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POTENTIAL COMPETITIVENESS

OF SAINT PETERSBURG´S INDUSTRIES

This study is an interim report of the project “Long-term Industrial Development Strategies for Saint Petersburg”. The project received financing from the members of the Saint Petersburg Assembly, SITRA (The Finnish National Fund for Research and Development) and ETLA (The Research Institute of the Finnish Economy).

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ABSTRACT: This study is a sub-report of the ongoing larger project called "Long-term Industrial Development Strategies for Saint Petersburg". The aim is to anticipate which manufacturing and service industries of Saint Petersburg will have a competitive edge in Russian and later in international markets. Simultaneously we will develop suitable industrial strategies, which will support this development.
Here we have presented a preliminary theoretical approach, which we will develop further as the project advances. By using Porter's diamond model we will describe the competitiveness of the most outstanding industries of Saint Petersburg. Porter´s cluster model is used as a tool to make projections of possible future cluster development. We have taken into account also the business environment of a transition economy and the effect of foreign direct investment. In Russia, both local and central government can have a remarkable positive or negative impact on the development of enterprises and entrepreneurship.
In this preliminary study we will present the industries of Saint Petersburg by using rather extensive data. There is large industrial capacity for producing power technology, heavy machinery and related metallurgy. Booming industries are the foodstuff industry and information technology, especially programming. Saint Petersburg is a transport junction of Northwest Russia, which offers excellent business possibilities. Huge unutilised potential is in tourism.

KEYWORDS: Russia, Saint Petersburg, Industries, Competitiveness.

DUDAREV, Grigori, **SEVENARD**, Konstantin, **PRIGARA**, Pavel, **FILIPPOV**, Pavel and **HERNESNIEMI**, Hannu, **PIETARIN TOIMIALOJEN POTENTIAALINEN KILPAILUKYKY**. Helsinki: ETLA, Elinkeinoelämän Tutkimuslaitos, The Research Institute of the Finnish Economy, 2000, 70 s. (Keskusteluaiheita, Discussion Papers, ISSN 0781-6847; No. 712).

TIIVISTELMÄ: Selvitys on osa laajempaa tutkimusprojektia "Pietarin pitkän ajan elinkeinopoliittiset kehittämisstrategiat". Hankkeessa on tavoitteena selvittää mitkä Pietarin teollisuuden ja palvelujen toimialat pitkällä ajalla voisivat kehittyä Venäjän sisällä kansallisesti ja myöhemmin kansainvälisesti kilpailukykyisiksi. Samalla hahmotellaan tätä kehitystä tukevaa elinkeinopoliittista strategiaa.
Tässä työssä on esitetty alustava teoreettinen viitekehikko, jota kehitetään projektin kuluessa. Porterin kilpailukykymallin puitteissa kuvataan Pietarin merkittävien toimialojen kilpailukykyä. Tulevaa kehitystä visioidaan klusterimallin avulla. Merkittävästi kilpailukykyyn vaikuttaa siirtymätalouden puitteet ja ulkomaiset investoinnit. Myös julkinen valta, Venäjän keskusvalta ja Pietarin omat päätöksentekijät voivat ratkaisevasti edistää tai huonossa tapauksessa hidastaa elinkeinoelämän kehitystä.
Esitutkimuksessa esitellään Pietarin elinkeinoelämä runsaan data-aineiston avulla. Kaupungissa on merkittävä teollinen kapasiteetti energiateknologian valmistuksessa sekä raskaassa koneenrakennuksessa ja metallurgiassa sekä laivanrakennuksessa. Tällä hetkellä nopeimmin kasvaa kuitenkin elintarviketeollisuus ja informaatioteknologia, lähinnä ohjelmistojen tuotanto. Pietari on Luoteis-Venäjän kuljetusten solmukohta, mikä tarjoaa pohjan erilaisille liiketoiminnoille. Turismissa on huomattavasti hyödyntämättömiä mahdollisuuksia.

AVAINSANAT: Venäjä, Pietari, toimialat, kilpailukyky

ESIPUHE - FINNISH FOREWORDS

Venäjän merkitys Suomelle kauppakumppanina on historian saatossa vaihdellut merkittävästi. Autonomian aikana Venäjän osuus Suomen viennistä oli 30-40 %. Neuvostovallan alku muutti tilanteen. Ennen sotia tavaravaihto oli hyvin vähäistä. Venäjän osuus Suomen viennistä oli alle viisi prosenttia ja kuihtui lähes kokonaan jo useita vuosia ennen sotia. Vuoden 1945 jälkeen alkoi uusi kausi. Venäjän osuus Suomen viennistä vaihteli 15-25 prosenttiin. Neuvostovaltion viimeisten vuosien talousvaikeudet näkyivät myös viennin laskuna ja viimein totaalisena romahduksena. Vuonna 1992 ”uuden” Venäjän osuus oli alle kolme prosenttia Suomen viennistä. Siitä se kohosi yli 7 prosentin vuonna 1997. Sen jälkeiset talousvaikeudet ja devalvaatio romahduttivat Venäjän osuuden jälleen runsaaseen 4 prosenttiin.

Nyt Venäjä elää kuitenkin selvästi uuden kauden alussa. Kestävä taloudellinen kehitys on alkanut. Ruplan devalvaatio teki tuontituotteista liian kalliita tavallisille venäläisille kuluttajille. Tämä antoi voimakkaan sysäyksen kotimaiselle kulutustavaratuotannolle. Toinen syy on kotimaisen taloudellisen kiertokulun uusi liikkeellelähtö. Aiemmin kulutus perustui pitkälle länsimaiseen lainarahaan, joka nopeasti myös tuonnin kautta ja valuuttasiirtoina palasi länteen. Nyt kallistuneiden raaka-aineiden viennistä saadut rahat näyttävät rikastuttavan kotimaista talouselämää. Elpymistä edistävät myös valtion lisääntyneet ostot sotatarvikesektorilta, mikä tuo rahaa eniten menettäneisiin keskuksiin. Venäjän talous näyttää kokeneen keynesiläisen kysyntäshokin, jolla on voimakkaita akseleraatiovaikutuksia. Uuden presidentin myötä oloihin uskotaan tulevan lisää vakautta, joka varmistaa kasvua. Venäjän kansatuote kääntyi vuonna 1999 voimakkaaseen kasvuun, ja kasvu näyttää jatkuvan lähivuosina.

Myös Suomi Venäjän naapurina elää uuden kauden alussa. Nyt kauppakumppanina on tervehtyvä kansantalous, jonka kuluttajat ja yritykset voivat perustaa ostonsa vapaaseen valintaan ja omiin päätöksiin. Kauppa ei enää perustu poliitikkojen tekemiin sopimuksiin kuten Neuvostovallan aikana. Kauppa ei myöskään perustu vanhojen kauppasuhteidemme luomaan etuun ja toisaalta venäläisen asiakkaiden palavaan haluun saada länsimaisia tuotteita kuten uuden Venäjän alkuvuosina. Erikoiset olosuhteet tekivät meistä mm. OECD:n toiseksi suurimman banaaniviejän vuonna 1994.

Nyt venäläiset ovat rakentaneet ulkomaankaupan tuontikanavat, tuntevat ulkomaiset tuotteet ja niitä on myös kilvan tarjolla heidän markkinoillaan. Tässä tilanteessa Suomen kilpailuedut rakentuvat samalle pohjalle kuin muidenkin maiden kanssa käytävässä kaupassa. Läheisyys ja maan tuntemus ja saavutettu luotettavuus toki vaikuttavat, koska ne alentavat kaupankäynnin kustannuksia. Kasvava merkitys on kuitenkin Suomen todellisilla kilpailueduilla. Niiden tuotteiden osuus, joissa Suomella on muillakin markkinoilla kilpailuetua, tulee kasvamaan myös Venäjän markkinoilla. Samoin ne yritykset, jotka nyt ovat laajasti kansainvälistyneet, pystyvät tulevaisuudessa etabloitumaan parhaiten myös Venäjän markkinoille.

Miten Venäjä tulee kehittymään tästä eteenpäin? Arviomme on, että vanhat koko entisen Neuvostoliiton ja jopa koko sosialistisen leirin kattaneet teolliset kompleksit jatkavat murenemistaan. Niiden sijaan eri teollisuuden ja palveluiden aloilla kehittyy alueellisia menestyskeskittymiä, alueellisia klustereita. Tuotanto keskittyy parhaiden osaajien käsiin. Paikalliset yhteystyöverkot osoittavat tehokkuutensa. Samalla jaetaan uudestaan Venäjän teollisilta komplekseilta periytyneitä kotimarkkinoita. Vähitellen menestyskeskittymät pyrkivät nykyistä voimakkaampaan vientiin. Tässä vaiheessa ne ovat kiinnostavia yhteistyökumppaneita ja ostokohteita.

Suomalaiset mukaan kehittämään ja hyötymään Pietarin kehityksestä

Suomea lähin ja yksi Venäjän merkittävimmistä taloudellisista keskuksista on Pietari. Mitkä ovat Pietarin tulevat menestyskeskittymät? Kehittyykö niistä kilpailijoita suomalaisille klustereille? Vai käykö kenties toisin päin? Tarjoavatko ne suomalaisille yrityksille uusia mahdollisuuksia yhteistyökumppaneina – alihankkijoina, toimittajina verkostoissa, T&K-toiminnassa sekä kanavina Venäjän markkinoille? Menestyskeskittymät voivat olla kehitysmahdollisuuksia suomalaille yrityksille ja klustereille.

“Long-term Industrial Development Strategies for Saint-Petersburg” –projektissa selvitetään Pietarin ja tarvittavassa määrin myös ympäröivän Leningradin alueen toimialojen nykyinen tilanne sekä pyritään arvioimaan niiden kilpailukyvyn tulevaa kehitystä. Projekti syntyi pietarilaisten aloitteesta, se tehdään pääosin pietarilaisin tutkijavoimin ja alkuvaiheen rahoitus on saatu Pietarin kaupunginvaltuuston jäsenten budjeteista. Tavoitteena on samalla, kun tutkitaan Pietarin toimialojen kilpailukyä ja sen muotoutumista, tarjota Pietarin ja Venäjän federaation viranomaisille materiaalia ja välineitä tehdä kehitystä edistävää alueellista elinkeinopolitiikkaa. Venäjällähän paikallisviranomaisilla on valtion keskusjohdon rinnalla melkoiset toimintamahdollisuudet.

Pietarilaiset halusivat myös suomalaisia mukaan tähän projektiin. Sitra ja Etla tarttuivat haasteeseen rahoittamalla Etlatiedon osallistumisen projektiin esitutkimusvaiheeseen. Suomalaisen osapuolen tavoitteena on, että esitutkimuksessa kerätään suomalaisten yritysten kannalta mahdollisimman hyödyllistä tietoa Pietarin yrityksistä ja liiketoimintaympäristöstä. Erityisesti selvitetään, missä määrin Pietarin yritykset, korkeakoulut ja tutkimuslaitokset voisivat niveltyä yhteistyöhön suomalaisten kansainvälisesti kilpailukykyisten klustereiden kanssa.

Projektin kuluessa järjestetään seminaari, johon kutsutaan edustajia kiinnostuneista suomalaisyrityksistä. Myöhemmin projektin syventävässä vaiheessa on tarkoitus, että nämä yritykset myös aktiivisesti osallistuisivat projektin työskentelyyn. Tavoitteena on esitellä Pietarin yritysten, korkeakoulujen ja tutkimuslaitosten mahdollisuuksia ja tarvittaessa myös joidenkin klustereiden piirissä yhdessä pietarilaisten yritysjohtajien sekä koulutuksen ja tutkimuksen vaikuttajien ja kaupungin päättäjien kanssa kehittää käytännön edellytyksiä yhteistyölle. IT:ssä ja joillakin muilla suomalaisten vahvoilla teknologia-alueilla Pietarissa on sellaista osaamista, joka voisi vahvistaa ja täydentää Suomen klustereita. Parhaissa tapauksissa voisi muodostua yli rajojen ulottuvia klustereita.

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SUMMARY[1]

Since the collapse of the Soviet Union in 1991, the Russian Federation has moved into the process of economic transformation from central planning to an open market economy. After nearly 10 years of economic transformation, Russian industry is still searching for its place in local and international markets. The Russian people and leaders entered this period of transition with hope of rapid improvements in the quality of life and wealth and the strong belief that Russian industry, given the chance and access, will be able to adapt to the new operating conditions. The deep recession that followed was a great challenge for policy makers and business leaders. Nevertheless, even after this period of time there is no clear consensus on the true degree of industrial competitiveness in Russia and St. Petersburg in particular. Thus one of the primary goals of this research project is to introduce an approach that will help in a comprehensive way to understand the present stage of industrial development in St. Petersburg and Russia and produce a framework for further decision making at the corporate and governmental levels.

This paper is the first paper in this research that is aimed at a preliminary identification of the basic industrial sectors that could serve as a basis for further competitive clusters formation. The paper also aims to provide ideas on an analytic framework that will be fine tuned in the course of the further research.

Chapter 1 of the present paper is devoted to describing the main questions and objectives of this research, and to introducing the thinking and ideas that are behind this research. The choice of employing Porter's "diamond" model as a main analytical tool for this research is discussed.

The application of Porter's model for the regional analysis as well as for the case of the transition economy environment made it necessary to adjust the model to take these factors into consideration. Chapter 2 concentrates on the description of these adjustments. There is wide discussion about the measures needed to achieve the innovation-driven stage of economic development in Russia. We argue in this chapter that Russia is in a factor-driven stage of its development and that transition to the investment driven stage is the right decision-making agenda at present.

In Chapter 3 we introduce the key figures that position St. Petersburg in Russia and in international trade. Consideration of industrial output and its structure, employment, privatisation and the labour market helps us to specify the true positions of the sectors of St. Petersburg industry.

