ETLA
ELINKEINOELÄMÄN TUTKIMUSLAITOS
THE RESEARCH INSTITUTE OF THE FINNISH ECONOMY
Lönnrotinkatu 4 B 00120 Helsinki Finland Tel. 358-9-609 900
Telefax 358-9-601 753 World Wide Web: http://www.etla.fi/

Keskusteluaiheita – Discussion papers

No. 1079

Markku Kotilainen

DETERMINANTS OF FINNISH-RUSSIAN ECONOMIC RELATIONS

The research has been financed by the Academy of Finland in the framework of the *Russia in Flux* research programme. I thank Kari Alho and other members of the research team for comments and John Rogers for checking the English of the paper.

ISSN 0781-6847 22.03.2007

KOTILAINEN, Markku, **DETERMINANTS OF FINNISH-RUSSIAN ECONOMIC RELATIONS.** Helsinki: ETLA. Elinkeinoelämän Tutkimuslaitos, The Research Institute of the Finnish Economy, 2007, 39 p. (Keskusteluaiheita, Discussion Papers, ISSN, 0781-6847; No. 1079).

ABSTRACT: The broad context of the study is the main determinants of Finnish-Russian economic relations during the post-Soviet era and the prospects for the future. The study explores the determination of trade as well as foreign direct investment (FDI). The main emphasis is on the structure and development of foreign trade. When measured by the Grubel-Lloyd index of intra-industry trade (SITC3, 4-digit), it is seen that less than 3 per cent of Finnish-Russian trade occurred inside the same industry in 2004. This percentage has even declined slightly during the period studied. In Finland's trade with Germany, the corresponding figure was 31 per cent and in trade with Sweden 47 per cent in 2004. When assessing the development of Finnish imports from Russia, we notice that the dominance of changes in oil prices and of imports of big companies does not allow sensible econometric explanations. In the case of Finnish exports to Russia we find econometric evidence on volumes and values, on aggregate and sectoral, and on annual and quarterly exports. We present several kinds of classifications of FDI, and ask which factors favour exports and which FDI. We also classify the investments of Finnish firms in Russia according to these criteria – in a very illustrative and preliminary way. Exports as well as FDI have profited from the high market growth and rapid structural change of the Russian economy.

Key words: Finland, Russia, economic relations, foreign trade, foreign direct investment (FDI)

JEL Codes: F14, F21, F23

KOTILAINEN, Markku, **DETERMINANTS OF FINNISH-RUSSIAN ECONOMIC RELATIONS (SUOMEN JA VENÄJÄN TALOUSSUHTEIDEN MÄÄRÄYTYMINEN).** Elinkeinoelämän Tutkimuslaitos, The Research Institute of the Finnish Economy, 2007, 39 s. (Keskusteluaiheita, Discussion Papers, ISSN, 0781-6847; No. 1079).

TIIVISTELMÄ: Tutkimuksen kohde on Suomen ja Venäjän taloussuhteet Neuvostoliiton romahduksen jälkeen ja niiden tulevaisuudennäkymät. Tutkimus tarkastelee sekä kaupan että suorien sijoitusten määräytymistä. Pääpaino on ulkomaankaupan rakenteessa ja kehityksessä. Ristikkäiskauppaa mittaavan ns. Grubel-Lloyd -indeksin mukaan alle 3 prosenttia Suomen ja Venäjän välisestä ulkomaankaupasta tapahtui saman hyödykeryhmän sisällä vuonna 2004 (SITC3, 4 numeron taso). Tämä osuus on laskenut hieman tutkimusajanjaksona. Suomen ulkomaankaupassa Saksan kanssa vastaava osuus oli 31 prosenttia ja Ruotsin kanssa 47 prosenttia. Suomen tuonnissa Venäjältä öljyn hintojen muutokset ja suurten yritysten dominoiva asema eivät anna mahdollisuuksia järkevään ekonometriseen tutkimukseen kauppaa määräävistä tekijöistä. Tutkittaessa Suomen vientiä Venäjälle löydetään ekonometrian avulla selittäjiä kokonais- ja hyödykeryhmittäisen viennin määrän ja arvon määräytymiselle sekä vuosi- että neljännesvuositasolla. Tutkimuksessa esitetään useita suorien sijoitusten luokituksia ja kysytään, mitkä tekijät puoltavat vientiä, mitkä suoria sijoituksia. Suomalaisten yritysten sijoituksia Venäjälle sijoitetaan alustavasti esitettyihin luokkiin. Sekä vienti että suorat sijoitukset ovat hyötyneet Venäjän talouden nopeasta kasvusta ja rakenteellisesta muutoksesta.

Asiasanat: Suomi, Venäjä, taloussuhteet, ulkomaankauppa, suorat sijoitukset

JEL-koodit: F14, F21, F23

Contents

1 Introduction

During the Soviet era economic ties between Finland and Russia were based on centrally controlled bilateral trade. The level of trade was heavily dependent on the price of crude oil and on the exchange rate of the dollar, which was used as the measure of value. They affected crucially the value of Finnish imports from the Soviet Union, which in turn were the main determinant for Finnish exports there.

The high oil prices in the mid 70s and early 1980s increased the share of the Soviet Union in Finnish imports as well as in exports. In 1982 the export share was 27 per cent and the import share 25 per cent. The Soviet Union remained Finland's biggest export partner until 1989, when Sweden replaced it. In imports the Soviet Union had lost its first place position already some years earlier due to the 1986 collapse in oil prices.[1]

The structure of trade was determined by comparative advantage. The bulk of Soviet exports to Finland consisted of oil, gas and other raw materials. Machinery and equipment exports were a rather small fraction of the whole. This item included among other things cars and machine-tools. Especially the Soviet side expected this export to widen, but this never happened. Finns travelled to some extent to the Soviet Union, mainly to big cities like Leningrad, Moscow and Tallinn. (About the Finnish-Soviet trade, see Alho et al., 1986.)

Finnish firms exported metal products, machines, ships, electronics, foodstuffs as well as textile and clothing. Finnish construction firms had several big construction projects in the Soviet Union (in Russia as well as in Estonia). Soviet construction projects in Finland were confined to some works in the construction of natural gas pipelines. Tourism of Soviet citizens was minimal. It consisted mainly of visits of official delegations and of a strictly limited number of specialists and invited guests.

The bilateral trading system started to show severe signs of malfunctioning already during the last years of the Soviet era, especially after the collapse of oil prices in 1986. The breakdown of the Soviet Union in 1990 meant an end of the centrally agreed bilateral trade relations.

The first years of the post-Soviet era were years of turmoil and adjustment in Russia. The same applied to Finnish-Russian economic relations. The share of the Soviet Union in Finnish exports had been on average almost 20 per cent since the Second World War. In 1992 the corresponding share of Russia had collapsed to about 3 per cent. Many previous importing firms in Russia had disappeared or had been reorganized. The purchasing power of Russian consumers also collapsed. Russian oil exports were at a low level in volume as well as in value (price) terms. (See Kotilainen et al., 2003.)

Gradually, the level of trade has increased. The price of oil has increased and the Russian economy has been stabilizing. In 1998 there was, however, a drawback in trade due to the Russian currency crisis (devaluation), but after that trade has been steadily increasing. In

[1] Sometimes special measures were used to keep the level of exports high. These measures include use of interest bearing accounts (to smoothen the adjustment in exports), trading of crude oil and refining the Soviet oil to the Western market. The two last-mentioned measures allowed a higher level of exports than otherwise would have been possible (not just smoothening).

2005 Russia already regained its position as Finland's biggest export partner with a share of 11 per cent.

The broad context of the study is to examine the main determinants of Finnish-Russian economic relations during the post-Soviet era and the prospects for the future. The study explores the determination of trade as well as foreign direct investment (FDI). The main emphasis is on the level and structure of foreign trade.

The questions studied include:

- Has the composition of trade changed, and if so in which direction and why?
- What determines the level and changes of the Finnish exports to Russia? This concerns the aggregate as well as sector-wise exports.
- Are exports and foreign direct investment substitutes or complements? How does it differ between sectors?
- What can we say about the level and structure of trade and other forms of economic cooperation in the future?

The paper starts in chapter 2 with a description of how Finnish-Russian economic relations have changed since the early 1990s. The chapter describes the aggregate and sectoral development of exports as well as that of foreign direct investment. In chapter 3 we study the changes in the composition of trade as well as the determinants of foreign trade empirically. We present calculations on the similarity of trade and on comparative advantage. We build econometric equations for aggregate exports as well as for exports of different product groups. In explaining the development of FDI we mainly concentrate on qualitative reasoning. Chapter 4 concludes the findings of the paper.

2 Finnish-Russian Economic Relations since the Collapse of the Soviet Union

Imports

The value of Finland's imports from Russia was in 2005 almost four times that in 1994. The average annual growth rate was 14 per cent. The increase in oil imports from Russia was 25 per cent p.a. on average. This was mainly due to the increase in prices. Wood imports increased also fast, by 13 per cent on average. These two items explain the major part of the increase in imports. They counted 63 per cent of Finnish imports from Russia in 2005. Imports of organic chemicals have also been growing by 22 per cent p.a. on average.

Finnish imports from Russia have been dominated by oil, natural gas and other raw materials. The share of oil and gas fluctuates with oil prices. Due to the recent drastic increase in oil prices, the share of oil and its products has increased to 53 per cent in 2005 from 36 per cent in 1992. (Table 1) This has partly also reflected the increase in the volume of oil imports from Russia. While the volume of natural gas has remained almost stable, its share has been declining.

Table 1 Structure of Finnish Imports from Russia, % shares by SITC commodity groups

Product group	1992	1994	1996	1998	1999	2000	2001	2002	2003	2004	2005
Total, mill. USD	1 398	1 968	2 137	2 092	2 261	3 186	3 156	3 369	4917	6591	8150
Of which , %											
33 Petroleum and prod.	36.0	33.0	30.2	27.3	38.0	46.7	41.7	42.3	41.8	46.2	53.3
24 Wood and cork	10.3	11.2	13.3	17.3	16.5	10.5	12.8	12.9	11.0	9.9	9.3
34 Gas, natural and manufactured	19.1	15.2	17.7	18.7	12.1	13.3	14.8	12.6	12.2	9.4	8.8
51 Organic chemicals	1.7	4.3	2.2	3.4	3.6	5.1	5.5	5.8	5.3	5.2	5.7
35 Electric current	8.2	5.8	5.3	5.4	4.7	2.1	3.7	4.4	6.2	4.4	3.5
28 Metalliferous ores and metal scrap	4.4	4.8	6.7	9.5	7.0	5.5	4.0	4.0	5.6	6.8	5.2
68 Non-ferrous metals	2.3	6.4	5.5	4.2	3.3	2.9	2.9	3.7	4.9	5.3	4.9
67 Iron and steel	2.0	4.7	4.5	1.8	3.1	3.2	2.9	3.0	2.6	2.5	1.5
32 Coal, coke and briquettes	3.7	3.6	3.1	1.4	2.0	2.5	3.8	3.0	4.5	4.8	2.2
52 Inorganic chemicals	1.9	2.9	3.0	2.0	1.2	1.3	1.3	1.0	1.3	1.3	1.2

Sources: OECD and Finnish Board of Customs.

Exports

In 2005 the value of Finnish exports to Russia was 4.3 times that in 1994 in current euro terms. On average the growth was over 10 per cent per year. The fastest growth was in the exports of telecommunication equipment, the level of which was in 2005 14 times that in 1994, the average annual growth being 21 per cent. This item includes mobile phones and their networks. Also in other electric machinery the growth rate has been high. In 2005 exports of this product group were 8 times that in 1994.

Paper and paper products exports in 2005 were 7 times and chemical products 9 times those in 1994. The corresponding average annual growth rates were 13 per cent and 16 per cent, respectively. In this group colour paints and medical products are important items.

Exports of food have been declining in 1994-2005 by about 10 per cent per year on average. The largest declines have been in coffee and vegetables, which were exported extensively through Finland during the post-Soviet collapse years. Meat exports have also been slightly declining due to Russian import restrictions. Exports of dairy products, mainly cheese, have been rather stable.

The structure of Finnish exports to Russia (in fixed prices) has changed more than that of imports. Immediately after the collapse of the Soviet Union, foodstuffs were an important product group. This reflected the problems in the domestic production as well as a shift in preferences towards foreign products. Gradually the share has declined together with the recovery in domestic production, in Russian as well as in foreign-owned firms. Import restrictions put on foodstuff imports, especially on meat products, have also affected food stuff exports negatively.

Liberalisation of imports of consumer and construction goods has led to an increase in exports of chemical products (especially painting colours), other construction material as well

as cars etc. Finnish construction companies have, however, started to produce paints and other construction material in Russia that inevitably has had some effect on exports, too.

Products which have increasing export shares also include paper, paperboard and paper products. Finnish firms have invested in several saw mills in Russia, but they have been very cautious in investing in pulp and paper factories. It is thus evident that paper exports will continue for some time. It is, however, just a matter of time when Finnish companies invest in pulp and after that in paper mills in Russia. Because these kinds of investments are very big in size, this requires improvements in the security of raw material supply, as well as an increase in the stability of the Russian political and legal system.

Table 2 Structure of Finnish Exports to Russia, % Shares by SITC Commodity Groups

Product group	Exports to Russia											Total exports in 2005, %
	1992	1994	1996	1998	1999	2000	2001	2002	2003	2004	2005	
0 Food and live animals	11.5	21.5	13.7	10.6	8.2	7.0	6.2	5.8	5.2	3.8	3.1	1.6
04 Careals and careal preparations	6.3	0.9	2.2	1.5	1.4	1.3	1.3	1.1	1.0	0.9	0.5	0.2
05 Vegetables and fruit	1.1	9.3	1.6	1.0	0.3	0.2	0.2	0.1	0.1	0.0	0.0	0.1
1 Beverages and tobacco	0.5	1.8	1.4	0.8	0.8	0.5	0.4	0.5	0.3	0.2	0.2	0.2
2 Crude materials except fuels	0.9	1.3	1.7	1.3	1.8	2.2	2.2	2.0	1.3	0.9	0.7	5.7
3 Mineral fuels, electricity	2.3	0.7	3.6	1.9	1.8	1.6	1.6	1.6	2.1	2.0	2.0	4.4
4 Animal and vegetable oils and fats	0.1	0.1	0.2	0.3	0.7	0.3	0.3	0.3	0.2	0.1	0.0	0.1
5 Chemicals and related products, n.e.s	8.0	5.9	9.9	10.1	11.5	12.1	11.4	14.7	14.9	13.3	12.1	7.6
6 Basic manufactures	14.0	18.3	22.7	22.0	23.2	22.4	21.9	20.1	18.4	17.3	13.9	30.0
64 Paper, paperboard, and articles thereof	2.9	3.6	8.5	7.0	9.3	9.1	9.2	8.2	7.6	6.9	5.8	13.9
69 Manufactures of metals, n.e.s	4.6	5.1	4.7	4.7	3.7	3.1	2.9	3.2	2.8	2.4	2.0	1.6
7 Machinery, transport equipment	43.6	31.5	29.9	36.6	38.4	40.0	42.8	43.7	47.9	54.3	61.6	44.0
72 Machinery for specialized industries	13.5	4.9	3.0	3.7	5.8	6.6	5.9	4.9	5.7	5.1	5.4	5.9
74 General industrial machinery, n.e.s	9.7	7.3	5.5	5.4	5.3	5.1	6.0	6.0	5.5	4.2	4.8	4.8
76 Telecommunications and sound recording equipment	2.5	5.3	5.4	6.7	6.6	11.1	12.8	14.9	20.3	24.7	28.8	18.8
77 Electric machinery, n.e.s and parts	3.2	4.3	6.3	9.6	10.3	8.9	8.0	8.6	9.3	8.8	8.2	5.0
78 Road vehicles	7.8	6.5	5.0	5.6	5.7	4.1	4.9	3.3	3.0	7.8	8.1	4.1
8 Miscellaneous manufactured articles	19.0	18.9	17.0	16.5	13.6	13.9	13.2	11.4	9.6	8.0	6.3	5.6
81 Prefabr. buildings; sanitary, lighting etc. fixtrs	6.2	3.7	1.8	1.2	1.2	1.3	1.4	1.5	1.3	1.1	0.9	0.8
89 Miscellaneous manufactured articles, n.e.s	2.8	4.7	8.0	9.7	7.2	7.1	6.5	5.6	4.6	3.5	2.5	1.6

Sources: OECD and Finnish Board of Customs.

An especially remarkable feature in the structure of Finnish exports to Russia is the huge increase in the share of telecommunication equipment, from 2.5 per cent in 1992 to about

29 per cent in 2005. This reflects the change in the structure of Finnish exports in general. The share of telecommunication equipment is, however, already much higher in exports to Russia than in exports in general, where the share was about 19 per cent in 2005. This phenomenon is partly explained by the fact that Nokia has no production in Russia. Elcoteq, a subcontractor for Nokia, has, however, established a factory in St Petersburg and it will be able to produce Nokia's phones there. The near geographic location between Finland and Russia points, however, to that at least some high-segment models will also in the future be exported directly from Finland. Because the company optimizes its production between factories at each point in time, there will obviously be fluctuations in Finnish telecom equipment exports to Russia.

One phenomenon in Finnish exports to Russia is large re-exports. This means that some of products are not produced in Finland but they are just delivered through the country to Russia. Re-exports differ from transit trade in the respect that they are compiled in the foreign trade statistics as Finnish imports when they come into the country and as exports when they leave the country. Statistics on transit trade are compiled in separate statistics.

