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Technological cooperation between Finland and Russia: Example of technology parks in St. Petersburg

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1.1 Technology parks and their basic types

Technoparks (or short of *technology parks*) play an important role in the economies of industrial nations. They contribute to development of both R&D and SME sectors, utilizing innovative ideas and putting them into practice. First of all, it would be reasonable to define what we call a technopark.

As much as there is no consistent definition for *technology park*, there is also no consistent term for the functions that a technology park provides. While in the United States, "*technology park*," "*research park*" or "*research and technology park*" are frequently used, "*science park*" is popular in Britain and Europe and "*technopole*" is widely used in France (Briggs and Watt, 2001). Comparing definitions based on different sources one can conclude either that *science/research* park is a synonym of technopark, or that those organisation types have very much in common but still slightly differ from each other.

So, International Association of Science Parks (IASP) defines science park as an organisation managed by specialised professionals, whose main aim is to increase the wealth of its community by promoting the culture of innovation and the competitiveness of its associated businesses and knowledge-based institutions.
To enable these goals to be met, a science park stimulates and manages the flow of knowledge and technology amongst universities, R&D institutions, companies and markets. It facilitates the creation and growth of innovation-based companies through incubation and spin-off processes; and provides other value-added services together with high quality space and facilities. According to IASP, the term *science park* may be replaced in this definition by the expressions *technology park* / *technopark* or *research park* (IASP, 2002).

Quite close to this is another definition given by North American Research Parks Association named AURP. According to it, a university research park is defined as a property-based venture, which has:

- Master planned property and buildings designed primarily for private/public research and development facilities, high technology and science based companies, and support services
- A contractual, formal or operational relationship with one or more science/research institutions of higher education
- A role in promoting the university's research and development through industry partnerships, assisting in the growth of new ventures and promoting economic development
- A role in aiding the transfer of technology and business skills between university and industry teams
- A role in promoting technology-led economic development for the community or region (AURP, 2006).

In EU the regulation of technopark structures is provided by EBN, the European BIC[1] Network. EBN was created about 20 years ago by the European Commission and European Industry leaders and its headquarters are located in Brussels, Belgium. EBN defines BIC as follows:

- Support organisation, public or private, for innovative small and medium sized businesses (SMEs) and entrepreneurs
- Incubator/Business resource centre dedicated to innovation, officially recognised by the European Commission through a certification scheme
- Contributing to regional and local economic development through the the creation of new innovative SMEs and innovative projects in existing SMEs
- Offering a range of integrated strategic guidance for innovative projects
- Grouped together within and benefiting of common services and tools provided by EBN (EBN, 2006).

That is necessary to mention, that innovation centre is generally accepted as a structure different from technopark as it has smaller range of functions. Nevertheless, in EU countries there are several other definitions suggested by national associations of science parks. For example, according to The United Kingdom Science Park Association science park is a business support and technology transfer initiative that:

[1] Abbreviation BIC means Business & Innovation Centre

- encourages and supports the start up and incubation of innovation led, high growth, and knowledge based businesses;
- provides an environment where larger and international businesses can develop specific and close interactions with a particular centre of knowledge creation for their mutual benefit;
- has formal and operational links with centres of knowledge creation such as universities, higher education institutes and research organisations (UKSPA 2006).

The four above-mentioned definitions obviously have many differences. It might be noticed that North American technoparks are closer linked to the universities and higher education institutions then science parks in other parts of the world. In EU big emphasis is given to certification and regulation of innovative activities within the framework of special organization, established by the Union's authorities. Nevertheless, the definitions have much in common. Thus it is possible to outline several basic features which characterize technology parks or science parks worldwide. In general, science park is an organization, which:

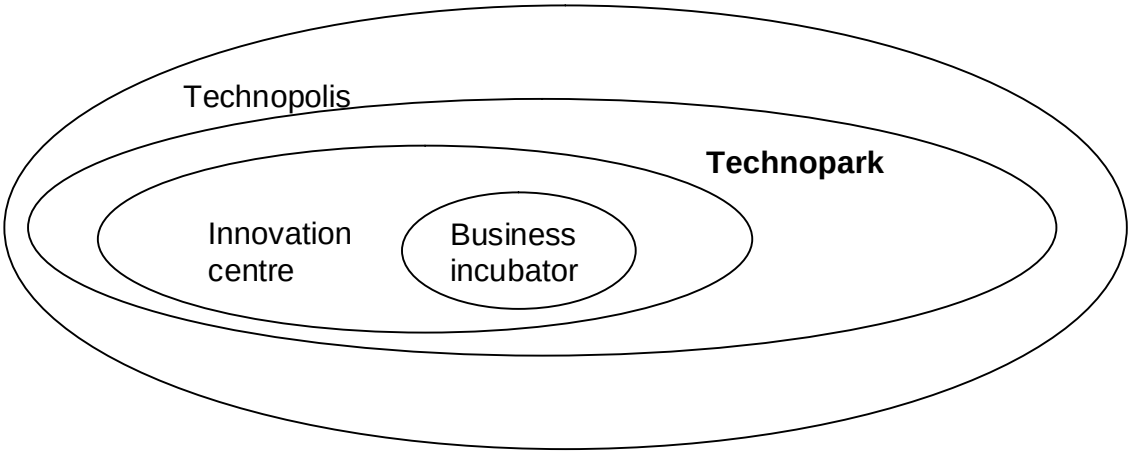
- Creates innovative environment and has necessary infrastructure for research activities (land, buildings, developed communication and support services)
- Facilitates the growth of small and medium innovative businesses, providing them with various assistance and serving as an "incubator" for promising start-ups
- Involves higher educational institutions and other scientific organisations into research and development process, utilizing and putting into practice innovations generated by fundamental science (especially in North America, where science parks are closely linked to the universities).

Despite most of technopark associations use technology park and science park as close synonyms, certain differences could be observed in the use of these terms. For example, on the territory of a science park quite often there are no production facilities, only research institutions, while technopark is a more universal type of innovation environment which normally has equipment for putting innovative solutions into practice.

However, it is rather hard to draw a line between applied research and experimental activities on one side and innovative production on the other. The processes of applied investigation and production can even merge in one, i.e. in software production.

Even a brief analysis of such a phenomenon as technopark shows that its forms vary from country to country. Nevertheless, there are four types of innovative structures that may be seen in a below pictured hierarchy (see Picture 1).

Figure 1 Hierarchy of innovative organisations



Two of these structures (*innovative centres* and *business incubators*) may be both integral parts of a science park and independently operating organisations. The largest innovative structure namely *technopolis* is a structure larger than a science park and has certain additional functions.

So, the smallest element in this hierarchy is *business incubator*. This organisation facilitates creation and development of innovative SMEs, most of which could be characterised as start-ups. These small businesses are provided with necessary infrastructure and equipment, often with a substantial discount. The start-ups receive working premises, equipment, information and consulting services. These business incubators could be both a nucleus of a technopark and a separate research organisation. The basic task of a business incubator is to support businesses which are

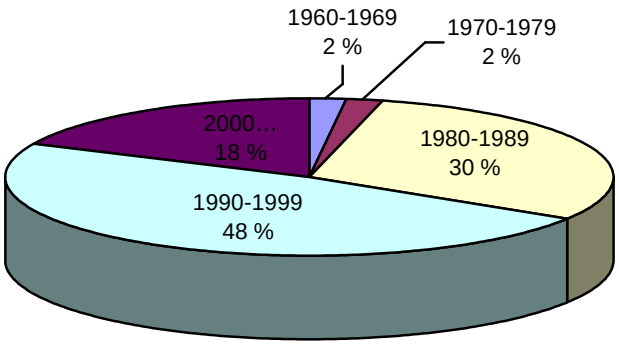
at initial or early stage of their development (also called start-ups). Separately working incubators may also support start-ups which have a small innovative/scientific potential or which do not have any (for example, those belonging to traditional fields of business). Moreover, independent incubators normally do not own land and can offer their clients smaller range of facilities, than science parks do. Incubators first appeared in the United Kingdom in 1970-ies, but today they are mostly widespread in the United States. In Russia this is practically a brand new phenomenon as there is only a small number of such organisations.

Innovation centre is a structure rather close to incubator, but it operates with more "mature" businesses which may need offices and production facilities more that intensive promotion required by the start-ups. However, that makes innovation centres also different from technoparks. The latter operate with both start-ups and more self-sufficient firms, alongside with providing other activities described below.

Technopolis is a largest organisational structure for innovative economic activity. It may include universities and other research centres; business incubators and other innovation centres, industrial or other enterprises involved in innovative activities. The basic aim of this structure is to unite scientific, industrial and living facilities in an environment able to invent, develop and produce innovations and innovative goods. In fact technopolis is a scientific or technological village or town (depending on its scale). This structure generates innovations on national or even global level (for example, world-known Silicon Valley).

Finally, technology parks in world economy constitute a rather new phenomenon. The below presented picture proves that fact, showing that the majority of today existing technoparks were created in the 1990-ies.

Figure 2 Periods when technology and science parks were established, % of the world's total



Source: IASP, 2006.