We identify and categorise the clusters of industrial competitiveness in St. Petersburg in Chapter 4. They are classified as "potential" - "Power engineering", "Food and Beverages", "Metallurgy", "IT sector", "Optical engineering", "Tourism", "Transport and Logistics", "Woodworking", and "latent" - "Shipbuilding and ship repair". A detailed review

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[1] Chapters 1,2,3 were written by Grigori Dudarev in co-operation with Hannu Hernesniemi, Chapter 3 with participation of Pavel Filippov also, Chapter 4 is a product of fruitful co-operation of all the authors of the present paper and the Finnish Foreword and Chapter 5 were prepared by Hannu Hernesniemi. The authors would like to express their gratefulness to Dmitry Efremov, Michael Zverev, Vladimir Gorelov, Aleksei Osipov for their contribution in processing and preparation of information and valuable comments.

of their related and supporting industries, determinants, rivalry, and firm strategies for each sector are presented.

There are no conclusions nor final judgement presented in this paper. Further research in this project will undoubtedly reveal more and provide better insights into industrial development in St. Petersburg. Plans for the continuation of this research are introduced in Chapter 5.

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1 INTRODUCTION

1.1 Main Questions and Objectives

This project was born out of numerous discussions on problems of the adaptation of industry in St. Petersburg and Russia to the new market conditions and operating environment, privatisation, the role of federal and local government in managing state ownership and transition to the market economy, etc. It represents one of the attempts to create a comprehensive analysis framework aimed to help in understanding the drawbacks and opportunities arising from this change, setting the knowledge based priorities for decision making on the corporate and governmental levels. The approach presented in this project is based on analysis of the micro-economic transition and its influences and interactions with the transformation of the overall economic system and change going on in Russia. Explaining and describing the micro-economic differences and challenges that are overcome in Russia and St. Petersburg will add its share to the overall understanding of the nature of the economic transition and development. There is a set of major questions that will be touched on and addressed in this research:

How the competitiveness of St. Petersburg could be defined? What are the factors and determinants of competitiveness? What is the efficient industrial policy in terms of competitiveness promotion? Who takes the initiative in development of regional competitiveness?

The present paper is the first paper in a series of publications in this project devoted to the analysis of competitiveness and industrial development in St. Petersburg. Its purpose is to set a general framework and show the further directions of research that will follow in the coming months. This research will go deeper into details concerning industrial development and conditions, the theoretical background and methodology, determinants of growth and possible governmental and legislative initiatives that could support and maintain competitiveness in the region. The main objective of the present paper is to answer the following questions:

What are the possible industries in St. Petersburg that could serve as cluster creating industries? Which analytic methods will help to produce reasonably comprehensive results?

1.2 Economic Transformation in Russia

The issue of economic transition from the central planning to a free market has acquired its present importance only ten years after the collapse of the Eastern Bloc and Soviet Union. A major transformation of these countries' economic systems into a very different social, economic and political environment started at that time. The whole economic system of these societies, including institutions, was effected by these changes. According to all basic terms – the scale, the speed and profoundness – of change that transforms societies and institutions, the world has not seen an equal. Transformation led to major changes in political systems, - from autocracy to democracy, to freedom of speech and mass media, free elections and multiple political parties – and in the social and economic systems of these countries.

At the beginning of transition, it was widely accepted that successful introduction of the new macroeconomic conditions and related rules, laws and regulations would be sufficient to alter the economic system and transfer it to a free market, open economy. Unfortunately

the reality has shown that a much greater diversity of problems and issues arising out of the application of such an approach exists. The existence of macro and micro differences among the countries has been revealed. Micro differences consist of subtle diversities in institutions, structures or co-ordination framework that broadly share the same set of macro-economic institutions. The increasing interaction of the economies and their major actors that globalisation brings about require for common rules of behavior and some common structures, not necessarily the same and uniform economic system. That means that there is room for diversity, and the real challenge that Russia is facing is to build globally competitive sectors that will lay the ground for sustained economic development. By addressing the issues of regional diversity and industrial sector transformation, we attempt to set the framework for the optimal corporate and government policy making aimed at achieving the sustained development and growth.

The influence of such exogenous factors as history and cultural heritage has arisen in the recent discussions. The countries of Eastern Europe and the Baltics are succeeding better in their economic development also due to the fact that their history in many cases contained much longer and stable periods of economic development and growth. Russia, on the contrary, represents one of the dimmest examples of a country with a short history of industrialisation that was interrupted by the brutal revolution and followed by communist rule that lasted 70 years. These issues will be addressed in our analysis and will be paid special attention. This, hopefully, will allow the reader to assign the right weight to such factors. After all, any economic system and any economy is the outcome of history and culture as much as the former influences the latter.

1.3 Regional Factor

This study is also aimed at studying the issues of regional differences in the economic transformation under the existing set of rules and macro-polices set at the level of the federal state. We believe in and aim to show that the new pattern of competitiveness development in Russia will, in our point of view, be based largely on the emergence of regional clusters of industrial competitiveness. We believe that these processes are a natural consequence of the overall trends set out in the federal political system identified in the new Russian Constitution and embedded in a large variety of laws and regulations.

The existing and ever increasing variety of regional developments in Russia rests on the country's enormous geographic scale and distances, existing cultural differences and an ability to elect local governing bodies as well as to introduce local laws, regulation and taxation within the limits set out on the Federal level, but not always perceived by the regional bodies.

Providing the answers to the issues of regional development is not in the scope of the present study. Nevertheless the reader will find some interesting ideas and implications that arise from the framework and pattern of analysis suggested by this project and the present paper.

1.4 Choice of Analysis Methods

The theoretical base of this research is the "diamond" model, which was developed by the famous American economist Michael Porter at the beginning of the 1990s. This method

spread widely in the world as an analytical tool for the determination of goals, priorities and methods of government policy, aimed to stimulate a nation's economic development.

This choice is based on the belief that, although a large variety of choices exists in policy and decision making in Russia, it is important to present ample benchmarks for further analysis, research and possible decision making. An analysis of global competitiveness and industrial potential serves best as the objective of the present research. It seems to be valuable for a range of reasons. It sets a good base that helps to present the industrial structure and approach to decision making in connection to the industrial, economic and corporate development that will not only show the present drawbacks and opportunities but also help to avoid some long-term damaging decisions, and to assess the possible future directions of economic development. This, in turn, may become a fruitful ground for decision making.

It will also assist in better understanding the true opportunities and optimal patterns of FDI in this region, serving, thus, the needs of the international companies seeking to participate in this challenging market development in St. Petersburg. At this stage, the aim is to describe the structure of potential clusters of Saint Petersburg and to find out the key determinants of their potential competitiveness.

2 ANALYSIS FRAMEWORK

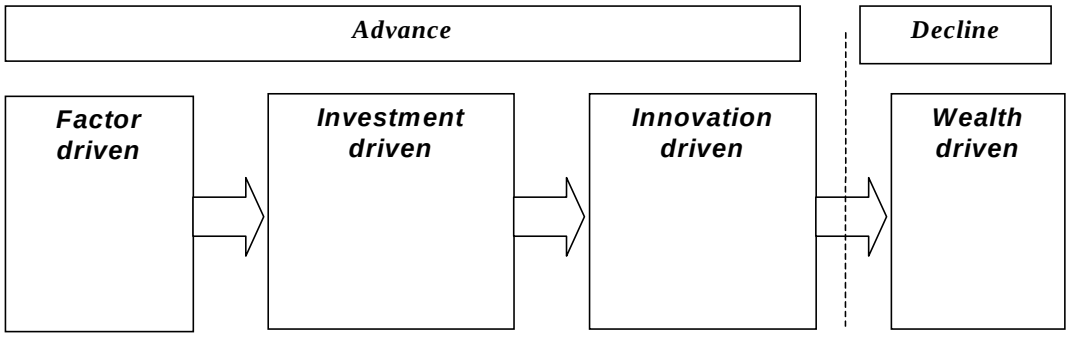
In the previous Chapter we have introduced the readers to our reasoning concerning the analysis framework that would at our point of view, service best the purposes of this project. We came to a conclusion that understanding the industrial competitiveness based on the approach specified in the M. Porter "diamond" model will give a new knowledge and help to systematise the existing one. In this chapter we will give a deeper introduction of the said framework. We present also some adjustments to the "diamond" model that create a necessary link of the general approach to the case of economic transition and analysis of the exogenous factors such as history and cultural heritage of St. Petersburg and Russia.

2.1 Evolution of Industrial Competitiveness in Russia

In the course of the numerous discussions and interviews in the framework of this project, analysing afterwards the reactions and answers we have identified one of the problems that may have a great importance in interpreting the reality and understanding the failure of many international initiatives in Russia. The Russians in their majority have different view and understanding of the present state of their economy's development. They tend to overestimate the existing capacity, value of the inherited capital and growth potential. There are numerous consequences of this misperception. As a result, major distortions and irregularities are observed in the policy making and drafting of the business strategies.

Porter recognizes four major stages a developing country's industry passes through. Stages may be overlapping, and the nation may move to either direction in its progress. The first three stages (factor, investment, and innovation-driven) are successive improvements in national prosperity whereas in the fourth stage, wealth-driven industrialization, national competitiveness will decline.

Figure 1. Stages of the Industrial Competitiveness Evolution



Source: The Competitive Advantage of Nations. M. Porter (1990)

These four stages will be observed in detail in order to determine the state of Russia and, particularly, Saint Petersburg in context of these stages.

Factor-driven stage

In this stage competitive advantages are based on low wages and input prices. Domestic production of investment goods is almost nonexistent. Firms apply imported and well-known technologies. Internal research and development is limited. Firms often lack direct connections to the end users. The economy is very sensitive to the fluctuations in the world commodity markets. While a fairly high standard of living can be achieved, maintaining it in the long run is unlikely.

Investment-driven stage

National competitive advantage is characterized by the willingness and ability of domestic firms to invest aggressively. Companies try to acquire the best technology available on the global market, and they often aim to create competitive advantages based on economies of scale. Upon applying foreign technologies they are also enhanced to suit local conditions. Since production technology is bought rather than invented, domestic producers are nevertheless in the second tier as far as technological advances are concerned. The majority of successful companies make fairly standardized products.

Innovation-driven stage

In the innovation-driven stage a country should have a wide range of internationally competitive industries. While successful enterprises have strong linkages to the traditional sectors, fitting the national environment and history, brisk innovation activity has created many sub-sectors. Domestic research and development has increased competitiveness in traditional branches and spin-offs have generated seeds for new industries. Domestic rivalry is fierce, and linkages to customers are an important source of new ideas. Firms do not only adopt innovations made elsewhere, but also innovate themselves. Competitive strength is founded on specialized and advanced factors; highly skilled labor and firm-specific knowledge are crucial. Firms compete in global markets with differentiated products. The service content of manufactured products is high. In this stage the economy is less sensitive to cyclical fluctuations.

Wealth-driven stage

In this stage the economy enjoys the fruits of accumulated wealth. Firms try to improve their competitive position by mergers and acquisitions rather than by investing in new capacity. As a high level of income is reached, eagerness for change diminishes; everyone tries to maintain the status quo and dynamism is lost. Productivity growth is sluggish, and there is chronic under-investment in the economy. The wealth-driven stage is the beginning of decline.

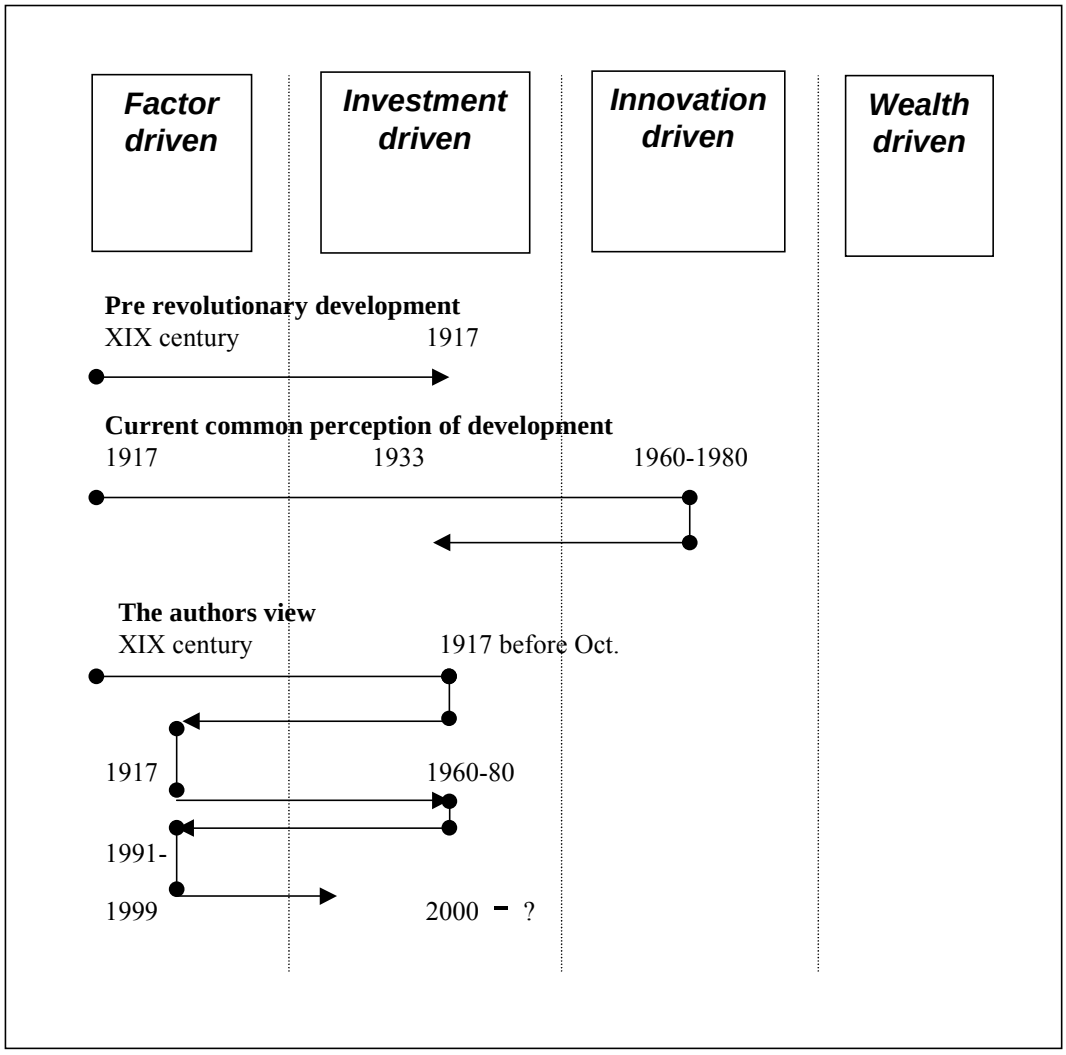
2.2 What is the Stage of Competitiveness of Russia?

