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# International Learning in Innovation Area: Finnish Experience for Russia

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## CONTENTS

## 1 Executive summary

International learning is a sign of globalization of national innovation systems. In most countries, even with different economic environments, common processes are developing in innovation systems, such as: convergence of priorities in science and technology, development of interdisciplinarity, growing mobility of researchers, appearance of new forms of organization of R&D, first of all – development of networking, and such. Under these circumstances benchmarking and mutual learning became more important in government decision-making then before.

In the paper two innovation systems – Russian and Finnish – are analyzed in comparative perspective that allows revealing differences and similarities, as well as strengths and problematic areas in organization of R&D, its financing, governance and innovation policy implementation at the government level, and in approaches to international learning.

The study reveals areas where mutual learning is the most beneficial for both countries, which instruments may be used in order to foster commercial application of R&D results, and organizational forms in which R&D may be developed most productively. A concrete example of Finnish participation in Russian innovation system is evaluated in the case of development of Technopolis technopark project in St.-Petersburg. The case shows that the expansion of such international operators with experience of building effective innovation infrastructure and cooperation networks may create mutual benefits for Russian and Finnish as well as other international operators. Another important aspect exemplified by the case is the cooperation and creation of networks with different levels of the national innovation systems involved in the innovation development. The case of Technopolis shows that involvement and support of local administration is important and sometimes may be crucial for the progress of foreign project in Russia.

## 2 Russian innovation system

### *2.1 The Evolution of the Innovation System in Russia*

Russia's economic structure is very different from most European countries – there is a predominance of large companies, concentration on mining and heavy industry, and an almost complete lack of high-tech, consumer goods industries. Therefore Russia's innovation system also has a quite distinctive outlook. Historically, Russia, as part of the former Soviet Union, has been characterised by a well developed system of public R&D institutes.

Currently Russia's research sector is comprised from 3622 R&D organizations, employing about 807 thousand people (all ranks) of which 48.2% are researchers[3] (table 1). During the transitional period, this part of innovation system experienced severe troubles: low level of financial support from the State budget and industry, decreasing in real terms salaries for scientists and engineers and de facto stagnation of R&D activity.

**Table 1. Total R&D Capacity by Sector of Economic Activity, 2006**

| Sector | Number of R&D organizations, # | Number of employees in R&D, thousand | Share in total number of employees in R&D, % |
|---|---|---|---|
| Government | 1341 | 274,802 | 34.0 |
| Industry | 1682 | 486,613 | 60.3 |
| Higher education | 540 | 44,473 | 5.6 |
| Private non-profit | 59 | 1,178 | 0.1 |
| Total | 3622 | 807,066 | 100.0 |

Source: Nauka Rossii v tsifrakh 2007. Statistical yearbook. M.: CSRS, 2007, pp. 17, 54.

Overall, major characteristics of R&D system in Russia are:

- 62% of financing comes from the federal budget. Starting from 2002, its share is growing annually.
- 73% of organizations conducting R&D are state-owned (are in federal property).
- 77% of all personnel in R&D work in state-owned R&D organizations.

Therefore Russian R&D sector is mostly government-owned and government-financed. It means that Russian business enterprise sector in S&T is mostly represented by

[3] Data for 2006. Source: Nauka Rossii v tsifrakh 2007. Statistical yearbook. M.: CSRS, 2007, pp.17, 54-55.

enterprises and organizations that are under direct or indirect government influence (through controlling shareholdings). With this in mind, a very significant share of the state in R&D expenditures is a result of the Federal Programs contribution to the scientific organizations of the business enterprise sector.

In 1993, some of the best and largest industrial R&D centres with unique equipment and infrastructure were selected from the overall group of industrial R&D institutes. They were granted the status of Federal Research Centres (FRC), which allowed them to get additional Federal support in the form of block funding. In most instances, they also received support from their supervising Ministries. Currently there are 52 such Centers (down from 58 in 1995-2006) which are mostly oriented towards applied research in the areas that are identified as government priorities. At the present time there are eight Federal priority directions of S&T development: information and communication systems, industry of nanosystems and materials, live systems, rational use of nature, energetic and power saving, perspective types of weapons and military technics, transport, aviation and space systems, and safety and counteraction terrorism[4].

The Russian Academy of Sciences is the largest and most prominent research organization in the country. It comprises 465[5] research institutes. In addition, there are several sectoral academies of sciences, but only two of them are actively engaged in R&D, namely, the Russian Academy of Medical Sciences, and the Russian Academy of Agriculture. The mandate of all these academies is to conduct fundamental research, but they also implement some applied research.

Russian universities do not play an important role in R&D. Only about 40% of the higher education institutes in Russia are actually involved in R&D. Funding for R&D at universities comes primarily from competition-based funding schemes and research contracts with industry and government. Financial and human resources in the higher education R&D sector comprise no more than 5% of the national total. Recently government has set new directions for university sector development by establishing two Federal universities. Government assigned large amounts of money for their creation, for four-year period. Each of these two universities (Siberian Federal University and Southern Federal

[4] Approved by the President of the RF on May 21, 2006.
[5] Nauka Rossii v tsifrakh 2007. Statistical yearbook. M.: CSRS, 2007, p.20.

University) was created by uniting four higher educational institutes into one legal entity. The rationale behind this transformation was the attempt to strengthen the quality of higher education, bring research and teaching closer together, stimulate regional development. The assumption was that large universities have higher potential to implement all these tasks then the smaller ones. The ambition goal is to make these Federal Universities leading in the world (namely, these universities should be in the rating of top 100 world universities by the year 2020). The real practice shows that adjustment and transformation processes take much longer then expected, and that larger organizations are also more bureaucratic ones, slow in decision making and thus not reacting effectively on changing innovative environment. It is early to judge outcomes of that organizational decision however some lessons may already be drawn. One of them is that increased financing without eliminating legal and some administrative barriers does not guarantee expected outcomes. The creation of such large organizations with special missions should be accompanied by a number of legal decisions that would let the new universities to achieve their goals.

The financial input into the development of the Russian R&D system from the government was remarkable during the latest years[6]. In 2005, the appropriation allocated to R&D by the central government and federal budgets (GABORD) has been already 0.63 % of GDP, which is - in relative terms - only slightly below the comparative value of the EU-25 (0.74 %) and Japan (0.71 %), but still considerably lower than in the USA (1.06%)[7]. Of course these are relative numbers and in absolute terms even budgetary expenditures on R&D in Russia are low in comparison with respective countries.