1.2 International experience of technology parks: North America and EU

Today technoparks could be found almost in every industrial economy. And the largest amount of technoparks logically belongs to the biggest industrial economy on globe, the United States. It has more than three hundreds of technoparks and among them the largest and most known ***Stanford University Research Park*** often called ***Silicon Valley***.

As in many other cases, civil innovation activities in this area grew out of military research zone for the needs of U.S. Navy, which first was initially located in the Valley but than moved to San Diego. In 1930-ies Frederick Terman, a professor at Stanford University, decided that a vast area of unused Stanford land was perfect for real estate development, and set up a program to encourage students to stay in the area by enabling them to easily find venture capital. One of the major success stories of the program was that it convinced two students to stay in the area, William Hewlett and David Packard. In 1939, they founded Hewlett-Packard, which would go on to be one of the first "high tech" firms in the area.

In 1951 a program initiated by professor Terman (often called “Father of Silicon Valley”) was expanded by creation of the Stanford Industrial Park (later *Stanford Research Park*), a series of small industrial buildings that were rented out at very low costs to technical companies. During the fifties the defence programs in the field of air, space and electronics strongly stimulated growth in Silicon Valley. Semiconductor procurements by the defence agencies amounted to approximately two-fifths of total production. Lockheed Aerospace Co. located itself in 1956 in Stanford Industrial Park and a year later in Sunnyvale. Lockheed is a good example of how Stanford succeeded in developing good relationships with companies. Lockheed helped starting up a space and air department at the university and Stanford gave scientific advises and training for their employees in return. Soon after the arrival of Lockheed other research departments went to the region like IBM (1952), NASA (1958), Xerox (1970). Silicon Valley experienced two technological booms: semiconductor in the 1970-ies and “dot-com” (software and Internet) in the 1990-ies. By the early 1970-ies there were many semiconductor companies in the area, computer firms, and programming and service companies. Industrial space was plentiful and housing for personnel was still inexpensive. The growth was fueled by the emergence of the venture capital industry in early 1970-ies; the availability of venture capital exploded after the successful USD 1.3 billion IPO of Apple Computer in 1980. Despite venture capital is highly risky by its nature, the results of its use in this very technopark exceeded all the expectations.

Today Stanford Research Park accommodates more than 3 thousands small and medium companies, most of which belong to high-tech sector of US economy. Besides that, Silicon Valley is a home of the most successful of its former start-ups which now locate their headquarters in the technopark. Among those one can mention Adobe Systems; Apple Computer; Cisco Systems; eBay; Google; Hewlett-Packard; Intel; National Semiconductor; NVIDIA Corporation; Oracle Corporation; Sun Microsystems; Symantec; Yahoo! Even despite the collapse of a “bubble” in American IT sector in the beginning of new millennium, in 2006 the Wall Street Journal found that 13 of the 20 most inventive towns in America were in California, and 10 of those were in Silicon Valley (Albergotti, 2006).

Alongside with Stanford Research Park there are several other noteworthy technopark zones in USA. ***Cummings Research Park*** in Huntsville, Alabama and ***Oklahoma***

Technology and Research Park in Stillwater, Oklahoma could be taken as additional examples.

Cummings research park (CRP) was formally established in 1962 when the City of Huntsville first zoned 3,000 acres of land area as a "research park district." Development of this technopark was supported by both nearby located University of Alabama and Huntsville's local authorities. The first private company to operate in the park was Brown Engineering. Other companies quickly followed that example, and made investments of their own. These early companies included the IBM Corporation, Lockheed Martin Corporation, and many others. Throughout the remainder of the 1960's development was brisk, with nearly 1,000 acres purchased and developed by private companies. By the end of the 1970's, the earliest phase of CRP creation would be nearly complete. In 1982, the second major phase of CRP was launched. A substantial new parcel of land, exceeding 800 acres, was purchased and planned by the City of Huntsville. This phase was to become known as CRP West, and elevated development standards in the park to rival - and in most cases to exceed - the quality of planned business parks anywhere in the world. That new stage helped CRP to develop into the second largest research park in the US. Today this technopark accommodates 220 companies in 175 buildings.

Oklahoma Technology and Research Park (OTRP) was created to develop collaboration among technology entrepreneurs and researchers of Oklahoma State University, specialised labs and equipment and talented graduates. It also brings to the mix the nearby located Meridian Technology Center with its capabilities in customised training and business support available to small, growing companies.

USA-based technoparks give us the example of close collaboration and common efforts of universities putting their knowledge into practice (with substantial financial benefits for these universities, especially for their researchers and graduates), companies trying to expand their R&D activities, local authorities willing to develop their territories, and private funds investing in risky but high-return projects. However, the basic initiative, as a rule, belongs to the universities.

The first technoparks on EU territory appeared in France in the 1960-ies. As an example one can take the largest French technopark ***Sophia Antipolis*** located near Nice,

France. Creation of Sophia is an example of a French approach towards technopark development which presumes leading role of state and, first of all, regional authorities. To the contrary of U.S. practice, here the process was initiated by the local government which in 1962 created an “Industrial Zone” which attracted the attention of such innovative companies as IBM and Texas Instruments. Later in 1965 the University of Nice was established, and one of the main reasons for that was the technopark’s further development. Shaping this innovative zone into a classical technopark was also provided by the state (Interministerial Committee for Land Development) in 1972.

In 2005 there were 1379 companies operating in Sophia Antipolis, including Air France, HP, Philips, Toyota etc. The leading industry of the technopark was IT. Information Technologies represented 23% of companies at Sophia, and 43% of jobs. The second largest sector was Higher Education, Research and Training, accounting for 5% of the establishments at Sophia and 12 % of jobs. Health Sciences and Chemistry were the third largest industry: they were represented by 4% of companies, and offered 9% of all jobs.

The basic peculiarities of French technoparks are rather large size (there are many parks large enough to be a technopolis) and specialization. Despite Sophia park is universal to some extend, nevertheless it has a certain leading industry (IT). The same refers to other smaller French technology parks. For example, Biopark Lion is focused on biotechnologies, technopark near Metz is supposed to become a new center for IT and microelectronics.

Another large technopark was created in Munich, Germany, on the basis of Munich University and formed a European analogue for American Silicon Valley called *Isar Valley*. Over 4,000 companies located in the Munich area are active in the new technologies sector. Munich has gained an international reputation as the Isar Valley metropolis, due to its leading position in microelectronics, hardware and software. Most global players in this field have established offices in the Isar Valley: Apple, Compaq, Intel, Lotus, Microsoft, Oracle, Siemens Nixdorf and Texas Instruments. Munich is home to small and medium enterprises, as well as to companies in the sectors of biotechnology and genetic engineering, biochemistry, medical engineering, energy, measurement, testing and control technology, information and communications

technology, and research in new materials. The assistance to development of innovative and knowledge-intensive services is provided by state institutions namely the Federal Ministry of Economics and Technology (Bundesministerium für Wirtshaft und Technologie).

The technoparks in EU seem to differ from their American analogues. In EU countries the basic actor in the development of leading technoparks seems to be not the university but the state and regional authorities (see the example of Sophia Antipolis, where the University appeared later than the park was established). State promotes and encourages the technopark development. In EU this promotion can be seen not only on the national, but also on the community level. The development of innovative organisations goes in framework of the Union's so-called Lisbon strategy aimed to make the EU the most competitive and most dynamic science-based economic region in the world.

2 Technology parks in Saint Petersburg: potential and present development

2.1 Saint Petersburg: scientific potential and regional economy

Saint Petersburg area (which includes two regions: the City of Saint Petersburg and Leningrad Province) is a huge agglomeration with total population of 6 million 226 thousand people. Research and innovative potential here is growing fast during the last years. Moreover, the City has large traditions in research and educational spheres, inherited from the Soviet past.

During the existence of the Soviet Union authorities tried to introduce some analogue of West-based technoparks in USSR. These were so-called *"science towns"* or *naukogrady.* They started to grow since 1940-ies. These "science towns" had many resemblances with technoparks in North America and Europe. At least the idea of concentrating innovative activities and transferring knowledge from researchers to producers looks like much the same. However, they differed much from what today is called a technopark. The differences were both in their functions and operation environment. So, "science town" was focused on co-operation with big enterprises of military-industrial complex or development of single high-priority project (in military or space fields). On the contrary, technopark is assisting the growth of numerous small and medium-scale companies, various multi-dimensional research projects and initiatives. Moreover, many of the "science towns" operated in a secret or half-secret environment due to their strong linkage to the military-related researches. Nevertheless, these "science towns" might have become sort of ground for creation and development of modern technology parks. The most known "science towns" were created in Moscow area (in Dubna, Zelenograd) and near Novosibirsk. The latter (often called *Akademgorodok*) started this transformation already in the 1990-ies, despite a general crisis in R&D sector of Russia's economy. The transformation of Akademgorodok near Novosibirsk to a more modern innovation structure to a big extend depended on establishing tight links with technoparks and hi-tech companies in developed countries, especially in the United States.

In Soviet times the city of Leningrad was very often regarded as an educational and scientific "capital" of the country. Indeed, long traditions of higher education, many educational establishments (the world-known Leningrad State University / LGU and a large number of institutes), a substantial layer of scientists and researchers in the city's social structure proved such a title. On the other hand, construction bureaus, R&D-focused enterprises of military-industrial complex and research institutes located in the city all had a huge demand for highly qualified personnel. However, the only *naukograd* in the region was in Petrodvorets (also known as Petergof). But it had functions different from that of typical "science town". The Petrodvorets project aimed at creating in Leningrad an analogue of Western university campus and taking certain faculties of LGU out of the city centre to the suburbs.