Ideals of the communism and socialism remind somewhat an approach that is assigned by Porter to the forth, wealth driven stage of development. These were the long perceived ideals of human society development in the Soviet Russia. Unfortunately the outcome is as it is. One of the problem is that the nation still needs to learn that notwithstanding the attractiveness of these ideals in true life the wealth and prosperity does not come without international competitiveness and domestic competition, the work of markets can not be replaced by the wise state.

One of the other major factors that influences development of the international competitiveness in Russia are its truly abundant natural resources. As we can see from the experience of other resource rich countries, transition to the investment and innovation driven stages was never an easy process for them. Nevertheless there is some advantage in this situation as well. There is a strong demand for equipment and new technologies for extraction of the natural resources. The remoteness of resources and harsh weather conditions at their location represent the relative disadvantages. Overcoming them under certain circumstances will create advantage for the domestic industry.

Investment-driven stage in Russia is at the beginning of its formation now. At present the local companies are motivated by the increasing demand to invest in new products and upgrading. Unfortunately, only few of them have own or may access the outside resources to make these investments. Some companies find themselves in “vicious circle”: there is unsatisfied demand and opportunity, their production does not meet market requirements due to the poor quality, as a consequence they cannot sell enough to generate the investment flows, on the other hand to produce the better quality products they need to invest in upgrading that is not possible without appropriate sales and financial results. Lack of comprehensive rules and practices keeps the venture capital activity very scarce and risky for large international venture capital financing providers that makes development of industry a very difficult process. In such case the opportunities for successful FDI increase in two ways, via acquisitions of the local manufacturing and by establishing the greenfield sites. This observation represents a possibility that Russia will finally start to develop as FDI driven economy. The difficulties associated with the local operating environment, messy rules and irrational business practices represent a huge obstacles for successful take-off of the FDI in Russia and in St. Petersburg. Nevertheless there are already a number of success stories in different industries proving the good chances of this approach to succeed (for instance, breweries, tobacco and candy manufacturers in St. Petersburg).

Figure 2 Evolution of Industrial Competitiveness in Russia[1]



Source: Authors Own Estimates

It is obvious that the basic factors of production are the main source of competitiveness at the moment in St. Petersburg and Russia. The companies exploit the availability of the inexpensive and relatively qualified labor, cheaper raw materials as well as the existing production facilities to acquire the competitive advantage. It is a wide spread practice to use in competition the possibility not pay the gas, electricity, water and tax bills, to sell the goods practically below the true costs of production. Advantages gained through these practices are vulnerable and short term due to the law and payment enforcement efforts as well as because of increasing costs of living and up-grading of the living and operating environment and infrastructure. We believe that the relative disadvantage that will be created once these factors will lose their appeal will serve as a powerful incentive for up-grading and

[1] During the Soviet era huge investments in up-grading of the industrial facilities were made. Some visible achievements in the new product development and competition on the international markets, and associated transfer of the country to the investment stage of development was to a large extent fictitious due to enormous mistakes in the choice of locations, technologies and processes. These mistakes were caused by the lack of genuine economic driving forces such as demand and competition.
There are some obvious signs of transition in the more advanced sectors of economy into investment or even innovation driven stages of development. These changes have yet to gain substantial force in order to drive the national and regional competitiveness into the investment and innovation driven stages.

innovation. Nevertheless the successful development will require also a major shift in the perceptions and approaches in the nation.

The basic production factors are the main source of competitiveness of Saint Petersburg industry (and of Russia as a whole). The investments in up-grading and new technologies and processes have become already the main source of competitiveness in some industries. We believe in slow, gradual shift to the investment driven stage of development.

2.3 Russia as a Federal State and the Regional versus National Competitiveness

According to the Russian Constitution the country is a federal state divided into 89 constituencies. Each of these constituencies enjoys a great degree of financial and political independence. The local assembly and the head of the executive body is elected by the direct voting. Each region has its own budget that is formed of tax collection, proceeds from operating and sale of their property. According to the Russian law, also the local governments can steer and ease the formation of factors that create appropriate competitive environment for the companies. While the taxes, capital appreciation rules, accounting and reporting standards are introduced and limited in the amount on the federal level, as are the general macro-economic conditions, the regional bodies are empowered to create and change the legislative base, to create their own taxation and budget policy within the limits set in the federal laws. Local governments are well equipped with the tools that allow them to participate in creation of additional competitiveness factors. This includes assistance in removal of entry barriers, stimulation of quality standards, development of the targeted educational systems, infrastructure etc. This is one of the reasons why we believe that the issues of industrial competitiveness in Russia should be considered starting from the regional level.

Traditionally, due to large distances between the administrative and industrial centres, the Russian industry was located nearby these centres and included a large number of interrelated companies. In the Soviet period, on basis of the political decisions, the companies were located not in the economically feasible locations, but in order to serve best the different set of priorities of the Communist party. This lead to a situation when in many industries the companies of the same sector and related companies concentrated in a single location were dependent on the remote suppliers. The co-operation links with such suppliers after the collapse of the Soviet Union and introduction of the custom duties and border controls has decreased substantially. The damaged links between industries is the other reason for considering the industrial competitiveness in Russia in regional terms.

The third characteristic feature of regional competitiveness is related to the existence and creation of the prerequisites for cluster formation. As a rule, regional clusters are less diversified in comparison with national ones. However, they relish the high level of cooperation and integration in conjunction with R&D and marketing activities. Thus, interconnections inside regional clusters are stronger. The balance of mutual interests is maintained and conditions for more complex local government policy are created.

The last feature is the increased mobility of such production factors as labor force, capital and technology. It is the result of relatively low transaction costs for resource movement inside the region. The importance of personal connections and contacts in business activity in Russia could not be underestimated. The companies are able to respond to market changes faster in case these resources are already available locally. The region benefits

from this mobility allowing to attract the necessary factors of production and favorable conditions for their optimal allocation in the regional economy.

We believe that application of the Porter's theory for the case of St. Petersburg region is fully valid as the following major prerequisites can be observed:

- The maximum level of co-operation and integration between the local economic actors
- Developed market infrastructure that reduces transaction costs (including wasted time) greatly for firms located in St. Petersburg
- High quality of professional skills of the labor force, its mobility and possibility for spin-offs, additional training and new labor force from the large number of educational institutions and R&D organizations

2.4 Sources of Competitiveness

The world economy knows great number of examples when industry or group of related industries became internationally competitive. Among the examples are: Swiss pharmaceutical industry, car industry in Germany, Korean shipbuilding, etc. The competitiveness of single cities is the common case as well. Financial sector of London, Detroit car-making and port services in Singapore can be noticed. Saint Petersburg is the city with great industrial potential, large pool of highly qualified personnel, unique history and geographical location. We believe that its industry could also have its noticeable share in the international market.

Globalization is the specific feature of the present world economy. Barriers for foreign commerce, capital flow and labor force migration are reduced dramatically. In this situation the place of the country and, in our case its region, in the international market should be comprehended clearly. Michael Porter's "Diamond" model describes and systematize factors that determine ability of analysis subjects to form, maintain, develop and utilise their competitive advantages. Determination of competitiveness sources and estimation of their degree of advancement allow us to evaluate competitiveness of the regional industries, their clustering and, as a consequence, the regional competitiveness as a whole.

Michael Porter distinguishes four main sources of competitiveness. They are:

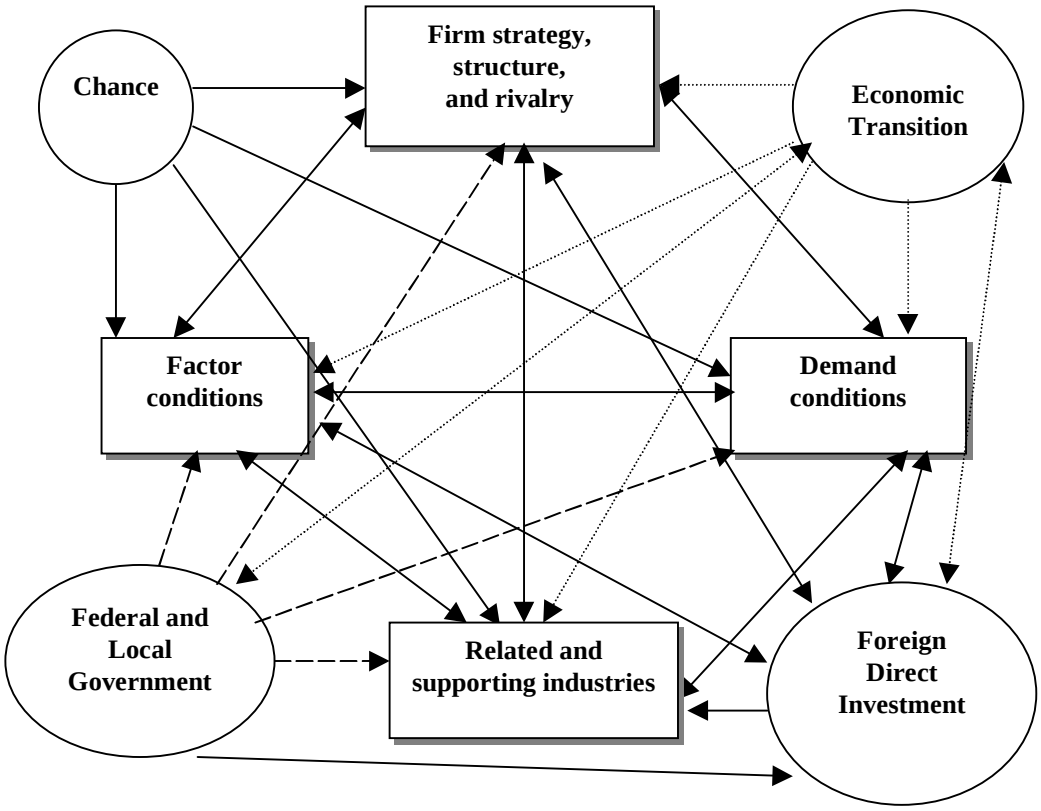
Factor conditions

This category includes main factors inherited from preceding development stages, as well as new factors that should be created in certain country or in region. First group can combine natural resources, demographic conditions, geographical location, existing production capacities and potential positions at various markets. Second group includes infrastructure, communication system, skills of residents that have been obtained in professional training, R&D potential.

Demand conditions

Presence of appropriate demand for cluster's primary goods is the necessary condition for development, as well as the source of competitiveness. This demand is created by the local and export constituents. The local demand is a starting point for competitiveness creation. Existence of historically strong sector or initial export nature of its production (for instance,

Figure 2. Transition Adjusted "Diamond" Model



Source: The Competitive Advantage of Nations. M. Porter (1990)

tourism, raw materials, etc.) means that there is the possibility for export demand to act as cluster driving force.

Related and supporting industries

Division of labor is the source of competitiveness considering increasing efficiency of production and specialization. Existence of various subcontractors in certain region allows offering more complex products and services and thus it is the source of competitiveness due to creation of unique local system of industrial cooperation that exceeds and surpasses similar systems competitors make use of.

Local supply usually means low costs for materials comparing to imported ones. At the beginning of the process some components and ingredients can be bought outside until structure of their local supply is developed. Presence of local suppliers allows companies that use imported components to avoid losses related to possible increase in import tariffs. High level of integration is characterized by involving adjacent firms in team-work (supply, production, "just-in-time" system, financing, R&D).

Firm strategy, structure and rivalry

The existence of rivalry between companies in certain region makes their development more intensive, stimulates introduction of new technologies, growth in labor productivity and cutting costs for one production unit. Thus, the rivalry is one of the main sources of competitiveness.

The following sources of competitiveness should also be taken into consideration:

Chance

The role of chance reflects rapid changes at world financial markets, unexpected growth in local/international demand and possibility of war.

Federal and Local Government

The regional and federal factors in the government regulation of the St. Petersburg, at our view, are best described by consideration of influence of the Federal and local government separately and in their inter-connection. The influence of government through current policy is considered only as an attribute to analysis. At the same time this policy determines performance of all components of the scheme. Governments can manage demand and supply conditions directly through interventions. They are the only ones who form economic systems and define fiscal, monetary and investment policies. Rational government policy provokes confidence growth from the side of potential investors and attracts capital, experience and technology to economy.

a) The federal government and parliament are involved in creation of the institutional and legal framework. They set the codes of conduct, regulate the export and import tariffs, introduce taxes and could finance and support the development of the certain regions. Creation of the favorable macroeconomic conditions takes place on the Federal Government and Parliament.

b) The local government and the legislative assembly could do a great deal of positive action in developing the local competitiveness conditions by enforcing the laws, introducing the rules, supporting and developing the targeted education and fundamental research programs, facilitating the operation of the service and financial sector, introducing incentives and managing the favourable taxation conditions.

Foreign direct investment

The role of foreign direct investment in creating sophisticated advantages for the Russian companies should not be underestimated. Due to largely worn-out out-dated industrial equipment and technologies, the heavy and largely incompatible and ineffective standards, the Russian products rarely successfully compete internationally. It is obvious that foreign direct investment could play a decisive supporting role in creating and upgrading of the competitiveness sources in Russia.

In the addition to the above we suggest to add another possible source of competitiveness created by the nature of transition from the central planning to the market economy.

Economic Transition

In the process of transition the country passes through the cycle of reforms concerning all activities in social life including economy. Every reform in progress affects the competitiveness of particular companies and industries. A large number of opportunities is created by the opening markets and structural change in demand. The recent ten years of economic development in Russia have shown some remarkable success stories that emerged as the new markets opened after the central planning restrictions were removed. First of all they

are the food and beverages companies. A large number of other companies that entered the service sector in the beginning of economic transformation and aimed at meeting the private consumption that was largely suppressed, succeeded greatly as well.