The crucial problem is under financing of R&D from side of business. The total R&D expenditure as % of GDP, including the appropriation by the business enterprise sector (BES) in Russia amounts to only 1.15 % (2004), out of which only a relatively small share of 31.4 % was financed by the business enterprise sector. Compared to Japan (3.20 % [2003]; 74,5 % financed by BES), USA (2.66 % [2004]; 61.4 % financed by BES) and the EU-25 (1.90 % [2003]; 54.3 % financed by BES) this is a low figure. The low appropriation of BES indicates deficits in terms of an insufficient industrial demand for R&D and a structural lack of absorptive capacities of Russian industries for advanced technologies,

[6] After the breakdown in 1998, Russia could reach its 1997 GABORD level in 2002.
[7] Science, Technology and Innovation in Europe, EUROSTAT, 2007.

processes and methodologies. This also may be an indicator that the quality of research conducted by R&D organizations is not acceptable for business enterprises.

In 2007 low financing for R&D from business was specifically noted in the statements made by top officials of the country – the RF President, Prime Minister, First Deputy Prime Minister. Moreover, at the end of the year the RF Ministry of Education and Science announced that R & D projects, where business failed to ensure the promised levels of co-financing, should be terminated.

It should be noted however that businesses have a need in research and development and it grows as equipment and currently used technologies become obsolete. Evidence of this fact is, for instance, the interest of companies in one of the sections of the federal target program "Research and development on priority directions of development of the scientific and technological complex of Russia in 2007 through 2012". In the framework of this Program business enterprises may propose their own directions of research (research tasks) which can later obtain co-financing from the budgetary sources. One of the conditions, under which co-financing can be obtained, is that companies should cover 50 per cent of the respective project costs in case there are carried out applied research, and 70 per cent of the respective project costs in the case of commercialization related projects. In 2007, such a tender attracted about 400 applications on the part of companies[8], what was significantly above the capacity of the RF Agency for Science and Innovation to co-finance projects. This development is evidence that companies have both the need in R&D and the resources to co-finance projects.

However overall Russia is lacking large science-intensive companies, from one hand, and small innovative enterprises, from the other hand. The number of small innovative companies is diminishing. The major problems that small companies face in their development are: insufficient financing for seed and start-up stages; lack of innovative infrastructure; lack of intermediaries like consulting services; high taxes and bureaucratic accounting procedures that increase expenditures of small firms; difficulties in creation of small companies as spin-offs of universities and R&D institutes. At the present time

[8] Poisk No. 1–2, January 11, 2008, p. 12.

government R&D organizations can be co-founders of private enterprises[9] but they cannot possess founder shares, nor can they possess intellectual property in these new enterprises.

The share of Russian enterprises engaged in innovation activities is comparatively low. Only 8.6% (data for 2006) of Russian enterprises are engaged in technological innovation as a per cent of total enterprises[10]. This indicates structural deficits of the Russian economy. In terms of innovation activity it is mostly imitative with predominant share of expenditures on purchasing equipment, often second-hand. Russia has a high negative balance deficit in terms of receipts from and payments for technology inputs. In 2004 its receipts from technology exports amounted to 384 million dollars and its payments for technology imports to 823 million dollars[11]. This order of magnitude is far below considerably smaller knowledge based economies such as Austria, Belgium, Denmark or Singapore.

The named tendencies show a considerable gap between the R&D performed and the observed innovation outputs in the Russian national innovation system[12]. This gap has been present for a long time in the Russian economy. It was a characteristic during the crisis period and economic recession in the 1990s and it still remains in the 2000s.

The current characteristics of Russian innovation system show not only low output in comparison with resource indicators (table 2) but also very weak linkages (university – company) and lack in variety of financial sources (availability of venture capital, business enterprise expenditures on R&D).

[9] Article 66, Civil Code, and also article 24, Federal Law "Concerning non-commerical organizations," No. 7-FZ of Jan. 12, 1996.
[10] Science in Russia in Figures – 2007. Statistical yeabook. M.: CSRS, 2007, p.162.
[11] Data taken from HSE (2007): Science and Technology Indicators in the Russian Federation. Data Book. Moscow: Institute for Statistical Studies and Economics of Knowledge.
[12] This problem is outlined in many national and international documents (see, for example, the OECD Paper No 539 "Stimulating Innovation in Russia: The Role of Institutions and Policies").

**Table 2. Some Characteristics of Innovation System: Russia, Western Europe and G7 (2007)**

| Indicators | Russia | Western Europe | G7 |
|---|---|---|---|
| Royalty and License Fees Payments, US$ million | 1593,20 | 2485,69 | 9519,11 |
| Royalty and License Fees Receipts, US$ million | 260,20 | 893,61 | 15103,16 |
| Researchers, per 1000 of population | 3319,00 | 3662,40 | 3411,71 |
| Expenditures on R&D, in % GDP | 1,17 | 1,94 | 2,21 |
| University-Company Research Collaboration (from 1 to 7) | 3,20 | 4,41 | 4,64 |
| Technical Journal Articles / Mil. People | 109,10 | 629,63 | 612,69 |
| Availability of Venture Capital (from 1 to 7) | 3,20 | 4,60 | 4,54 |
| High-Tech Exports as % of Manuf. Exports | 8,10 | 18,95 | 20,20 |
| Business enterprise expenditures on R&D (from 1 to 7) | 3,40 | 4,52 | 4,91 |
| Patents Granted by USPTO | 194,40 | 538,24 | 22099,69 |
| Firm-Level Technology Absorption (from 1 to 7) | 4,40 | 5,45 | 5,51 |

Source: http://info.worldbank.org/etools/kam2/KAM_page3.asp?default=1

There are several external obstacles hampering science-industry collaboration:

- Underdeveloped mechanisms of financing of R&D (lack of programs and initiatives that would encourage joint science-industry R&D projects);
- Financial barriers for public organizations and FRCs to commercialization (especially in the area of patenting and licensing);
- Legal barriers for collaboration (difficulties in establishing small innovative enterprises and thus lack of interest to use external innovative infrastructure such as incubators or technology parks).

Technology transfer centres, business incubators, and technology parks are examples of intermediary organizations or structures that aim to bridge the gap between public research organizations and the business community and to commercialise the knowledge and technology generated by research. The short history of these organizations in Russia starts with the establishment of technology parks in the late 1980s, followed by the introduction of Innovation and Technology Centres (ITCs) in 1996, and of Technology Transfer Offices (TTOs) in 2003. Technoparks and ITC have been organized mainly in close relationship with universities and other higher education institutions. They both

focused on the development rather than the commercialization of S&T achievements and hence proved to be not very successful in stimulating entrepreneurial activity.

At the present time there are about 80 Technology Parks in Russia, although an evaluation of their effectiveness in 2000 indicated that only about ten or twelve of these met international standards.[13] The evaluation was based on such criteria as strength of linkages with the parent university, level of involvement of students, number of technologies created and transferred to industrial enterprises, and degree of interest in the Technology Park from regional authorities and industries.[14] (Notice that these criteria contain no reference to profitability of the new innovations developed in the Technology Parks.)

