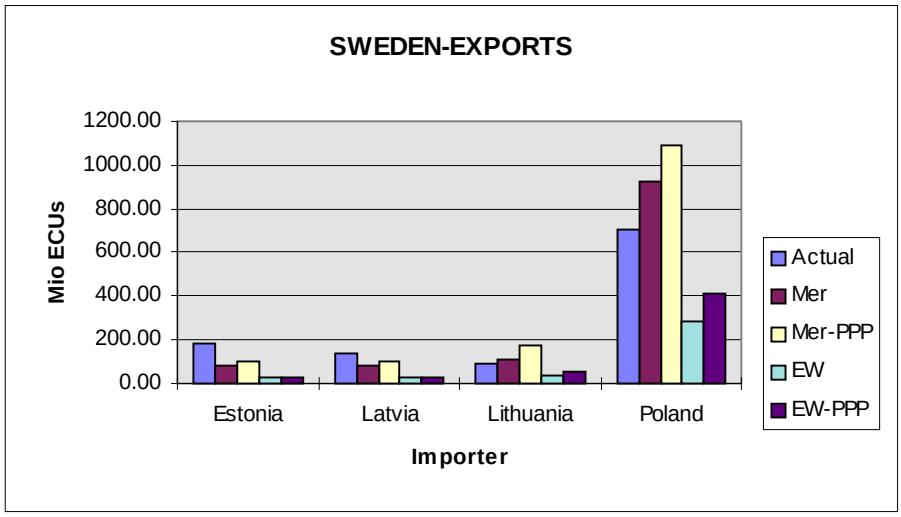
Figure 7. Germany's trade potential to North-West Russia



Germany's exports to North-West Russia have by all measures not yet reached their potential. Novgorod and Pskov show a five-fold export potential if compared to actual tax-receipts induced values of 10 mio ECUs, but if imports-deduced actual values are used there is not export potential. Leningrad Oblast and especially St. Petersburg are potentially significant export targets, the maximum potential reaching 400 mio ECUs.

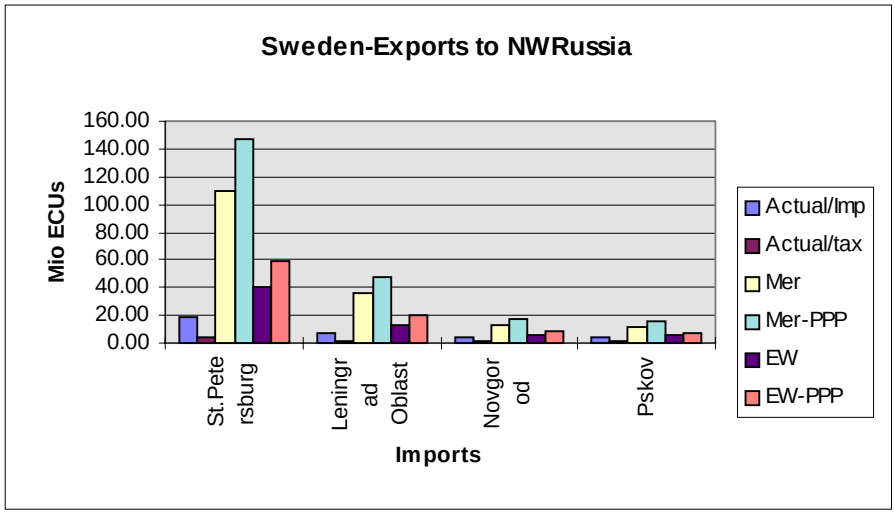
4.4 SWEDEN

Figure 8. Sweden's trade potential to Baltics and Poland



The Swedes resemble Finns in that their actual trade with Estonia and Latvia exceeds their export potential. Lithuania is different, the Meronen-model suggests a maximum of 80 mio ECUs of unused export capacity, whereas the EW-model suggest that the actual exports of 90 mio ECUs are already three times greater than the basic EW-approach of 30 mio ECUs. Poland is again on a different scale, the actual exports reach 700 mio ECUs, and maximum amount of unused export potential is roughly 380 mio ECUs.