2.5 Clustering of Related Industries

According to the Porter's theory, sustained competitive advantage is created in the regions where the "clustering" of related industries occurs. The main difference that can be observed in the transitional economies is that the process of clustering is a part of the overall restructuring of economy and industries, of their adaptation to operation in the free market and competition. In developed economies industries that consume and industries that supply are in close connection. They create relatively homogeneous clusters. In this network firms tend to form optimal vertical value chain according to production process stages: suppliers, producers, distributors, supporting services. The competitiveness of region as a whole is defined by existence of competitive clusters. In the case of transition we can observe now only the first signs of the cluster creation due to a long time required for reintroduction of the links between consumer and supplier industries. The objectives of government policy should include in this case: competitive sources determination, creation of effective development system, creation of supportive infrastructure and legislative environment.

Cluster can consist of companies of any profile, government structures, research institutes, universities, vocational schools, etc. All the organizations mentioned participate in cluster development. Thus, they promote effective concentration of efforts and opportunities by means of cooperation and reinforcement.

Cluster analysis assumes that every particular industry cannot be studied separately from others, but should develop inside the cluster of vertically related industries. Every diversified economy can rapidly raise the competitiveness of the primary goods by improving condition of related industries that determine quality, prime cost and service specifics for primary goods. It is evident that formation of base industry will push forward suppliers and consumers, as well as service sector belonging to the cluster.

Countries and particular regions cannot be competitive in all the sectors at the same time. In all developed countries international competitiveness developed initially nearby certain clusters. Sweden competitiveness in pulp and paper sector concentrated around wood processing equipment, equipment for paper manufacturing, conveyer lines, and some related consumers (for instance, matches manufacturing companies). In case of Denmark this country exploited specific agricultural and food processing technologies. Similarly, German car-makers and machine-builders benefit from existence of highly developed components' producers for these industries. In Italy special clusters had formed in industrial areas, where some combinations of branches were built: metal-working – cutting instruments, fashion - design, leather – shoes, wood processing – furniture.

Clustering exists in all the economies. Large countries usually have greater number of key industries than medium or small ones. However, success does not always depend on quantity. It is the result of quality of clusters that are defined and formed by government policy beginning from the earliest stage of their development.

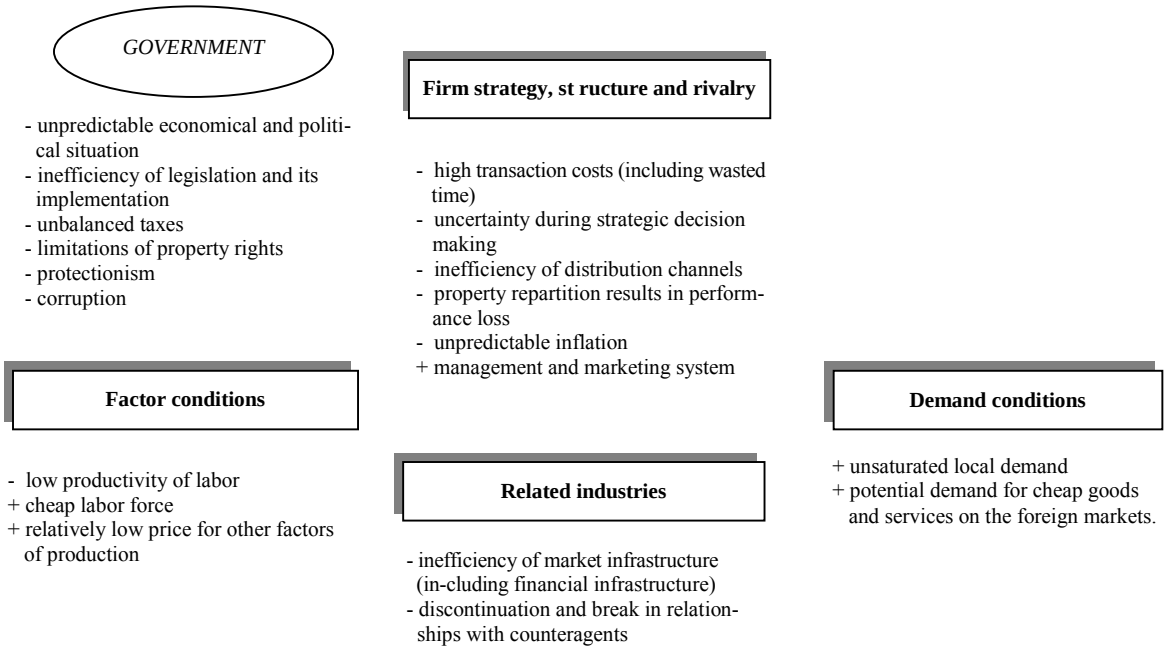
Formation of clusters is the process that follows the first key reforms in transition economies that include:

- Liberalization of prices
- Introduction of free trade
- Development and implementation of new legislative system
- Privatization
- Market infrastructure development
- Adaptation of tax system
- Autonomy of Central bank
- Stabilization of monetary system:
  - Realization of currency reform
  - Budget limitations
  - Reduction of inflation rates

All these factors influence vastly the competitiveness of clusters in transition economies. Influence of these changes can be described as additional determinants of competitiveness added to the general analysis scheme (See Figure 4). It is worth noticing that influence and structure of these determinants can fluctuate greatly in different regions. The limits of these fluctuations are defined by:

- The power of local governments to alter the economic conditions and environment within the boundaries set by federal bodies;
- Initiatives of local governments (their aspiration to influence positively the economic development of the region);
- Combination of the geographical, social, cultural factors, overall commitment to reform in the particular region;
- Traditional specialization of the regional industrial sectors.

Figure 4. Determinants of competitiveness in transition economies



2.6 Critics of the Porter's theory

Porter's competitive advantages theory represents the set of models and principles for economic analysis at both macro and micro levels. They are used in a wide range of tasks related to competitiveness evaluation of regions, branches and companies. This theory does not contain ready solutions, but offers great analytical tools for creation, development and sustaining competitive advantages.

Weak sides of "diamond" model is the lack of clear division for sources of competitiveness (what part of the model the certain source of competitive should be included in) and relatively complex relationships between different model parts that exclude simple interpretation of data.

Model does not assume using complex methods of analysis and mainly has the descriptive orientation. Thereupon the offered system for competitiveness evaluation of particular industries and goods has qualitative and non-formalized character. The comparison of research objects is limited and priorities cannot be distinguished in case the differences in prospects for industries are not obvious.

Adaptation of Porter's theory to Russian economy requires transition economy specifics to be taken into account. They define dynamics of Russian regions' development in many respects.

Besides, Porter's theory is initially oriented on country's competitiveness analysis. The regional economy aspects also should be considered and appropriate corrections of research methods should be made.

At the same time complexity and uncertainty of Russian macroeconomic conditions, as well as the lack and doubtfulness of data practically exclude implementation of regular quantitative methods in analysis. Thereupon the emphasis of Porter's theory on qualitative analysis cannot decrease its practical value.

3. SAINT PETERSBURG AND ITS ECONOMY

3.1 Saint Petersburg in Russia

The City of Saint Petersburg is the second largest city in Russia. It has a beneficial geographic location as the largest Baltic Sea port, within a close distance to Finland border – the European Union member and a relatively developed communication and transportation networks. A large part of imports and exports from/to Scandinavian countries and Finland goes through the transport hubs of the city. The City of St. Petersburg was a capital of Russia under the Tsar rule. It was also a main administrative, financial and industrial center of Russia at that time. As a consequence the City of St. Petersburg has a rich history of industrial development. During the Soviet Union period and, till nowadays, it is still considered to be a second largest industrial center[2] and the cultural capital of Russia.

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[2] The role of St. Petersburg as a second largest industrial center of Russia at present is doubtful due to substantial comparative industrial output decline. We suggest to consider it more as an education, trade and industry centre for the North and North-West of Russia.

Table 3.1 Industrial Production Output in 1st quarter of 1999

	Billion Rubles	% to 1st quarter 1998	Permanent Residents in 1998, mln	Ranking Among the Regions in Russia
The Russian Federation	1262,0	103,1	146,5	
St. Petersburg	40,4	93,0	4,7	4
Leningradskaya oblast	14,5	109,4	1,7	28
For information:				
Moscow	77,6	103,9	8,5	1
Moskovskaya oblast	34,5	112,4	6,5	2

Source: Petrocomstat (1999)

From the comparative data presented in the Table 3.1 we can see the relative position of St. Petersburg in Russia in terms of industrial output compared to Moscow, Moskovskaya and Leningradskaya oblast.

Among the 65 regions of Russia that recorded industrial production growth in 1999 Leningradskaya oblast was on 20th position, and among 13 regions, where decline was recorded, St. Petersburg was on the 8th place. In the present research, we aim at providing the comprehensive framework in analysis of reasons for the continuing decline of the industrial output in St. Petersburg and drafting appropriate industrial policy and business strategies tha will help to reverse these trends.

3.2 Description of Economy

General

Notwithstanding the rich history of industrial development, deep routed traditions and inherited knowledge the industry of St. Petersburg is in a very difficult condition at the moment. This is due to the huge structural distortions that were created in the period of central planning and heavy militarisation of the country. At that time St. Petersburg became one of the major centers of the armaments production, traditional links between other industries were broken and new suppliers were introduced. These new suppliers or even departments of the same company were located in the far away regions, other republics or countries. Investments in new technologies and capacity were made without consideration of the feasibility of location and transportation expenditures. The companies specialising in wide range of products from large cruises to missile targeting devices, military electronics, helicopters design and etc. were established. Transfer of industrial activities into the profit based lead to cancellation of the infeasible supplier and partnership connections, a sharp decrease in domestic demand for armaments during the transition to the open market economy, dramatic decrease in the government spending on defence lead to a major difficulties and restructuring in this sector. Despite the major conversion efforts and projects only few companies dependent on military orders succeeded in introducing competitive products.

Table 3.2 Dynamics of Industrial Production Output

	1995	1996	1997	1998
Total Industrial Output (in nominal prices), mln. Rubles	23947	34971	37381	45548
% to the previous year (in comparable prices)	87,3	76,8	106,5	99,9

Source: Petersburgcomstat(1999)

Table 3.3 Production Output and Employment in Small Business in 1998

	Total	**By Ownership**			
		Private	Mixed	Mixed with Foreign ownership	Foreign Owned
Total Companies, thousands	111,8	102,3	4,9	3,3	1,3
% of total	100	91,5	4,4	2,9	1,2
Employment, th.person	591,2	535,8	30,5	18,3	6,6
% of total	100	90,6	5,2	3,1	1,1
Employment					
Fixed Term	74,5	66,0	5,3	2,3	0,9
Permanent	38,6	32,0	4,8	1,3	0,5
Production Output					
Billion roubles	27,8	24,7	1,9	0,8	0,4
% of total	100	88,7	6,8	3,1	1,4

Source: Petersburgcomstat (1999)

Adaptation and restructuring of these industries is still under way. These are the main reasons for continuing decline of the local industrial output. The other reasons are, at the authors point of view, the low demand for industrial products, unfavorable business environment, drawbacks in privatisation, low productivity of labor, lack of the employer loyalty among employees, underdeveloped infrastructure etc.

Privatisation and Industrial Ownership

St. Petersburg was one of the best examples of privatisation effort in Russia in 1992-1994 and continuously lead the privatisation initiative. It was also a leader in terms of speed and scale of privatisation. At the very beginning of privatisation nearly all the small service sector companies were privatised (see Table 3.3). The small business sector is a growing sector of St. Petersburg economy. In employment this sector already exceeds the total in large and medium sized companies.

The larger industrial companies were also privatised. There are few exceptions (Admirateiskyie Shipyard, Klimova Amalgamation etc) that were considered strategically important for the national security. The larger industrial companies were privatised in numerous tranches and the operating management and employees typically have managed to take over the largest slice of the ownership.

Table 3.4 Ownership and Industrial Production in St. Petersburg in 1998[3] (Large and Medium Size Companies)

	Employment, th. Person	Output (incl. Services), mln rubles	Share in Total, %
Total	312,5	40435	100
Including by ownership:			
Federal	53,5	3959	9,8
Municipal	0,2	2	0,0
Non-profit organisations	3,8	404	1,0
Private	102,8	13138	32,5
Mixed	152,2	22932	56,7

Source: Petersburgcomstat (1999)

After privatisation has slowed its pace in 1995, 1996 some of the remaining shares of state remained unsold and are kept now in the ownership of the City of St. Petersburg or federal ownership. Both are physically managed by the Property Committee of the City that is technically responsible for the overall management issues. As the outcome the companies with mixed (state/private) ownership in St. Petersburg industry constitute the largest part in terms of production output (56,7%). The figures are presented in the Table 3.4 for the large and medium sized companies.

Table 3.5 Industrial Structure by Sector, % of total output by large and medium size companies.

	1991	1995	1996	1997	1998
Total	100	100	100	100	100
Including:					
Power Generation[4]	1.5	17,2	22,1	22,1	15,4
Chemical and Petrochemical Industry	5.2	3,5	2,9	2,7	2,0
Machine-building and metal-working	37.6	36,6	35,2	36,2	33,8
Timber processing, pulp and paper	3.6	3,5	2,8	2,6	2,3
Construction Materials	2.2	3,0	2,7	2,7	2,7
Light Industry	17.7	4,4	2,8	2,7	2,2
Food and Beverages	16.7	18,4	17,9	18,2	31,3
Others	13.3	13,4	13,6	12,8	10,3

Source: Petersburgcomstat (1999)

[3] Here and further in this paragraph in the data for 1995-1997 small companies and joint ventures and in the data for 1998 only small companies are separated from the large and medium size companies data.