Most Technology Parks in Russia have remained *structural subdivisions* of universities. The length of time that a firm may remain within a Technology Park is not limited, and at the present time is on average about 10 years, compared with 2-3 years in Technology Parks outside Russia. Since many Russian Technology Parks are not much older than ten years themselves, whether firms will ever leave in large numbers is still an open question.

Part of the reason that many Russian Technology Parks seem to be functioning in a different way from those outside that country (on which they were, at least in part, modeled) is that Technology Parks in Russia bring different benefits to the firms within them: comfortable facilities (communications, consulting services) and protection from criminality. Most Russian Technology Parks are situated on guarded territory and are relatively well protected from the criminality and corruption that were rampant in the nineties and still exist.

The small number of actually operating Technology Parks in Russia can be explained by the fact that when they were formed they were not so much responses to perceived market needs as they were means to receive government subsidies. The government did not base its selection on calculations of the commercial viability of the projects. And this insensitive government policy continued, as shown by the fact that the evaluation in 2000 mentioned above did not have any consequences – not on tax advantages nor on

[13] O. Golichenko, "The innovation system of Russia: a model and the future possibilities of its development," RUDN press, 2003, p. 181.
[14] Poisk (No. 33-34), August 25, 2000, p. 13.

subsidies. Government money continued to be distributed *uniformly* to all operating Technology Parks which were created with the assistance of such money.

### *2.2 Innovation Policy Implementation in Russia*

In Russia innovation policy at the government level is implemented by the following organizations:

a) *policy-making and coordinating agencies:* Ministry of Education and Science (MES), Ministry of Economic Development, Ministry of Industry and Trade, Ministry of Energy, the Federal Agency for Science and Innovation, Russian Academy of Sciences and the Federal Space Agency (the last two agencies receive the largest share of the civilian R&D budget);
b) *financing agencies*: financial support from the State budget is the principal source of funding for R&D. Most funds are distributed through R&D implementing agencies in the form of direct grants, although some competitive allocation of R&D resources takes place as well. There are three State budget funds: Russian Foundation for Basic Research (RFBR), Russian Foundation for Humanities (RFH) and The Fund for Assistance to Small Innovative Enterprises (FASIE);
c) *regulatory agencies*: The most important regulatory bodies are the Federal Service for Intellectual Property, Patents and Trade Marks (Rospatent), the Federal Agency for Technique Regulation and Metrology, and the Federal Antimonopoly Service.

The three agencies that control most of the civilian State R&D budget are the Russian Academy of Sciences (RAS), the Federal Space Agency (Roskosmos), the Federal Agency for Science and Innovation (FASI). FASI implements government policy, provides governmental services, and manages state property in the sphere of scientific, technological, and innovative activities. This includes overseeing the activities of the federal centres of science and high technology, state-run scientific centres, the unique scientific facilities, national IT research networks and supplying information on science, technology and innovation activities.

FASI supports science and innovation across a wide range of industries through a variety of instruments, such as the Federal Programme “R&D by Priority Fields,” technoparks, technology transfer offices, and business incubators. It also manages the support for the Federal Research Centres.

A small part of the state R&D budget is allocated on a competitive basis through the following three funds - the Russian Foundation for Basic Research, the Russian Foundation for Humanities, and the Fund for Assistance to Small Innovative Enterprises.

All three foundations are fully state owned and government funded. They are grant agencies which support R&D projects at research organizations, universities, and small firms (Fund for Assistance).

Other decision-makers in innovation policy include:

- Defence Ministry which controls a large defence-related budget and the part of defence R&D obligations
- Ministry of Industry that controls a substantial sum of defence-related R&D as well as R&D budget for other industries
- Ministry of Economic Development - supports applied research programs in economics and initiated several innovation related measures, such as SME support, R&D tax deduction for industrial enterprise, the program for technology oriented free economic zones and established the Venture Company.

In the context of analysis of innovation policy making a special place may be given to the Fund for Assistance to Small Innovative Enterprises. The Fund for Assistance develops a wide range of different programs and their number is growing over time. Initially the Fund provided financing to small innovative enterprises that were at the stage of commercial production. The aim was to support R&D at these enterprises to give them a boost for further development (such as creation of new product or technology, widening the market share, entering a new market, etc.). This approach was chosen in order to lower the risks, an important criterion in a time of economic instability. The strategy was passive in the sense that the Fund did not directly stimulate creation of new companies.

Later on the Fund for Assistance began to increase support to companies at earlier stages of development. The change was stimulated not only by a stabilization of the general economic situation, but also by the fact that the financial resources of the Fund were becoming larger. Since 2003 the Fund initiated a program called START in order to support start-up companies. By its composition and used instruments the START program

reminds the American SBIR program. The Program proved to be quite successful: 20% of supported firms were able to find investors for further development.

The Fund has a set of basic criteria to define the effectiveness of its work. They include: rate of growth of production by small enterprises (should be more than 15% a year), output per person per year (should be at least $20,000), and the amount of newly created intellectual property which has been transformed into commercial products. By these criteria, about 50% of all small enterprises supported by the Fund for Assistance have been successful.

In 2005 and in 2006 the Fund for Assistance has conducted the overall monitoring of small firms that participated in any of the Fund's programs. The sample group was 10% of all supported SMEs. The data from this survey show that there is no unified picture on the situation among small innovative enterprises. In that situation any average comparisons may not be informative. However the survey was also aimed to compare planned indicators of the Fund for supported firms against the factual results achieved in surveyed group of small firms. The results demonstrate that the support from the Fund for Assistance was effective (table 3).

**Table 3. Performance of SMEs Supported by the Fund for Assistance**

| Indicator | 2005 | | 2006 |
|---|---|---|---|
| | Plan | Fact | Fact |
| Annual volume of innovative products, rubles per 1 ruble of Fund's investments | 3 | 2.90 | 3.70 |
| Annual increase of innovation production per one employee at small firm, % | 15 | 21.50 | 24.80 |
| R&D expenditures at small firm, as % of sales | 6 | 9.40 | 13.10 |
| Increase in the number of employees, in % to the previous year | 5 | 5.00 | 6.00 |
| Increase in paid taxes, in % to the previous year | 15 | 13.50 | 14.20 |
| Attracted investments, rubles per 1 ruble of Fund's investments | 1 | 1.01 | 1.21 |

Sources: Otchet o deyatelnosti za 2005 god. Fund for Assistance, Moscow, 2006, p.82; Otchet o deyatelnosti za 2006 god. Fund for Assistance, Moscow, 2007, p.105.