Re-exports concern goods like cars, washing machines etc. that Russian customers buy from Finnish wholesale or retail companies, or from individual citizens. A part of the re-exports are just due to logistical practices. This is the case when mobile phones, produced for example in Hungary, are stored and repacked in Finland to be delivered to different destinations in Russia. There are no reliable statistics on re-exports, but they are estimated to account for about 20 per cent of total merchandise exports.[2] The value-added that remains in Finland varies between products. It is mainly created in the wholesale and retail trade, in harbours and in transport companies.

Re-exports are a problem with respect to the measurement of value-added contents created in Finland. In this study they are not, however, a major problem because we relate Finnish exports to Russia to Russian demand factors – not to Finnish supply. In addition to re-exports, also general globalisation creates problems in interpreting export statistics. The import content of, for example, the electronics industry is significant and varies over time.

Foreign Direct Investment

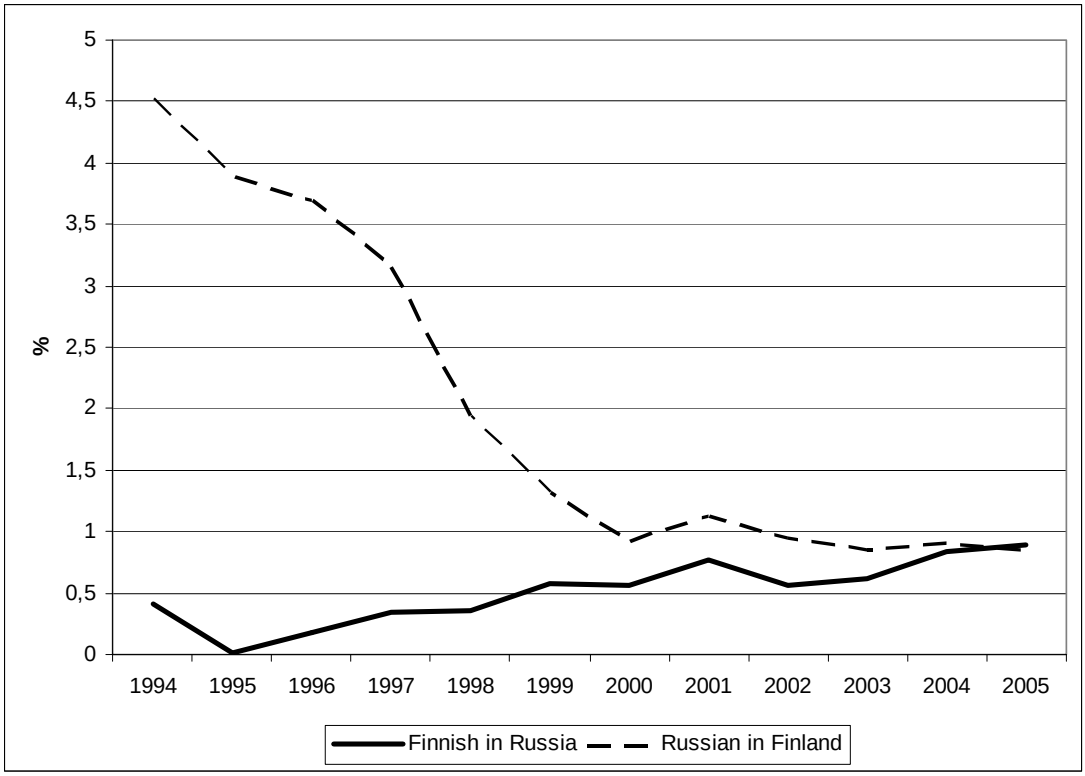
Finnish direct investment in Russia has been rather steadily increasing since the mid-1990s. At the end of 2005 the stock was 559 million euros, which is 13 times that in 1994. Also in relation to the total Finnish outward FDI stock there has been a clear increase (Figure 1). When compared to the size and geographical proximity of Russia, this FDI stock is, however, small. It is about the same as Finnish FDI in Estonia.

Russian direct investment in Finland, in turn, has been growing more slowly. In the end of 2005 it was 378 million euros, i.e. 1.5 times that in 1994. Russian investment in Finland is to a large extent from the Soviet time. These include the oil wholesale company Teboil and

[2] Ollus and Simola (2006) estimated preliminarily that the share of re-exports would be about 15 per cent. The Finnish Board of Customs (2007) estimated that the share was at least 21 per cent and perhaps even 25 per cent in 2005. The greatest uncertainty concerns re-exports of mobile phones.

the car whole sale company Delta-Auto (previously Konela)[3]. There are also newer Russian-owned companies in Finland. They are mainly small firms involved in trading between Finland and Russia.[4]

Figure 1 Finnish Direct Investment (FDI) in Russia as a Share of Total Finnish Outward FDI Stock and Russian Direct Investment in Finland as a Share of Total Inward FDI Stock in Finland, %



Source: Bank of Finland.

Finnish firms have direct investment in Russia in several sectors. According to Filippov et al. (2005) 75 Finnish companies had invested in Russia at the time of research.

Forest industry has until now been the largest investor when measured with capital (see Filippov et al., 2005, 234). All three big Finnish forest companies (UPM Kymmene, Stora Enso[5] and Metsäliitto Group) have invested in saw mills, which are rather capital intensive in the beginning. Investment in pulp and paper factories have been planned, but they wait for a safer environment in terms of factors influencing raw wood deliveries.

---

[3] Konela (Delta-Auto) used to sell Soviet cars (Lada, Moskwitch, Volga) in Finland. Nowadays, when sales of Russian cars in Finland are minimal, sales of Italian cars (Fiat, Alfa Romeo) have compensated for this loss in sales.

[4] In autumn 2006 Norilsk Nickel bought a stake in the OMG Group that produces metal-based special paints. The deal includes also mining activities, partly in Finland, partly in Australia. The value of the deal was 320 mill. euros. The company employs 215 employees. This deal increases drastically Russian FDI in Finland. Lukoil, in turn, bought the international Jet car service station chain. In Finland the company has 50 automatic gasoline stations.

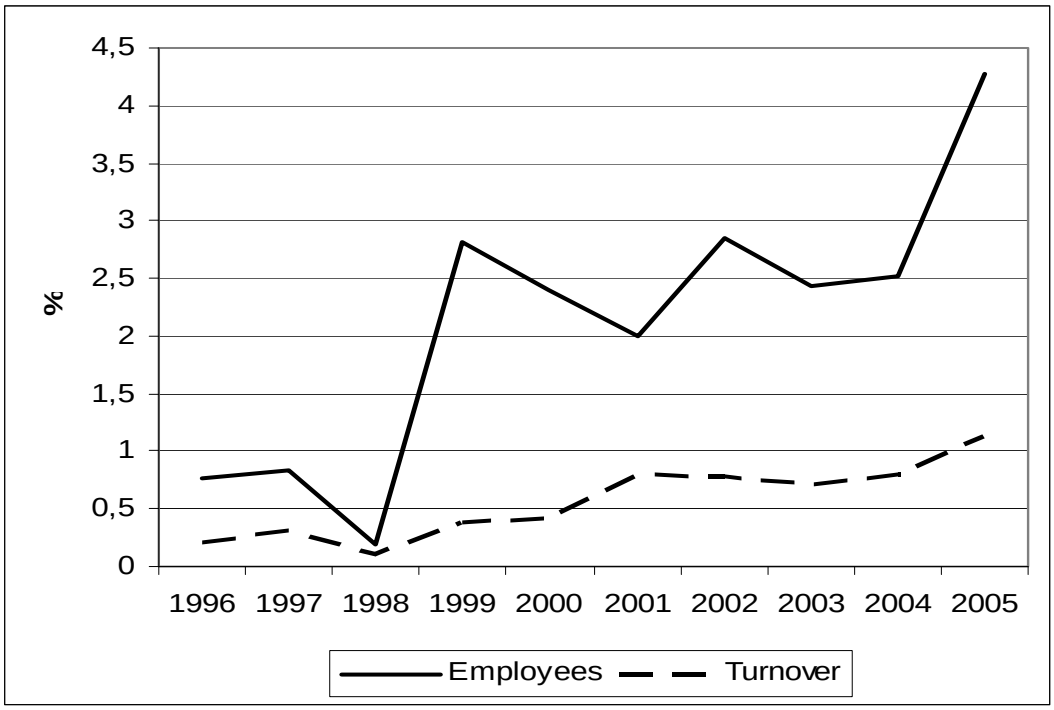
[5] Stora Enso is registered in Finland. It was formed through a merger of Finnish Enso-Gutzeit and Swedish Stora. It is still to a large extent owned by the Finnish state as well as by Finnish residents. It is an important player in the Finnish forest industry.

The second largest investors have been energy and wholesale firms. In the former group the investment of the electricity company Fortum dominates. Fortum has a large stake in the electricity company Lenenergo which will be merged with a couple of other North Western electricity companies. In the wholesale and retail trade the most important investor is Stockmann plc, which has department stores in Moscow and St. Petersburg.
Finnish companies have important investments also in the food industry (Raisio, Valio), in electronics (Elcoteq) and machine building, in the chemical industry (Tikkurila Paints), in construction (YIT) and the construction material industry (for example cement companies Parma Betonila and Lohja Rudus, window company Tiivi).

In telecommunication services the Finnish-Swedish Telia-Sonera has a share in the Russian Megafon company. Telia-Sonera is, however, registered in Sweden. Hartwall, which initiated its beer production in Finnish ownership of the Baltic Beverages Holding (BBH), is currently a part of the Scottish&Newcastle company (headquarters in Edinburgh). These two companies have a very large FDI stock in Russia, larger than the FDI stock of all those companies that are registered in Finland. The current market value of their investment is about 3 billion euros (Filippov et al., 2005). Internationalisation of firms creates thus a severe problem in the FDI statistics and in the interpretation of them.

According to the statistics of the Bank of Finland, Finnish firms employed about 15 000 persons in Russia in 2005. They employ more people in Russia than abroad on average when compared to investment. This is shown by the much larger share of Russian employment of Finnish firms than the shares in FDI stock and turnover. The share of employment was 4.3 per cent, while the shares in FDI stock and turnover were somewhat about one per cent in 2005. (Figures 1 and 2).

Figure 2 Employees and Turnover of Russian Subsidiaries and Branches of Firms Resident in Finland, % of Total Finnish Foreign Subsidiaries and Branches



Source: Bank of Finland.

3 Explaining the Past and Exploring the Future Trends of Foreign Trade and FDI

In the following we analyse the developments in the structure of trade, in Finnish imports from Russia, in exports to Russia and in FDI, especially in Finnish FDI in Russia, by quantitative as well as qualitative methods. Quantitative methods are applied to items which have clearly identifiable explanatory factors. The problems here are, however, the short time series of the post Soviet era as well as the economic and political turmoil of the first transition years. The quick structural change of those years has hidden some basic economic relationships. These problems mean that the presented quantitative explanations must be regarded as tentative.

In the case of FDI we refer to econometric explanations, but the main emphasis is on the qualitative identification of factors affecting FDI. Here we study them to some extent also at the sector and firm levels.

In addition to exports and FDI, also other forms of economic cooperation are relevant. These firm level forms of cooperation include subcontracting of Russian firms for Finnish firms, licensing, franchising etc. In this paper we concentrate, however, on foreign trade and FDI because they are most relevant. In foreign trade we concentrate on merchandise trade and bypass for example transport and tourism services.

Structure of Trade

Trade between Finland and the Soviet Union/Russia has always been based on comparative advantage: countries have exported products where they are relatively competitive and imported products where they are not. When looking at Tables 1 and 2 we notice that comparative advantage as a determinant of trade relations has strengthened during the post-Soviet era.

In 1994 the share of petroleum and products, natural gas and raw wood in Finland's imports from Russia was 59 per cent. In 2005 it was over 71 per cent. This was mainly due to an increase in oil prices, but it is relevant because long-run supply and demand factors indicate that oil prices will continue to remain high also in the future, even though variations will certainly occur. When summing up all raw materials presented in Table 1 the aggregate share was 92 per cent in 1994 and 96 per cent in 2005.

In exports a similar concentration has occurred during recent years. The share of machinery was 32 per cent in 1994, and 62 per cent in 2005. This development has been dominated by the increase in exports of telecommunication equipment (especially mobile phones). The share of this item was 5 per cent in 1994 and 29 per cent in 2005.

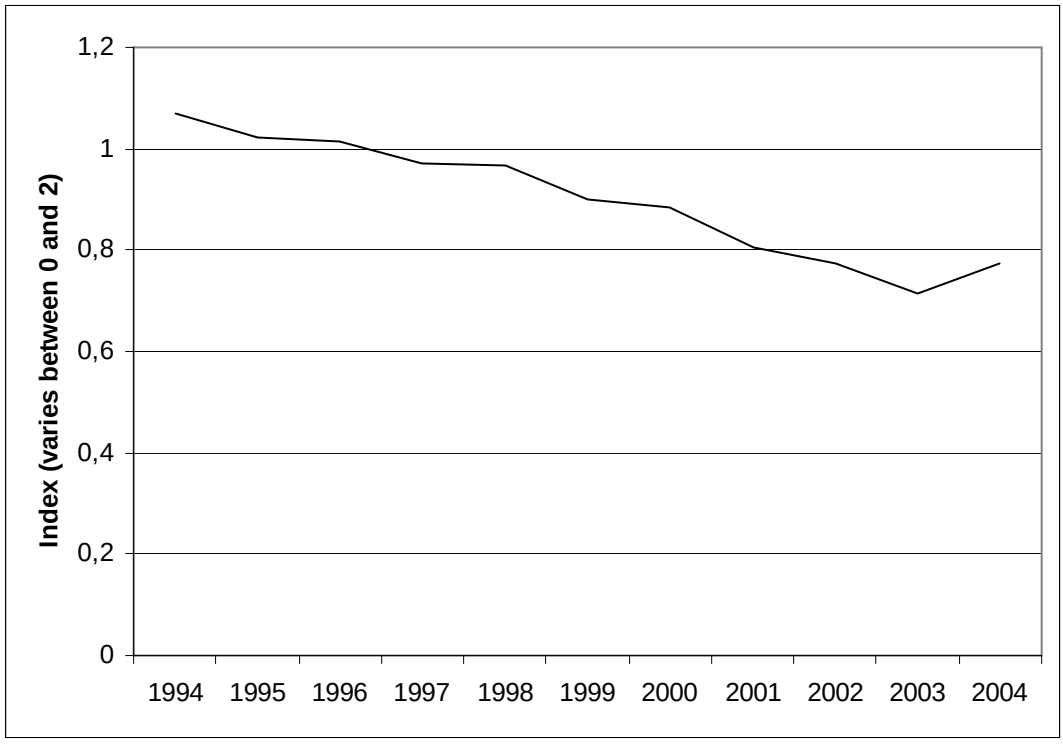
The structure of exports to Russia resembles that of total exports more than in the early 1990s when for example the share of foodstuff exports to Russia was large. The share of paper products has, however, continued to be much higher in the Western exports than in exports to Russia.

The increase in similarity is shown by the index presented in Figure 3. The similarity index (SI) is of the form:

$$SI = \Sigma_i |s_i^R - s_i^T|,$$

where s_i=the share of industry *i* in total merchandise exports. Superscript R refers to exports to Russia and T to total merchandise exports. Σ is the sum operator and subscript i refers to the product group in question. The index is thus formed by adding the absolute values of the differences of shares in each product group. Here the calculation has been made at the 3-digit level of the SITC-3 classification. (For this kind of similarity measure, see Kotilainen, 1996; for other kinds of similarity measures of export structures, see Kotilainen et al., 2003, 21.)

Figure 3 Similarity Index of Finnish Merchandise Exports to Russia and Total Merchandise Exports



Note: The index has been calculated at the 3-digit level of the SITC-3 classification. The index obtains a value of 0 when export structures are identical and a value of 2 when they are totally different.

Source: OECD, ITCS International Trade by Commodity.

It is seen in the figure that there was a clear tendency toward growing similarity between 1994 and 2003. In 2004 there was, however, a turn towards more diversity. This reflects the fact that the share of telecommunication exports was already clearly higher in exports to Russia. This development continued in 2005.