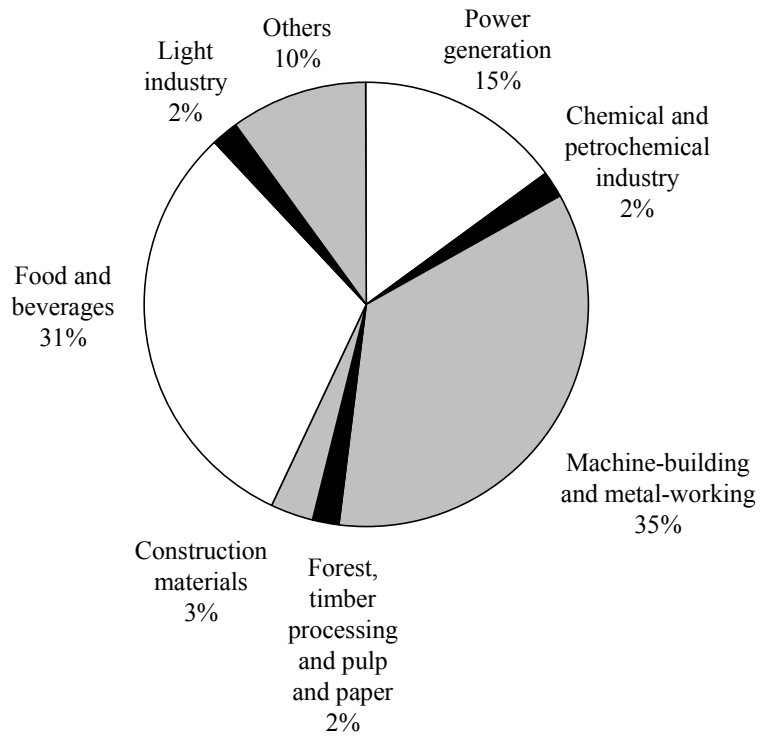
[4] The relatively rapid growth of the power generation sector is due to the change in pricing not volumes of the production.

Industrial Structure

Analysis of the industrial structure change provides a good insight into the process of transition and competitiveness of the different segments of industry. Dynamic change in the shares of different sectors presented in the Table 3.5 as well as emergence and development of the small business provide a good idea of development pattern the transition has brought into St. Petersburg economy. Some industries have lost their significance such as light industry. On the other hand we can observe a spectacular growth of the food and beverages sector of industry. This sector is the most competitive and advanced at the moment.

The Figure 3.1 and Table 3.6 provides more important insights in development of the industrial sectors in St. Petersburg. The relatively larger share of employment in the heavy industry and machine-building signals the low productivity and utilisation of the production facilities. That are characteristics of declining in this sectors. The share in the total production and in tax revenues makes it still a strategically important sector - "the backbone" of economy in St. Petersburg. On the contrary the food and beverages records high productivity and highest share in the tax revenues providing nearly the half of the total. This is an example of "miracle" that competitiveness could bring.

Figure 3.1 Industrial Structure by Sector in 1998,%



Source: Petersburgcomstat (1999)

Table 3.6 Industrial structure of Saint Petersburg in 1998 , %[5]

Sector	Production volumes	Tax proceeds	Employment
Total:	100	100	100
Power generation	15,4	7,8	4,0
Metallurgy	3,7	0,8	3,0
Chemical and petrochemical Industry	2,0	2,4	3,4
Machine-building and metal-working	33,9	29,5	58,0
Forest, timber processing, pulp and paper	2,3	2,2	3,3
Construction materials	2,7	3,3	2,7
Light industry	2,2	2,7	6,9
Food and beverages	31,3	45,0	11,2
Others	6,5	6,3	7,5

Source: Petersburgcomstat /(1999)

Financial Results

Analysis of the financial results in the key industries is one of the integral parts of the overall economic analysis that shows the present state and development trends in the transition of the economy. There is a prospective growth tendency overseen in this statistics (Table 3.7). In the first eight months of 1999 compared with the same period of 1998 there was recorded profitability growth in all the sectors of industry. The largest growth (30,9 times) could be overseen in machine-building, the light industry and construction materials production follow with the increase of 13,7 and 12,8 times accordingly. Although these are optimistic figures they most probably show only the dire conditions of these industries in the previous periods. An overall increase in the business activity and demand will stimulate for some period of time the compensation development of these industries. Nevertheless it is clear that achieving sustainable growth and competitiveness will require more effort that makes the long term prognosis for these industries very difficult. In the physical amounts the largest growth in profitability was achieved in the food and beverages industry and transport.

Industrial Output

Dynamics of the industrial output development represented in the Table 3.8 provide a good basis for analysis of the relative development of the industrial sectors of St. Petersburg economy. The figures start from 1990 when the central planning was in place. We could see from this Table how the transition has influenced different sectors of the economy when the industrial output started to be dependent on the work of the open markets that provided demand for their products rather then state that guaranteed purchase of the industrial output at the agreed prices.

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[5] Only large and medium size companies.

Table 3.7 Financial Results of the Large and Medium Size Companies in Saint Petersburg in January-August 1999[6]

	Profit/Loss(-), mln. roubles	In % to the last years' results[7]
In Total, including:	11990	4,0 times
Industry, including	5324	5,8 times
Power Generation	192	2,0 times
Fuel Sector	1	-
Ferrous Metallurgy	133	3,7 times
Non-Ferrous Metallurgy	18	3,5 times
Chemical and Petrochemical	47	1,7 times
Machine-building	520	30,9 times
Timber, Wood-processing and Pulp and Paper	803	-
Construction Materials	153	12,8 times
Light Industry	154	13,7 times
Food and Beverages	2826	4,5 times
Transport	3342	5,0 times
Telecommunications	1210	1,6 times
Construction	951	2,5 times
Retailing and Catering	447	4,0 times

Source: Petersburgcomstat (1999)

Table 3.8 Index of Physical Output Dynamics in Selected Sectors of Saint Petersburg Economy, (in % to the previous year)

Industrial Sector	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999[8]	2000[9]
Metallurgy	99,8	92,6	67,2	85,1	72,7	93,2	80,1	117,5	102,2	101,2	103,0
Machine-building	99,5	105,1	93,4	83,7	65,2	90,6	63,7	106,2	95,6	94,3	107,0
Timber, wood-processing, pulp and paper	102,3	104,6	73,2	92,4	44,5	76,2	63,7	89,2	92,8	96,4	103,0
Food and Beverages	95,6	89,3	79,5	88,0	90,5	100,3	97,9	125,6	106,8	120,8	106,0

Source: City Committee for Economy. Industry and Investment (1999)

Labor Market

One of the main factors in the region's competitiveness is its labor force. Employment structure in St. Petersburg is presented in Tables 3.6, 3.7, 3.8.. We see that proportion employed in industry constantly declined and redistributed in favor of retailing and other activities that include employment by the federal government, city bodies and administration. Machine-building and metal-processing industries remain by far the largest regional employers.

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6 The rate of growth is evaluated on a basis of the range of comparable companies.

7 The sign – means that cumulative financial results of the companies in this sector was negative in any period compared.

8 according to running data

9 estimates

It is worth mentioning that the overall condition of the labor force in St. Petersburg is also influenced by the following factors:

Demographic situation. Typically the industrial and economic analysis tend to understate the scale and importance of this factor in St. Petersburg. Understanding the true demographic situation in St. Petersburg is a key and solution to many problems. More then 60% of the total population in St. Petersburg are not of the working age at the moment. The proportional share of elder people[10] substantially exceeds the children number (Table 3.10). Mortality rate significantly exceeds the new birth rate (2 times). In other words there is a tendency for further sustainable decrease in St. Petersburg population unless the migration will not fill this gap (Table 3.9).

Table 3.9 Demographic Situation in St. Petersburg

	1991	1996	1997	1998	1999	According to 1989 census
Total Population	5035	4802	4779	4749	4728	5023
Permanent Residents, including	5002	4769	4746	4716	4695	4991
Men	2262	2155	2144	2131	2120	2247
Women	2740	2614	2602	2585	2575	2744
% in the total						
Men	45	45	45	45	45	45
Women	55	55	55	55	55	55

Source: Petersburgcomstat (1999)

Table 3.10 The Number of Pensioners in St. Petersburg

	1995	1996	1997	1998
Totally, including	1222,9	1232,6	1239,8	1252,1
Receiving pensions based on:				
Age	897,7	870,7	854,0	873,2
Disability	240,7	268,7	288,0	276,5
Loss of Parents	54,1	55,3	56,4	57,7
Terms of Employment	5,0	10,7	12,4	13,5
Social Conditions	25,4	27,2	29,0	31,2

Source: Petersburgcomstat (1999)

Professional training. Significant reductions in financing of the secondary, professional and higher education in the process of economic transformation badly influenced the quality of education. There are less higher educated students and much less trained workers for industry graduating nowadays in St. Petersburg compared to the end of Soviet era. The recent growth of demand and increase in production volumes in some companies have been constrained by lack of the sufficient number of professionals.

Migration of the skilled workforce. The lower salaries, limited professional and personal growth opportunities in St. Petersburg[11] led to migration of high skilled labor force to other regions of Russia, mostly to Moscow, on a threatening scale.

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[10] A total of 1252 thousand people received state pensions in 1998.

[11] Due to the overall economic decline.

Table 3.11 Employment by Sector, %[12]

	1990	1992	1994	1995	1996	1997	1998
Industry	33	32	28	25	25	23	23
Agriculture	1	1	1	1	1	1	1
Transport	9	10	10	9	9	9	10
Construction	11	11	11	10	11	10	10
Retail trade, catering	8	8	11	14	12	14	13
Public utilities	6	5	5	5	6	6	6
Social services, health care	6	6	7	8	7	8	7
Education and culture	9	10	10	10	10	10	10
Science	13	11	9	8	8	8	7
Others	4	6	8	10	11	11	13

Source: Petersburgcomstat (1999)

Table 3.12 Employment in Small Business by Sector in 1998

Sectors	Number of Companies		Full Time		Other	
		% of total	persons	% of total	persons	persons
Industry	16202	14,5	103112	17,4	13237	10080
Agriculture	291	0,3	1096	0,2	177	46
Transport	2762	2,5	17776	3,0	3137	942
Telecom	288	0,3	1755	0,3	241	266
Construction	13957	12,5	92116	15,6	11820	6397
Retailing	55439	49,6	278126	47,0	25863	8260
Trading	1144	1,0	5865	1,0	679	190
IT	489	0,4	2599	0,4	467	235
Real Estate	1095	1,0	4146	0,7	949	182
Commercial	4301	3,8	16406	2,8	2774	1442
Housing Management	427	0,4	2649	0,4	594	433
Services	10011	0,9	7376	1,2	1422	343
Health, Medical Care, Sports, Social Services	3103	2,8	14819	2,5	2035	509
Education	967	0,8	3176	0,5	1645	1156
Culture & Arts	1341	1,2	6371	1,1	1015	809
Scientific Research	5611	5,0	17257	2,9	6390	6270
Finacial Services	759	0,7	3503	0,6	450	236
Other	2568	2,3	13016	2,4	1593	778

Source: Petersburgcomstat (1999)

Rapid development of the small business in all sectors of St. Petersburg economy represents a good sign of emerging and tightening competition. It is created also through spin-offs and entering of the new actors into the opened markets. One of the great opportunities created by the economic transition were initially low entry barriers in many segments of economy. There was a chance to buy a large company's control in the privatisation process for reasonably wide range of newcomers. The entry costs are still relatively low. That creates a good chance that more successful entries will happen, especially in supporting and relating industries. This trend will support and deepen development of the industrial competitiveness. The data presented in the Table 3.11 provides a valuable illustration. By far

[12] A large and medium size companies.

the largest small business concentration is in the industry where a large number of companies were created as a spin-offs from the large companies (Table 3.12). Retailing was another sector that attracted a lot of underemployed people from the troubled companies in the military and heavy industry sectors.

Table 3.13 Average Salaries on the Large and Medium Size Companies by Sector (th. roubles)

Sector of Industry	1990	1991	1992	1993	1994	1995	1996	1997	1998[13]	1999[14]
Metallurgy	0,3	0,6	6,8	61,8	217,9	444,3	993,8	1304,3	1515,2	3171[15] 2973
Machine-building	0,3	0,5	4,3	43,0	177,0	425,5	718,9	911,1	1188,2	2752
Timber, wood-processing, pulp and paper	0,3	0,6	5,3	57,2	205,0	459,0	727,7	918,8	1080,3	2681
Food and Beverages	0,3	0,7	7,4	78,0	294,6	607,6	1281,6	1638,7	2621,3	5283

Source: Petersburgcomstat (1999)

Capital Assets

Another very important tool for economic development analysis that allows to estimate the present condition and growth prospects for different sectors of industry is a study of asset condition in these sectors (Table 3.15). As we could see from the Table 3.14 the value of assets involved in the industrial production in St. Petersburg totals 94044 mln. roubles or 22,4% of the total registered assets as of 31.12.98[16]. These assets are significantly depreciated (close of above 50%). A large part of assets is completely worn-out (Table 3.16). These facts acquire even more dangerous meaning if take into consideration a very long depreciation periods for capital assets in the industry in Russia.

The other factor that helps to define the industrial production potential and its present state of activity is the structure and purpose of assets. As we see from the Table 3.14 only 22,4% of the total assets were used in the material production sphere that duly reflects the relative share of the industrial production output in the total Gross Regional Product. The share of industrial assets in the total is constantly declining in favour of the service sector as well as due to the rapid retirement of industrial assets. The active part (machinery and equipment) in the total industry assets has relatively larger weight then in the service sector, although it is retired much faster (15% annually compared to the average 8,3) and this retirement is not compensated by the capital investment.[17]

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[13] Roubles

[14] According to the running data for December 1999.

[15] First number - ferrous and the second – non ferrous metallurgy.

[16] Transition from the Soviet period accounting to the free market involved a comlicated recalculation of assets, further inflationary changes were also annually recalculated on basis of the coefficient tables issues by the State authorities. These methods produced major distortions in the books of companies. This influence dramatically business strategy and investment decisions. This is frequently mentioned as the main cause for under-investment. The evaluation of influence is a matter of separate research and is beyond the scope of the present study.

[17] The current capital investment covers only 6,8% of the total new assets acquisition. It is important to mention that technologies and machinery purchased does not contain the latest international developments that is further reflected in productivity.