Even though the programs supported by the Fund for Assistance were successful, the overall number of SME in innovation area and their output stays low. With a budget of

about 30 million dollars a year the Fund is not able to make a major change in the situation. It can only demonstrate the success of certain instrument or approach. Unfortunately the experience of the Fund is poorly used by other government agencies, and this cannot make the innovative environment sustainable.

### *2.3 International Learning in Russian Innovation Policy*[15]

The international learning has become an important component in government innovation policy making. Thus, in 2005 Russian MES experts engaged in preparing the draft "Strategy of the Russian Federation to Develop Science and Innovations until 2010" requested a German TACIS expert team for their assessment and assistance. This work was done as part of the project TACIS IBPP Key Institutions project "Innovation and Strategy in the use of Intellectual Property", implemented by the German Federal Ministry of Education and Research (BMBF) and the German Federal Ministry for Economics and Labour (BMWA) together with the Russian Ministry of Education and Science. The assessment of the German experts was intended solely for in-house consideration of the MES. But later it was published as a public deliverable of the project.

In 2006 the OECD issued a report "Economic Survey of the Russian Federation: Sustaining growth in the Russian Federation: key challenges". Russian and foreign experts were involved in the survey of innovation policy. The report concludes that Russia can do much more to make innovation policies effective. Russia's innovation potential is considerable but its innovation performance remains disappointing. Realising this potential will require further steps to create a healthy, open business environment, as well as steps to stimulate greater private R&D and strengthen the domestic IPR regime. Reform of the large but inefficient public science sector could make it more responsive to business needs and more dynamic as an engine of knowledge creation. Specific innovation-promotion schemes, like special zones or technoparks, should be limited in scope, carefully targeted and rigorously assessed in order to avoid deadweight losses and market distortions.

The OECD experts believe that the potential of public science sector is enormous but it badly needs to be reorganised towards reducing the number of direct recipients of

[15] This section is partly based on the IMEMO RAS Report "INNO Policy TrendChart – Policy Trends and Apprisal Report: Russia" / Ivaniva N., Dezhina I., Pipiya L. etc. M.: IMEMO RAS, 2007, chapter 1.2.2.

budgetary R&D funds, shifting to project-based rather than institutional financing and pursuing the commercialization of the results of their research.

In the background paper for that report the authors put special attention to the new targeted innovation initiatives – Special Economic Zones (SEZ) and Russian Venture Company (RVC). The government is well aware of the risks related with the SEZ activity and has attempted, in drafting the SEZ legislation, to provide safeguards against the kinds of abuses seen in the 1990s. So the legislative procedure for establishing zones is competitive and requires lower-level governments wishing to create such zones to make significant commitments of their own; they can no longer use special zones simply to extract resources from the federal budget, conclude the authors.

Government support for RVC also raises an issue of moral hazard, and the track record of state-owned or -managed VC funds in most countries is not very good. But the authors believe that Russia's approach looks more promising than some, particularly as the new innovation strategy explicitly states that the RVC's resources are to be allocated on a competitive basis and that the state's share in the new VC funds will decline over time.

The 2006 World Bank publication «Russian Economic Report» №13 contained a chapter on innovation entitled «Fostering an innovation economy in Russia". Experts evaluated positively the current high priority of the Russian government to promote economic diversification, develop competitive industries outside of the resource sectors, and cultivate a knowledge-based or "innovation" economy. But the general assessment of innovation policy measures is rather controversial. The experts consider that the emerging strategy represents a certain shift away from the classical liberal economic objectives of creating a level playing field for private initiatives and entrepreneurship, toward "industrial" or "regional" policy where the objective, on the contrary, is to create special conditions for the priority development of certain sectors, regions, or firms. The logic behind this strategy is the perception that market forces alone are pushing Russia down a path of resource dependence and low international competitiveness, and that government intervention is required to remedy this problem.

The state might play a specific role in stimulating innovation activity through programs such as matching grants or participation in private venture funds, the World Bank experts believe. The experience of other countries in this area strongly suggests that an innovation

economy thrives primarily on dynamic decentralized processes in the context of fierce international competition. While Russia has made some progress in creating such an environment during 15 years of economic transition, this agenda remains highly incomplete. Furthermore, recent trends toward greater centralization and expanding government participation in the economy could even hinder future progress in this area. The vision of such a Russian "national economic model" may be consistent with a continued resource-oriented path of development, but it is unlikely to deliver much success in developing a highly competitive or innovation economy in Russia, conclude the authors of the report.

Learning from foreign experience is growing but it is not yet a standard activity of responsible government ministries. A new approach was demonstrated in 2007 by the Ministry of Economics and Trade during the creation of the Russian Venture Company. They invited the CEOs of innovation funds in Finland and Israel to become members of its Board of Directors. Thus, the international experience was not only studied but implemented with the foreign assistance.

Overall, Russia has made a lot of progress in the formulation of innovation policy and in the creation of an innovation governance system including growing number of ministries engaged in innovation policy and international learning. However Russian innovation policy is still based on a linear, research-centred ideology. The major weaknesses of the Russian innovation system are:

- Absence of large high tech companies;
- Low participation of business in financing R&D;
- Underdeveloped SME sector, comparatively low government support for small innovative companies at the early development stages;
- Absence of government policy aimed to improve intersectoral knowledge and technology diffusion, lack of intermediary organizations;
- Ineffective technological infrastructure for innovations;
- Low level of development of linkages among major actors of innovation system.

The most important problem is to bring about a successful innovation climate throughout society, to supplement state support for R&D, industrial enterprises and infrastructure by soft stimulating measures. The big challenge is to induce a stronger participation by the

Russian business sector in the whole innovation process, including that of conducting research. A healthy business environment may be considered a precondition for boosting innovation activities. Russian research remains attractive as attested by different international expert panels and supporting organizations, but commercial potential stays low and one of the gaps is in lack of intermediary organizations and effective infrastructure, such as technology parks, consulting services, and such.

# 3 Finnish innovation system[16]

## *3.1 The Evolution of the Innovation System in Finland*

Finland is one of the first countries to adopt the concept of a national innovation system as a planning model for the development of science, technology, and innovation policy. In recent years, Finland's competitive environment has been rated as one of the most favourable in the world in numerous international comparisons. Especially indicators focusing on dimensions of operational environment, such as the national innovation system and the regulatory and institutional environment, characterised by low corruption, and high transparency, predictability and openness have been rated very positively. A stable societal system, including welfare, health and educational systems, can also be regarded as strengths considering Finland as a location for knowledge-based innovative business activities.