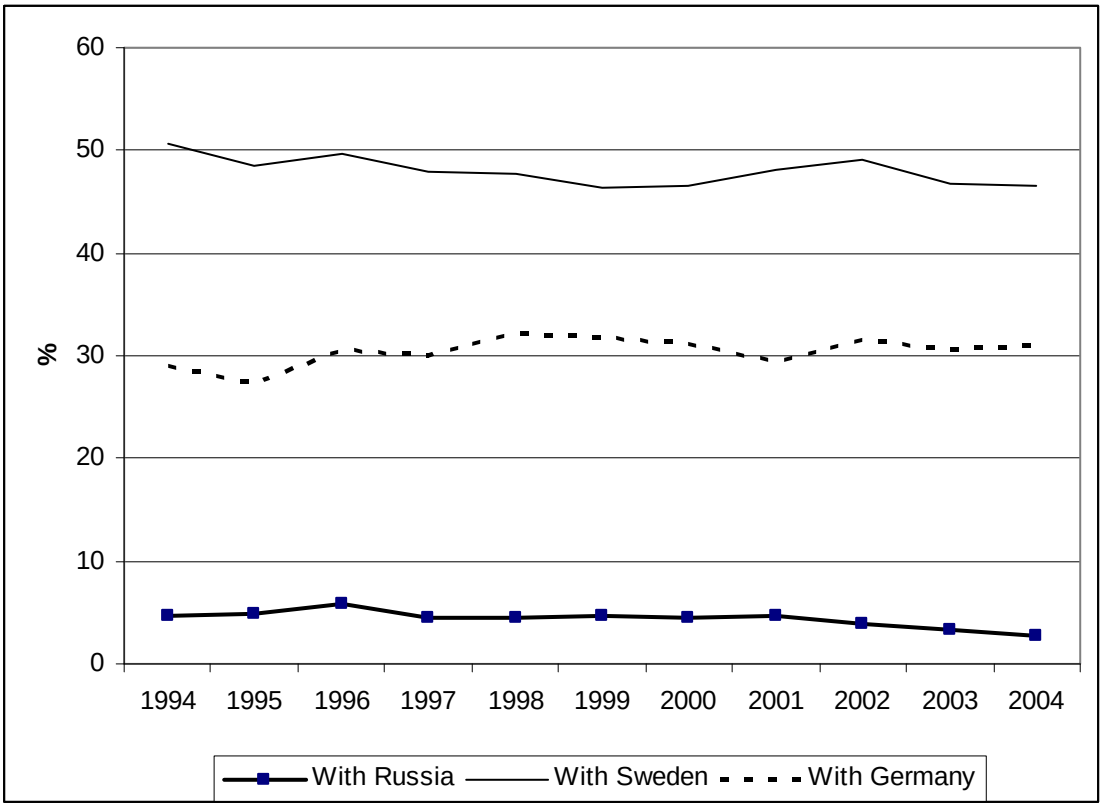
There exist several types of indices describing the extent of comparative advantage in foreign trade. One of them is the extent of intra-industry trade between the countries. This is usually measured with the so-called Grubel-Lloyd index. The lower the value of the index, the more trade is based on inter-industry trade (comparative advantage) and the less on intra-industry trade. The index (IIT) is as follows:

$$IIT = 100 * [\Sigma_i(X_i+M_i) - \Sigma_i|X_i-M_i|] / \Sigma_i(X_i+M_i).$$

This form of the index shows the extent of intra-industry trade in percentage form. When the value is 0 there is no intra-industry trade. When it is 100, all trade is of this type. The symbols are as follows: X= exports, M=imports, i= the sector in the foreign trade classification.

In Figure 4 we present the Grubel-Lloyd indices calculated at the 4-digit level of the SITC statistics for trade between Finland and Russia as well as between Finland and Sweden and Finland and Germany. It tells clearly that Finland's trade with Russia is based on comparative advantage and that this feature has strengthened during the first half of the 2000 decade. In 2004 less than 3 per cent of the trade occurred inside the same industry (narrowly defined). Trade with Sweden is at the other extreme. It is very much based on intra-industry trade. This reflects similar production structures of the countries. The share of intra-industry trade has declined in trade with Sweden with increasing specialisation, too. Germany takes a middle position. The comparative advantage element in trade reflects for example forest industry exports to Germany and car imports from Germany to Finland. In trade with Germany the share of intra-industry trade has slightly increased.

Figure 4 Extent of Intra-Industry Trade in Finland's Trade with Russia, Sweden and Germany (Grubel-Lloyd Index), %



Note: Calculated at the 4-digit level of the SITC, rev. 3 classification. The lower the disaggregation level is in the statistics, the more narrowly defined the "industry", and the lower the share of intra-industry trade.

Sources: OECD, ITCS International Trade by Commodity.

Russia will also in the future export a lot of energy and raw materials to Finland and Finland's exports to Russia will heavily concentrate on machinery and transport equipment. It is probable that Finland will import more intermediate goods and labour-intensive manu-

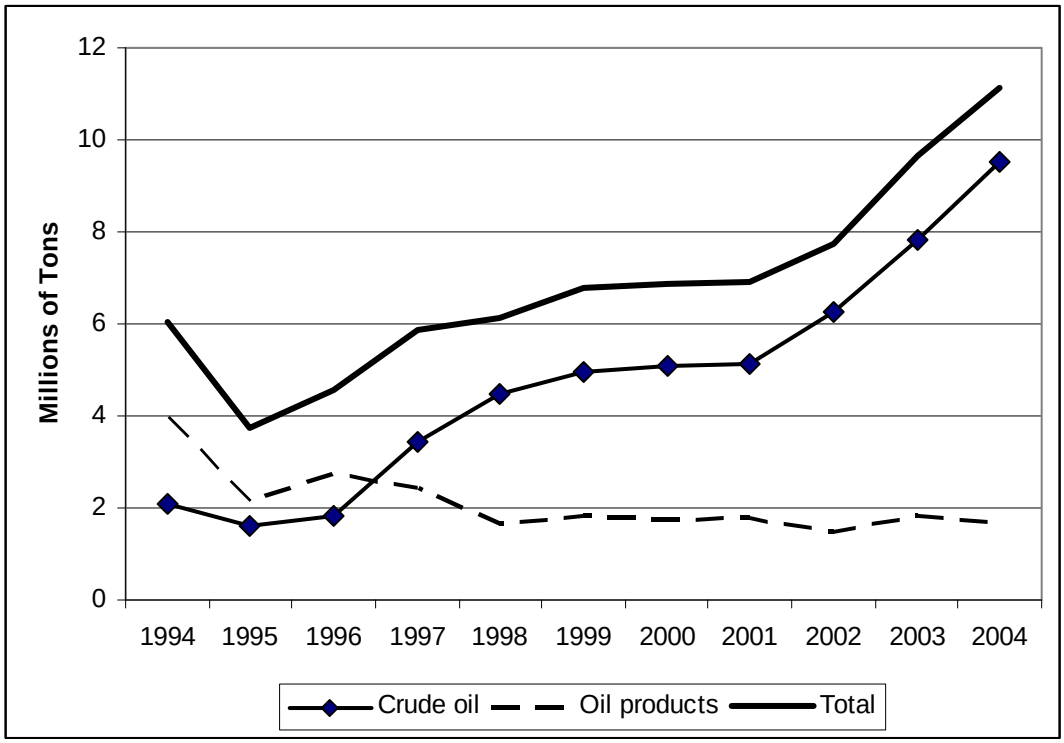
facturing goods from Russia if the country succeeds in diversifying its production structure. This could happen partly from production units of foreign, for example Finnish-owned firms. This development can, however, easily be curbed by increasing energy prices.

Finland has been running a deficit in its merchandise trade with Russia since 1999, after running a surplus before that. In 2005 the deficit was about 800 million euros. Also in the future the net position will change, to a large extent due to changing oil prices. In the long run, the development of all countries' exports to Russia depends on the value of Russia's own exports. The development of the price of oil as well as other exports is crucial for Russian imports. In the short run Russia has a rather large buffer in the form of foreign exchange reserves.

Imports

When Finland's merchandise imports from Russia grew four-fold between 1994 and 2005 in current euro terms, about 60 per cent of it was due to the increased value of petroleum product imports (crude and processed oil as well as some petroleum products). Of this about 60 per cent was due to an increase in the import price and 40 per cent due to increased volumes. (Figures 5 and 6) About 9 per cent of the increase in total merchandise imports came from imports of raw wood, 6-7 per cent from imports of natural gas, 2-3 per cent from electricity, 6 per cent from organic chemicals and 4-5 per cent from non-ferrous metals. These items explain 90 per cent of the growth of Finnish imports from Russia between 1994 and 2005.

Figure 5 Finnish Crude Oil and Oil Product Imports from Russia, Millions of Tons



According to SITC rev. 3; crude oil: item 333; oil products (refined): item 334.

Source: OECD, ITCS International Trade by Commodity.

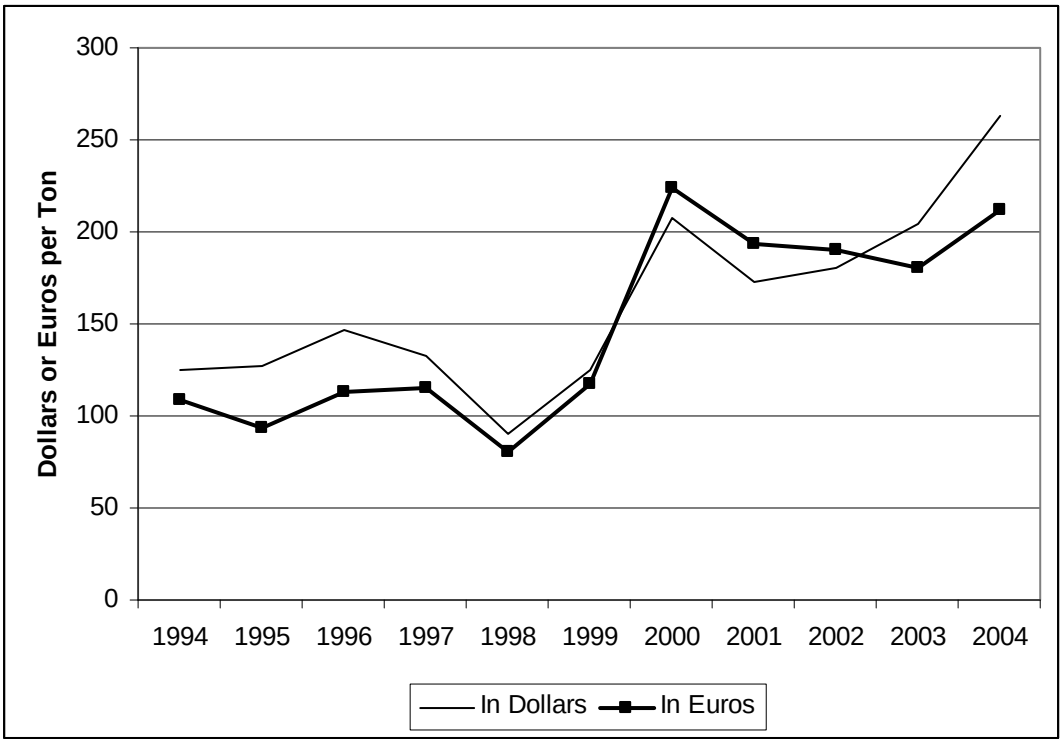
Finnish imports from Russia are thus to a large extent determined by the demand and supply of energy and other raw materials as well as by their price developments. Petroleum products dominate the broad picture. Aggregate level econometric explanations of imports are thus not very relevant.

In the early 1990s Russia had problems in providing as much oil as the Finnish importers would have liked to have bought. Later on, supply side constraints have become less important. Because the Russian oil quality Ural is sulphur rich, the Finnish producer of oil products Neste Oil has had to import also less sulphur rich raw oil qualities from the North Sea and from the Persian Gulf to have an optimal blend. Now when Neste Oil's new refinery in Porvoo can separate sulphur more efficiently than before, Neste Oil could in principle import almost all of its crude oil from Russia.

In the coming years Neste Oil will import annually somewhat more than 10 million tons of crude oil for its refineries. In a more distant future the magnitude of imported oil depends on the competitiveness of the Finnish refineries in the export market as well as, to a small extent, on the development of bio-fuels, which could compensate for about 5-10 per cent of mineral fuels in car diesel blends. Of course, the development of Russian oil supplies affects the imports, too. Russia is increasing its oil exports to other European countries as well as to China. In some circumstances also supply bottlenecks can limit Finland's import volumes from Russia.

Imports of oil products consist of imports of the Russian-owned oil wholesale company Teboil, of imports of Neste Oil (for further refining) and of gasoline and diesel purchases of individual car owners behind the Finnish-Russian border.

Figure 6 Price of Finnish Crude Oil Imports from Russia, Dollars and Euros per Ton



Import value of crude oil imports (SITC item 3330) divided by the corresponding quantity.

Source: OECD, ITCS International Trade by Commodity.

The increase of crude oil price has contributed about 35 per cent to the cumulative growth of total merchandise imports between 1994 and 2005. (See Figure 6) Even if dollar and euro prices vary between years, the price effect between 1994 and 2004 does not depend very much on the exchange rate. During the 2000s the strengthening of the euro has, however, dampened the increase in imports (because crude oil is priced in dollars).

Also in the future price developments will have a large role in the development of Finnish imports from Russia. In 2005 imports of oil and natural gas (the price of which follows closely oil prices) were 62 per cent of total imports. Also prices of some chemicals follow oil prices.

Imports of other raw materials will grow in the future. Russian and foreign-owned companies will, however, process the materials more inside Russia. This development will set constraints on, for example, imports of raw wood. Imports of manufactured goods will increase in the future, partly due to foreign investment in Russia. These items currently form such a small fraction that even high growth rates do not affect aggregate imports very much.

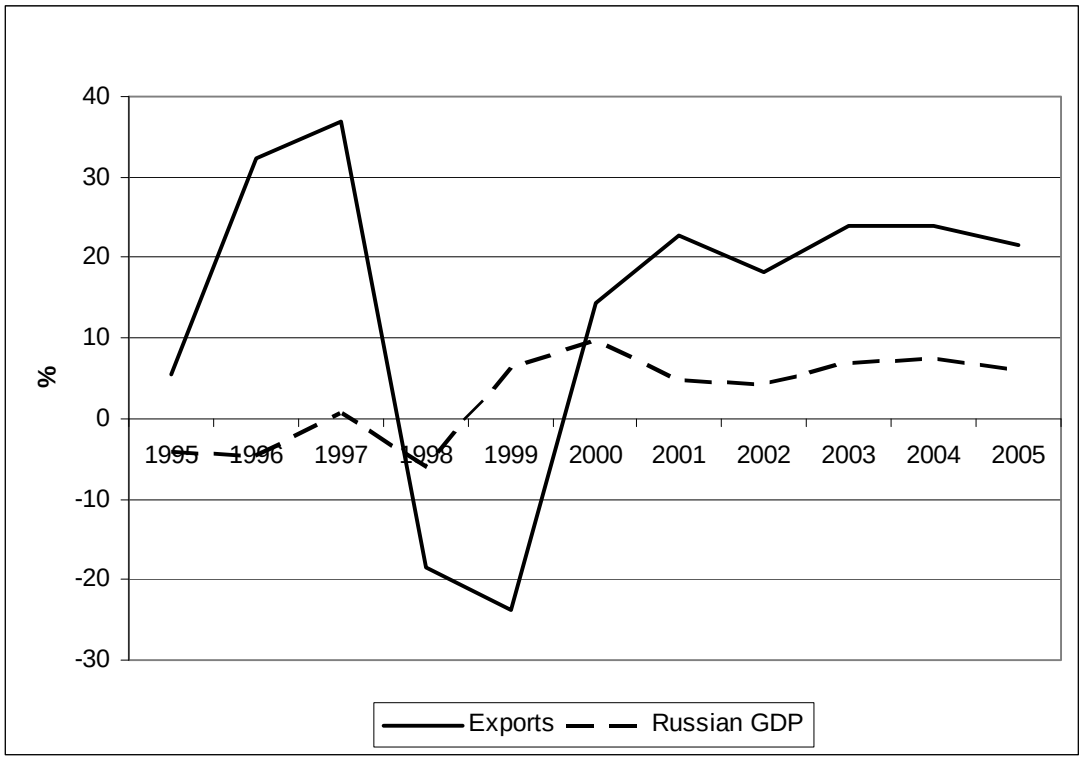
Exports

Aggregate Merchandise Exports

Explaining Volumes

Russian real GDP is a natural candidate as a determinant for Finnish exports to Russia. The relation between these variables has not, however, been very close during the post-Soviet era (Figure 7). The correlation between the variables was 0.16 in 1995-2005. (See also Kotilainen

Figure 7 Finnish Exports to Russia (Volume) and Russian Real GDP, % Change



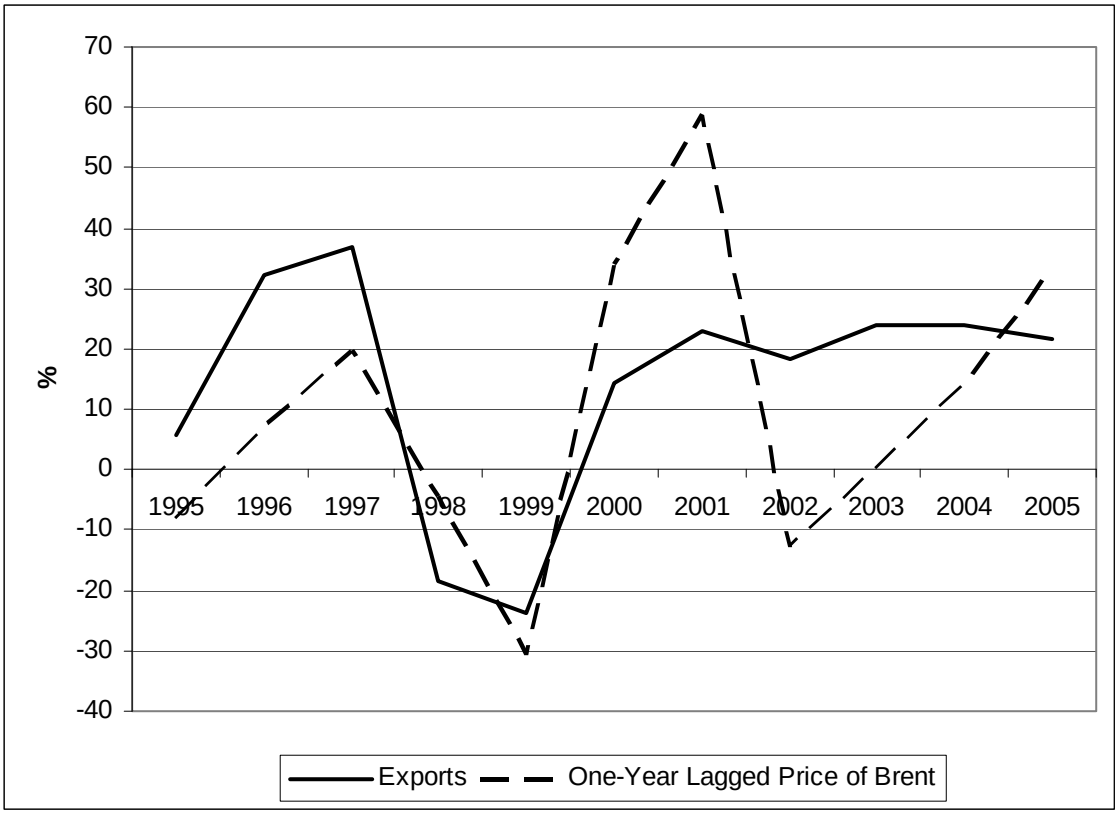
Note: Finnish merchandise exports are deflated by the aggregate export price index of Statistics Finland.