Table 3.14 Capital Assets Structure by Sector

	1998		In % to the total	
	Mln. roubles	In % to the total	1996	1997
Total assets	419672	100	100	100
including:				
Manufacturing sectors	94044	22,4	28,3	27,1
Industry	82385	19,6	25,1	24,1
Construction	11473	2,7	3,1	2,9
Other material goods production	186	0,1	0,1	0,1
Services	325628	77,6	71,7	72,9
Agricultural	31	0,0	0,0	0,0
Transport	58215	13,9	16,2	15,2
Telecommunications	8067	1,9	2,1	2,0
Trade and catering	5838	1,4	1,6	1,4
Trade	3034	0,7	0,7	0,7
Procurement	62	0,0	0,0	0,0
Information technology	383	0,1	0,0	0,1
Intermediate in real estate	440	0,1	0,0	0,1
General Commercial Activity	1443	0,4	0,0	0,0
Geology and meteorology	216	0,1	0,1	0,1
Housing related	130599	31,1	22,9	25,5
Public	46899	11,2	9,6	9,6
Social	770	0,2	0,3	0,3
Healthcare, sports and social care	11425	2,7	2,7	2,6
Public education	23550	5,6	5,2	5,1
Culture and art	6256	1,5	2,0	2,0
Science	19366	4,6	5,7	5,6
Financial, insurance and pension funds	1740	0,4	0,5	0,6
Management	7091	1,7	2,1	2,0
Public Organisations	203	0,0	0,0	0,0

Source: Petersburgcomstat (1999)

The state of capital assets in St. Petersburg is close to its critical state (Table 3.17): the total depreciation is close to 40% and in industry – more then 50%. More then 20% of fully retired capital assets are in use in industry. There is no possibility for the companies to fund its expansion and upgrading through equity or loan financing, - both are scarce, very difficult to attract and very costly. To succeed in fund raising the companies shall have an attractive and competitive product range. Unfortunately the transition from central planning pre-defines the product range that is not market and private consumption oriented. Introduction or upgrade of products requires substantial investment itself. In this manner many companies find themselves in the vicious circle where there is no way out unleast some outside –help may come. This help may have a form of FDI (most commonly thought to be the only way to upgrade) and state orders and intervention by placing orders for competitive products, thus facilitating their development locally.

Table 3.15 Rate of Capital Asset Usability[18]

	%
Capital Assets in total, including:	60,3
Manufacturing sectors	48,3
Industry	47,9
Construction	50,9
Other material goods production	52,2
Services	63,8
Agricultural	64,5
Transport	57,6
Telecommunications	59,9
Trade and catering	64,2
Trade	56,1
Procurement	38,7
Information technology	71,0
Intermediate in real estate	65,9
General Commercial Activity	85,0
Geology and meteorology	56,0
Housing related	72,7
Public	47,3
Social	64,0
Healthcare, sports and social care	63,4
Public education	61,3
Culture and art	76,2
Science	56,9
Financial, insurance and pension funds	83,4
Management	74,7
Public Organisations	71,4

Source: Petersburgcomstat (1999)

Table 3.16 The Share of Fully Depreciated Capital Assets

	%
Capital Assets in total, including:	11,8
Industry	20,1
Construction	18,2
Transport	9,8
Telecommunications	9,3
Trade and catering	14,0
Trade	12,3
Housing	7,7
Housing related	12,8
Public services	12,8
Healthcare, sports and social care	5,4
Public education	20,0
Culture and art	7,7
Science	14,7
Financial, insurance and pension funds	6,5
Management	1,4

Source: Petersburgcomstat (1999)

[18] The rate of usability of capital assets is equal to their net book value divided by their gross book value.

Table 3.17 Depreciation of Industrial Assets by Sector (% of the total capital asset book value)

Industrial Sector	1990	1991	1992	1993	1994	1995	1996	1997	1998
Metallurgy	62,8	53,5	53,3	47,1	49,7	43,6	50,3	51,0	54,1
Machine-building	50,0	46,8	48,4	47,1	51,1	48,5	51,4	55,2	56,4
Timber, wood-processing, pulp and paper	57,9	49,2	46,5	43,9	48,9	50,1	55,0	54,9	46,7
Food and Beverages	49,8	44,9	45,3	36,9	47,4	46,4	48,7	44,5	33,4

Source: Committee for Economy, Industrial Policy and Investment (1999)

Investment

Investment is the key to economic and industrial development. The state role and foreign direct investment are seen as the main factors in upgrading the competitiveness of regions. In the Table 3.18 below we present the investment inflow in St. Petersburg in 1999.

The total investment in 1999 represented 66150,4 mln. roubles and 659,6 US dollars. A share of investment in non-financial assets decreased substantially (from 78% to 44%). In financial investments in 1999 short term investment clearly prevailed, they increased from 81% of the total in 1998 to 94%. These tendencies could be based on the post-crisis cautiosness, high economic and political country risks, that prevented investors from investing in productional assets.

As a good tendency we could notice the increase in foreign investment in the second half of 1999. After the credit rating of Russia will be upgraded one could expect further increase in activities of international investors in Russia.

Table 3.18 Investment in St. Petersburg in 1999

	Mln. Roubles	In 1998
Investments in financial assets (without small companies), including:	36383,9	3948,5
Long term	2252,8	759,6
Short term	34131,1	3188,9
Investments in non-financial assets (without small companies)	28717,0	13819,5
In capital assets	24732,4	11545,3
FDI (including small companies)		
Mln US dollars	659,6	309,0
Mln Roubles	1049,5	1019,8

Source: Committee for Economy, Industrial Policy and Investment (1999)

Non-financial assets investment structure has changed significantly in comparison with 1998 that can be seen in Tables 3.19 and 3.20. As a positive trend we could mention also the increase in the share of immaterial assets, that signals increase in innovation – purchase of technologies and know-how. The share of investment in renovation decreased in favour of investments in new purchases, especially in machinery and equipment.

Table 3.19 Investment in Non-financial Assets by the Large and Medium Size Companies in 1999

	Mln roubles	In % to the total	In1998 in % to the total
Investment in the Non-financial Assets	28717,0	100	100
Including:			
Capital Investments	24732,4	86	83
Renovation of the Capital Assets	3202,5	11	15
Investment in Immaterial Goods	532,3	2	1
Other	249,8	1	1

Source: Committee for Economy, Industrial Policy and Investment (1999)

Table 3.20 Structure of Capital Investment in 1999

	Mln. roubles	In % to		In 1998 in % to the total
		The total	1998	
Capital Investments, including	29651,2	100	102	100
Housing	3221,9	11	106	11
Buildings (other then housing)	10650,0	36	81	45
Machinery and equipment	15238,9	51	123	42
Other	540,4	2	83	2
In the total investment				
Construction	12075,2	41	116	52
Foreign Direct Investment	171,6	1	37	2

Source: Committee for Economy, Industrial Policy and Investment (1999)

Table 3.21 Foreign Investment Structure[19].

		Received in 1999	In % to		Returned in 1999
			The total	1998	
Total, including:	Mln. US dollars	659,6	100	210	430,3
FDI		235,4	35,7	143,0	156,9
Share Capital		63,8	9,7	142,7	0,1
Portfolio		41,0[20]	0,0	X	0,2
Other		424,2	64,3	290	273,2
Totally, including	Mln. Roubles	1049,5	100	102,9	47,9
FDI		987,3	94,1	106,0	35,1
Share Capital		972,4	92,7	104,9	0,4
Portfolio		12,5	1,2	19,1	11,9
Other		49,7	4,7	210	0,9

Source: Committee for Economy, Industrial Policy and Investment (1999)

[19] Data presented without financial institutions.
[20] Thousand US dollars.

Table 3.22 Capital Investment Structure by Sector in 1999

	Mln. roubles	In % to the total	In 1998 in % to the total
Capital Investment, including	29651,2	100	100
State	9401,8	32	39
Municipal	1,8	0,0	0,0
Public Non-profit Organisations	3,3	0,0	0,0
Private	6918,1	23	20
Mixed Russian	6705,9	23	19
Mixed Russian/Foreign	4872,3	16	16
Foreign	1748,0	6	6

Source: Committee for Economy, Industrial Policy and Investment (1999)

As we could see from the Table 3.22 the share of investment of the Russian origin in the total is a largest of the total by far. The state is leading as an investor and private investment is already close to the state share. These figures suggest that development of the St. Petersburg economy is driven by the Russian state and private decision making. These decisions could provide a higher effectiveness if focused on the development of the factors and sources of the competitiveness in the region.

Table 3.23 Corporate Arrears by the Key Sectors

	Total	Bad Debts		Number of Companies with Bad Debt	
	Mln Roubles	Mln. Roubles	in % to the total sector debt	Number of companies	In % to the total number of companies of the sector
Receivables					
Totally, including:	62047	20539	33,1	1027	34,3
Industry	26876	8027	29,9	333	54,6
Agriculture	81	30	36,7	14	73,7
Transport	11538	6829	59,2	84	38,4
Telecommunication	1722	95	5,5	7	25,9
Construction	5197	1423	27,4	162	57,0
Retailing and Catering	3267	211	6,5	89	12,5
Payables					
Totally, including:	92950	23543	25,3	874	29,2
Industry	47227	11527	24,4	303	49,7
Agriculture	234	135	57,9	15	78,9
Transport	15095	7282	48,2	73	33,3
Telecommunication	2722	44	1,6	4	14,8
Construction	5453	1311	24,0	131	46,1
Retailing and Catering	6035	251	4,2	69	9,7

Source: Petersburgcomstat (1999)

Current Assets and Payment Balance

Another important factor in understanding the economic transition and development in St. Petersburg is the state of the current payment balance on the state and enterprise levels. The high volumes of payment arrears and non-monetary forms of payments (barter trade, inter-company clearing, exchange of the unsecured debt) distort to a large extent the cost, price and assets structure of the firms. That in turn leads to deviations in the business strategies aimed not at the increase in productivity but to rise the efficiency of these exchange transactions. These activities endanger the long-term competitiveness of many sectors of the economy.

The share of companies that have a high level of arrears is 34,3% of the total enterprises (Table 3.23). It is much higher than average in agriculture where is reaches 73,7%, construction - 57,0% and industry (54,6%). The main reasons are the current insolvency of consumers, legislative drawbacks and inefficient marketing and sales.

Receivables represent still the largest share in the current assets of the companies in St. Petersburg, although we could note a positive tendency of its reduction from 57,3% to 53,6% of the total in 1998 (see Table 3.24).

Table 3.24 Structure of Current Assets in St. Petersburg Econmy in 1998, mln. roubles

	Beginning of the year	End of the year	Annual increase
Current assets, including:	65169	87528	22359
Stock	18960	23874	4914
in % to the total, including	29,1	27,3	22,0
Raw materials, etc	5862	7802	1940
in % to the total	9,0	8,9	8,7
Unfinished production	6978	8489	1511
in % to the total	10,7	9,7	6,8
Inventories	2100	2642	542
in % to the total	3,2	3,0	2,4
Goods for Resale	1947	2946	999
in % to the total	3,0	3,4	4,5
Cash	2987	6400	3413
in % to the total	4,6	7,3	15,3
Receivables	37342*)	46933	9591
in % to the total, including	57,3	53,6	42,9
Bad debt	15588*)	19226	3638
in % to the total	23,9	22,0	16,3
Trade receivables	31274*)	35494	4220
in % to the total	48,0	40,6	18,9
Bad trade debts	13895*)	15707	1812
in % to the total	21,3	17,9	8,1

**) The data as of 1.04.98*

Source: Petersburgcomstat (1999)

3.3 St. Petersburg In International Trade

The strong, sustainable position in the international markets is the main determinant of the competitiveness of industries, regions and countries. St. Petersburg has a truly advantageous position in this respect as a developed international port and transport centre located close to the common market of the European Union. Not only the foreign trade but also its industries have a good chance to benefit from such location. Still, success in the international markets requires much more then favourable location. Identifying the opportunities and competitive advantages of St. Petersburg is one of the goals of this research project. Unfortunately the figures presented in the Table 3.25 does not show the optimistic picture. St. Petersburg is a net importer of goods. Its share of exports is decreasing, although at a lower speed then the imports.

In the Chapter 4 of the present paper we present our view on basic industries that under certain favourable conditions could become a formation base for clusters of industrial competitiveness. The data shown in Table 3.25 and 3.26 is important in understanding the present position of these sectors (only metallurgy is a clear net exporter at the moment) and estimating the effort that will be needed to reverse the trends described above.

Table 3.25 Export and Import Volumes in 1998[21]

	1997	1998	1998 figures comparing to the year 1997, %
Exports, Including:	1758	1619,2	92,1
Other world	1581.9	1474,3	93,2
CIS countries	176.1	144,9	82,3
Imports, Including:	3995.8	3545,5	88,7
Other world	3658.5	3281,7	89,7
CIS countries	337.3	263,8	78,2
Balance, Including	-2237,8	-1926,5	86,0
Other world	-2076,6	-1807,4	87,0
CIS countries	-161,2	-118,9	74,0

Source: North-West Custom Service (1999)

Table 3.26 Product Structure Of Export And Import In 1998, $mln

	Balance	Export	Import
Energy sector products	-24,4	4,3	28,6
Ferrous and non-ferrous metals	176,8	343,2	166,4
Chemical industry products	-330,2	71,3	401,5
Heavy engineering products	-225,9	874,1	1100,0
Leather, furs	7	17,6	10,2
Raw wood and related products	-22,5	102,4	124,9
Products of light industry	27,3	58,7	31,4
Foodstuffs and related products	-1392,4	35,7	1428,1
Other goods	-142,5	111,9	254,4

Source: Petersburgcomstat (1999)

[21] Traditionally international trade statistics are heavily distorted in Russia. Export statistics are typically closer to real. Though still undervalued. Imports are heavily undervalued and some of them are not recorded at all.

The Table 3.27 shows export figures of the "tourism" potential cluster identified later in this paper. The numbers are really showing now great is the gap between potential of St. Petersburg as an international tourist center and today's reality. The factors that identify such position as well as opportunities are described in the Chapter 4 of the present paper.

Table 3. 27 Export of International Services (transport services excluded) to Foreign Countries in 1998, $mln

	1998	% of total	% of 1997
Total	185,1	100	160
Including:			
Hotel and restaurants	74,3	40,1	210
Storage facilities and additional transport related services	42,8	23,1	180
Mail and communications	25,6	13,9	140
Marketing and law	19,1	10,3	130
Other services	23,3	12,6	108

Source: Petersburgcomstat (1999)

4 POTENTIAL COMPETITIVENESS OF ST. PETERSBURG INDUSTRIES

4.1 Identification of Clusters

The clusters of industrial competitiveness of St. Petersburg were identified on a basis of M. Porter's "diamond" mode that was adjusted to regional analysis. The impact of the economic transition was also taken into consideration. In the Chapter 2 of the present paper authors' approach to the analysis and appropriate adjustments is discussed.