In 1990-ies the structure of Saint Petersburg's economy changed dramatically. Education, science sector, the City's military-industrial complex and R&D-focused industries of civil economy (like machine building) lost their previous significance. The leadership shifted from knowledge-intensive industries to food production and trade. Despite the total amount of qualified graduates remained nearly on the same level, the major part of the students was choosing non-technical education (even the still prevailing technical institutes and universities introduced non-technical faculties and specialities). After graduation, many technical specialists emigrated to the West. Economic reforms encouraged fast creation of small businesses, but the vast majority of those related to trade sector. Many experienced scientists already working at research institutes and construction bureaus left their jobs either due to mass retirement (so-called *sokrashenija*) or because of low salaries. Most of those moved to other sectors of regional economy and lost their technical knowledge. A sharp decrease of state orders in early 1990-ies had a deeply negative impact on formerly "privileged" military-industrial complex of Saint Petersburg. One could conclude that during this decade the City's research potential diminished substantially, both at supply (scientists and researchers) and demand (research institutes and knowledge-intensive industries) sides.

Nevertheless, despite severe crises the City managed to keep its higher education potential. By the year 2005 in Saint Petersburg worked 14% of all Russian researchers; 13% of all graduate students and 15% of registered PhDs. More than 8% of all Russian

students were educated here. The number of the City's inhabitants employed by science and research sector was estimated as 300 thousand. Saint Petersburg remained a home for 49 scientific organisations with academic status[2]; 12 state scientific centres; 78 higher educational establishments. The City had over 300 research institutes and construction bureaus on its territory in 2005.

The basic reason for a dramatic decline in Saint Petersburg science and research sectors in the 1990-ies seemed to be the deep economic crisis which came along with the transformation of Russia's economy. The crisis, despite its deep impact, was a temporary phenomenon and was followed by the economic growth of 2000-ies.

In the beginning of the new millennium economic development in the region included not only overall growth of the City's economy, but also restructuring of the latter. In these new conditions knowledge-intensive industries started to regain their former importance. Huge investment boom led to re-equipment of many enterprises and modernisation of the regional economy in general. In the table below you may see that the share of knowledge-intensive industries in the City's economy is increasing.

Table 1 Structural Dynamics of Industrial Sector of Saint Petersburg's Economy

	2001	2002	2003	2004	2005
Chemical Industry	**1,2**	**1,2**	**1,1**	**1,4**	**3,2**
Wood-processing	2,4	2,4	2,4	2,5	4,1
Construction Materials	2,8	3	2,6	2,9	5,0
Light Industry	2	1,8	1,3	1,2	1,2
Food Industry	37,5	34,9	30,3	30,1	28,9
Machine-building*	**30,8**	**33,4**	**35,8**	**35,4**	**32,5**
Power Industry	10,5	11,7	14,9	10,8	10,7
Other	12,8	11,6	6,0	15,7	9,0

Source: Petrostat, 2006; the authors own calculations

**Note: certain decrease of share of machine-building in 2005 compared to 2004 is due to changes in statistical methodology: before metal processing referred to machine-building, since 2005 to metallurgy and thus gets into "other" category.*

Moreover, the growth of several branches shows even more impressive picture. While the total output of Saint Petersburg economy in 2005 grew by 3,2 %, the output of

[2] Affiliated with Russian Academy of Science or other Academies, having an official status.

machines and equipment sub-industry increased by 16,8%, and chemical production more than doubled. In general, comparatively low dynamics of the industrial sector in 2005 (plus 4,2%) was caused by the temporary decline in energetic machine-building (it constantly happens due to the large production cycle in the sub-industry). Thus it is easy to conclude that knowledge-intensive industries today not only constitute a large and growing share in regional economy, but determine its dynamics.

In 2000-ies a certain revival in the City's military-industrial complex may be observed as well. Formerly important state orders were substituted by large export contracts with countries like China and India, modernising their armed forces. Contracts in shipbuilding and other military-linked exports in 2000-ies constituted a bulk of regional foreign trade. Due to these military exports such EU countries like Germany and Netherlands, which took the leading positions among Saint Petersburg export partners in the 1990-ies, were replaced in the 2000-ies by China and India buying ships built at the City's shipyards[3].

During the 2000-ies another knowledge-intensive industry of Saint Petersburg economy, namely communication, developed extremely fast. For example, during the peak year of 2004 the subscriber base of mobile operators in Saint Petersburg grew by 60%. In general, during 1995-2005 the penetration level of mobile operators increased from nearly zero in mid 1990-ies to more than 100% in 2005 (in some high-tech economies, i.e. Finland, this indicator also exceeds 100% meaning that some mobile subscribers use more than one cellular operator). In 2005 the number of mobile subscribers in Saint Petersburg area[4] totalled 7,4 million. Internet access still has lower penetration in Saint Petersburg, but grows at a similar rate (the obvious reason is that PC are more expensive and thus less affordable than cellular phones) (Petrostat, 2006).

Another tendency of regional development in the 2000-ies was the investment boom observed both in the City and in surrounding Leningrad Province. Leningrad Province experienced in 1999-2005 a considerable increase of investment, sometimes (i.e., in 2003 investment[5] growth equal to 36% compared to previous year) far ahead of Saint Petersburg and Russia as a whole. This growth was driven primarily by large FDI-based

[3] It is noteworthy, that despite in 2004 Germany temporarily regained the leadership among main destinations of regional exports, India still remained the second. In 2005 the first place came back to China.
[4] Includes Saint Petersburg and Leningrad Province, which have one common area code.
[5] Here: investment into non-financial assets.

"green-field" projects of large foreign companies namely Ford Motors, Philip Morris, Nokian Tyres, Caterpillar, etc. In 2004 the Province topped the national investment list by annual investment per capita, being the third among 88 Russian regions after Moscow and Tumen Province[6]. The investment boom changed the structure of the Provincial economy in favour of R&D-focused industries, compared to the 1990-ies when regional economy was dominated by one huge oil refinery named *Kinef* (Ibid.).

Saint Petersburg had a less impressive, but also rather positive investment performance, especially during the 300-year anniversary campaign of 2003, when investment in City's economy grew by 24%. In 2006 Saint Petersburg was ranked by a well-known Russian economic magazine *Expert* as number one region in Russia by investment risk (meaning the City has the lowest integral investment risk among all 88 regions of the country). It is noteworthy, that this investment boom created considerable spill-over effects on the regional economy, especially in a SME sector. Most experts suppose the growth of investment in both Saint Petersburg and Leningrad Province to continue (Expert, 2006).

In could be concluded, that this growth wave of 2000-ies changed the priorities for the City's science and research sector: from preserving the Soviet heritage towards further development on a new basis. The demand for scientific and technological products is growing due to several basic factors:

- Increase in share and total output of knowledge-intensive sectors of regional economy;
- "Revival" of the City's military-industrial complex due to international co-operation;
- Investment boom in Saint Petersburg and, especially, neighbouring Leningrad Province;
- New rapidly growing sectors of regional economy, namely cellular communication and Internet-related services.

The author supposes that despite increasing demand for research and technology and relatively strong educational and scientific basis in Saint Petersburg, the link between fundamental science and higher education on one side and knowledge-intensive

[6] Main oil and gas producer in Russia.

production on the other, namely applied and experimental research and innovation, is rather weak compared to developed economies in North America and EU or it is even missing. However, just recently several new projects were launched in innovative sector of Saint Petersburg to change this situation.

2.2 Innovation projects in Saint Petersburg

From the very start of economic reforms the Government of Saint Petersburg tried to utilize the educational and research potential of the City in new economic environment. However, despite the declared willingness to create modern innovative structures in Saint Petersburg, the results of the Government's initiatives were rather modest.

In 1993 on 22.07 the City's Major Alexander Sobchak signed a directive number 557-r on "creating a science and technology park 'Saint Petersburg'". To develop this initiative in 1996 on 23.04 First Vice-Major Vladimir Putin issued another directive number 363-r "On the economic development zone 'Science and Technology Park Saint Petersburg'". This new directive had an idea of creating a special development zone and was attributed by the description of the zone's functions and framework. The initiatives were supported by Saint Petersburg Centre of Russian Academy of Science, State Optical Institute, Radium Institute, and other research institutions.

However, the plans to create a technopark structure in Saint Petersburg did not come into practice in 1990-ies. And there were obvious reasons for that. Basing on the world experience one can conclude, that creating a technopark requires substantial financial assistance from state and/or regional authorities. This assistance may be provided by allocating some land area with developed infrastructure or by some other non-financial means, but the support from authorities exists in all cases of technopark creating (especially strong it become is EU). In Saint Petersburg (as well as in Russia as a whole) there were no substantial budgetary or other resources for implementing this project. Definitely, there were many other targets for budget expenditures that had higher priority in the 1990-ies.