Sources: Finnish Board of Customs (export value); Statistics Finland (export prices of total Finnish merchandise exports); Rosstat (Russian GDP).

et al., 2003). The relation is positive but the value of the coefficient of correlation is low. When Russian GDP is lagged by one year, the coefficient of correlation increases to 0.29.

The other two candidates are the oil price and the real exchange rate (competitiveness). The price of crude oil is an important determinant for GDP growth in Russia as well as a major source of foreign exchange. In the case of oil prices (approximated with the dollar price of Brent quality) the contemporaneous correlation with Finnish exports to Russia has not been very high, either, just 0.11 in 1995-2005.[6] When the oil price is lagged by one year, the correlation is 0.57 (Figure 8).

Figure 8 Finnish Exports to Russia (Volume) and One-Year Lagged Price of Crude Oil (Brent), % Change



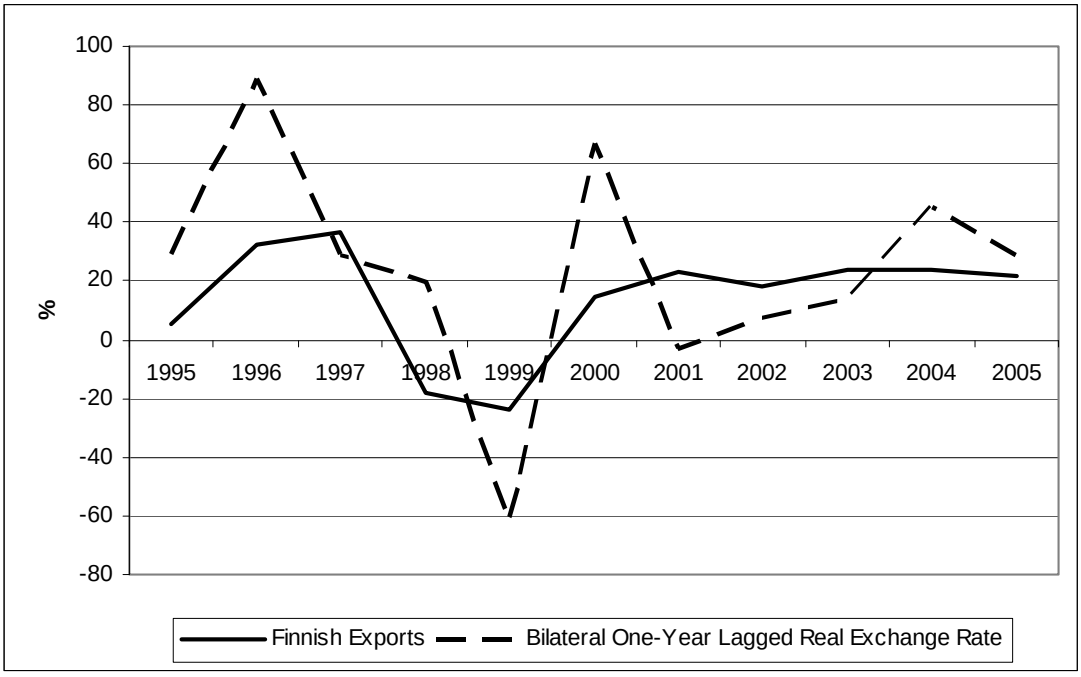
Sources: Finnish Board of Customs (export value); Statistics Finland (export prices of total Finnish Merchandise Exports); HWWA Institut (Brent).

The situation is very similar when we look at the bilateral Finnish-Russian real exchange rate. The contemporaneous correlation with changes in export volume was just 0.08 in 1995-2005, but in the case of the lagged real exchange rate it was already 0.60 (Figure 9).[7]

[6] Use of the price of Brent quality instead of the price of Ural quality is motivated by the short time series data of the price of Ural quality.

[7] Kotilainen et al. (2003) find a correlation of 0.71 between changes in the volume of Finland's exports to Russia and changes in Russia's real effective exchange rate (IMF) in 1994-2002.

Figure 9 Finnish Exports to Russia (Volume) and One-Year Lagged Real Bilateral Finnish-Russian Exchange Rate[1], % Change



[1] Decline in the curve means depreciation of the rouble. The price component of the real bilateral exchange rate is calculated by using consumer prices.

Sources: Finnish Board of Customs (export value); Statistics Finland (export prices of total Finnish Merchandise Exports, Finnish inflation); Bank of Finland (exchange rates); Rosstat (Russian inflation).

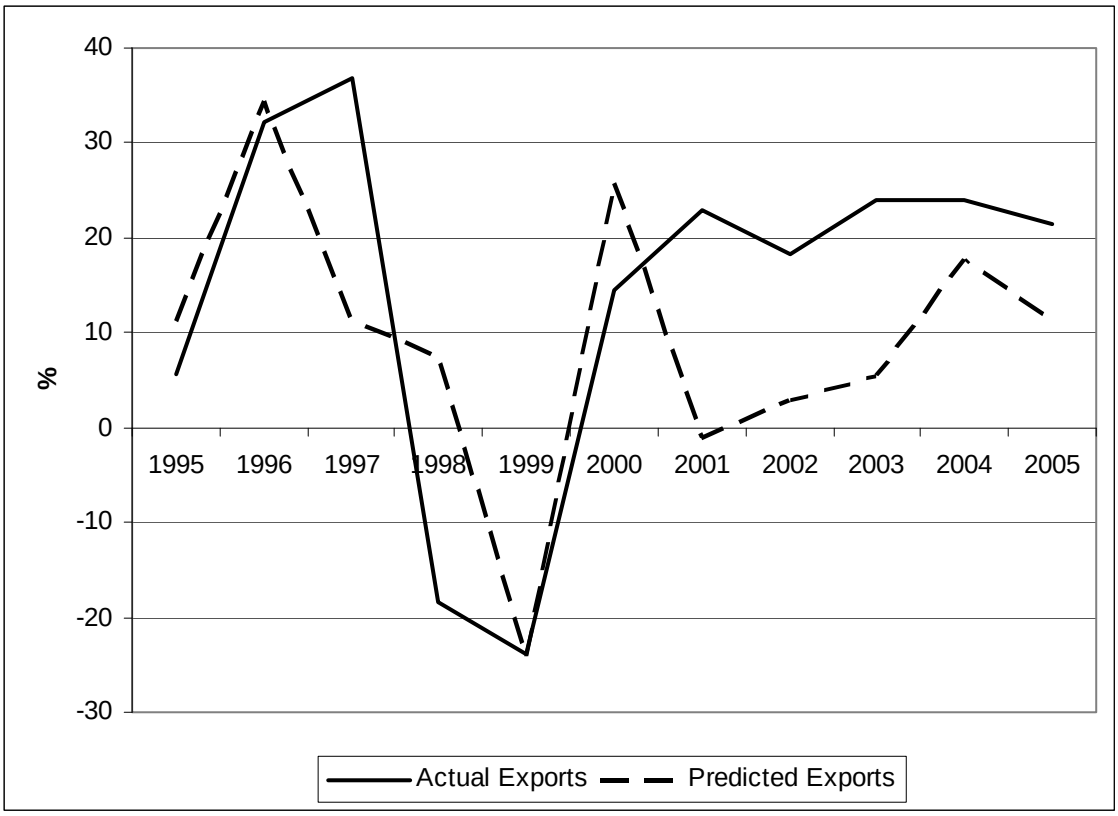
Even though the above-mentioned variables are evidently the most important explanatory variables for Finnish exports to Russia, it is not easy to find a regression equation including a combination of them. One problem is the shortness of the time series.

The real exchange rate was an important explanatory variable in the latter part of the 1990s. The high explanatory power of this variable for the whole period comes from this subperiod. In the early 2000s it has, however, underestimated the growth of exports. The equation used in Figure 10 is as follows:

(1) $FXR=0.39*RBE$, $R^2=0.53$.
(3.39)

The symbols are: FXR= change in the volume of Finnish merchandise exports to Russia (value deflated by the aggregate merchandise export price index), RBE=real bilateral Finnish-Russian exchange rate (increase means real appreciation of the rouble), t-value is presented in parenthesis, $R^2=0.53$.

Figure 10 Finnish Exports to Russia (Volume) Explained by One-Year Lagged Real Bilateral Finnish-Russian Exchange Rate, % Change



The explanatory power of the above equation is poor for the 2000s, especially in 2001-2003. Adding a constant variable to the equation increases the explanatory power in the 2000s but the constant is not significant. The explanatory power also declines for the whole period. It seems that the importance of Russian GDP developments has increased in explaining Finnish exports. For the whole period 1995-2005 using GDP or oil prices as explanatory variables works more poorly than the real exchange rate. Using all three above-mentioned variables does not succeed due to too few observations. They do not work together well in any case. The significance of GDP and oil variables vanishes when the real exchange rate variable is used.[8]

Explaining Values

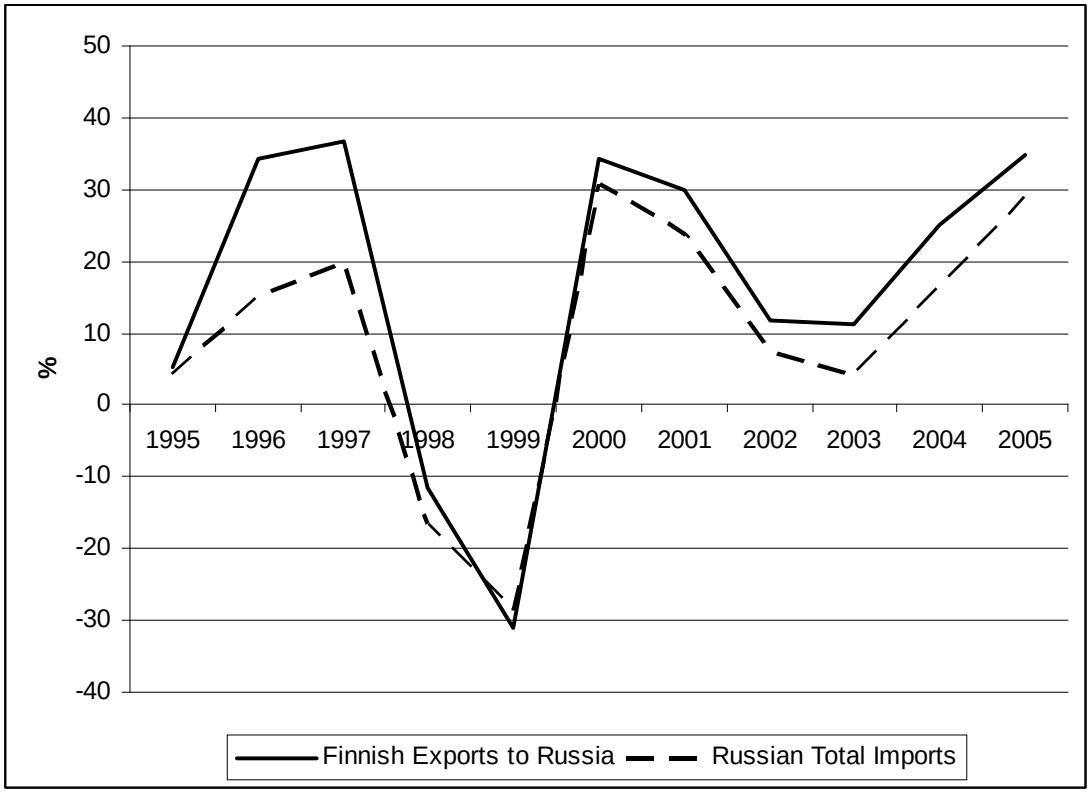
After having difficulties in finding a direct and stable relation between the volume of Finnish exports and Russian final demand and cost factors, we turn to relating Finnish goods exports (value) to total Russian goods imports (value). We use first **annual data** and present later some estimations with quarterly data.[9] In Figure 11 we see that changes in Finnish exports have followed rather closely changes in Russian imports. The correlation between these variables was 0.97 in 1995-2005.

---

[8] Customs tariffs have not changed drastically in Russia during the research period. Weighted averages for most favoured developed nations in the case of manufactured goods were 6.79 per cent in 1993, 8.31 per cent in 1994 and 8.66 per cent in 2002 (there was, however, a short peak of 11.23 per cent in 1997, related to the currency crisis) (UNCTAD, Trains Database).

[9] In the case of values we are able to study also quarterly figures, although export figures always include random timing of especially big export deliveries. In the case of volumes the lack of an appropriate deflator for exports is an important additional problem in using quarterly figures.

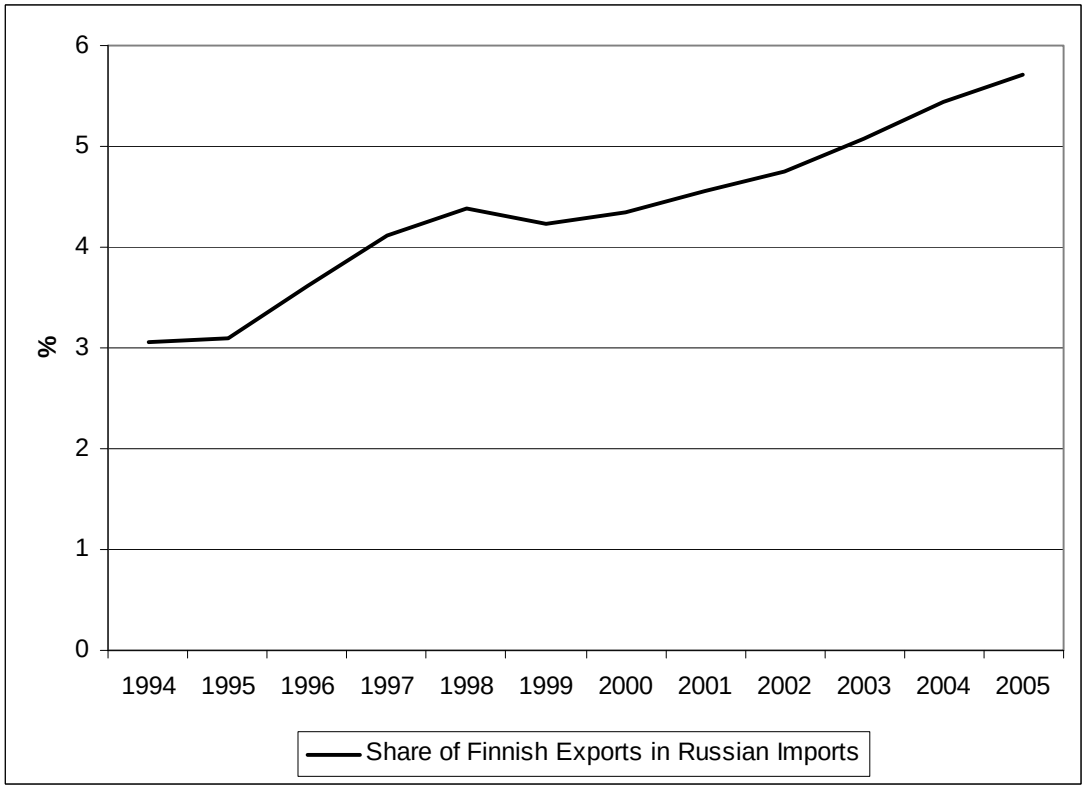
Figure 11 Finnish Goods Exports to Russia (Value) and Total Russian Goods Imports (Value)[1], % Change



[1] Both are measured in fob terms in euros.

Sources: OECD (Finland); IMF Financial Statistics (Russia). The exchange rate used is the conversion rate used by the OECD.

Figure 12 Share of Finnish Goods Exports to Russia (Value) in Relation to Total Russian Goods Imports (Value), %



Sources: See Figure 11.