In international comparisons, Finland is among the countries in the world investing most in R&D in terms of percentage of GDP, with total R&D expenditure amounting to about 3,5 per cent of GDP in 2006. Most of the R&D, around 70 per cent, is carried out by businesses. The contribution of the manufacturing sector to corporate R&D is the highest, whereas the percentage of the service sector is lower than the EU average. The increase in overall R&D expenditure conceals the fact that one company, Nokia Corporation, alone accounts for a significant share of industry R&D expenditure.

As the corporate R&D input in Finland has increased signifigantly, the relative share of public R&D expenditure has diminished, even though the amount of public R&D funding has not decreased in absolute terms. According to Statistics Finland, the share of public R&D funding of GDP exceeded 1.05 per cent in 2006. Public R&D financing is increasingly allocated on the basis of competition and is also aimed at promoting the R&D and innovation activities of SMEs. The utilisation of international research results and technological development is regarded as a particularly important source of growth for small countries like Finland.

[16] Where not otherwise referred the information in this chapter is based on INNO-Policy TrendChart – Policy Trends and Appraisal Report: Finland. European Commission, 2007.

**Table 4. R&D expenditure by sector and GDP share of R&D expenditure in 2000-2006**

| Year | Business enterprises | | Public sector* | | Higher education sector | | Total | GDP share of R&D expenditure** |
|---|---|---|---|---|---|---|---|---|
| | EUR million € | % | EUR million € | % | EUR million € | % | EUR million € | % |
| 2000 | 3,135.9 | 70.9 | 497.4 | 11.2 | 789.3 | 17.8 | 4,422.6 | 3.34 |
| 2001 | 3,284.0 | 71.1 | 500.9 | 10.8 | 834.1 | 18.1 | 4,619.0 | 3.30 |
| 2002 | 3,375.1 | 69.9 | 529.7 | 11.0 | 925.6 | 19.2 | 4,830.3 | 3.35 |
| 2003 | 3,527.9 | 70.5 | 515.4 | 10.3 | 961.7 | 19.2 | 5,005.0 | 3.43 |
| 2004 | 3,683.5 | 70.1 | 530.1 | 10.1 | 1,039.8 | 19.8 | 5,253.4 | 3.45 |
| 2005 | 3,876.9 | 70.8 | 554.7 | 10.1 | 1,042.1 | 19.0 | 5,473.8 | 3.48 |
| 2006 | 4,107.8 | 71.3 | 574.2 | 10.0 | 1,079.2 | 18.7 | 5,761.2 | 3.45 |

Source: Statistics Finland, Science and Technology Statistics, *http://www.stat.fi/*

According to Finnish science and technology information service[17] a total of nearly € 5.5 billion was spent on research and development in Finland in 2005. The expenditure is estimated to have increased by a further € 260 million in 2006. Today the private sector is the major performer of R&D. Government R&D funding is channeled mainly through the Ministries of Education, and Employment and the Economy. The Academy of Finland[18] and Tekes[19] (the Finnish Funding Agency for Technology and Innovation) are the foremost expert financing organisations implementing science and technology policy. The Academy of Finland allocates most of the funds at its disposal on a competitive basis through universities and research institutes to researchers and research projects, centres of excellence in research, researcher posts and researcher training. Tekes finances and boosts challenging R&D projects carried out by business enterprises, research institutes and universities. The aim is to diversify the industrial structure, promote exports and create new business and jobs.

The higher education sector and public R&D system consists of the universities, polytechnics and state research institutes. The universities are responsible for higher education and basic research, while the polytechnics are more practically oriented, training

[17] Finnish science and technology information service *http://www.research.fi/en*
[18] The Academy of Finland *http://www.aka.fi*
[19] Tekes (the Finnish Funding Agency for Technology and Innovation) *http://www.tekes.fi*

professionals. The state research institutes are responsible for applied and mission-oriented research in their respective administrative fields. In total, R&D activities carried out by state research institutes and public administration correspond to about 10 per cent (2005) of total R&D expenditure. The performance of Finnish innovation financing and service organisations has been rated very highly in a number of evaluations carried out during recent years, especially due to its clear financing structure. The financing structures of the Finnish national innovation system have recently been geared towards stimulating and encouraging innovation in SMEs and start-up enterprises.

Finland has a strong and locally established network of public and semi-public intermediary institutions providing innovation support and expertise, set up to help Finnish businesses, universities and other providers of knowledge utilise different services at different stages of the innovation process. In 2005, an assessment of the intermediary R&D organisations in Finland showed an overall high intensity of co-operation among these organisations.

Overall, the Finnish NIS has obvious advantages and disadvantages. Finnish industries have demonstrated a strong capacity to renew their activities, which has had a clear impact on industrial structures. Collaboration between the private and public sector is strong, not only nationally, but also increasingly internationally. Further strengths include an internationally high level of education and research and globally competitive businesses. It has also been argued that the low level of social hierarchy and the compact size of the country have had a positive impact on knowledge flows and co-ordination between the different players. On the other hand, the small size of the country may lead to difficulties in gathering critical mass in those areas in which volume can be expected to make a difference. Furthermore, the number of players carrying out various types of intermediary and enabling functions in the innovation system has increased over the years at both the national and regional levels, which raises a question about co-ordination and the relevant division of labour.

### *3.2 Innovation Policy Implementation in Finland*

The national innovation governance system has been remarkably constant in Finland over the last 20 or so years. The main governmental advisory body responsible for RTDI policies is the Science and Technology Policy Council, which works under the Prime

Minister. The other governmental organisation with primary responsibility for the science, technology and innovation policy are the Ministry of Employment and the Economy and the Ministry of Education is in charge of matters relating to education and training, science policy, institutions of higher education, and the Academy of Finland. The Ministry of Employment and the Economy deals with matters relating to industrial and technology policies, Tekes (the Finnish Funding Agency for Technology and Innovation) and a number of public research institutes. Nearly 80 per cent of the government R&D funding is channelled through these two ministries. The role of the Science and Technology Policy Council is to contribute to the realisation of the strategy by means of science, technology and innovation polices and partly through education policy.In other words, the government outlines the principles underpinning science, technology and innovation policy and drafts relevant legislation. The ministries are responsible for planning and implementing science and technology policy. [20]

Currently, the development of the university sector structure is gathering pace with a view to increasing co-operation and networking within a comprehensive and dense regional network of universities and polytechnics. The government research institute sector is also in the middle of a transition period. As in the case of universities, the field of sector research has been considered to be not only fragmented, but also missing functional coherence and also accessibility, efficiency, and impact of public innovation services for companies are to be reformed. The existing enterprise service system is assessed to be organisation-oriented and complex, with several hundred intermediaries operating at the interface between the public and private sectors. Besides science parks, technology centres and business incubators, there are various public and private innovation services and municipal arrangements.