As it was mentioned above, the economic environment in Saint Petersburg during the early reform period also did not encourage the innovation activities. Innovative projects have long-term effect which becomes too uncertain during the economic crisis and decline. Moreover, there was simply no big demand for innovative products and research at those days. Economy and society struggled for survival.

Other possible actors in creating technoparks are universities (especially in North America). However, Russian universities got much less resources than their American colleagues. They also experienced dramatic decline of financing during the reforms. Nevertheless, using their scarce financial resources and production facilities (premises, laboratories, equipment, databases) inherited from Soviet times, several Universities of the City (first of all Saint Petersburg State University and State Technical University / former “Politech”) started creating research centres on their own basis. These innovative structures required fewer resources and thus were more affordable for universities. They also helped many young scientists to conduct their researches and thus decreased the “brain drain”. Today these centres may make their contribution to planned technopark projects in the city.

The aforementioned new demand for innovations in Saint Petersburg economy (as well as in Russia as a whole) that appeared in 2000-ies was widely acknowledged by all the main contributors of technology production process: research community (research institutes and centres, emerging small innovative companies); companies from knowledge-intensive industries (both Russian and foreign); educational establishments (universities, institutes, Russian Academy of Science and its subsidiary in Saint Petersburg); local and federal authorities. Moreover, improvement of regional and federal budget indicators and creating state owned Stabilisation Fund (SF) enabled the authorities to support innovative structures in the region.

Finally, the idea to develop technology production and innovative activities in Russia in 2005 became one of the national priorities. Almost constantly growing (since 1999) oil and gas price on one hand, enabled Russia to improve its budget, to get rid of high foreign debts created in the 1990-ies and inherited from USSR in 1991, to increase budget-financed salaries and pensions. On the other hand, the “oil revenues” made

Russian economy excessively dependant on world fuel market and the state started looking for the ways to reduce this dependence by changing economy structure in favour of knowledge-intensive sectors. “Innovative” economy was often proclaimed as a long-term target for Russia. And to achieve this goal the state decided to support innovative structures using its huge budgetary and SF reserves.

The main dimension of state-supported innovation policy was creation of Special Economic Zones (SEZ). There were similar (by title) structures before, called Free Economic Zones (FEZ). FEZ were established in early 1990-ies in several regions of Russia. However, they soon became either internal offshores or means of cheap custom clearance (i.e., FEZ in Kaliningrad). FEZ did not reach their goals (stimulating economic development of depressive or border regions), but got substantial tax exempts. Partially the idea of FEZ failed due to severe economic realities of the 1990-ies. Presently established SEZ got a different concept and, contrary to FEZ, declared state support. SEZ are subdivided into two types:

- industrial-and-production SEZ (IP SEZ);
- technological-and-innovative SEZ (TI SEZ).

The zones are supposed to have not only favourable tax regime, but also specially allocated territories with necessary infrastructure; SEZ might receive financial and other forms of support from the authorities. Start of SEZ project was accompanied by creating a specialised state organisation named “Federal agency for management of special economic zones” and a legislative framework of several laws. The most important of the latter was the federal law number 116-FZ “About special economic zones in the Russian Federation” adopted on July 22nd, 2005.

In fact many regions tried to get SEZ on their territory, and a competition was introduced. In the result 6 regions won: Lipetsk, Lipetsk Province; Elabuga, Republic of Tatarstan; Dubna, Moscow Province; Zelenograd, the City of Moscow; Tomsk, Tomsk Province; the City of Saint Petersburg. The first two locations were for IP SEZ, the last four were for TI SEZ. Moreover, each SEZ got its branch specialisation. So, for Saint Petersburg it was *development of hi-tech production*. Specialisation of locations was fixed in the Government order for SEZ creation signed on December, 21st, 2005. For construction,

future maintenance and management of SEZ infrastructure JSC *Special Economic Zones* was created in April 12, 2006. And already on April 26, 2006, the first TI SEZ in Tomsk was launched (FAUOEZ, 2006).

Saint Petersburg thus appeared to be in focus of state innovation policy: the City got an opportunity to create ***technological-and-innovative SEZ*** on its territory. This SEZ will have, however, a definite specialisation. The basic activities of the technopark will be the following:

- software production;
- production of communication equipment and consumer electronic devices;
- constructing equipment for automated production;
- production of medical appliances;
- production of military and civil avionics
- precision engineering.

The TI SEZ will be located on two territories: one in Strelna, south-west from the City (on a territory called "Neudorf"), other in the northern part of Saint Petersburg, near Novo-Orlovsky Park. Implementation of SEZ project may lead to creation of new technoparks in Saint Petersburg (Ibid.).

The first possible ***technopark*** may appear ***near/in Petergof***. A SEZ territory "Neudorf" is presently an empty land area. But this area lies very close to Petergof. As it was mentioned above, the town of Petergof (located in the suburbs of Saint Petersburg) was a "science town" or *naukograd* even in Soviet period. Since 1970 several research and educational institutions have been based here: three faculties of Saint Petersburg State University/SPbGU (namely Faculties of Applied Mathematics; Mathematics and Mechanics; Physics), State Marine Academy named after S. O. Makarov, Naval Radio and Electronics Institute named after A. S. Popov, North-western Technical University, Lomonosov Educational Complex, Laser Physics Centre, Telecommunication Centre. Although Petergof was not a typical *naukograd* (performing more educational, than scientific functions) it became one, at least officially, in July 2005 (under the decision of Federal Government). The "science town" status, however, was given to Petergof only for a 5-year period. Petergof, with its 11 thousand students and 10 thousand lecturers

and researchers living on a rather small area (with typical campus living facilities) may contribute to the development of SEZ "Neudorf", at lest by supplying educated and qualified personnel. Moreover, the City Administration plans to create a technopark in the area (Saint Petersburg City Administration, 2006). The technopark is supposed to utilize the benefits of established SEZ. Nevertheless, it presumes developing several dimensions which exceed the framework of SEZ' specialisation. The planned technopark might produce researches also in biotechnology, genetic engineering, nanotechnology. Beside that the planned technopark may have production facilities as well: it would produce bio-chemicals. Military dimension would develop here as well: nanotechnology centre may contribute to processing the outdated dangerous armaments. On the basis of *naukograd* SPbGU Administration plans to create a business-incubator. So, Petergof may get an innovative structure close to classical technopark with educational component (provided by SPbGU and aforementioned other institutions), living facilities (university campus), business-incubator, state supported innovation programme (SEZ), necessary infrastructure, production facilities (that will provide real link between innovative science and consumer market). The demand for produced innovation may be generated both by presently existing R&D-active enterprises and the potential newcomers. Some of the enterprises already declared their willingness to become residents of future technopark in Petergof; among them Alcatel, JSC Plant named after Kozistki, Physics and Technical Institute named after Ioffe, etc. (the total of 51 potential residents).

The Petergof area will be only the first of two basic locations for created SEZ. Another location is in the northern part of the City, near Novo-Orlovsky Park. This location will become the second step in SEZ development. On of the basic reasons to choose this location for technopark was its closeness to Primorsky District, one of the most dynamically developing districts of Saint Petersburg with relatively young population. However, it is rather difficult to assess the potential of Novo-Orlovsky sub-zone roght now. This territory has no infrastructure or any definite development planning to-date. And it is rather far from any educational institutions except half-secret Physics and Technical Institute named after Ioffe (located not so far away from Novo-Orlovsky sub-zone but having no infrastructural connections with this development territory).

The planned amount of investment in Saint Petersburg SEZ infrastructure totals RUR 1,5 billion[7]. Federal authorities give 51% of this sum from specially established investment fund. Besides creating the infrastructure the Government gives substantial tax relieves to the residents of SEZ. For example, the rate for Unified Social Tax decreases almost two-fold (from 26% down to 14%). Some taxes (i.e., Property Tax) could not be imposed on SEZ residents during the first 5-year period (Ibid.). The preferences include custom duties relief as well. The future SEZ could also be of big social importance, creating 12 thousand jobs by 2010. However, the creation of TI SEZ in Saint Petersburg may meet several obstacles. On of these is traditional Russian bureaucracy: these kinds of projects are rather new for Russian authorities. Moreover, implementation of the project presumes close co-ordination and taking common decisions by federal and regional authorities which is not an easy practice in Russian Federation.

Another technopark project is created in one of the most populated residential areas of Saint Petersburg namely Nevsky District (eastern part of the City, not far from the centre). That is cluster-focused specialised ***Information Technology Park or IT-Park***. This technopark is built in the framework of state programme "Creating high-technology sector technoparks in Russian Federation". This project is the first one under the aforementioned programme. The IT-Park would be based on Saint Petersburg State Telecommunication University (GUT) named after M.A. Bonch-Bruevich and located nearby. The future park contrary to the one in Petergof presently has no infrastructure except GUT building. It would be located in relatively densely populated area which does not allow large infrastructure projects; however, that may not become a big problem for IT-related companies. The project is led by the Federal Ministry for Information Technologies and Communication and its chief Leonid Reiman, who is a graduate of GUT. This circumstance raised some speculations in mass media about the project supposing that it might lead not to technopark creation, but to expanding GUT's premises and activities. However, that might be an exaggeration.