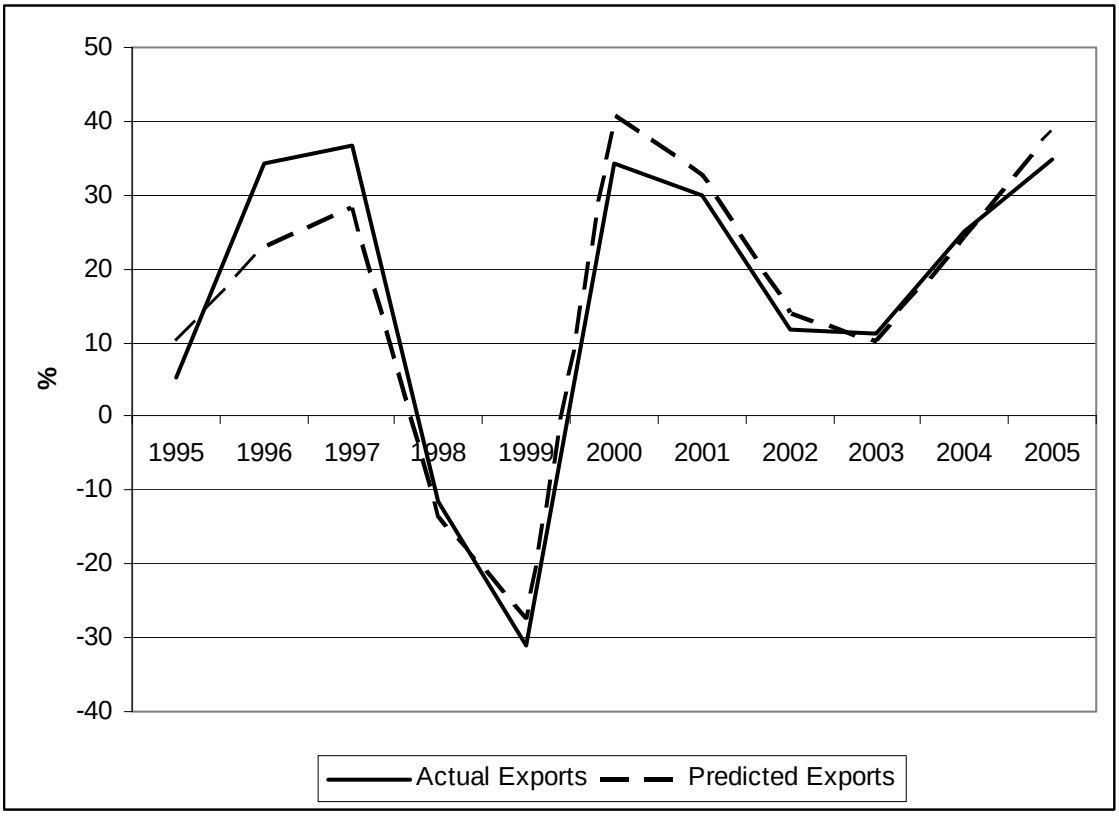
Finland has, however, won some market shares in Russian imports (Figure 12). This is to a large extent due to the favourable structure of Finnish exports, mainly due to mobile phones.

We explain in the following changes in the value of Finnish goods exports to Russia (FXN) with the equation:

(2) FXN=5.45 + 1.15*RIN, R^2=0.94.
(2.70) (11.41)

RIN refers to changes in the value of Russian goods imports. All variables are measured in euros. The actual and predicted exports are presented in Figure 13.

Figure 13 Changes in Finnish Exports to Russia (Value) Explained by Changes in Total Russian Goods Imports (Value), %



Sources: See Figure 11.

The fit of the above-presented equation is good and the t-values (in parenthesis) are significant. The short time series are of course a problem.

We check now whether the fit could be improved by adding the one-year lagged real bilateral (Finnish-Russian) exchange rate to the equation. It is now as follows:

(3) FXN=4.38 + 1.02*RIN + 0.10*RBE(-1), R^2=0.95.
(2.27) (8.47) (1.73)

Symbol RBE(-1) refers to the one-year lagged Finnish-Russian real bilateral exchange rate (measured as previously). The increase in the variable means a real appreciation of the rouble. The explanatory power of this equation, measured with R^2 statistics, improves only

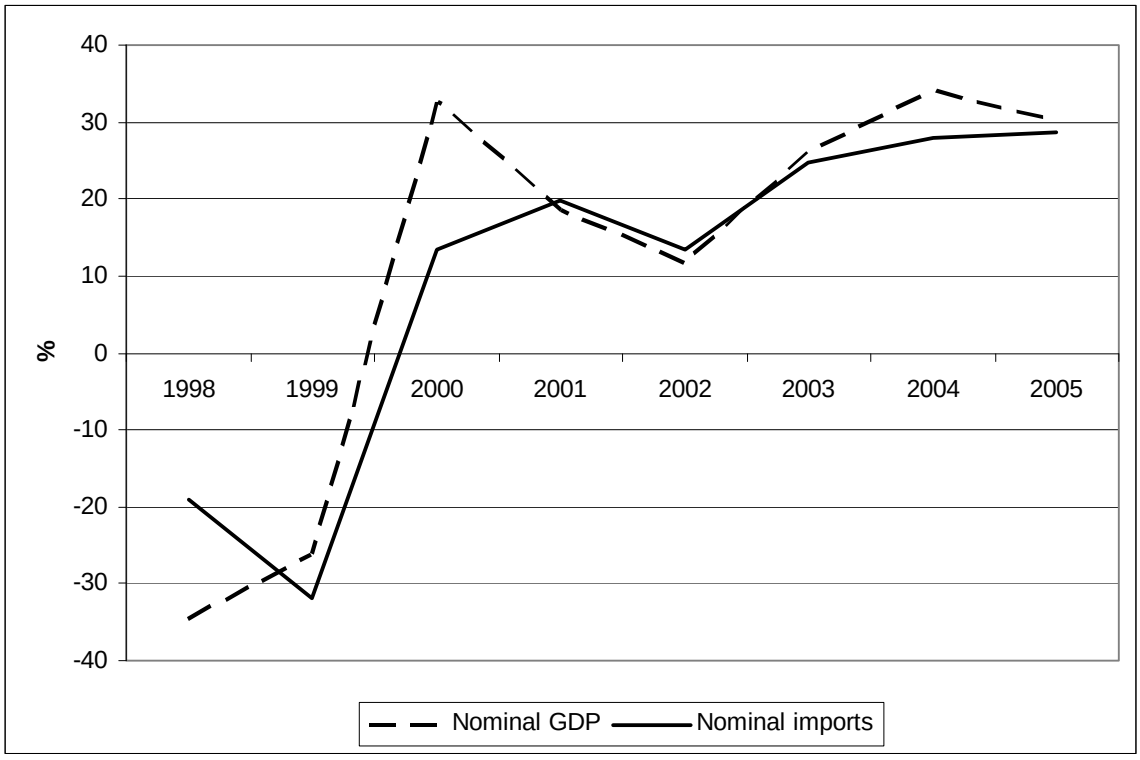
slightly. This is due to the fact that changes in total imports already mirror changes in the overall Russian competitiveness. Changes in bilateral competitiveness can add only slightly to it. The significance of the coefficient of the real exchange variable is not quite satisfactory, either.

All in all we can conclude that Finnish exports to Russia have changed closely in conjunction with aggregate Russian imports. Finland has, however, won market shares due to its favourable export structure. This obviously will continue some years into the future, but in the long run this extra bonus will tend to vanish when Russian imports from emerging market economies, especially from China, increase and when the market for mobile phones becomes saturated. Exports of mobile phones are affected by Nokia's division of production between plants, too.

When forecasting the development of Finnish exports to Russia, a starting point can be to use forecasts of Russian imports (using all possible information) and to link equation (2) to it. In the longer run the market share will, however, not increase any more. In the short run it is necessary to be aware of the possibility of fluctuations due to shifts in mobile phone deliveries.

The determinants of Russian imports in turn include GDP, real exchange rate, oil prices, changes in the demand structure, developments in domestic production etc. These relationships are, however, rather complicated and are left aside here. A rough estimate on the basis of recent history is that Russian merchandise imports in value terms have increased slightly less than the nominal GDP. (Figure 14)

Figure 14 Russian Nominal GDP and Russian Nominal Merchandise Imports in Dollar Terms, % Change



Source: Rosstat.

In the 2000s Finnish exports have been growing slightly more than Russian GDP. As a crude estimate, ceteris paribus, changes in Finnish goods exports in nominal terms will in the near future follow changes in the Russian nominal GDP but they will grow slightly more if the gain in market shares continues. (Figure 15) The value of the GDP reflects the purchasing power of the Russian economy in real and price terms. The price component includes changes in oil prices as well as changes in the exchange rate. Presenting Finnish exports in value terms, in turn takes into account the fact that the price of exports also matters in the budget constraint of the customers.

Figure 15 Finnish Nominal Exports and Russian Nominal GDP in EuroTerms, % Change

Sources: OECD, Rosstat.

We can use the following equation (4) to relate Finnish exports to Russia with the Russian GDP (both in nominal euro terms). Adding a constant to the equation takes into account the trend growth of exports. The equation is estimated for 1996-2005.

(4) FXN=7.10+0.85*RGDPN; R^2=0.81; D-W=1.53.
(2.02) (6.14)

After having studied annual changes of Finnish exports to Russia we now turn to **quarterly** data. The main benefit in using quarterly data is the increase in the number of observations. Depending on the equation formulation we have about 45 observations.

A problem is that this kind of high-frequency data includes more random observations than annual data. Finding a direct link between changes in exports and changes in macro variables is thus not straightforward. We must also take into account the own logic of the exports. By adding a constant or a lagged value of changes in exports as an additional explanatory variable, we can, however, see a relationship between changes in Finnish quar-

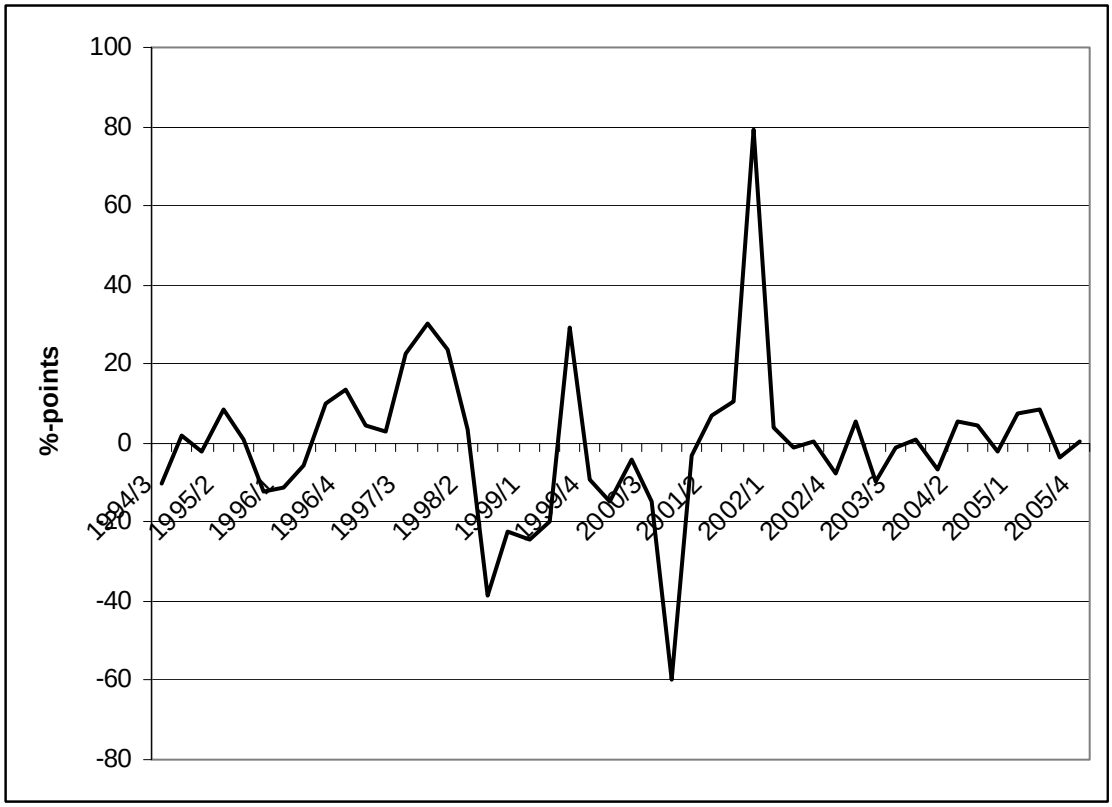
terly exports to Russia and corresponding changes in Russian nominal GDP. We report first the results when a constant is used (equation 5):

(5) FXNQ=9.14+0.66*RGDPNQ; R^2=0.49;
(2.79) (6.44)

FXNQ=percentage changes of the quarterly values of Finnish merchandise exports over the corresponding quarter a year before, and RGDPNQ=corresponding quarterly changes in the Russian nominal GDP. All are measured in euros.[10]

There is some autocorrelation in the error term, but the Durbin-Watson test value 1.41 exceeds, however, the critical value 1.38 at the 1 % significance level). The residuals for equation (5) are presented in Figure (16).

Figure 16 Residuals of Equation (5)



We notice that there are two quarters when the equation has the biggest difficulties in explaining the exports (Figure 16). These are 1998/3 and 2000/4. Because the data is in percentage changes, the values a year after are also affected (1999/3 and 2001/4). In 1998/3 the rouble was devalued, which affected Finnish exports negatively. In 2000/4 weakness was observed in exports of several items. Two working days less - due to the timing of Christmas - than a year before was one explanation, but obviously not the only one. The timing of Christmas was similar in 2001 and there was a large increase in exports in 2001/4. Exports are naturally sensitive to all kinds of timing factors.

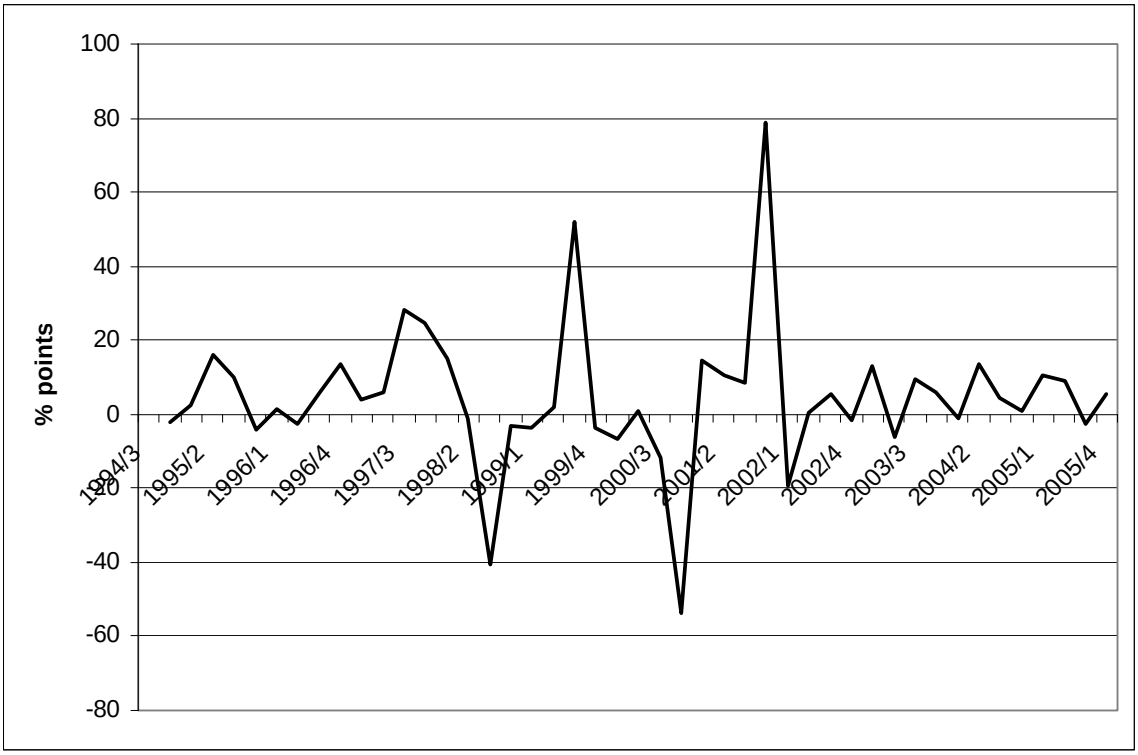
When using a lagged value of Finnish exports to Russia as an explanatory variable, we end up with the following equation:

[10] Euro values of the time series before 1.1.1999 are calculated through the Finnish markka values by using the official markka-euro exchange rate of 1.1.1999 (1 euro=5.94573 markkas).

(6) FXNQ=0.52*RGDPNQ + 0.37*FXNQ(-1); R^2=0.49.
(3.82) (2.81)

Because of the lagged endogenous variable, the Durbin-Watson statistics is not a reliable measure of autocorrelation of the errors. By explaining error term observations with lagged errors and the explanatory variables of equation (6), we notice that the coefficient of the lagged error term is not statistically significant (a very low t-value). Autocorrelation of the error terms is thus not a problem here.

Figure 17 Residuals of Equation (6)



The problem years are about the same as in the case of equation (5). Equations (5) and (6) have both worked well from 2002 onwards.

In the case of quarterly percentage changes, the explanatory power of equations (5) and (6) is quite high. The equations mainly describe how exports have developed. It is not very useful in forecasting because the quarterly data of Russian GDP is published with a long lag and it is unreliable. If GDP indicator data were available early enough, it could give a rough benchmark for changes in exports a quarter ahead.

We have used also other kinds of model specifications. When we used annual changes in moving four-quarter sums in the variables we had problems with autocorrelation of the error terms. Quarterly changes of crude oil prices or changes in the nominal euro-rouble exchange rate did not work either.