The division of duties between ministries have been updated, and, in this context, a Ministry of Employment and the Economy was established in the beginning of 2008.The new Ministry assumed responsibility for the duties of the existing Ministry of Trade and Industry, the tasks of the Ministry of Labour, excluding migration and integration matters, and the functions of the Department for Development of Regions and Public Administration

[20] Ministry of Education, *http://www.minedu.fi*; Ministry of Employment and the Economy *http://www.tem.fi*; Finnish science and technology information service, *http://www.research.fi/en*

of the Ministry of the Interior, excluding the Regional and Local Administration Unit. According to official reasoning, the new ministry structure will give the government better tools with which to tackle the challenges Finnish society is currently facing: the need to simultaneously invest in labour and its availability, productivity and innovations, not forgetting the major structural changes occurring in energy policy.

An often-mentioned distinctive feature of the Finnish innovation governance system is the active collaboration and co-operation between policy makers and stakeholders representing major public and private players in the science, technology and innovation policy fields. This is seen as proof that the system facilitates smooth and effective communication between players. The systematic evaluation culture is also considered one of the strengths of the Finnish innovation governance system. Not just policy instruments, but also science, technology and innovation support organisations, have been under regular evaluation in Finland for a long time.

The Finnish government has established a number of policies and instruments and organisations to support innovation activities. Science, technology and innovation policies in Finland rest on several pillars. There are direct subsidies in the form of grants for R&D projects within thematic programmes. Small and medium-sized enterprises are provided with support and services in relation to innovation, co-operation and technology consulting and transfer. Public innovation support includes subsidies, loans, venture capital, and infrastructure supply. Direct subsidies to companies and research institutions are the most important innovation policy measures, grouped by volume. It has been estimated that one in three SMEs in Finland has received some form of public subsidy or funding. A major trend in the implementation of the Finnish R&D and innovation policy over the past two decades has been a distinct move towards competitive funding instruments - the Tekes Technology Programmes and the Research Programmes of the Academy of Finland being primary examples here.

The existing national policy palette corresponds rather well with the targets set for business policy in Finland. Policies targeting enterprises focus on the development of the business environment, the creation of an atmosphere conducive to entrepreneurship, assuring entry of firms to market and the promotion of early-stage companies' growth. A lack of innovative growth-oriented SMEs and start-ups is one of the identified weaknesses

of the Finnish system. It is argued that Finns remain relatively averse to risk-taking, and there is a need to do more to provide a supportive climate for entrepreneurship. Nowadays, there is, however, a multitude of services targeting emerging businesses, start-ups and growth oriented companies.

Close co-operation between companies, research organisations and universities is considered a specific strength of the Finnish system of innovation and is consistently supported by innovation policy measures. The single most important ongoing activity promoting co-operation and encouraging networking consists of Tekes' National Technology Programmes. The technology programmes are demand-oriented in the sense that they have been planned with the needs of companies in mind, and have been implemented in collaboration with companies. The new instrument, Strategic Centres for Science, Technology and Innovation, is designed to create a new, more efficient framework for collaboration between companies, universities, research organisations and sources of funding.

### *3.3 International Learning in Finnish Innovation Policy*

International examples have had a significant standing in science, technology and innovation policy making in Finland for a long time. International learning is a strong priority of government innovation policy. According to 2007 INNO Trend Chart Country Report, two of three major challenges; increasing Finland's attractiveness for investments and ensuring creation of high level competence and research; are associated with internationalization of learning, including cooperation with Russia.

Experience from abroad is routinely taken into consideration when new instruments or programmes are designed. Finnish innovation policy making in relation to the EU has been proactive and national decisions have in many instances preceded new developments at the European level. Finnish science, technology and innovation policy makers have extensively used international evaluations, data and other sources of information. The policy criteria are derived from the international markets and emphasise competitiveness and effectiveness. In recent years Finland has also invested a lot in national innovation and innovation policy studies focusing on innovation processes, co-operation, internationalisation of R&D and policy delivery structures and schemes for innovation. Studies and reviews carried out by international organisations, such as the OECD, have

traditionally been attentively followed among policy makers. Active participation in international networks channels information on national performance to policy makers. In addition, the technology counsellors working at Tekes' overseas offices form a valuable information network on the development of innovation policies abroad.

In recent years the key Finnish innovation policy players have commissioned reviews covering development in a given country or a region of special interest to the Finnish economy and industry. Finland's membership in the European Union since 1995 has strengthened the European links in the science, technology and innovation policy arena. At the same time, it has been considered highly important to increase and strengthen bilateral cooperation with technologically and economically leading countries and regions outside the EU — links to the U.S and Japan have been emphasised for a long time, while active networking with emerging economies, such as China and India, is a more recent phenomenon.In addition, collaboration with neighbourhood countries around the Baltic Sea has been intensifying over recent years.

Co-operation with other countries has gradually been developing as well. Finnish decision makers are involved in numerous trans-national networks aiming to bring national players and policy makers into closer interaction with each other. Furthermore, there is an increasing number of examples of deeper co-operation in policy implementation in more specified areas. Tekes is closely involved in European co-operation activities and in co-operation arrangements in which the participants receive funding from the respective home countries. The same principle has been applied in the bilateral programmes carried out by Tekes in collaboration with foreign partners.

The Finnish innovation centres established in global locations with rapid economic development and R&D provide an example of a new "policy instrument" designed to promote internationalisation of Finnish companies, attract foreign companies and investors to Finland and strengthen knowledge flows to and from abroad. The Innovation Centres are one tool in the promotion of the internationalisation of national poles and clusters of excellence. Their task is also to ensure investment in innovation goes to the right place and has an impact through links with international innovation centres. The first innovation centre, FinChi, was established in Shanghai, China, in 2005. The second one, FinNode, was opened in Silicon Valley, California in January 2007. The Ministry of Trade and

Industry, Tekes and Finpro are among the founders in both cases. In addition, Sitra, the Academy of Finland and VTT have been closely involved in establishing FinNode. At the same time, further extension of the Finnish innovation centre network in St Petersburg, Russia has been launched. FinNode Russia, launched in St Petersburg in the beginning of 2008 is an example of the increasing cooperation with Finland and Russia in the field of innovations and it has been created in cooperation with Finpron, Tekesin, VTT, Academy of Finland, Sitra and business organization within the Lappeenranta ja Imatra regions. [21]

It should be noted that some Russian experience may be useful for Finland as well – thus, experience in establishing large universities (Federal universities) may be a good example. The Finnish Ministry of Education proposed that a new entity of international class should be built by merging the Helsinki University of Technology, the Helsinki School of Economics and Business Administration, and the University of Art and Design into a new university of technology, economics and art and design. The Russian Federal universities were created using the same approach. Therefore for Finland this may be both positive and negative learning from Russian practice. And in any case mutual experience is invaluable.