The Agreement on creating the IT-Park was signed between the Ministry for IT and Communication and Saint Petersburg Administration in April 2006. The Park should be built until 2012 and create 14 thousand jobs. It will include:

[7] According to December 2006 EUR/RUR exchange rate, the sum is nearly EUR 43 million.

- an office centre; computer centre; research centre; library; technopark (the total of 60,000 square metres);
- administrative and service buildings (the total of 6,000 square metres);
- objects of IT companies which are the Park residents (the total of 40,000 square metres);
- infrastructural objects (living facilities; kindergarten; school; supermarket; parking places);
- university campus (the total of 30,000 square metres) (Ibid.).

So the project is aimed at creating a technopark which would correspond to the internationally successful analogues. It integrates educational and scientific institutions with applied research and innovation producers, supporting this process with living facilities and infrastructure. But it definitely lacks any starting basis, being a sort of "green-field" investment.

Start of the two new projects will boost the demand on qualified IT-specialists, i.e. programmers. That may lead either to shortage of such labour force in the region or to excessive rise in their salaries. The latter may occur also in case the regional prices continue their race, pushing the salaries ahead.

Inflation in Saint Petersburg seems to be another big obstacle for innovation projects. These projects are long-term and their effectiveness could be negatively influenced by high price rise. Despite certain slowdown of regional consumer price inflation, its annual rate still remains on a high level: 12,7% in 2004; 12,0% in 2005. Prices on some important goods and services increased even more. For example, prices on medical services in 2005 rose by 32,4%; fuel price (on most popular AI95 fuel) grew by 16,7% (Petrostat, 2006). And the year 2006 impressed by an unpredicted and great boom on real estate market: during 12 months (since November 2005 till November 2006) the USD-nominated price of square metre of residential space in Saint Petersburg grew by 124,2%: from USD 1087 up to USD 2437 per metre (Zhitkov, Nekrasov, 2006). Present developments on the regional real estate market could have a negative influence on

planned projects, as creation of modern technoparks presumes building social infrastructure, research and living facilities, purchasing land, etc.

To conclude the analysis of innovative sector of Saint Petersburg and its prospects it would be reasonable to create a SWOT-table which would reflect the sector's basic peculiarities.

Table 2 SWOT-analysis of innovative sector of Saint Petersburg

Strengths	**Weaknesses**
• Solid educational basis • High-qualified labour • Labour costs still much lower than in developed countries • Growth of knowledge-intensive industries of regional economy creating demand for innovation • Substantial state support of regional innovative projects • Planned investment into infrastructure development	• Absence of practical experience of implementing innovative projects • Absence of required infrastructure • Most of new innovative projects are at zero-stage of development • Dominance of state financing in innovative projects' budgets • Limited amount of certain key types of specialists • High rise in labour costs during last 5 years
Opportunities	**Threats**
• Utilising rich educational and scientific heritage of Soviet system • Attracting qualified technical specialists and educated researchers by relatively low salaries • Generated knowledge could be utilised in regional economy, consumers are just nearby	• Low experience may lead project to many practical failures • Building infrastructure in Russia often requires much time and may pass very slowly • Dominating role of state financing may lead to huge corruption • Simultaneous start of several innovative projects may lead to

• State support diminishes expenditures and allows significant tax relief • Newly built infrastructure may become a benefit itself as it might be more up-to-date than developed countries have	qualified labour shortages • If high inflation in Russia and corresponding rise in labour costs persists, low salaries may become excessively high

3 Innovation projects in Saint Petersburg in the framework of technological co-operation between Finland and Russia

3.1 Investment co-operation between Finland and Russia in technology-intensive industries during the last decade

Russian-Finnish technical and investment co-operation in experienced a long period of development. Even in the times of so-called "closed" economy of Soviet Union, Finland became one of two developed countries (another one was Greece) which participated in large investment projects on Russian territory[8]. In these projects the Soviet side was represented by special State Committee for Foreign Economic Relations, the Finnish side by large companies (most of which were private). The most known examples are building of an iron mining and processing plant in Kostomuksa, Karelia, and reconstruction of a pulp and paper plant in Svetogorsk, Leningrad Province. Two big joint projects were implemented on the Finnish territory, namely in Loviisa and Raahe.

In the 1990-ies the "iron curtain" fall giving the way to broader co-operation between Russia and its Western partners. Already in 1991-1992 the government started to liberalise the external economic activities, foreign trade and cross-border investment. Very soon Russia re-oriented its foreign trade from former East European partners towards former political "enemies" in the West Europe. The latter turned into basic Russian foreign economic partners, both in trade and investment fields, with an

[8] Here meaning the territory of RSFSR, Russian Soviet Federative Socialist Republic.

undisputable leadership of Germany. Even the closest neighbours and political allies, CIS countries, became less important for Russia's foreign economic relations.

During the same time Finland experienced a real outward investment boom. Becoming one of the most internationalised economies in the world, Finland started to export large amounts of capital abroad. The total stock of Finnish outward investment during the last 15 years increased greatly: from EUR 7,539 million in 1991 up to EUR 63,080 million in 2005; so they grew more than eight-fold (SPT, 2006). For many large Finnish companies like Nokia, Outokumpu, Kemira, Kone, Ahlström, Huhtamäki, UPM, Metso Group, etc. their activities abroad became much more important than exporting from Finland. So, in 2002 the turnover of Finnish companies' foreign subsidiaries was EUR 128,288 million, while the Finnish foreign trade turnover in the same year equalled EUR 82,504 million.

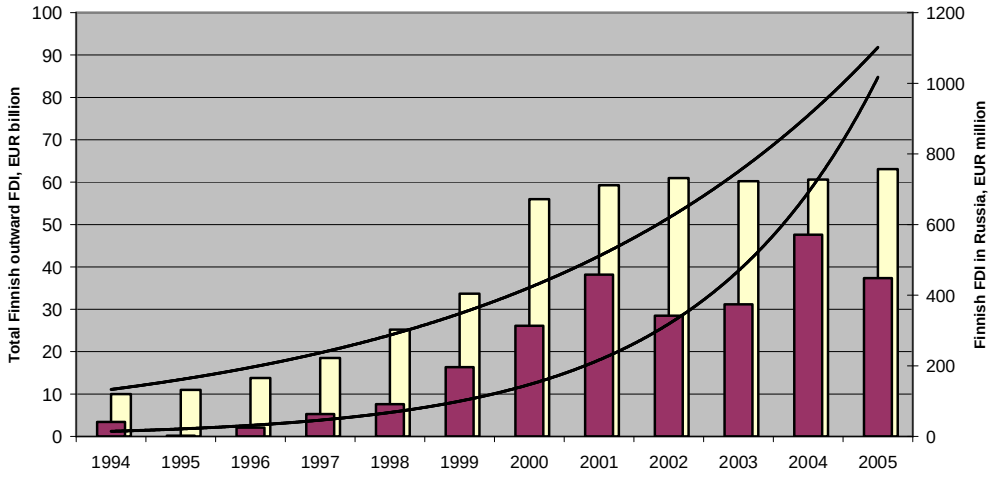
Taking into account the changes in post-Soviet Russia and fast internationalisation of Finnish economy, one could suppose that the proclaimed market reforms together with the special heritage and experience of co-operation in the past will lead to a boom in economic co-operation between the two countries. The boom was observed only in mutual trade. However, despite almost constant (except crisis and first post-crisis years: 1998 and 1999) growth of mutual trade turnover during the last decade, the relative importance of trade with Russia for Finland's economy (Finnish-Russian trade's share of the total Finnish foreign trade) is much lower than during the Soviet era. When it comes to investment and technical co-operation, the author supposes it to stay below the potential level.

Russian economy became an attractive target for Finnish investors after the Federation started transition towards the market economy. Since the 1990-ies it simply became possible to invest, as private ownership was introduced and cross-border capital flows liberalised. But political end economic uncertainties became the major obstacles for the Finns to invest. Nevertheless, since 1994[9] till 2005 Finnish FDI stock in Russian Federation increased from EUR 41 million up to EUR 448 million, so more than ten-fold. But one should not forget that it was a jump from almost nothing. In comparison to Russia, other post-Soviet country namely Estonia became a much more attractive

[9] Bank of Finland's Statistics Department registers Finnish FDI to Russia and other post-socialist countries since 1994.

investment target. In 1994 the Finnish FDI stock in Estonia was EUR 64 million. The same indicator for 2005 looks much more impressive: EUR 857 million. Thus, the small Estonian economy received almost twice as much as the big Russian. Of course, cultural and political ties between Finland and its new partner within the EU could be closer than in case of Russia. Nevertheless, the potential of mutual investment co-operation is not effectively utilised. In general, Finnish-Russian investment co-operation develops rapidly but not as fast as it could do (e.g., in case of Estonia). Basically, the trend (see Figure 2) is even below the average dynamics of total outward FDI stock.