The most of data applied for this analysis was provided by the State Bureau of Statistics of Russia (Goskomstat) and its Saint Petersburg branch (Petersburgcomstat). Information provided by the departments of the City of St. Petersburg Administration and Legislative Assembly was also useful. Last but not least source is the information provided by private firms. The present identification of clusters[22] is based on both statistical data and expert opinion on future development of the appropriate base sectors that could serve as a base for further competitive cluster formation. *It is important to emphasize that under the term "clusters" we practically mean the base sectors around which the cluster formation has a good chance to form due to the existing prerequisites*. The preliminary analysis of the industrial output was accomplished for primary goods determination.

At this stage we identified the following competitive clusters:

- Power engineering
- Shipbuilding and ship repair
- Food and beverages
- Transport, logistics
- Tourism
- Wood processing
- IT sector
- Optical engineering
- Metallurgy

[22] It is important to stress that the presented analysis, classification and grouping of clusters has a preliminary character and will be further adjusted while the more detail will be available.

4.2 Classification of Clusters

At this point we propose to classify the clusters according to the level of self-awareness and self-reinforcing as it was suggested by Michael J. Enright in his recent work ”Survey on the characterization of regional clusters”. He identifies the following types of clusters:

Working clusters are those in which a critical mass of local knowledge, expertise, personnel, and resources create agglomeration economies that are used by firms to their advantage in competing with those outside the cluster. Working clusters tend to have dense patterns of interaction among local firms that differ quantitatively and qualitatively from the interactions that the firms have with those not located in the cluster. They often have complex patterns of competition and co-operation and often are able to attract mobile resources and key personnel from other locations. Even if participants do not call themselves a “cluster” there tends to be knowledge of the independence of local competitors, suppliers, customers, and institutions.

Latent clusters have a critical mass of firms in related industries sufficient to reap the benefits of clustering, but have not developed the level of interaction and information flows necessary to truly benefit from co-location. This can be due to a lack of knowledge of other local firms, a lack of interaction among firms and individuals, a lack of a common enough vision of their future, or a lack of requisite level of trust for firms to find and exploit common interests. In any case, such groups of firms do not think of themselves as a cluster and, as a result, do not think of exploring the potential benefits of closer relationships with other local organizations.

Potential clusters are those that have some of the elements necessary for the development of successful clusters, but where these elements must be deepened and broadened in order to benefit from the impact of agglomeration. Often there are important gaps in the inputs, service, or information flows that support cluster development. Like latent clusters, they lack the interaction and self-awareness of working clusters.

Policy driven clusters are those chosen by governments for support, but which lack a critical mass of firms or favorable conditions for organic development. Many of the electronics and biotechnology “clusters” found in foreign governments’ programs are examples of this type of cluster. Policy driven clusters tend to be chosen more on political grounds than through any detailed analytical process. They tend to rely on the notion that policy can create clusters from a relatively unfavorable base.

“Wishful thinking” clusters are policy driven clusters that lack, not only a critical mass, but any particular source of advantage than might promote organic development.

As it was already mentioned before the clusters in St. Petersburg have no clear identification due to the on-going transformation of the economy. In our analysis we came to a conclusion that “Power engineering”, “Food and Beverages”, “Metallurgy”, “IT sector”, “Optical engineering”, “Tourism”, “Transport and Logistics”, “Wood processing” tend to be close to the definition of the potential clusters. There are prerequisites of the cluster formation around these base sectors. They are rooted in advantages of sophisticated skills, inherited capital, local or international market demand, beneficial location (“Tourism”, “Transport and Logistics”). Nevertheless these clusters have an ineffective institutional industry structure, lack interactions between firms and appropriate government policy.

The “Shipbuilding and ship repair” is recognized as tending to latent type of clusters. Lack of clear sustainable local and international demand for their primary products, significant drawbacks in productivity and new product development were the main reason for their identification. There is also no distinct policy of government in developing and up-grading advantages in these sectors.

4.3 Power engineering

General description

This cluster is represented by the leading Russian machine-building companies such as LMZ, Elektrosila, Nevsky Zavod etc. The main factors of competitiveness in this cluster are inherited industrial capital, technologies and highly skilled, well-educated workforce.

The Russian power engineering is one of the most stable industries of domestic heavy engineering. A fall in production volumes in 1991-95 had changed to growth in 1996. Crises of 1998 weakened the sector position and downswing for many products continues. However, power engineering companies compete aggressively for these traditional markets.

As the outcome of the Soviet State policy, oriented on the full energy supply, self-sufficiency and independence in terms of energy equipment supplies, that was carried out until 1990, - an extensive energy sector equipment production and technology development capacity was created in Russia. St. Petersburg became the major centre for technology development and engineering. There was a stable demand for the energy equipment and technologies supported by the state investment in the energy sector. A large part of energy equipment was exported until the 1990[23].

Transformation of the Russian economy that started in 1991 has lead to a substantial decrease in the energy demand and amount of the new energy construction. The severe financial constraints have put a serious limitation on the utilities investment in rehabilitation and replacement of the worn-out and out-dated equipment. That, in turn, has lead to a substantial stagnation and output decline in technology development and equipment manufacturing sub-sectors. The main consumer for these sub-sectors manufacturers on the domestic market is RAO UES. This company plans to invest in construction of about 44 power plants and 10 thousand km of new transmission lines until 2005. Today about 300 thermoelectric power plants, 40 hydropower plants and 9 nuclear power plants are operating in Russia. Their annual retirement rates exceed replacement rates greatly. There is a large replacement market due to the above.

The other potential market is the regional utilities. In Russia, the regional utilities operate and own all local grids and about 73% of the country's generating capacities. The total generating capacity in Russia is equal to 205 thousand GWe (68.1% - thermoelectric power plants; 21.5% - hydroelectric plants; 10.4% - nuclear power plants). Power output has the evident correlation with production output. During 1991-94 generation of the electric energy decreased and starting from 1995 these negative trends reversed. The utilities and RAO UES purchasing power was greatly affected by the decline in the total production.

Table 4.1 Dynamics of Power Equipment production

		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Steam turbines	MWe	7793	6464	4919	4090	4060	3225	1665	1793	515	475
Hydraulic turbines	MWe	347	638	504	872	887	519	278	356	1005	730,5
Generators to steam, gas and hydraulic turbines	MWe	6331	5504	3258	3475	1939	1212	1626	3182	2193	1600
Large electric machines	Units	4464	3779	3663	1999	920	707	732	937	813	1200

Source: Petrocomstat (1999)

[23] It did not created any competitive edge in the international markets as these exports headed mainly to the less developed countries and Eastern Europe and were distributed by state rather then sold.

The largest regional utility is located in Saint-Petersburg (Lenenergo). There is an urgent, large scale need to replace and upgrade technologies and equipment in this company. It may become most important consumer for the local power engineering sector.

Cluster structure

The following power engineering companies are located in St-Petersburg:

- Electrosila
- LMZ ("Leningr'adsky Metall'ichesky Zav'od")
- ZTL ("Zav'od Turb'innih Lop'atok")
- Nevsky zavod
- Proletarsky zavod

Besides the above listed companies, the power engineering products are produced by multisector heavy engineering plants like Klimov's engineering plant (design and manufacturing of helicopter engines), Baltiyskiy zavod (shipyard), Kirovsky zavod (tractors, etc) and Izhorsky zavod (heavy excavators etc).

Table 4.2 Sales in 1997-1998.

	Sales volumes 1997, bln RUR	Sales volumes 1998, bln RUR	Export 1997 (% share) / volume (bln RUR)	Sales volumes/ staff,1997, bln RUR	Sales volumes/staff, 1997, bln RUR
LMZ	124,7	83,8	47,0 / 58,6	16,3	15,2
Electrosila	110,3	84,8	36,0 / 39,7	21,2	18,8
ZTL	31,6	53,5	45,0 / 14,2	22,2	38,2
ZIO	110,5	153,1	19,6 / 21,7	16,2	38,3
UralElectroTyazhMash	56,4	36,7	7,8 / 4,4	12,3	12,2
AtomMash	31,9	51,0	19,9 / 6,3	5,1	10,2
BelEnergoMash	125,3	112,2	11,0 / 13,8	15,2	16,0
ChehovEnergoMash	44,0	51,0	7,0 / 3,1	14,9	25,5
Krasny Kotelchik	94,1	N/a	43,0 / 40,5	7,3	N/a

Source: Advance Investment Company.

The production of St. Petersburg power engineering is highly specialized. Around 30-40% of their production is manufactured in co-operation with other companies.

The products of St. Petersburg power engineering are purchased not only by utilities but also by the domestic and foreign petrochemical, oil and gas, metallurgy, and other companies.

One of the primary consumer markets for the local power engineering is Lenenergo – a local utility company, which supplies about 100% of electric power and 58% of heat in St-Petersburg. Remaining heat is supplied by the Municipal Company Toplivno-energeticheski Complex.

Special Study 1. Lenenergo

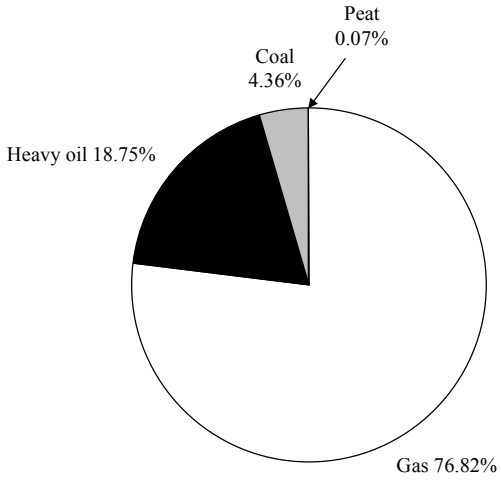
Lenenergo consists of 36 departments: 12 thermoelectric power plants, 4 hydroelectric plants, 11 electricity distribution units, heat distribution unit, 7 general-purpose companies (repair company Lenenergospetsremont, Center of information technology, etc.). Electricity supply networks of Lenenergo connect Leningradskaya nuclear power plant to high voltage grid, as well as the other 12 generating plants of Saint-Petersburg and Leningradskaya oblast. Generating capacities as at 31.12.1996 were equal to 4,698.5 MWe for thermoelectric power plants and 638,5 MWe for hydroelectric plants. The length of local transmission grid that is owned by Lenenergo is equal to 35,902 km.

Power generating assets of Lenenergo are largely worn-out and out-dated. 50% of transmission grid and transformer substations are long due to be renovated. The most of them had been put into operation 20-30 years ago. The company is increasing expenses for maintenance. About 20% of grid operated more than 50 years and needs upgrading that will cost about RUR 300 bln (in 1997 prices). In 1996 Lenenergo invested RUR 33 bln to the repair the grid.

Constant shortages of working capital of industrial consumers causes permanent delays in payments for electricity. As a consequence the Company owes to fuel suppliers as at the end of 1997 RUR 2,781,747.4 mln (+73% from the end of 1996). Consumers paid for only 24,8% of energy consumed. The most part of these payments were so called "barter". Cash represented only 2.6% of the total. Debts to gas suppliers as of 1 of April, 2000 amounted to RUR 4,680 bln. The share of cash in payments was equal to 52% in the first quarter of 2000 vs. the 40% in 1999.

The structure of fuel consumption by Lenenergo in 1997 was the following: coal – 4,36%, heavy oil – 18,75%, peat – 0,07%, gas – 76,81%. The gas dominates company's consumption. This defines demand for gas-fired power generating equipment.

Figure Special Study 1.1 Fuel Consumption of "Lenenergo"



Installed generating capacity in Lenenergo is not sufficient to satisfy the energy demand in the region. Average demand equals to 5 GWe, while Lenenergo generated only 2,5 GWe in 1997. The company imports about 40% of energy from the Russian energy market.

Table Special Study 1.1 Electric Energy Production in 1998 in St-Petersburg

	Power, MWe	Comparing to year 1997,%
Own production	14863680	111
Power imports	15494348	94

Source: Lenenergo

The main consumers of energy in St. Petersburg are industrial enterprises. Industrial consumption amounts to 33% of production volumes and 48% of sales.

A total of 18% of electricity sales went to private, residential consumers that represented only 6 % of revenues. The main reason for that was lower tariff for such consumers. Another considerable share of consumption belongs to organizations and companies that are state budget financed. These consumers cannot afford to pay for the energy that results in the constant growth of accounts receivables in Lenenergo.

Special Study 2. Toplivno-energeticheski Complex

Municipal company Toplivno-energeticheski Complex is one of the key infrastructure companies in St. Petersburg. It provides a 40% hot water and heat. The company supplies heat to Saint-Petersburg and the part of Leningradskaya oblast (Kronshtadt, Lomonosov, Peterhoff, Kolpino, etc.). It consists of more than 20 divisions that constitute a network of boiler-houses in city districts, as well as transport, construction and maintenance departments.

The main activity of the company is a production and distribution of heat. Heat energy is delivered to customers through hot water and steam. It is used both for heating and other technological needs (dry-cleaning, etc.).

The Regional Energy Commission decides upon the company's tariffs. Revenues from industrial consumers are the main source of cash income.

The company sells a heat below its cost of production and, thus, runs a heavy losses. The losses are compensated from municipal budget on basis of accrued actual expenses.