In general, it can be concluded that Finnish policy makers and innovation policy players are well aware of the need to monitor and benchmark developments abroad. Benchmarking successful international and national models and practices has become an integral part of Finnish innovation policy making. In addition, less successful, but otherwise interesting, examples have been used as learning opportunities. Active participation in the evolving European innovation governance solutions, e.g. within the EU context as well as in Nordic and Baltic Sea co-operation, is opening up new possibilities. There has been a drive towards increased horizontal and vertical co-operation in innovation governance in recent years.

[21] FinNode http: www.finnode.com

# 4 Finnish experience for Russia: Technopolis in St Petersburg[22]

Finnish participation not only in policy advice but also in practical implementation of proved to be effective mechanisms is important for Russia's innovative development. Below we analyze the experience in establishing intermediary innovative infrastructure in Russia in the form of a technopark development project Technopolis in St.-Petersburg.

## *4.1 Developing a technopark in Russia*

Technopolis Plc. (former Oulu Technology Park Ltd.) was established in Finland in1982 as the first science park in Scandinavia. Today Technopolis employs 9,000 people and is one of the largest technology centre operators specialising in the provision of operating environments for technology intensive companies in Europe in terms of the number of clients. Currently, there are around 12 000 people employed by 930 companies and other organisations working in the Technopolis technology centres which are located in five regions in Finland: Oulu, Helsinki region, Lappeenranta, Jyväskylä and Tampere. Technopolis is also the largest company in Finland specialising in providing operating environments for high tech companies and offering services including premises, business and development services.

Technopolis business idea can be explained by the service concept it has developed for the needs of technology companies. The concept consists of three areas, namely premises, business services and development services. Technopolis technology centres provide their customer companies with premises that can be designed for the needs of each company. Business services are produced by Technopolis together with its partners. The services are aiming at improving companies´ cost-efficiency and increasing the flexibility of their operations. The services include for example legal, accounting, patenting, translation and communications services. Development services, on the other hand, are designed to help customer companies to build their competitiveness and resources to succeed in international markets. They are developed for start-up companies or companies on the verge of strong growth, but also for those that are already established in international markets. In addition, Technopolis offers its customers regional attractiveness

[22] This chapter is based on the information retrieved from interviews with two company representatives and materials available on the company website

programs and incubator services. Technopolis also provides consulting services, as well as related planning and training services.

A couple of years ago the company made a strategic decision to expand its operations to Russia. The decision to expand to Russia and namely to St. Petersburg was affected by the quantity of Finnish companies in the region and also by the concentration of high-tech companies in this city. Potential customers in St. Petersburg are the Russian and international high-tech companies from the ICT-sector. The company has been involved in several projects in Russia and the activities will be briefly described in the following sections.

After the decision to internationalise to Russia, negotiations with the Russian Federation concerning the participation of Technopolis in the special economic zone of Neudorf in St. Petersburg region were started. The company was, however, prepared for the slow progress of the project and therefore launched several other projects simultaneously.

The second project of Technopolis in St. Petersburg involved cooperation with St. Petersburg State University of Telecommunications and Ministry of Information Technologies and Communications which according to the company has proved to be more business oriented than the agency for special economic zones. The ministry has also hired Technopolis to consult in the creation of the concept of the technoparks, for the other cities they plan to build technoparks in. Within the framework between Technopolis and Russian Ministry of IT and Communications, Technopolis has signed the cooperation agreement with the newly-established “St. Petersburg Technopark”. The agreement relates to future construction of the State University of Telecommunications based IT science and technology park. OJSC “St. Petersburg Technopark” has been set up to implement the state program “On creation of high-tech technology parks on the territory of Russian Federation”. Before, Technopolis along with the Ministry of IT and Communications, has been already actively involved in implementation of particular parts of this program.

The third step of the international expansion was finalised in December 2006 when the company purchased 4,6 hectares of land near the Pulkovo airport from the private market. After closing the deal the company has started the process of acquiring all necessary approvals, permits and investigations in order to obtain the permission to build.

Technopolis plans to establish a technology park with about 80 000 square meters of office premises and parking places. The location was selected due to its proximity to the airport and good connections to the city centre. Pulkovo Technology Park will be designed as a platform for Finnish and international companies interested in starting or expanding their operations in St. Petersburg and also for Russian companies internationalising. This technology park is being designed as a hub for international business activities providing customer companies with flexible, tailor-made premises, business services and development services. The technology park concept has been developed for over twenty years and is designed to meet the specific needs of technology companies. The model for the Pulkovo technopark is similar to Vantaa technopark, which is situated close to the Helsinki airport.

The fourth important step in the internationalisation process was the creation of an innovation centre in St. Petersburg. The innovation centre was established mainly to serve the Finnish companies needing support in establishing their operations in St. Petersburg. Technopolis also hopes that the clients of the centre might become their future tenants in the technopark to be built in the region later. The centre is also a manifestation of the intentions of the company to seriously establish themselves in Russia and start to create a position in the market.

The center will strengthen collaboration and relations between the participating Finnish businesses and public entities and the evolving Russian innovation environment. The new center is implemented by collaboration between Finpro, Lappeenrannan Kaupunkiyhtiöt and Technopolis Plc. From the outset, the innovation center premises in central St. Petersburg will accommodate a good number of companies and other entities. Spring 2009 will see the center's relocation to the Nevsky Centre, once construction has been completed. The Nevsky Centre is a shopping center being developed by Stockmann, the Finnish department store company, and Technopolis will control about 4,300 square meters of its premises. Each of the collaboration parties behind the innovation center play its own special role. Finpro will be responsible for the innovation center's national mission and its linking to innovation policy. Technopolis's role is to support the growth development of tenant companies by offering them premises, services and networks. The City of Lappeenranta (through Lappeenrannan Kaupunkiyhtiöt) will provide the center with practical innovation services and university collaboration.

Some of the innovative clusters the company sees as potential in the future and is also itself interested in developing partnerships such as the energy cluster and aviation cluster. This choice is natural due to the proximity of the airport. The company also wants to serve the existing clients in their technoparks in Finland as well as other Finnish companies and help them, especially small and starting businesses and even larger companies not yet established in Russia to move into the country. The centre also helps Technopolis to form good relationships with the companies who might later become their clients in the Pulkovo technopark and create networks for future cooperation.