Figure 3 Finnish FDI in Russia compared to total Finnish outward FDI, stock of investment, and corresponding exponential dynamic trends



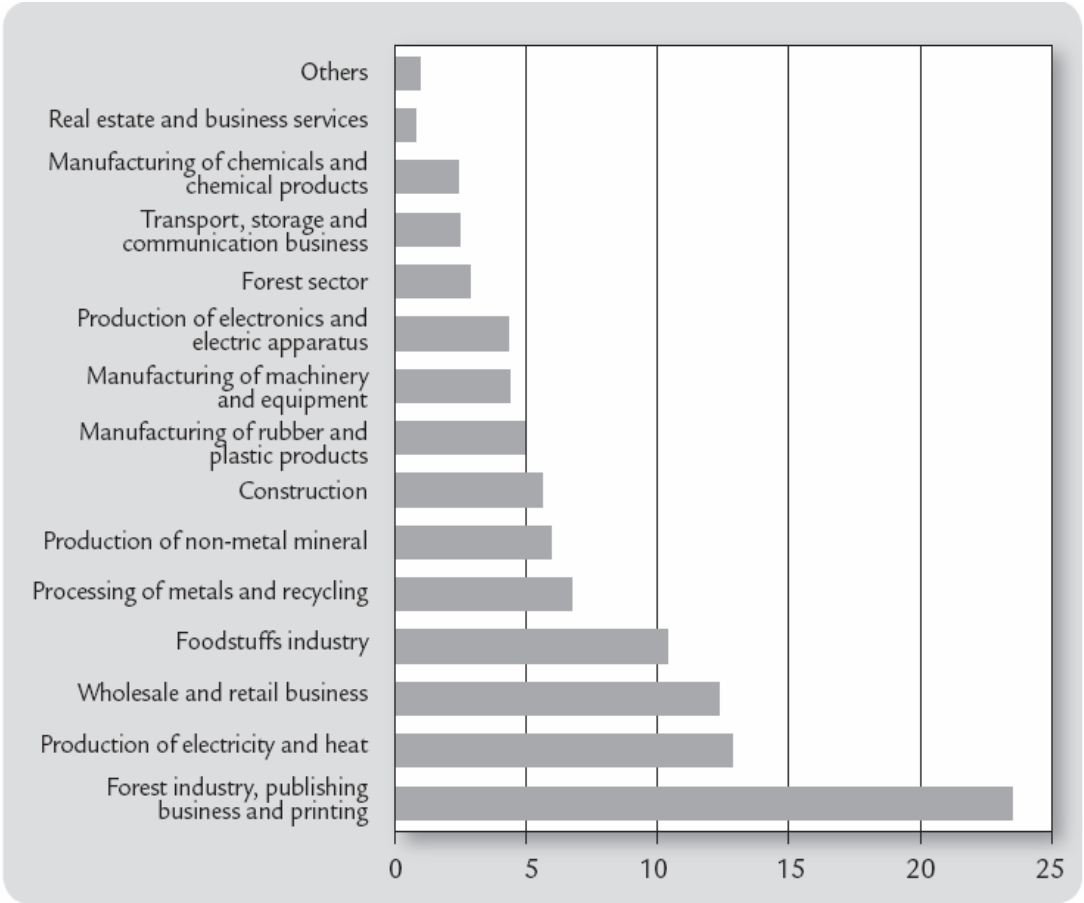
Source: Bank of Finland's Statistics Department (Suomen Pankki Tilasto-osasto), 2006

The above shown dynamic trends reflect a backlog of Finnish FDI to Russia: it is still lower than could be if developed in line with Finland's total outward FDI. The level of investment co-operation seems again too low if we take into consideration the economic growth which is definitely one of Russia's strong points. Nevertheless, it could be easily

seen that the trends tend to meet (at least) in the nearest future. Another important remark is that the given statistics excludes several investors that were initially Finnish, changed the owners (became non-Finnish) but kept their assets in Russia, e.g. BBH Holding with its Saint Petersburg-based Baltica Brewery. With these ex-Finnish investment considered, the investment dynamics of Finnish FDI to Russia will become much more impressive.

The structure of Finnish FDI to Russia (see Figure 3) shows the dominance of forest industry and publishing, electricity and heat generation, wholesale and retail business, and food industry.

Figure 4 Structure of Finnish enterprises' investment in Russia, 2005, %

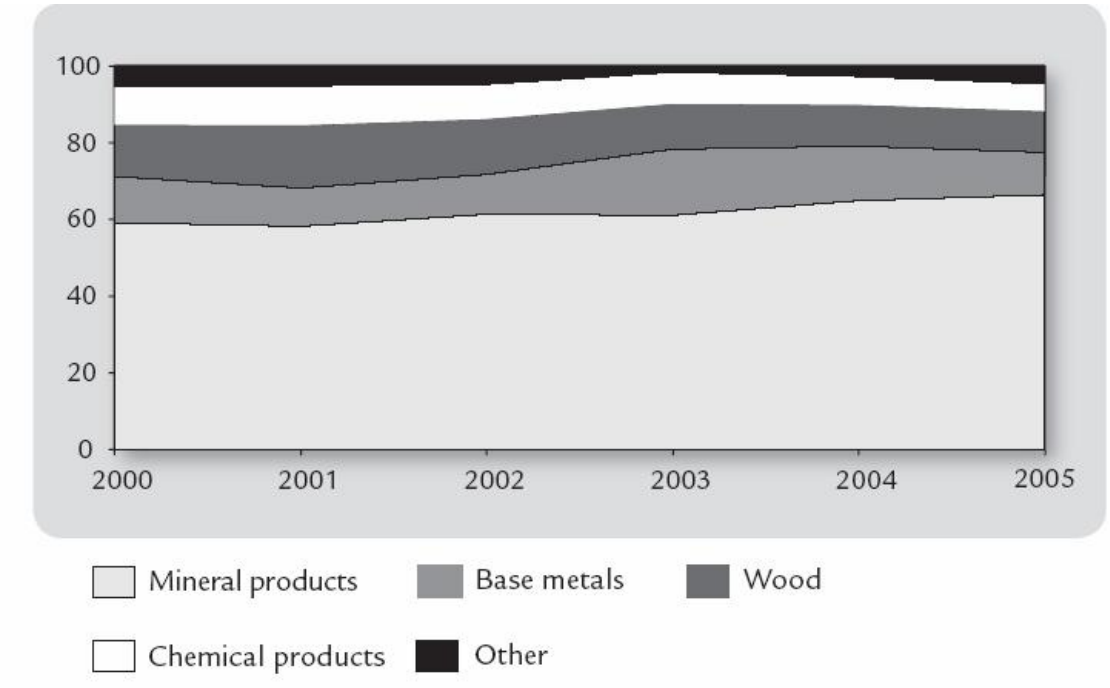


Source: Bank of Finland, 2006

It could be seen, that nearly one forth of Finnish direct investment comes to forest industry, forestry and related sub-industries. The share of knowledge-intensive industries namely machinery and equipment manufacturing, and production of electronics and electric apparatus seem to be comparatively small: both get less than five percent of total Finnish investment in Russia. Chemical production is also a comparatively small target for Finnish investors.

To assess the structure of Finnish investment in Russia, let us take into analysis the structure of foreign trade between Finland and Russia. The Russian exports to Finland are almost the same than to any other developed country: mineral fuel dominates the commodity structure (see Figure 5).

Figure 5 Commodity structure of Russia's exports to Finland in 2000-2005, %



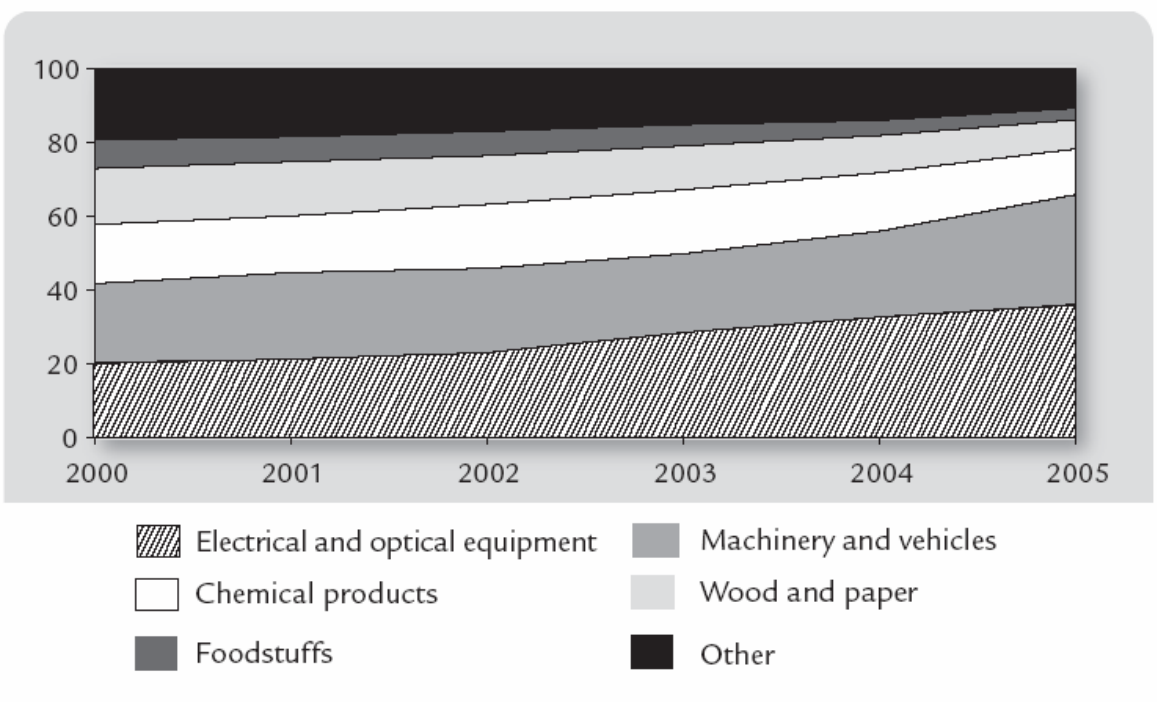
Source: Finland's National Board of Customs, 2006

Significant role of wood exports here is a distinctive feature of Russia's trade namely with Finland. Their share is much dependant on oil and gas prices. When the world fuel prices decrease, the share of wood and related products in total Russian exports to

Finland grows, and vice versa. Moreover, Russian exports are rather homogeneous: a large part of these exports is represented by just three commodities: crude oil, natural gas, and wood logs.