Exports by Product Groups

In addition to aggregate merchandise exports we have tried to explain the development of exports by product groups. We have confined ourselves to the value of exports because there are no suitable deflators for them. We report first the results obtained with **annual**

data for the years 1996-2005. At the end of the section we briefly present some results obtained with quarterly data. More estimations with quarterly data are presented in Appendix 1. The estimations presented here must be regarded as rough and tentative. The development of exports of each product group has also its own specific explanations. Because these explanations are often not very systematic, it is useful to relate the development also to clearly observable macro variables. In the cases of some product groups even two or three equation specifications work satisfactorily – usually, however, only one.

We have found out that **changes in contemporaneous Russian nominal GDP** explain significantly changes in Finnish exports of the following product groups (SITC-3, 2-digit level; see appendix 2):

1) dairy products (elasticity 0.76, R^2=0.42),
2) wood (elasticity 0.43, R^2=0.31),
3) inorganic chemicals (elasticity 1.45, R^2=0.14),
4) rubber manufactures (elasticity 1.11, R^2=0.13),
5) wood manufactures (elasticity 0.49, R^2=0.42),
6) textile yarn and related products (elasticity 0.40, R^2=0.28),
7) non-metallic mineral manufactures (elasticity 0.81, R^2=0.32),
8) manufactures of metal, n.e.s. (elasticity 0.67, R^2=0.41)
9) metal working machinery (elasticity 1.36, R^2=0.25)
10) other industrial machinery and parts (elasticity 0.73, R^2=0.32)
11) road vehicles (elasticity 1.76, R^2=0.17)
12) prefabricated buildings etc. (elasticity 0.79, R^2=0.42)
13) travel goods, hand bags etc. (elasticity 0.66, R^2=0.30)
14) clothing (elasticity 0.53, R^2=0.28)
15) footwear (elasticity 1.02, R^2=0.57)
16) professional and scientific instruments (elasticity 0.60, R^2=0.28).

The explanatory power of the equations varies, but it is quite satisfactory in several cases. When looking at the elasticities, we notice that they tend to be higher for high value-added products than for more standard products, as is plausible.

A constant and changes in contemporaneous Russian nominal GDP explain exports of the following product groups:

1) coffee, tee etc. (constant -20.83, elasticity with respect to Russian nominal GDP 0.71, R^2=0.51)
2) furniture and parts thereof (constant -11.88, elasticity with respect to Russian nominal GDP 0.71, R^2=0.51)
3) telecommunication equipment (constant 22.30, elasticity with respect to Russian nominal GDP 1.47, R^2=0.77).

Coffee etc. and furniture have lost their market shares in Russia (negative constants and low GDP elasticities), whereas telecom equipment has increased its market share significantly (high positive constant and high GDP elasticity).

Russian nominal **GDP and the price of crude oil** a year before explain exports of prefabricated buildings etc. The GDP elasticity is 0.48 and the elasticity with respect to the oil price 0.54. R^2=0.84. Oil revenues thus seem to have an effect on the demand for these products.

Changes in nominal **Russian GDP in the previous year** explain the development of exports of the following product groups:

1) meat and meat preparations (elasticity 1.13, R^2=0.56),
2) fish and preparations (elasticity 1.03, R^2=0.72)
3) feedstuff for animals (elasticity 1.04, R^2=0.50)
4) non-metallic mineral manufactures (elasticity 0.96, R^2=0.62)
5) manufactures of metal, n.e.s. (elasticity 0.73, R^2=0.56)
6) power generating machinery and products (elasticity 1.06, R^2=0.18)
7) other industrial machinery and parts (elasticity 0.85, R^2=0.49)
8) road vehicles (elasticity 1.81, R^2=0.17)
9) other transport equipment (elasticity 7.70, R^2=0.20)
10) prefabricated buildings etc. (elasticity 0.59, R^2=0.24)
11) miscellaneous manufactured articles, n.e.s. (elasticity 0.48, R^2=0.26).

Lagged GDP as an explanatory variable works often well in the case of investment goods and consumer durables, where the price of the good is usually high. GDP elasticities of these product groups are also relatively high. In products like feedstuffs the structural change in Russian feedstuff production favours exports of Finnish high-quality feedstuff.

Contemporaneous and one-year lagged Russian GDP explain the development of exports in the following product groups:

1) wood manufactures (elasticity with respect to GDP =0.36, elasticity with respect to GDP(-1)= 0.29; R^2=0.55)
2) non-metallic mineral manufactures, n.e.s. (elasticity with respect to GDP =0.41, elasticity with respect to GDP(-1)= 0.73; R^2=0.76)
3) manufactures of metal, n.e.s. (elasticity with respect to GDP =0.37, elasticity with respect to GDP(-1)= 0.53; R^2=0.69)
4) other industrial material and parts (elasticity with respect to GDP =0.41, elasticity with respect to GDP(-1)= 0.62; R^2=0.64).

Some explanations for exports of certain product groups can be obtained at the **quarterly** level, too. We first use the model: $FXNQ^i$=a + b*RGDPNQ, where a= constant, $FXNQ^i$=quarterly changes in nominal exports of SITC product group i (compared to the corresponding quarter a year before) and RGDPNQ=corresponding change in Russian quarterly nominal GDP. The research period is 1994/3-2005/4. This function form works more or less for the following product groups:

1) plastics in non-primary form ($FXPNQ^{57}$=25.12+0.68*RGDPNQ; R^2=0.23; D-W=1.52)
(4.20) (3.62)

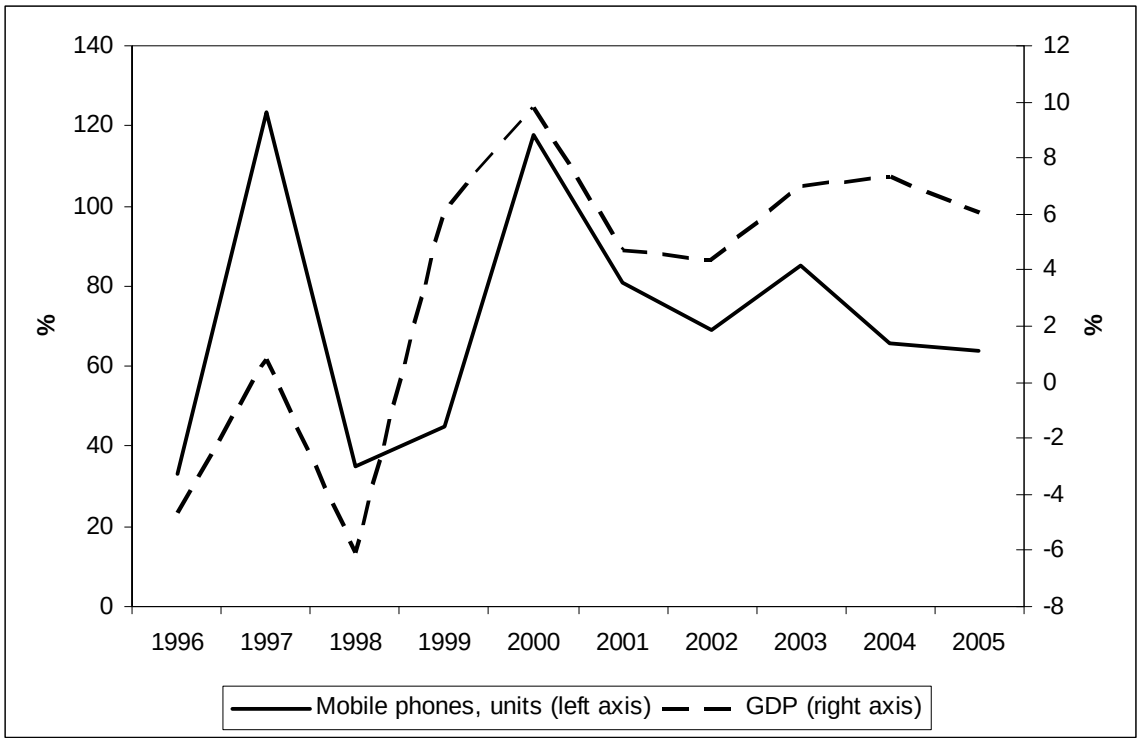
2) telecom equipment ($FXNQ^{76}$=26.87+1.18*RGDPNQ; R^2=0.43; D-W=1.81).
(4.11) (5.73)

Taking into account the quarterly dynamics requires, however, usually the lagged value of the endogenous variable $FXNQ^i$(-1) on the right side of the equation. In this case we drop the constant. We can explain the export development of many product groups with this kind of an equation. We report these equations in appendix 1.

Mobile Phone Exports

The fast growth of mobile phone exports (see below) has affected the aggregate export development strongly and they already account for almost a third of merchandise exports to Russia (see Table 2). This variable thus requires special attention. The growth of the number of mobile phones was about 65 per cent per year in 2004-2005. Some years earlier the growth rate was even higher. (Figure 18.) The coefficient of correlation between changes in the Russian real GDP and in Finnish mobile phone exports was 0.52 in 1996-2005. The elasticity of mobile phone exports to changes in GDP has been declining during the past few years – evidently due to the already high mobile phone density in big cities. The elasticity is still high. For the whole period it was 8.8 in an equation without a constant.

Figure 18 Finnish Exports of Mobile Phones to Russia (Units) (Left-hand Axis) and Russian Real GDP (Right-hand Axis), % Change



Sources: Finnish Board of Customs (mobile phones); Rosstat (Russian GDP).

When using a constant, we obtain the following equation:

(7) FMOB = 61.1 + 3.1*RGDP; R^2=0.27.
(5.6) (1.7)

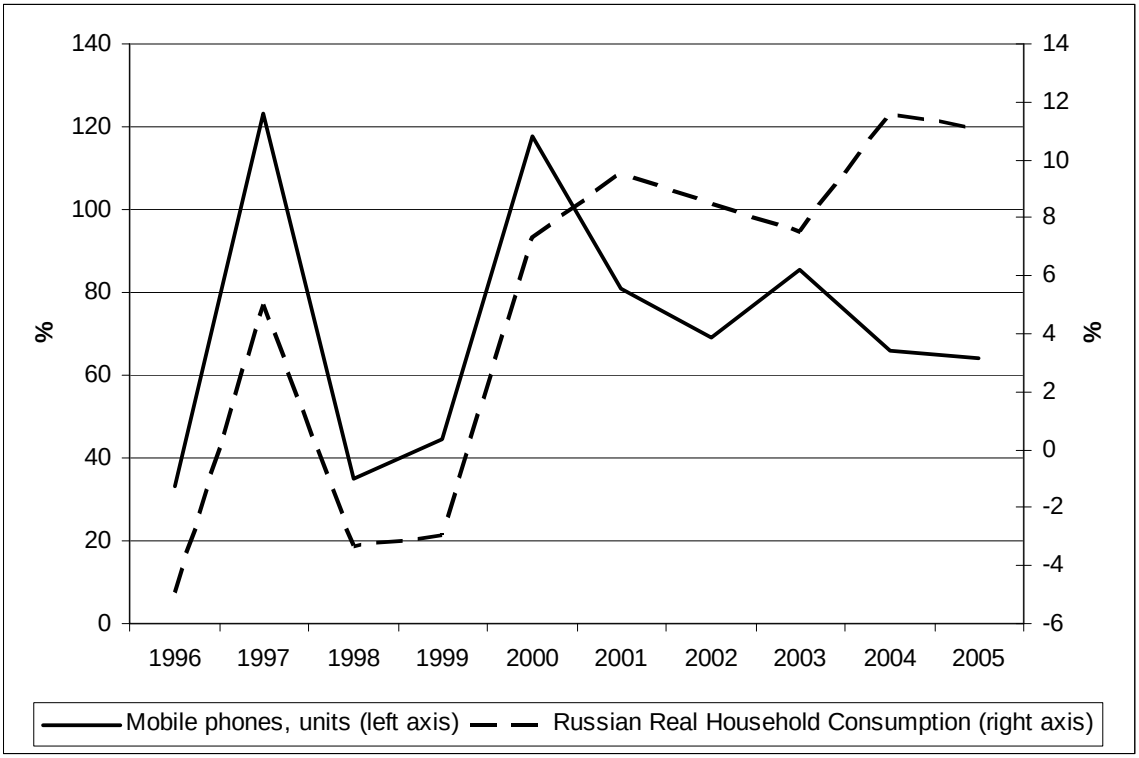
FMOB is annual changes in the number of mobile phones and RGDP changes in the Russian real GDP. The constant is significant. The explanatory power of the equation is, however, lower than in an equation without a constant.

A slightly better fit than with respect to GDP is obtained by using Russian real household consumption as the explanatory variable. We have the following regression equation:

(8) FMOB = 7.6*RRCONS; R^2 = 0.57.
(3.4)

FMOB is as before and RRCONS depicts annual changes in Russian real household consumption. The equation underestimates the exports of the 1990s, when mobile phones were a new phenomenon and their use increased "on their own weight". The equation functions better for the 2000s. The development of both variables is presented in Figure 19.

Figure 19 Finnish Mobile Phone Exports (Units) (Left-hand Axis) and Russian Real Household Consumption (Right-hand Axis), % Changes



Sources: Finnish Board of Customs (mobile phones); Rosstat (Russian real household consumption).

When adding a constant we obtain the following equation:

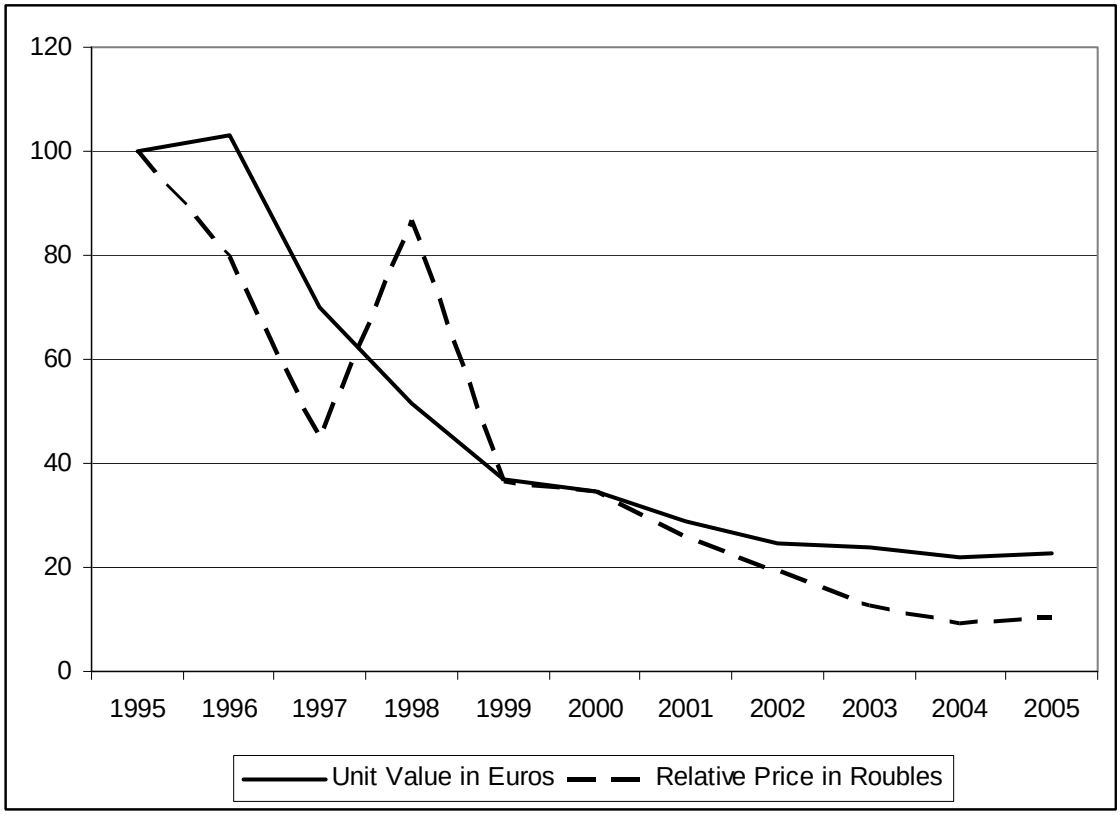
(9) $FMOB = 58.3 + 2.8*RRCONS; R^2 = 0.31.$
(5.2) (1.9)

The constant is again significant. On the other hand, the explanatory power decreases from that without a constant.

The relative price of mobile phones in roubles is not significant in explaining the development of changes in mobile phone exports. (Figure 20.) The price has declined in a trend-like way in euros. The relative price in roubles has declined even more. The only remarkable increase was when the rouble was devalued in 1998. In this year import price of mobile phones increased clearly but mobile phone exports continued to rise.[11]

[11] The price of mobile phones in Russia is affected by customs duties and assorted taxes. Taking these into account could, in principle, change the explanatory power of the price variable. The evidence based on the export unit value strongly indicates, however, that it is not significant.

Figure 20 Unit Value of Finnish Mobile Phone Exports in Euros and the Relative Price of Mobile Phones in Roubles, 1995=100[1]



[1] The relative price is the relation of unit value of Finnish mobile phone exports to the consumer price index (both in roubles).