The last phase of the international development so far has been Technopolis decision to establish the local organisation, since it was realised that by running the operation from Finland the goals of the company in Russia could not be achieved. Therefore the establishment of a local company and hiring local employees to be responsible for the Russian operation was necessary. The organisation allows the company to be more operative and to react more rapidly. The local management has also been able to deepen the cooperation with Russian partners and create the network of Russian and Finnish partners.

### *4.2 Introducing a new service concept in St. Petersburg*

The service concept designed by Technopolis is quite new to the Russian market. Pointed out by Kihlgren[23] among others the science centers in St. Petersburg have been concentrations of scientific excellence rather than service organisations providing a wide range of business support and especially management support and consulting have been largely lacking in traditional science centers. The model for the Pulkovo technopark is Vantaa technopark which differs from common business centers mainly by a wider range of services available in single location. The level of modern services and operating environments differentiates the service concept of Technopolis from the traditional science centres in St. Petersburg. The company sees a lot of potential for their service concept in Russia, since according to them there is a lack of a single technopark operating with a similar concept on the market. The company's perceived competitive advantages are excellence service, the premises designed and built for the purposes of high-tech company and participation development programs.

[23] Kihlgren, A. (2003) Promotion of Innovation Activity in Russia Through the Creation of Science Parks: Case St. Petersburg (1992-1998). Technovation 23, 65-76.

The infrastructure of most the office space in Russia has not been built for the purposes of the ICT industry and usually does not comply with the specific needs of the sector. Many of the office buildings have been originally designed for other purposes and for example former factories and residential buildings have been transformed into office use and although the buildings are redeveloped they have not been designed for the purposes of ICT companies, which can cause problems due to impropriate infrastructure for instance. Office space provided by Technopolis are located and designed for the purposes of ICT industry which can give them a competitive advantage in Russia especially. The company has also conducted enquiries among potential customers concerning their needs, partly in order to market their services and found out that their opinion had not been asked before and therefore the services developed before might not suit their needs.

Tehcnopolis sees the customer orientation essential in service development and business services will be designed to enable customers to focus on their core businesses. In Finland the services include everything from catering and cleaning to legal services and event management. The service range is constantly developing and changing in accordance with customer needs. In St. Petersburg the service package will be strongly localised, and will take into account the special features of the St. Petersburg business environment. Technopolis had to make adaptations to local environment in its service concept. For instance, it has been necessary to incorporate transportation services in the service package it offers its customers in its innovation centre in Russia. Furthermore, for Finnish companies entering Russia, support services related to establishing a company in Russia, accounting, legislation and recruiting are essential. The entire service concept will be localised and also development services will be totally different from Finland, because of differences in Russian legal and operating environment.

Considering the services developed by the company for the Russian market, the company is extending the market of the existing service concept developed in Finland, but also making extensions to it to meet the local demand. The company also wants to serve its existing customers and provide them with a new operating environment in a different locations. Completely new cooperation models are developed such as the innovation centre to assist the customers in internationalisation. Partner network is essential for the development of Technopolis's services in general as most of the realisation of the business support services offered for companies are outsourced. In order to start

operations in Russia, Technopolis had to build a network of cooperation partners for providing the services to their customers. These companies include consulting companies, law firms, transportation companies etc.

Other cooperation partners in Russia are Finnish private and governmental actors such as Finpro, Sitra, Ministry of Trade and Industry, and various Finnish cities which Technopolis had relationships already in its pre-international stage. Technopolis has created partnerships with the city administration of St. Petersburg as well as other public sector actors, such as Russian Ministry of Information Technologies and St. Petersburg State University of Telecommunications. Nevertheless, the partnerships with Russian public sector actors have been characterised with bureaucracy related to for instance entering the Special Economic Zone. The relationships with the local public administration is, however, very important in the service development as the regulations of operations and participation in cooperation projects with the public administration offers opportunities for new service development. The most visible examples of the effect of the public administration on the service development and the operations in general are the negotiations of the participation of the company in the special economic zone. The technology park operator was aiming to develop their service concept in a new kind of environment, but the negotiations were halted by the administration. The support of the public sector is in this case a very important factor in the development of the service concept in this location also as a source of information and cooperation partner.

## 5 Discussion

As stated earlier in this report one of the strengths of the Finnish innovation system is a well developed network of intermediary institutions providing innovation support and expertise, set up to help Finnish businesses, universities and other providers of knowledge utilise different services at different stages of the innovation process. Collaboration between the private and public sector is also strong, not only nationally, but also increasingly internationally. On the other hand, the small size of the country, although promoting the cooperation, can be considered a weakness in relation to gathering a critical mass in areas in which volume can be expected to make a difference. Aside of that the domestic market for innovations and R&D is quite small. Russia on the other hand provides with a large potential market and resources for innovative activities. Russia still has transitioning innovation system where market oriented actors coexist with Soviet-style organizations and mechanisms (including policy decision-making). The lack of cooperation and coordination of different organisations in the innovation system and almost nonexistent intermediary system have had a negative effect on commercialization of innovations. The different strengths and weaknesses create many opportunities for mutual learning and cooperation between Finland and Russia.

The case company Technopolis' experiences and development process of their operations in Russia enlightens several aspects which can be considered to apply and have importance for the development of innovation cooperation between Finnish and Russian organisations in a wider context. The different projects the company has been involved in present examples of several cooperation possibilities on different levels.

The expansion of the Finnish technology park operator in the Russian market and introducing a relatively new service concept in the market reflects the opportunities provided by the Russian innovation system for international innovation operators to expand and develop different kinds of cooperation projects. As pointed out the lack of intermediary organizations and effective infrastructure, such as technology parks and consulting services has been considered as a weakness in the Russian innovation system affecting the commercialization and cooperation between different levels of the system. The expansion of such international operators with experience of building effective

innovation infrastructure and cooperation networks and create mutual benefits for Russian and Finnish as well as other international operators.

Among important novelties introduced by Technopolis in Russia, are: simultaneous development of different schemes of support for innovative development, well-structured three-elements concept of providing premises, business and development services, strong orientation on specific industry type of clients (namely, IT sector), and study of their needs before (and not after) establishment of the set of services. All these approaches are generally not in use in Russian technoparks most of which turned into facilities that suggest preferential leasing. Therefore introduction of Technopolis concept in Russia is an important learning experience for the Russian actors of innovation system.

Another important aspect exemplified by this case is the cooperation and creation of networks with different levels of the national innovation systems involved in the innovation development. Cooperation with the public sector organizations has been especially important in this case and also some of the problems related to it can be seen in the slow progress of the projects. Creating cooperation networks and linkages both with the Finnish and Russian partners has, however, been vital to the expansion of the operations. It can therefore be said that policies enhancing cooperation between Finnish and Russian innovation organizations are needed, especially cooperation within concrete projects with mutual benefits should be supported by governments on both sides.

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