Russian imports from Finland have a totally different structure: there is a great share of high-technology products (see Figure 6). These goods belong to different commodity sub-groups and items but they all have one basic similarity: technology and knowledge are dominant factors in their production.

Figure 6 Commodity structure of Russia's imports from Finland in 2000-2005, %



Source: Finland's National Board of Customs, 2006

The share of electrical and optical equipment in Russia's imports from Finland is the largest among all goods. Moreover, this share is increasing: from 20% in 2000 up to 36% in 2005. When coming to sub-groups, mobile phones form the majority accounting for nearly 20% of total imports. Other electrical equipment, mainly household and communication appliances, is also an important commodity group in Finnish exports to Russia. Machinery and vehicles are another important and increasing commodity group

in Finland's exports to Russia. In 2005 their share reached 30% of total Russia's exports from Suomi. However, it is important to notice that this group is represented mainly by re-exported goods, first of all cars produced in EU and North America. Products of Finnish origin constitute a smaller part of the total group's volume and are represented by paper machines, forestry and agricultural machines.

Chemicals constituted nearly 12% of all imports from Finland in 2005. The bulk of these chemicals are consumer goods produced by the most knowledge-intensive sub-industries namely pharmacy and biochemistry. That differs much from Russia's chemicals exported to Finland; these are mostly semi-processed intermediate products (e.g., chlorides) and petrochemicals. Pharmaceuticals alone take 4% of Russia's imports from Finland. However, the share of re-exported goods (produced outside Finland) in the category is high as well.

Structural comparison of Finnish investment to Russia with Russian-Finnish trade creates a strong impression that Finnish investment to Russia is cost-driven. It means that Finnish companies invest in Russia mostly in those sectors of economy (forestry, fuel and energy production) which are basically exporting to Finland, not importing from it. This idea was developed further by some researchers, proving the emergence of so-called cross-border industrial clusters, first and foremost in forest sector[10] (see, e.g., Dudarev, Hernesniemi, Filippov, 2002). According to this concept investment activity of Finnish companies in Russia is driven by relatively low costs for natural resources (i.e. wood and energy) and labour. For example, Finnish forest sector companies utilise these comparative advantages of Russian economy and built wood-processing plants in Russia (later pulp and paper plants and so on). These companies may benefit much from a synergy of lower costs in Russia and their strong positions on the world paper and wood market.

Recent economic developments, however, weakened the advantages of the above-mentioned approach. First of all, the costs were uprising in Russia. High inflation along with RUR revaluation made the costs increase at a very high speed. E.g., salaries for some specialities, initially low, already exceed those in Finland. A second important

[10] Including forestry, pulp and paper, printing and related sub-industries.

change was Russia becoming one of the attractive markets due to size and growing incomes of the population. And the third important factor was relative stabilisation in Russia, both political and economic, which diminished market entry risks, both political and economic. Together these tree factors not only increase the total volume of Finnish investment to Russia, but also change the investment motives. The recent investigation made by the Bank of Finland's Institute for Economies in Transition (BOFIT) shows that today Finnish investment to Russia is mainly market-driven, i.e. focused on the production for the Russian market (Ollus & Simola, 2006). That is different from Finnish investment to China and Central and Eastern Europe which is mainly cost-driven and aimed at production for global markets.

This new paradigm for Finnish investment to Russia presumes that the structure of this investment will change. Market-driven investment develops according to a basic principle "follow your trade flows". If we come back again to the structure of Russia's imports form Finland, one could conclude that investment might shift towards high-tech sector. That would much closer correlate with the structure of mutual trade. It would be logical for Finnish exporters of knowledge-intensive industries to move their production facilities to Russia, thus avoiding customs duties and transport costs. Beside that many of them can utilise lower factor costs advantage which still exists in Russia (some examples of such a mixed approach please see below). However, there are certain obstacles that explain the existing structure and still prevent the Finnish investment in technologically advanced projects in Russia.

"Grey" imports. This obstacle seems to be rather important due to its scale. The unofficial and purely criminal practices (e.g., double invoicing) were observed in Russian-Finnish trade during a long period, since the early 1990-ies. They led to constant trade statistic discrepancies between Russian and Finnish customs data. Explained partly by legal reasons (FOB/CIF differences and re-export statistics), these discrepancies also reflect the "grey trade", which decreases the value of imports from Finland nearly by one third. The main motive for practicing this illegal business is reduction of customs duties, and, consequently, lower price for imported goods on the Russian market. A recent scandal linked with these illegal practices involved a big Russian company Evroset, a national leader of cellular phones market. The "grey trade"

(with not only Finland but some other Russia's trade partners) reduces comparative advantages of production in Russia, making illegally imported high-tech products more price-competitive. This obstacle, nevertheless, is loosing its importance due to restricting of state customs policies. Besides Evroset, one could mention a case of large Russian furniture importer company Tri Kita, which practiced "grey" imports using the support of high officials in FSB (Russian National Security Service) headquarters. Despite the high support, the practice was revealed and terminated.

Size of the enterprises. A great number of companies in knowledge-intensive sectors of Finnish economy, e.g. machine-building and chemical production, are small and medium-size companies (SME). These companies avoid investing in Russia due to relatively high risks and undeveloped infrastructure in a country of destination. However, they actively export to the Russian market, accounting for a third of exports of aforementioned knowledge-intensive sectors (BOFIT, 2006). Hopefully, recent changes in Russia might encourage these enterprises to enter the Russian market. During the last 5 years Russia' economic risks decreased. Moreover, regions like Saint Petersburg have economic and political risk level much lower than the national average. Improvements in Russian financial system, making capital resources more accessible for SMEs, may also contribute to decreasing the barriers.

Role of the state. During a certain period the state in Russia did not support actively the development of knowledge-intensive industries on its territory. That differed much from the situation in other countries where these industries were directly or indirectly supported by the state. In Russia investors from these industries faced intellectual rights abuse which was not considered by the state as a huge problem. Nevertheless, recent events in this sphere prove that Russian state changed its attitudes and made the development of knowledge-intensive industries one of its priorities.

When coming to regional level, the above analysed problem seems even more important for Saint Petersburg than for Russia as a whole. In 2005 Finland took the third position among the investors to Saint Petersburg with 12,2% of the total inflow. It was behind of "traditional" Russian offshore Cyprus (which mostly re-invests originally Russian capital) and the USA, but ahead all the other EU countries. The structure of Finnish investment

in Saint Petersburg resembles the national-level structure with the exception of forest sector which is not so important for the City's economy[11]. Thus, power generation with recent investments of Fortum and food industry with Fazer Group are the leaders.

Despite in general Finnish high-technology companies are still not so active in Saint Petersburg the above-mentioned shift to more knowledge-intensive sector could be observed already. In 2006 a new investment project was implemented by Finnish electronics company Elcoteq. In October 2006 the company completed the creation of modern electronics-producing plant in the suburbs of Saint Petersburg. The business concept of this company, however, is mostly cost-driven production for the markets of Finland and other EU countries. Nevertheless, at the opening ceremony on October 7, 2006, the Finnish side expressed an opinion that big domestic (regional and national) consumer markets are targeted by the investors as well. Actually, this investment project is an attempt to mix cost-driven and market-driven approaches and willing to utilise present and anticipate future advantages. Another example could be Finnish electronics company PKC Group which invested in creating production facilities in Karelia and Pskov regions. This project enjoys small labour costs in the aforementioned regions: salaries there are much lower than in Saint Petersburg. The production plants of PKC Group presently created for exporting to EU may in future re-orient towards the Russian market, as both regions are located not far from Saint Petersburg and Moscow. These cases reflect gradual improvement of investment climate which is of big importance for knowledge-intensive industries. Successful attempts to improve investment climate at a regional level, however, can not change the situation alone being much dependant on national environment. Even the most FDI-attractive Russian region can not get investment rating higher than the national rating for Russia. The latter is constantly improving which gives more opportunities for Saint Petersburg.

In general investment co-operation between Finland and Russia in technology-intensive industries during the last decade may be characterised as inadequate to its potential. Finnish technology-intensive producers in the majority still tend to export rather to invest.

[11] Detailed structure of Finnish investment to Saint Petersburg is not observed by the local statistics authority Petrostat, and thus excluded from the investigation.