Figure 9. Sweden's trade potential to North-West Russia



Sweden's trade with North-West Russia is hugely under its long-run export potential, percentwise. All Russian subregions show clear potential for increased, the prime

specimen being St.Petersburg with its maximum increase of 140 mio ECUs, or 39 times the current level when tax receipts are used, or 8 times the current level if imports-induced actual figures and Meronen-PPP figures are used. Nevertheless, despite the regime used there definitely exists trade potential for Sweden in the Russian North-Western regions.

5 CONCLUSIONS

The obtained results generally reflect the degree of development and openness of the studied countries around the Baltic Rim. Although the Baltics still show unused trade potential, it is Poland and especially North-Western Russia where the largest percentage increases in exports are to be found. Poland is one of the truly emerging markets, and its large size makes the percentage increases loom large even by absolute amounts. North-Western Russia has been somewhat unchartered territory outside the core St.Petersburg region, and the evidence in this study shows that it has not yet developed its full potential as an export destination for the EU countries.

This study confirms the already suggested hypotheses of the importance of distance in the geographical distribution of trade. It could be that Finland's predominance in exports in the neighbouring regions is mainly based on its geographical proximity. The same argument goes for Poland in the case of Germany, together with their combined size and economic performance. These are all natural results and correspond to the expectations set by the used gravity models. The main difference between this study and the previous studies is the use of a typified model and newer data to forecast potential trade. The Meronen-model shows consistently larger values compared to the EW-type model, and could thus perhaps be preferred by the exporters.

In a broader context, and especially if we are inclined to rely more on the results set by the Meronen-model, the striking feature and implied conclusion is that the exporting countries should take into closer consideration the North-Western regions of Russia. The potential new concept of Northern Dimension is a clear example of the usefulness of the results found in this study. North-Western Russia should, both in geographical, economical and political terms, be accounted as an integral and natural part of the total Baltic Rim region.

The above hypotheses is based on a number of assumptions, which should be taken notice of when drawing conclusions. The reliability of the Russian statistical system is an obvious example of the difficulties faced in this study. Other key issue is the use of PPP-corrected values when calculating the GDPs in the respective countries, as well as the possible volatility of exchange rates when converting into a common currency. These matters aside, although faced in every econometric study, one should be able to make a conclusion of the region's importance and potential for increased trade.

The final implication of the results of this study is its relevance to the political situation around the Baltic Rim. Although not directly related, the potential for increased trade could well be the boosting factor for closer political co-operation between the countries in the region. The proposed new concept of Northern Dimension could possibly bring more political stability and future possibilities to the Baltic Rim area. And that, more likely than not, would increase the trade potential even higher.

APPENDIX 1: AN ABBREVIATED LIST OF USED VARIABLES

	FINLAND	**SWEDEN**	**DENMARK**	**GERMANY**
	FimBio	SkrBio	DkrBio	DmBio
GDP 1995	545.73	1645	970.8	3495.2
	$Bio	$Bio	$Bio	$Bio
in Dollars $	126	229.1	172.9	2414
PPP conv.rates	6.23	10.1	8.65	2.07
GDP 1995/PPP	87.60	162.87	112.23	1688.50
GNP 1995	104.9	209	155.4	2253
GNP 1995/PPP	90.6	163.1	110.4	1644
	Mio	Mio	Mio	Mio
Population 1995	5.1	8.8	5.2	81.9

	ESTONIA	**LATVIA**	**LITHUANIA**	**POLAND**
	$Bio	$Bio	$Bio	$Bio
GNP 1995	4.29	5.7	7	107.7
GNP 1995/PPP	6.3	8.4	15.2	208.4
GDP 1995	3.6	4.4	5.96	117
GDP 1995/PPP	6.2	8.3	14.9	200
	Mio	Mio	Mio	Mio
Population 1995	1.5	2.5	3.7	38.6