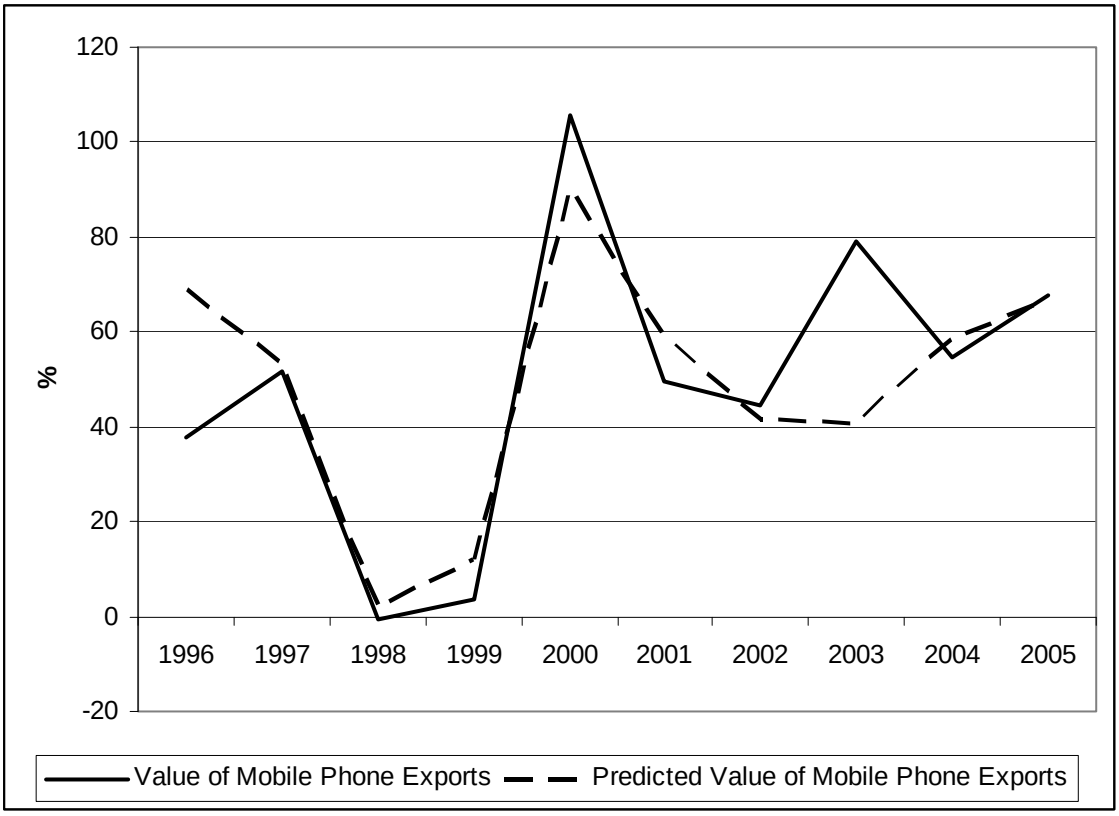
Sources: Finnish Board of Customs (unit value of Finnish mobile phone exports, HS item 85252091); IMF (Russian inflation).

As in the case of aggregate exports we shift to **value measures** also in explaining mobile phone exports. Below we explain changes in the value of Finnish mobile phone exports with the value of Russian GDP (both in euros) and with a constant (Figure 21). The equation is as follows:

(10) $FMOBN = 35.63 + 1.04*RGDPN$; $R^2=0.69$.
(5.24) (4.22)

When using the values the fit is again better than when using volumes. This is related to the fact that the nominal Russian GDP (in euros) reflects better the purchasing power of the economy with respect to euro countries (the budget constraint). On the side of exports using the value instead of volume has a corresponding budget constraint explanation. The above-mentioned equation clearly fails to explain the mobile phone exports only in 1996 and 2003.

Figure 21 Value of Finnish Mobile Phone Exports Explained by the Value of Russian GDP, both in Euros, % Changes[1]



[1] Equation 10.

A problem in explaining or forecasting Finnish mobile phone exports to Russia is that Nokia, the main producer of these goods, can shift exports between several factories located in different countries. Exports can thus fluctuate due to rather short-run reasons. The main potential alternatives for exports from Finland are Hungary, China and Germany as well as Elcoteq's factories in St Petersburg and in Estonia. Elcoteq is an important subcontractor for Nokia and it also assembles phones for it. Another problem in interpreting the statistics is that the foreign component of the phones is very high and it can vary between years. The phone can have received just the cover in Finland and the rest is imported from abroad. In the extreme it is just repacked in Finland for further delivery.

In the near future export growth of mobile phones will decelerate due to the saturation of the market for first phones. Replacements, however, will keep the growth rates high.

3.4 Foreign Direct Investment: Joint Determination with Foreign Trade

3.4.1 Investment from Finland to Russia

Kotilainen et al. (2003, 114) estimate the development of Finnish FDI to Russia with a gravity model. According to the estimates made with two alternative model specifications, the FDI stock was projected to be between 850 and 1100 million euros in 2010.[12] At the end of 2005 it was 559 million euros. This figure is located between the two projections.

[12] As usual, the distance between capitols, i.e. Helsinki and Moscow, was used as the distance variable in the regression equation. In the case of a big country this is naturally only indicative.

According to the previously mentioned study, actual Finnish FDI to Russia is about a half of the potential FDI. Exports in turn exceed their potential level. The possible explanations for this include the still short market economy period in Russia, Russia's political and economic instability, uncertainty in the access to raw material and other inputs (especially in forest industry) and the geographical proximity that makes it possible to serve the Russian market from Finland (especially the St Petersburg area). It is noticeable that Nokia has no production in Russia and that there is no Finnish-owned pulp or paper mill in Russia, either.

In principle, new specifications of gravity models could be estimated to explain and forecast the development of Finnish *aggregate* FDI to Russia. The results would obviously, however, not differ very much from the above-mentioned ones. These kinds of models show the historical and statistical relationships between the variables.

It is clear that in the current globalizing world companies decide more and more on their long-run foreign trade and investment strategies in a unified framework. This decision process is difficult to model. Investment decisions take several years whereas foreign trade responds immediately to orders if there is enough capacity.

FDI can be classified in several ways. One is the division between *horizontal* and *vertical* FDI. In the former production of similar goods is divided between different countries. In vertical FDI different production phases are carried out in different countries.

FDI can also be classified according to its motive: whether it is mainly *cost driven* or *market driven*. In the case of emerging economies both motives are present.

Production of different types of products differs also substantially in terms of the *need for local presence*. It concerns the nature of products. Local production is usually necessary in the case of services. For example, retail trade, banking and telecom services require FDI. This is the case to a large extent also in construction. FDI in these sectors is mainly market driven. The size of transport costs is important in the case of manufactured goods.

Foreign trade and direct investment can be *net substitutes* or *complements* at the macro level. FDI can lead to a decline in the domestic production or it can strengthen it. All the above-mentioned types of FDI can belong to either of the categories. In the case of horizontal FDI, a positive outcome is possible through the strengthening of the market position of the firm. A negative outcome occurs if the focus of production shifts abroad due to cost or market reasons.

Vertical FDI can strengthen the firm and lead to an increase in the domestic output if production of components abroad leads to lower costs. This enables more sales domestically and abroad. In the beginning, however, there is a loss of domestic output of the components. If the strengthening competitiveness cannot be utilized, the final outcome can be negative for the domestic output of the firm.

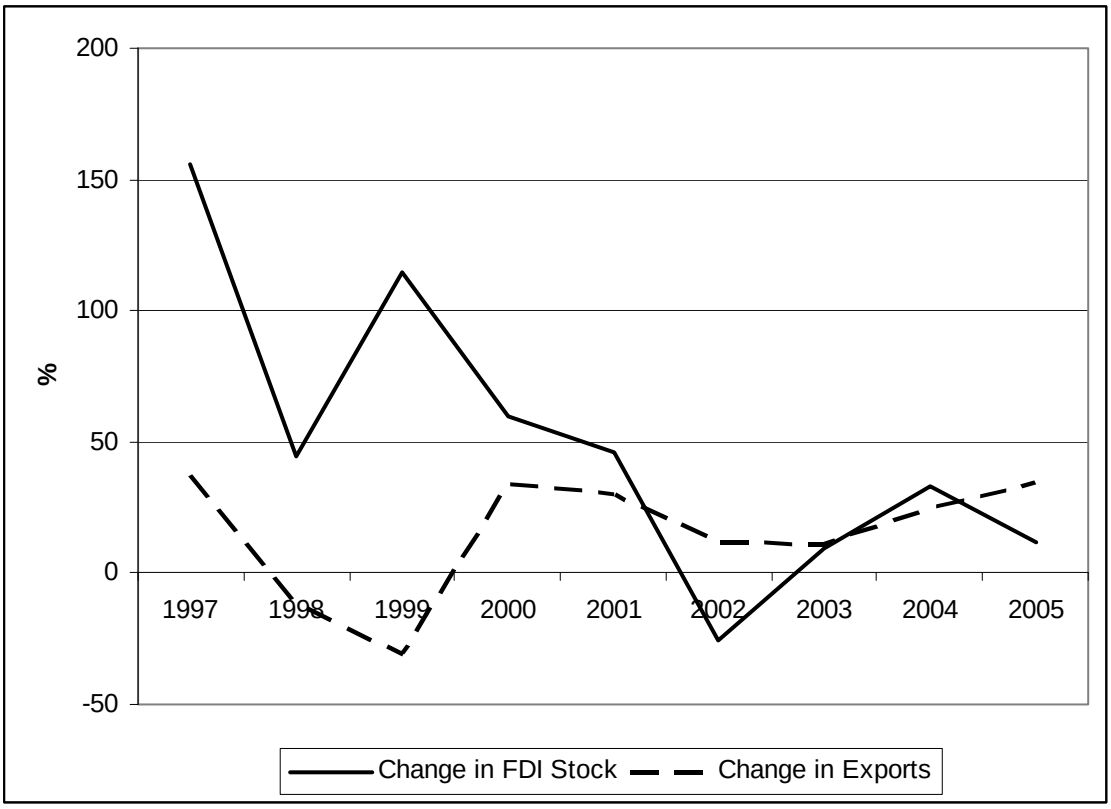
If FDI is based on low employment costs and the whole production is relocated to Russia, it is substitution. A low cost strategy can, however, be combined with a business concept which develops production also in Finland. This is the case when some labour-intensive parts of the production are located in Russia. For example, the PKC Group produces components in Kostamuksa (Kostamus) near the Finnish border and imports them to Finland. Gradually, however, more production has been shifted to Russia because labour costs are much lower there, 15-20 per cent of those in Finland. The labour force can be skilled also

in Russia. Individual firms can also export advanced production facilities and organizations to their foreign production units.

The correlation between annual changes in Finnish exports to Russia and changes in Finnish FDI stock was -0.09 in 1997-2005. (Figure 22.) In 1994-2005 it was 0.27. There is thus no clear short-run relationship between FDI and exports. This can reflect the fact that the substitution as well as the complementary effects are at work. Of course FDI is also more based on long-run considerations than exports.

In the long run FDI as well as exports have been increasing. The correlation between FDI and export levels was 0.82 in 1994-2005. In 1997-2005 the FDI stock grew by 37 per cent on average and exports by 13 per cent on average per year.[13] In the 2000s growth differentials have, however, narrowed.

Figure 22 Changes in the Value of Finnish FDI Stock in Russia and Exports to Russia (both in Euro terms), %



Because formal modelling of the joint determination of foreign trade and FDI is a complicated issue, we present below a non-formal list of factors that favour either trade or FDI. The balance between the effects of these factors is an empirical issue and varies over time.

Table 3 Factors Favouring Either Exports or FDI

[13] In 1994-1996 the value of FDI was small and correspondingly percentage fluctuations very large.

Factors Favouring Exports

- Local production presence not necessarily required (technically or commercially)
- Low transport costs
- Small (potential) sales volumes
- Important scale economies
- Large use of domestic raw materials and natural resources
- Specific skill requirements
- No important cost disadvantage in the home country
- High investment risks abroad
- No important competitors investing in the country in question

Factors Favouring FDI

- Local production presence required (technically or commercially)
- High transport costs
- High (potential) sales volumes
- Important cost advantage in foreign production
- Large use of local raw materials and natural resources
- Manageable investment risk abroad
- Competitors invest in the country in question
- Client company producing in the country in question (relevant in the case of subcontractors)

It is difficult to place every investment in one of the categories presented above. Often they belong to several categories. In the following some investments are preliminarily placed in one or two of them.

Local production presence required (technically or commercially):

- Fortum (electricity), Telia-Sonera (telecommunications), YIT (construction), Fazer Bakery, Stockmann (retail trade), Rautakesko (retail trade), Nordea (ownership in a bank), Huurre (services and marketing of refrigerating machines)

High transport costs:

- Zao Rannila (roofings of steel), Parma Betonila (concrete products), Lohja Rudus (concrete products), Optiroc (stone products)

High (potential) sales volumes:

- Nokian Tyres, Tikkurila Paints, Baltika (beer) + almost all other investors

Important cost advantage in foreign production:

- PKC Group (cables etc.), Elcoteq (subcontracting in electronics industry), Tiivi (windows), Tikkurila Paints, Raisio (margarine)

Large use of local natural resources:

- UPM, Stora Enso and Metsä-Botnia (saw mills), Stora Enso (paperboard), Kuusakoski (recycling)

Most of the above-mentioned investments are *horizontal* in nature. Similar goods are produced in Finland and/or in some other country. This means that the high market growth and rapid structural change in Russia have been the dominant factors behind the investments. PKC Group used to produce components in Russia and to import them to Finland, but lately the company has been shifting also production of final goods to Russia. Finnish-owned saw mills provide wood chip to be used as raw material for pulp mills of the parent company located in Finland.

Finnish FDI in Russia will increase in the coming years due to the cost advantage, too. Part of the production is meant for the Russian market, but a part of it, mainly components, is geared toward the Finnish market. So it is evident that vertical investments in Russia will increase, too. Finnish-owned forest companies will undoubtedly invest in pulp and paper mills when the time is ripe. The new Russian forest law, accepted in autumn 2006, is one step further on this road. Increases in the export duties of raw timber, if realised, may also increase incentives to invest in the Russian forest sector.

3.4.2 Investment from Russia to Finland

When anticipating the prospects of Russian FDI in Finland we have no clear method. In principle gravity models could be used. They are suitable in anticipating aggregate FDI. Russian FDI is, however, very sector specific and it is determined on the basis of the sector-specific factors. Large Russian investments in Finland as well as in many other countries are in the energy or other raw materials sector – reflecting the comparative advantage of the Russian economy. In Finland the investments of Lukoil (Teboil- and Jet- gasoline stations), Gasum (joint venture in the natural gas sector) and Norilsk Nickel (OMG Group) are very large individual investments, which constitute a large part of the total. In addition to large investments, there are a lot of small Russian-owned firms that are active in trade between Finland and Russia.

It is probable that also in the future Russian investments in Finland are mainly directed to the energy and other raw materials sector as well as to the trading sector. In the energy sector there are, however, natural limits due to competition policy and due to the strong position of Finnish actors in the field. One phenomenon in FDI is that Russians prefer to locate their company in Finland rather than in Russia, because the economic and political environment is more stable in Finland. The number of these entrepreneurs will probably diminish when the Russian society becomes more stable.

4 Summary and Conclusions

The value of Finnish imports from Russia grew by 14 per cent on average per annum in 1994-2005. About 60 per cent of the cumulative growth was due to the increased value of petroleum and its products. The dominance of oil increased. Its share in total imports was 36 per cent in 1992 and 53 per cent in 2005.

Finnish exports to Russia grew by 10 per cent per annum on average in value terms. Finnish exporters increased their market share from 3 per cent in Russian imports in 1994 to almost 6 per cent in 2005. Exports of telecommunication equipment were the fastest growing item. Its share increased from 2.5 per cent in 1992 to 29 per cent in 2005. The structure of exports, when measured with a similarity index, became more similar to Finnish total

exports until 2003. In 2004, however, the higher than average share of exports of telecommunication equipment shifted the export structure towards more divergence.

When measured by the Grubel-Lloyd index of intra-industry trade (SITC3, 4-digit), less than 3 per cent of Finnish-Russian trade occurred inside the same industry in 2004. This percentage has even declined slightly during the period studied. In Finland's trade with Germany, the corresponding figure was 31 per cent and in trade with Sweden 47 per cent in 2004.

When explaining the development of Finnish imports from Russia, we notice that the dominance of changes in oil prices and of imports of big companies does not allow any econometric explanations.

In the case of Finnish exports to Russia we try to find econometric evidence on volumes and values, on aggregate and sectoral, and on annual and quarterly exports. We study first the *volume* aggregate exports. The best explanatory variables seem to be the real bilateral exchange rate, crude oil prices and the Russian real GDP, in this order. All these must be lagged by one year. In the case of volumes, the problem is that there is no country-specific deflator for the export values.

Better fits are obtained when we explain the development of the *value* of exports. The values include, in addition to volume, also price and exchange rate developments. In the case of aggregate annual exports we notice that Russia's imports are a good explanatory variable. We must, however, add a constant due to increasing market share. Russia's nominal GDP is an important determinant of its imports. There seems to be a direct relation between changes in the value of Finnish exports to Russia and Russian nominal GDP. When studying changes in aggregate quarterly exports, we obtain again quite satisfactory results when using changes in the nominal Russian GDP as an explanatory variable.