While in other sectors the effects of mutual proximity, cost-related and market-related advantages were already utilised by the Finnish companies coming to Russia, the reviewed sector of Russian economy is still behind. Nevertheless, reduction of the above-mentioned barriers for co-operation and growing market potential of Russia may change the situation in the nearest perspective. The author supposes that new projects of Finnish investors in Saint Petersburg may become the example of such changes in the nearest future. Let us assess one of these projects namely the initiative of Finnish company Technopolis to create a technology park in Saint Petersburg.

3.2 Technopolis creates a technopark in Saint Petersburg: practical example of technological co-operation between Finland and Russia

Technopolis Plc. (former Oulu Technology Park Ltd.) was established in 1982 as the first science park in Scandinavia. Today Technopolis employs 9,000 people and is one of the Europe's largest companies specialising in the provision of operating environments for high-tech companies. Being originally one technology park located in Oulu, Finland, today Technopolis expanded to several other locations in Finland namely Vantaa, Espoo and Lappeenranta. The company supplies nearly 256,000 square metres to 700 technology-intensive companies. Number of Technopolis clients is smaller than that of aforementioned giants as Sophia Antipolis or Silicon Valley, but bigger than of some well-known science parks as Cummings research park, for instance.

Technopolis concentrates on certain innovative sectors: telecommunications, IT, electronics, pharmacy and biochemistry. The company acts as a technopark operator, providing its clients with premises, sector-specific expertise, strong links with information providers, and other forms of assistance. In its technoparks 90% of facilities are used as offices and remaining 10% for production.

Initially Technopolis developed from the Technical Research Centre of Finland which was established in Oulu to develop this formerly depressive region in 1970-ies. This Research Centre acquired educational and scientific background due to close co-operation with the University of Oulu. The Centre's development into a technology park

was to a big extent supported by the state, regional authorities and some Finnish electronics companies, first and foremost Nokia. The technopark's exports of telecom products (telephones) to Soviet Union played an important role in its development.

Today Technopolis maintains close relations with educational and scientific institutions in Finland. It also develops international scientific contacts. Companies-clients of Technopolis get opportunities to network both with other high-tech companies and with research and educational institutes. Nevertheless, from the very start the concept of Technopolis presumes dividing business and scientific work: it differs from traditional university-based incubator model.

Expansion of the technopark within Finland was either green-field (like in Vantaa) or brown-field (acquisition of Innopoli, a technology centre in Espoo). Since 1999 Technopolis has been listed on the Helsinki Stock Exchange. Turning into a leading technopark in Finland gave Technopolis international significance and, consequently, international ambitions. Finally, Technopolis chose Saint Petersburg, Russia, as the first dimension for international expansion.

The reasons for such a choice could be observed on national and regional levels. Intensively growing Russian market is becoming more important for Finnish high-tech sector companies, the clients of Technopolis. Huge potential of the market may attract companies from Finland presently exporting to Russia to move their production and/or research facilities to destination market. Moreover, a new technopark in Russia may attract hi-tech companies from other developed countries which will use Technopolis' premises as a gateway to the new market. That opportunity may become especially important for knowledge-intensive SMEs being too small to make a market entry using their own resources.

Creating a modern technopark in Russia may support hi-tech residents as well. Huge intellectual, scientific and educational potential together with reviving demand for technologies inside the country may create a boom among Russian high-tech SMEs and start-ups. The number of such enterprises in Russia is increasing. They may develop

into bigger promising high-tech businesses, but require support and access to infrastructure available in modern technoparks.

On regional level the reasons for the company to create a technopark in Saint Petersburg are primary linked with:

- Geographical proximity to Finland and EU borders;
- Big market potential of the region itself;
- Relative (by Russian standards) proximity to Central Russia and Moscow which are big and promising markets;
- Growth of local knowledge-intensive industries;
- Presence of qualified and educated labour;
- Relatively developed infrastructure;
- Probable support of the authorities.

And the factor of time here is the last but not the least. Emergence of several innovative projects in Saint Petersburg would inevitably lead to competition among them. That fact was considered by the company as well.

Among all the declared innovative projects in Saint Petersburg Technopolis has a huge competitive advantage. Today it is the only operator of modern technoparks with a vast and long-term experience in this field coming to Russia. Indeed, if we turn back to Figure 2 less than one third (namely 32%) of presently existing technoparks were established before 1989, and Technopolis was among these. Aforementioned state-supported projects in this sphere in Saint Petersburg (i.e., Petergof SEZ/technopark and IT-Park) lack experience and are far from practical implementation.

On October 7, 2005, Technopolis Plc. and Saint Petersburg City Government signed a memorandum on creating a modern technology park in Saint Petersburg. According to this document, Technopolis promised to invest nearly EUR 220 million in the technopark near Petergof, on a territory of TI SEZ in Neudorf. The technopark was planned as a system of modern premises and specialised infrastructure able to host knowledge-intensive companies and research collectives. The fields of the park's commercial and scientific specialisation included IT, communication, and software production.

Unfortunately, today this idea remains just on paper. Negotiations between Technopolis and the state authorities stopped at the end of the summer 2006. The partners have not come to mutually advantageous solution by now.

Moreover, Technopolis plans to contribute to IT-Park in Saint Petersburg established in April 2006. That initiative was expressed by the company in its negotiations with GUT and the City's officials. In this project Technopolis might become one of key participants.

Finally, in October 2006 Technopolis took a decision to create the technopark without any contribution of the Russian state or regional authorities. Therefore it purchased a territory in the southern part of Saint Petersburg namely in Pulkovo with the total size of 4,6 hectares. During two years the company plans to create a technopark with 80 thousand square metres of premises. According to regional media this location is chosen due to its proximity to the City's transport infrastructure (Expert SZ, 2006). Indeed, the park will be situated close to the main transport hub of Saint Petersburg. Today Pulkovo is the area were both of the City's two airports (Pulkovo I and Pulkovo II) are located. Pulkovo area is also becoming a key logistical hub with a number of new cargo terminals and warehouses created. It lies on the crossways of recently constructed the City's ring-road, Pulkovo main road leading to the airports and southern suburbs (including Petergof), planned so-called "Western High-speed Highway" (a projected part of the already existing ring-road passing over the waters of the Finnish Gulf, west of the City), and Moskovsky avenue connecting this area with the City's centre.

As Technopolis representative Antti Pätilä says, Pulkovo technopark might become a place for both Finnish and international companies aimed at entering the Russian high-tech market. It would also serve Russian knowledge-intensive businesses which want to expand both nationally and internationally.

Thus Technopolis is currently implementing three innovation projects in Saint Petersburg. According to company's Saint Petersburg subsidiary CEO Peter Coachman, that is not a problem for Technopolis as the space for opportunities in this sector of Russian market is really vast (Ibid.).

4 Conclusion

By now it becomes obvious that Russian economy needs to change its structure in order to become less dependent on its fuel sector. From economic area this idea recently moved towards national politics and even became one of mid-term (hopefully not long-term) national priorities. A component of the country's economic growth contributed by fuel exports and related industries is considered to be either "very important" or even "dominant" by most of the experts. If the letter is right and Russia's GDP grows mainly due to uprising of fuel export prices, the growth itself is not only uncertain but to a large extent useless for the country's economy long-term development. "The Dutch disease" and its circumstances are already well-known.

Despite that Russia still has a huge potential of knowledge-based economic development. It inherited big innovation experience and facilities (and also educational basement) from the Soviet Union which invested big financial and resources in fundamental science and applied research. There are some regions of Russia where the scientific and research potential exceeds the country's average due to economic specialisation acquired long before the market reforms started. Definitely, Saint Petersburg is one of such regions.

Today's development of the City's knowledge-intensive industries including machine-building, engineering, chemistry and military-industrial complex creates regional demand for innovation and research. A big number of educational establishments and research institutes supply educated specialists and experienced researchers. Some of these institutions certainly have links with producing sector of economy. But in general this link between applied science and production is rather week. Innovation was considered a weak segment of Soviet economy (with some exceptions, of course), the same is it now. And creation of modern innovation structures namely technoparks may help to eliminate this disadvantage. Especially after the technoparks proved their effectiveness and successful role in integrating science and business in most of developed countries of the world.

Saint Petersburg has the basement for creating modern innovative structures. Moreover, today the region gets support from the state taking the innovation policy into focus. Several large state-supported and state-financed technopark projects were introduced in the City just recently. The research and business communities both expressed their interest and willing to participate in the projects. But all these technoparks are almost start-ups. Development of these structures requires special experience and know-how.

That could become a new dimension for Finnish-Russian mutual economic relations. Technological co-operation between our countries has long traditions. And today's Finland being one of the world-recognized technological leaders (at least in certain sectors) can contribute much to the development of innovative structures in Russia. Technopolis running successfully technoparks in Finland might become the first contributor. The company is already making the first steps towards implementing this idea.

Moreover, implementation of one or several technopark projects in Russia by well-known Finnish operator might produce a multiplicative effect, engaging more Finnish hi-tech companies. These firms which either export to Russia or have expansion plans may decide to enter the big growing market of Suomi's eastern neighbour, following Technopolis and using its technoparks in Saint Petersburg. That might change the branch structure of Finnish-Russian investment relations, at least on the side of Finnish FDI to Russia. And that will contribute a lot to overall development of technological co-operation between Finland and Russian Federation.

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