	St.PETERSBURG	**LENINGRAD OBLAST**	**NOVGOROD**	**PSKOV**
	Bio rubles	Bio rubles	Bio rubles	Bio rubles
GDP/GNP 1995	47011.60	12507.10	4407.90	4618.30
in Dollars $ 1995	$Bio 10.32	$Bio 2.75	$Bio 0.97	$Bio 1.01
GDP/GNP with PPP	20.65	5.49	1.94	2.03
	Mio	Mio	Mio	Mio
Population 1995	4.8	1.674	0.745	0.835

APPENDIX 2: ACTUAL EXPORTS vs. POTENTIAL TRADE

	ACTUAL EXPORTS		MERONEN-Model		WIDGREN-ERKKILÄ	
FINLAND	In 1000$s	In Mio ECUs	In Mio ECUs			
			"Current"	"PPP"	"Current"	"PPP"
Estonia	939125.80	716.89	269.38	314.53	53.12	65.37
Latvia	220893.40	168.62	59.27	74.57	17.37	21.50
Lithuania	114825.60	87.65	51.28	81.27	17.96	31.86
Poland	506853.10	386.91	455.63	528.75	157.01	250.03
St.Petersburg	79168.18	60.43	155.77	205.23	67.98	111.67
Leningrad Oblast	29688.07	22.66	49.46	64.90	22.55	37.08
Novgorod	19792.04	15.11	16.05	21.09	3.80	6.24
Pskov	19792.04	15.11	13.42	17.71	3.66	6.01
DENMARK	In 1000$s	In Mio ECUs	In Mio ECUs			
			"Current"	"PPP"	"Current"	"PPP"
Estonia	61707.90	47.11	27.49	30.37	17.24	17.13
Latvia	59982.90	45.79	35.79	42.61	21.43	21.41
Lithuania	128614.70	98.18	69.60	104.39	27.86	39.89
Poland	636182.90	485.64	952.02	1045.53	275.17	353.68
St.Petersburg	21181.62	16.17	47.94	59.77	30.16	39.99
Leningrad Oblast	7943.11	6.06	16.01	19.88	10.15	13.47
Novgorod	5295.41	4.04	6.26	7.78	4.14	5.49
Pskov	5295.41	4.04	6.01	7.51	4.15	5.50
GERMANY	In 1000$s	In Mio ECUs	In Mio ECUs			
			"Current"	"PPP"	"Current"	"PPP"
Estonia	248264.60	189.51	195.34	229.19	103.95	106.34
Latvia	397694.70	303.58	250.94	317.24	128.69	132.42
Lithuania	515701.90	393.67	461.37	734.81	164.67	242.84
Poland	8632237.10	6589.49	6251.97	7290.55	3727.24	4934.01
St.Petersburg	271517.56	207.27	352.98	467.32	183.65	250.80
Leningrad Oblast	101819.08	77.72	118.08	155.68	61.82	84.52
Novgorod	67879.39	51.82	46.51	61.42	25.29	34.54
Pskov	67879.39	51.82	44.97	59.64	25.37	34.64
SWEDEN	In 1000$s	In Mio ECUs	In Mio ECUs			
			"Current"	"PPP"	"Current"	"PPP"
Estonia	237117.90	181.01	84.23	100.12	24.92	27.47
Latvia	183406.00	140.00	79.37	101.65	28.27	31.33
Lithuania	118514.90	90.47	105.90	170.87	33.03	52.47
Poland	928125.20	708.49	923.71	1091.24	287.27	409.67
St.Petersburg	24285.07	18.54	109.43	146.77	40.11	59.01
Leningrad Oblast	9106.90	6.95	36.04	48.14	13.44	19.80
Novgorod	6071.27	4.63	13.34	17.85	5.40	7.95
Pskov	6071.27	4.63	12.25	16.45	5.34	7.86

REFERENCES

Baldwin, Richard E.: Towards an Integrated Europe. CEPR 1994.