In the case of sectoral exports, we succeed in finding econometric evidence for rather many branches of industry. Changes in contemporaneous Russian GDP explain exports in several sectors. Adding a constant improves the fit in some cases. One-year lagged Russian nominal GDP explains the development of exports in some sectors, too. Even when studying quarterly sectoral exports, we find some econometric evidence. Usually, we need, in addition to GDP, lagged Finnish exports to Russia as an additional explanatory variable.

Mobile phones have an important role in Finland's exports to Russia. In this case we can use the number of mobile phones as well as their value as data. We notice that in the case of changes in volumes, the Russian real GDP and real consumption work satisfactorily. In the case of changes in values, changes in the Russian nominal GDP plus a constant work well.

Even though we can find demand-side explanations for Finnish exports to Russia, we know that especially at the sectoral level there is a relation between exports and FDI. At the aggregate level we can explain FDI by using gravity models. We refer first to them. After that we present several kinds of classifications of FDI, and ask which factors favour exports and which FDI. We also classify Finnish investments to Russia according to these criteria – in a very illustrative and preliminary way. We also ask whether Finnish FDI to Russia and exports there are substitutes or complements. Obviously some are substitutes and some are complements. When looking at correlations between changes in FDI stocks and exports, we find very low correlations. They, however, change over time. When looking at levels we already see rather high positive correlations. These findings point to the

direction that in the long run exports and FDI have not been in a conflict with each other. Both have profited from the high market growth and structural change of the Russian economy.

LITERATURE

Alho, K., O. Forssell, J. Huttunen, M. Kotilainen, I. Luukkonen, O.-T. Mattila, J. Moilanen, P. Vartia (1986) "Trade between Finland and the Soviet Union in the Finnish Economy". The Research Institute of the Finnish Economy, Series B 50. Helsinki 1986. (220 pages, in Finnish, with an English summary.)

Board of Customs (2007) ”Jälleenvienti Venäjälle vuonna 2005” (”Re-exports to Russia in 2005”). Kauppa 2007:M04 (09.02.2007). Helsinki. (In Finnish.)

Filippov, P., S. Boltramovich, G. Dudarev, D. Smirnyagin, D. Sutyrin and H. Hernesniemi (2005) “Investoinnit ja investointiedellytykset Venäjällä” (“Investment and Conditions for Investment in Russia”). Research Institute of the Finnish Economy (Elinkeinoelämän Tutkimuslaitos) (ETLA), Series B 215. (Also in the Ministry of Trade and Industry, Rahoitetut tutkimukset 8/2005, Markkinaosasto). (In Finnish.)

Kotilainen, M. (1996) “Is the EU an Optimal Currency Area and Is Finland a Part of It”. In K. Alho, M. Erkkilä and M. Kotilainen (eds.) *The Economics and Policies of Integration – A Finnish Perspective*. Kluwer Acedemic Publishers. Dordrecht/Boston/London, pp. 117-148.

Kotilainen, M., V. Kaitila, M. Widgrén and K. Alho (2003) ”Suomen ja Venäjän taloussuhteiden kehitysnäkymät” (“Prospects for Finnish-Russian Economic Relations”). Research Institute of the Finnish Economy (Elinkeinoelämän Tutkimuslaitos) (ETLA), Series B 205. (In Finnish with an English summary.)

Ollus, S.-E. and H. Simola (2006) “Russia in the Finnish Economy”. Sitra Reports 66. Helsinki.

APPENDIX 1

EQUATIONS EXPLAINING THE DEVELOPMENT OF QUARTERLY EXPORTS OF CERTAIN PRODUCT GROUPS FROM FINLAND TO RUSSIA

The equations explaining changes in the value of quarterly exports of different SITC-3 product groups at the 2-digit level is of the following form:

(11) $FXNQ^i = a*RGDPNQ + b*FXNQ^i(-1)$,

where $FXNQ^i$=quarterly changes in nominal exports of SITC product group i (compared to the corresponding quarter a year before) {(-1) refers to a lag of one period} and RGDPNQ=corresponding change in Russian quarterly nominal GDP. The research period is 1994/3-2005/4 (45 observations). Because of the lagged endogenous variable, the Durbin-Watson statistic is not a reliable measure of the autocorrelation of the errors. By explaining the error term observations with lagged errors and the explanatory variables of equation (11), we notice that the coefficient of the lagged error term is not statistically significant (a very low t-value). Autocorrelation of the error terms is thus not a problem in these equations.

The specific equations for each product group are as follows:

1) meat and meat preparations (SITC 01):

$FXNQ^{01} = 0.31*RGDPNQ + 0.64*FXNQ^{01}(-1)$; $R^2=0.49$
(1.74) (5.49)

2) vegetables and fruits (SITC 05):

$FXNQ^{05} = 0.33*RGDPNQ + 0.47*FXNQ^{05}(-1)$; $R^2=0.25$
(1.77) (4.68)

3) cork and wood (SITC 24):

$FXNQ^{24} = 0.35*RGDPNQ + 0.28*FXNQ^{24}(-1)$; $R^2=0.30$
(2.04) (3.87)

4) textile fibres (SITC 26) :

$FXNQ^{26} = 1.17*RGDPNQ + 0.35*FXNQ^{26}(-1)$; $R^2=0.23$
(2.47) (2.61)

5) inorganic chemicals (SITC 52):

$FXNQ^{52} = 1.03*RGDPNQ + 0.54*FXNQ^{52}(-1)$; $R^2=0.52$
(2.77) (7.29)

6) dyeing, tanning and colouring materials (mainly paints) (SITC 53):

$FXNQ^{53} = 0.42*RGDPNQ + 0.47*FXNQ^{53}(-1)$; $R^2=0.42$
(2.69) (3.97)

7) fertilizers (SITC 56):

$FXNQ^{56}$=1.68*RGDPNQ + 0.14*$FXNQ^{56}$(-1); R^2=0.97
(2.64) (39.61)

8) plastics in non-primary forms (SITC 58):

$FXNQ^{58}$=0.48*RGDPNQ + 0.38*$FXNQ^{58}$(-1); R^2=0.40
(3.16) (2.90)

9) cork and wood manufactures (excluding furniture) (SITC 63):

$FXNQ^{63}$=0.32*RGDPNQ + 0.37*$FXNQ^{63}$(-1); R^2=0.51
(3.67) (4.97)

10) other industrial machinery and parts (SITC 74):

$FXNQ^{74}$=0.48*RGDPNQ + 0.35*$FXNQ^{74}$(-1); R^2=0.32
(3.04) (2.66)

11) office machines and automatic data processing machines (SITC 75):

$FXNQ^{75}$=0.62*RGDPNQ + 0.66*$FXNQ^{75}$(-1); R^2=0.46
(2.28) (6.00)

12) telecommunication equipment (SITC 76):

$FXNQ^{76}$=1.24*RGDPNQ + 0.28*$FXNQ^{76}$(-1); R^2=0.35
(4.43) (2.18)

13) electrical machinery (SITC 77):

$FXNQ^{77}$=0.50*RGDPNQ + 0.48*$FXNQ^{77}$(-1); R^2=0.23
(2.32) (3.73)

14) furniture and parts thereof (SITC 82):

$FXNQ^{82}$=0.22*RGDPNQ + 0.35*$FXNQ^{82}$(-1); R^2=0.26
(1.74) (2.99)

15) photo apparatus, optical goods, watches and clocks (SITC 88):

$FXNQ^{88}$=0.65*RGDPNQ + 0.41*$FXNQ^{88}$(-1); R^2=0.31
(2.44) (3.04)

16) miscellaneous manufactured articles (SITC 89):

$FXNQ^{89}$=0.21*RGDPNQ + 0.71*$FXNQ^{89}$(-1); R^2=0.75
(1.88) (11.95)

SITC-3 CLASSIFICATION, 2-DIGIT LEVEL

00 Live animals other than animals of division 03
01 Meat and meat preparations
02 Dairy products and birds' eggs
03 Fish, crustaceans, molluscs and preparations thereof
04 Cereals and cereal preparations
05 Vegetables and fruits
06 Sugar, sugar preparations and honey
07 Coffee, tea, cocoa, spices, and manufactures thereof
08 Feedstuff for animals (excluding unmilled cereals)
09 Miscellaneous edible products and preparations
11 Beverages
12 Tobacco and tobacco manufactures
21 Hides, skins and furskins, raw
22 Oil seeds and oleaginous fruits
23 Crude rubber (including synthetic and reclaimed)
24 Cork and wood
25 Pulp and waste paper
26 Textiles fibres and their wastes
27 Crude fertilizers other than division 56, and crude minerals
28 Metalliferous ores and metal scrap
29 Crude animal and vegetable materials, n.e.s.
32 Coal, coke and briquettes
33 Petroleum, petroleum products and related materials
34 Gas, natural and manufactured
35 Electric current
41 Animal oils and fats
42 Fixed vegetable oils and fats, crude, refined or fractionated
43 Processed Animal and vegetable oils and fats
51 Organic chemicals
52 Inorganic chemicals
53 Dyeing, tanning and colouring materials
54 Medicinal and pharmaceutical products
55 Essential oils for perfume materials and cleaning preparations
56 Fertilizers other than group 272
57 Plastics in primary forms
58 Plastics in non-primary forms
59 Chemical materials and products, n.e.s.
61 Leather, leather manufactures and dressed furskins
62 Rubber manufactures, n.e.s.
63 Cork and wood manufactures (excluding furniture)
64 Paper and paper manufactures
65 Textile yarn and related products
66 Non-metallic mineral manufactures, n.e.s.
67 Iron and steel
68 Non-ferrous metals
69 Manufactures of metal, n.e.s.
71 Power generating machinery and equipment
72 Specialised machinery
73 Metal working machinery
74 Other industrial machinery and parts
75 Office machines and automatic data processing machines
76 Telecommunication and sound recording apparatus
77 Electrical machinery, apparatus and appliances, n.e.s.
78 Road vehicles
79 Other transport equipment

81 Prefabricated buildings, sanitary, heating and lighting fixtures, n.e.s.
82 Furniture and parts thereof
83 Travel goods, handbags, etc.
84 Articles of apparel & clothing accessories
85 Footwear
87 Professional and scientific instruments, n.e.s.
88 Photo apparatus, optical goods, watches and clocks
89 Miscellaneous manufactured articles, n.e.s.
93 Special transactions & commodities not classified
96 Coin (other than gold coin), not being legal tender
97 Gold, non-monetary (excluding gold ores & concentrates)

E L I N K E I N O E L Ä M Ä N T U T K I M U S L A I T O S (ETLA)
THE RESEARCH INSTITUTE OF THE FINNISH ECONOMY
LÖNNROTINKATU 4 B, FIN-00120 HELSINKI

Puh./Tel. (09) 609 900 Telefax (09) 601753
Int. 358-9-609 900 Int. 358-9-601 753
http://www.etla.fi

KESKUSTELUAIHEITA - DISCUSSION PAPERS ISSN 0781-6847

Julkaisut ovat saatavissa elektronisessa muodossa internet-osoitteessa:
http://www.etla.fi/finnish/research/publications/searchengine

No 1047 ALBERTO DI MININ – CHRISTOPHER PALMBERG, A Case for Non-Globalisation? – The Organisation of R&D in the Wireless Telecommunications Industry. 23.10.2006. 28 p.

No 1048 TUOMO NIKULAINEN – RAINE HERMANS – MARTTI KULVIK, Patent Citations Indicating Present Value of the Biotechnology Business. 25.10.2006. 21 p.

No 1049 TOMI KYYRÄ – MIKA MALIRANTA, The Micro-Level Dynamics of Declining Labour Share: Lessons from the Finnish Great Leap. 02.11.2006. 35 p.

No 1050 KARI E.O. ALHO, Structural Reforms in the EU and The Political Myopia in Economic Policies. 03.11.2006. 30 p.

No 1051 MIKKO KETOKIVI, When Does Co-Location of Manufacturing and R&D Matter? 03.11.2006. 22 p.

No 1052 MIKA PAJARINEN – PETRI ROUVINEN – PEKKA YLÄ-ANTTILA, Uusyrittäjien kasvuhakuisuus. 03.11.2006. 77 s.

No 1053 RAIMO LOVIO, Sijainti seuraa strategiaa: Kokonaiskuva suomalaisten monikansallisten yritysten globaalien karttojen muutoksista 2000 – 2005. 03.11.2006. 30 s.

No 1054 KARI E.O. ALHO – NUUTTI NIKULA, Productivity, Employment and Taxes – Evidence on the Potential Trade-offs and Impacts in the EU. 10.11.2006. 24 p.

No 1055 JUSTIN BYMA – AIJA LEIPONEN, Can't Block, Must Run: Small Firms and Appropriability. 11.11.2006. 30 p.

No 1056 AIJA LEIPONEN, Competing Through Cooperation: Standard Setting in Wireless Telecommunications. 11.11.2006. 30 p.

No 1057 TERTTU LUUKKONEN – MARI MAUNULA, Riskirahoituksen merkitys biotekniikka-alalla – Pääomasijoittajien vertailu yritysten näkökulmasta. 14.11.2006. 50 s.

No 1058 VESA KANNIAINEN, Yrittäjyyden ja yritysten verokannustimet. 08.12.2006. 28 s.

No 1059 JYRKI ALI-YRKKÖ, Ulkoistus ja toimintojen siirrot Suomesta ulkomaille – Katsaus 2000-luvun alun tilanteesta. 11.12.2006. 24 s.

No 1060 OLLI-PEKKA RUUSKANEN, Time Use during the Parental Leave and the Return to Employment. 30.12.2006. 32 p.

No 1061 VILLE KAITILA – NUUTTI NIKULA – JUDIT KARSAI, Suomalaiset yritykset Tšekin, Slovakian, Unkarin ja Slovenian markkinoilla. 18.12.2006. 90 s.

No 1062 NIKU MÄÄTTÄNEN – PANU POUTVAARA, Should Old-age Benefits be Earnings Tested? 18.12.2006. 24 p.

No 1063 AIJA LEIPONEN – CONSTANCE E. HELFAT, When Does Distributed Innovation Activity Make Sense? Location, Decentralization, and Innovation Success, 20.12.2006. 32 p.

No 1064 CHRISTOPHER PALMBERG – MIKA PAJARINEN – TUOMO NIKULAINEN, Transferring Science-Based Technologies to Industry – Does Nanotechnology make a Difference? 04.01.2007. 64 p.

No 1065 NIKU MÄÄTTÄNEN – MIKA MALIRANTA, T&K-toiminnan verokannustimet ja yritysdynamiikka. 04.01.2007. 23 s.

No 1066 TARMO VALKONEN, Tutkimus- ja tuotekehitysinvestointien verotuki. 11.01.2007. 24 s.

No 1067 TERTTU LUUKKONEN – MARI MAUNULA, Non-financial Value-added of Venture Capital: A Comparative Study of Different Venture Capital Investors. 18.01.2007. 26 p.

No 1068 MARKKU MAULA, Verokannustimet yksityishenkilöiden riskipääomasijoitusten aktivoinnissa. 22.01.2007. 40 s.

No 1069 OLAVI RANTALA, Palvelualojen kilpailu ja hinnanmuodostus kansainvälisessä vertailussa. 22.01.2007. 40 s.

No 1070 JYRKI ALI-YRKKÖ, Ulkoistukset Suomen teollisuusyrityksissä – onko toimialalla merkitystä? 12.02.2007. 15 s.

No 1071 JYRKI ALI-YRKKÖ, Tuotannon ja T&K-toiminnan ulkoistaminen – motiivit ja onnistuminen. 12.02.2007. 16 s.

No 1072 CHRISTOPHER PALMBERG, Nanoteknologiastako seuraava yleiskäyttöinen teknologia? – Havaintoja Suomen näkökulmasta. 08.02.2007. 25 s.

No 1073 JUKKA LASSILA – TARMO VALKONEN, Longevity Adjustment of Pension Benefits. 12.02.2007. 20 p.

No 1074 KARI E.O. ALHO – NUUTTI NIKULA, Productivity, Employment and Taxes – A Svar Analysis of the Trade-offs and Impacts. 22.02.2007. 19 p.

No 1075 RAINE HERMANS – MARTTI KULVIK, Simulaatio lääkekehitysalan kannattavuudesta ja riskeistä. 26.02.2007. 25 s.

No 1076 TERHI HAKALA – OLLI HALTIA – RAINE HERMANS – MARTTI KULVIK – HANNA NIKINMAA – ALBERT PORCAR-CASTELL – TIINA PURSULA, Biotechnology as a Competitive Edge for the Finnish Forest Cluster. 26.02.2007. 76 p.

No 1077 RITA ASPLUND, Finland: Decentralisation Tendencies within a Collective Wage Bargaining System. 02.03.2007. 31 p.

No 1078 PAVEL FILIPPOV – VLAD YURKOVSKY, Essay on Internationalisation Potential of Northwest Russian and Finnish Energy Clusters. 20.03.2007. 36 p.

No 1079 MARKKU KOTILAINEN, Determinants of Finnish-Russian Economic Relations. 22.03.2007. 39 p.

Elinkeinoelämän Tutkimuslaitoksen julkaisemat "Keskusteluaiheet" ovat raportteja alustavista tutkimustuloksista ja väliraportteja tekeillä olevista tutkimuksista. Tässä sarjassa julkaistuja monisteita on mahdollista ostaa Taloustieto Oy:stä kopiointi- ja toimituskuluja vastaavaan hintaan.

Papers in this series are reports on preliminary research results and on studies in progress. They are sold by Taloustieto Oy for a nominal fee covering copying and postage costs.