Baldwin, Richard E.:The potential for trade between the countries of EFTA and Central and Eastern Europe. EFTA Occasional Paper No.44, 1993.

Central statistical office of Poland: Demographic Yearbook, 1997.

EIU: Country Report: Estonia. The Economist Intelligence Unit, 1998.

EIU: Country Report: Latvia. The Economist Intelligence Unit, 1998.

EIU: Country Report: Lithuania. The Economist Intelligence Unit, 1998.

EIU: Country Report: Poland. The Economist Intelligence Unit, 1998.

Erkkilä, Mika and Widgren, Mika: Baltian ja EU-maiden kauppa: todellisuuden ja mahdollisuuksien vertailua. Kansantaloudellinen aikakauskirja 91, 1995.

Erkkilä, Mika and Widgren, Mika: Suomen ja Baltian kaupan potentiaali ja suhteellinen etu. ETLA B101, 1994.

Eurostat: Internal and external trade of the EU. 1996.

Goskomstat Rossii: Rossijskij statiticeskij ezegodnik 1997.

Goskomstat Rossii: Sankt-Petersburgij komitet, gosudarstvennoi statistiki. 1996.

Goskomstat Rossii: Sankt Petersburg 1996 , kratkij statisticetskij sbolnik. Sankt-Petersburgij komitet, gosudarstvennoi statistiki, 1997.

Hamilton, C. and Winters, A.: Opening Up International Trade with Eastern Europe. Economic Policy 14, 77-116, 1992.

Hazley, Colin and Hirvensalo, Inkeri: Barriers to foreign direct investment in the Baltic Sea region. ETLA Discussion Papers No. 628, 1998.

Hernesniemi, Hannu: Barriers to economic cooperation of Baltic Rim countries. ETLA Discussion Papers 555, 1996.

IMF: International Financial Statistics Yearbook. International Monetary Fund, 1996.

Kaitila, Ville and Widgren, Mika: Baltian maiden EU-jäsenyys ja Suomi. ETLA B139, 1998.

Kala, Ants and Rajasalu, Teet: Economic integration and subregional cooperation in the Baltic states. Estonian Academy of Sciences, Discussion Paper No.2, 1995.

Merenkulkulaitoksen tilastotoimisto: Keskimäärisiä etäisyyksiä meritse Suomesta eri maihin.

Meronen, Juha: Gravitaatiomalli kansainvälisen kaupan tutkimuksessa - Baltia avautuu länteen. Kansantaloustieteen pro gradu-tutkielma, Helsingin yliopisto,1997.

Nurmio, Aarne: Mahdollisuuksien aika. SITRA 179, 1998.

OECD: Short-term economic indicators. Transition economies, supplement 4, 1997.

OECD: Main Economic Indicators, December 1996.

Okko, Paavo; Miettilä, Asko and Hyvärinen, Jari: Globalisaatio ja aluerakenteen muutos. SITRA 177, 1998.

Statistisches Jahrbuch fur das Ausland, 1997.

Statistisches Jahrbuch fur die Bundesrepublic Deutschland, 1997.

Suomen ulkomaankauppaliitto: Pietari ja Leningradin alue. Muuttuva Itä-Eurooppa, Uudistuvat markkinat, 1997.

Sveriges Kungliga Sjökarteverket: Map 2, 1994.

Tilastokeskus: Pietari numeroina. Suomen lähialueet 2, 1997.

Wang, Z. and Winters, A.: The Trading Potential of Eastern Europe. CEPR Discussion Papers No: 610, 1991.
Working Centre for Economic Reform: Russian Economic Trends No. 2, 1997.
World Bank: World Development Report 1997: The State in a changing world. World Bank, 1997.