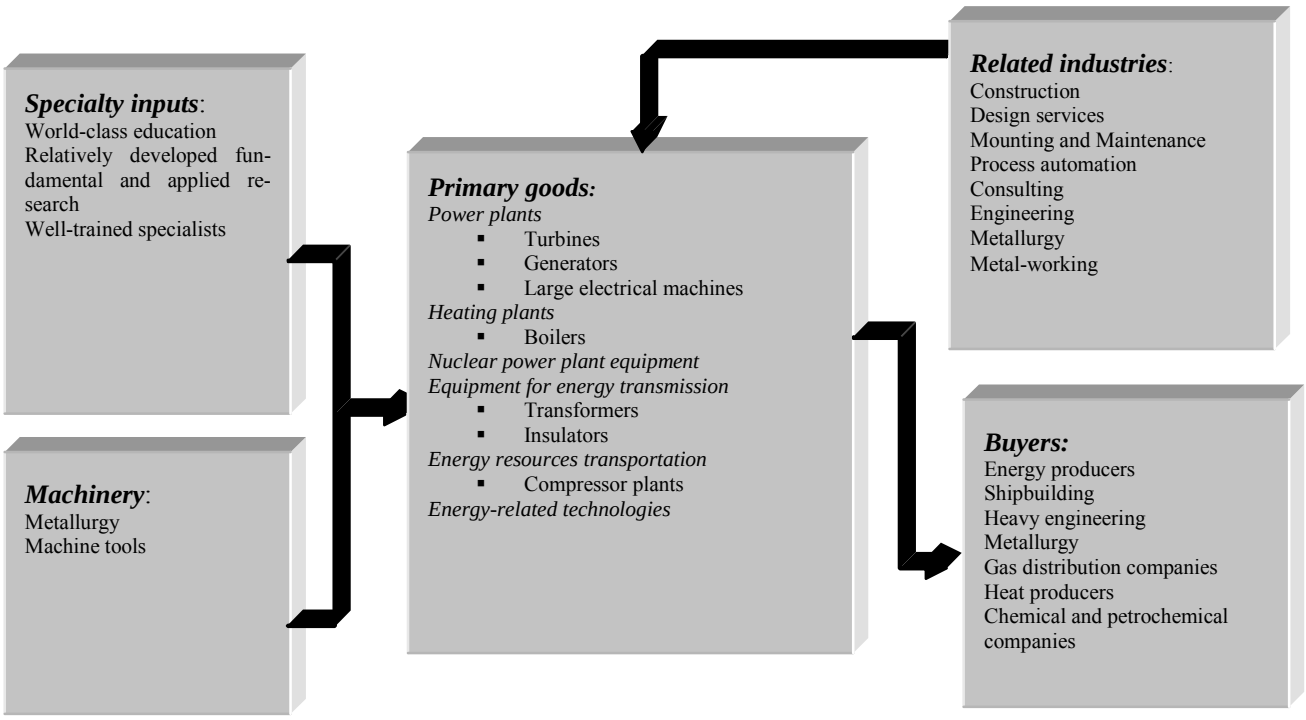
As many government owned bodies, the company hardly operates on the free market terms. Great losses of this company are explained not only by the low tariffs and high level of physical deterioration of assets , but also by the poor technology and management.

Lenenergo, which is the main rival of the company, is bound by the same tariffs and limitations. Due to the centralized production and the use of relatively modern equipment it doesn't run a loss and is profitable. The cost of electricity in Lenenergo's heat generation plants is two times lower than in Toplivno-energeticheski Complex's boiler-houses.

The Company needs large investments in replacements and upgrading. However, the costs of production could not be lowered to the level of Lenenergo without optimizational and structural changes.

The following cluster structure was formed according to existing data:

Figure 4.1 Preliminary Cluster Structure of Power Engineering



Factors of competitiveness

The energy demand and consumption are the main driving forces for the energy equipment manufacturing and technology development. Dynamics of energy generation follow the industrial development of the country. In Russia 11,9% growth in industrial production was registered in the first quarter of 2000. The growth rates of the main energy consumers were higher (30% for non-ferrous metallurgy). This growth has the compensation character and high rates of current growth are based on the low starting level. The overall political and financial stabilization will, hopefully, provide that the positive trends in the country development will sustain for some time.

The Russian energy generation suffers from a great deterioration of its equipment. This creates a great local advantage for local power generating equipment producers. Unfortunately this opportunity may become short term and will not lead to creation of sustainable competitive advantage, if the Russian standards will remain unchanged. These standards are different substantially from internationally accepted ones and do not promote development of the efficient, environmentally friendly technologies.

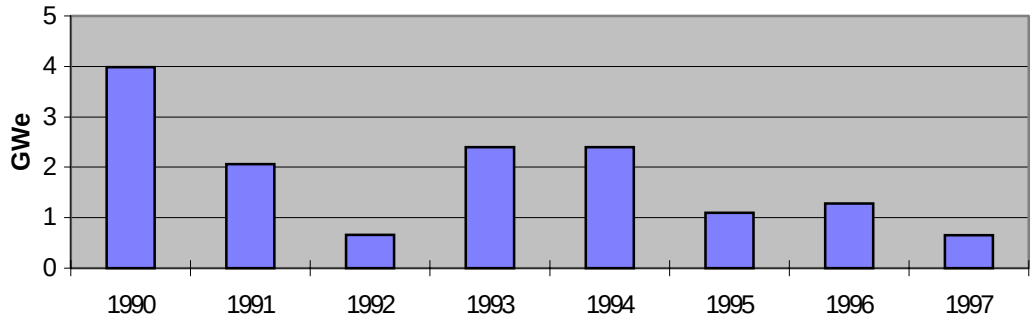
The obstacles in industry's development are also inefficiencies in management: the lack of business strategy, ineffective management structure, ineffective marketing and new product development.

In addition to the above the industry suffers from loss of highly qualified personnel that cannot be employed and well paid at the current production volumes. Succession of generations is lost: 1-2 generations of workers and operating personnel are missed. That leads to the increase in average ages of workers. As a result of educational sector restructuring the inflow of young qualified workers and engineers for power engineering reduced substantially.

Special Study 3. Deterioration of generating capacities

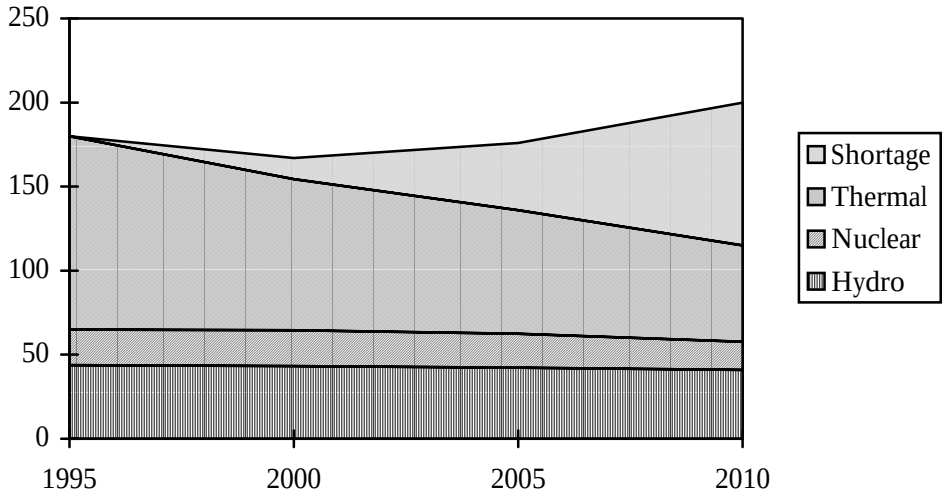
According to the Unified Energy Systems data - until the year 2005 a total of 80 GWe of generating capacity will fully work out its service life. This means that one third of the total generating capacity must be replaced. If the service life cycles will be used a basis for replacement decisions, in the year 2010 the 50% of thermal hydropower plants must be replaced. Before 1990 the annual volume of production of steam turbines was 12 to 15 GWe, hydraulic turbines from 2 to 4 GWe shown Figure 3.2. At present the volume of production have fallen to 10 to 25% of the pre-transition levels.

Figure Special Study 3.1 New Generating Capacities Annual Start-up in Russia



Source: Ministry of Economy Report (1998)

Figure Special Study 3.2 Change in the Installed Electricity Generation Capacity, GWe



Source: RAO UES (1998)

Insufficiency of installed generation equipment can be explained by the two factors: deterioration of the installed equipment and stabilization of the demand. To eliminate this is sufficiency when demand for energy will increase, an intensive energy saving program shall be implemented together with the investment for rehabilitation of the installed capacities as well as for completion of the on-going and new construction projects. However, non-payments for purchased equipment by domestic consumers as well as low tariffs for power do not allow power suppliers to form sufficient investment resources. We expect that recent increase in production output will drive demand for energy and the shortage will be created. That could push upwards demand for generating equipment and energy saving technology.

Due to above the reasons the domestic market is the most promising for power engineering companies and could provide a real challenge in creating a sophisticated competitive advantage. Internationally, the Russian companies also have good prospects on the Asian markets, especially in India and China.

Special Study 4. Rivals for Saint-Petersburg Power Engineering Companies.

Table Special Study 4.1 Producers of main types of power engineering products in Saint-Petersburg and Russia.

Segment	Producers in St-Petersburg	Other Russian producers
Turbine equipment	LMZ (Leningrad metal work's plant) Proletarsky Zavod Klimova Amalgamation Kirovsky Zavod Nevsky Zavod ZTL (Turbine blades plant)	KTZ (Kaluga turbine plant)
Electrical equipment	Electrosila Electrooapparal Proletary	UralElectroTyazhMash (Yekaterinburg) ElSib (Novosibirsk)
Boiler equipment	Baltiysky plant	PMZ (Podolsk) BelEnergoMash (Belgorod) Krasny Kotelshik (Taganrog) SibEnergomash (Barnaul)
Pipeline equipment	ZTL Nevsky Zavod	ChehovEnergoMash BelEnergoMash SibEnergomash Permskiye Motory Rybinskiye Motory
Compressors	LMZ Nevsky Zavod	SibEnergomash UralGidroMash (Sverdlovsk region)
Metallurgy equipment	NZL ZTL Proletarsky plant	
Special equipment for nuclear plants	Izhorsky plant	AtomMash (Rostov region) PetrozavodskMash (Petrozavodsk) PMZ (Podolsk machinery plant)

The main foreign competitors are Siemens, ABB, General Electric, Westinghouse Electric, Hitachi. These companies take roots in the markets that were traditional for Russian producers (Eastern Europe, Iran, China, India, etc.)

Foreign companies succeeded in out-competing the domestic producers on the Russian power equipment market. Moreover, they took part aggressively in privatization of the sector and own now a significant share of the Russian companies. However, foreign players haven't yet succeeded in managing efficiently their Russian industrial portfolios.

Significant entry barriers for international companies imports in these markets should also be taken into consideration. These are created through the government policy of protec-

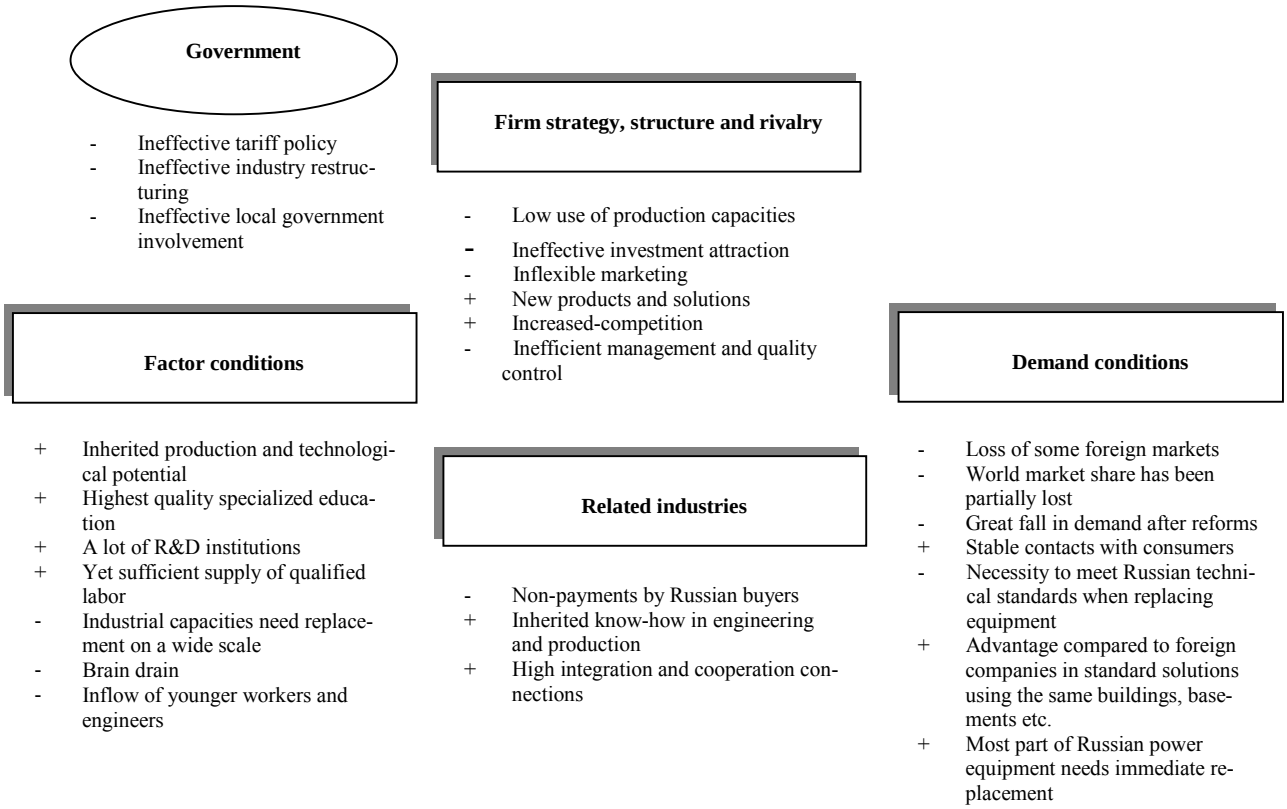
tionism and support of the local producers. For instance, for such key consumers as Gasprom and RAO UES, significant limitations in equipment imports are imposed. Such limitations have formal, normative and, also, perceptional nature (the Russian is better then foreign). The competitive positions of imported equipment on the Russian market are further complicated by the custom duties, taxation, and licensing.

Taking into consideration the above factors we could summon that acquisition of the local producers might be feasible in servicing this market in Russia. This could allow the foreign companies to benefit from cheaper and qualified workforce, local market knowledge of the Russian companies in conjunction with new technologies, know-how, project management skills, and marketing channels

The advantage of foreign companies is their relative advancement in low and medium- capacity (10-100 MW generating equipment) and automatic control systems. These types of equipment enjoyed the strong upsurge in demand during the recent years. The Russian companies traditionally produce larger capacity equipment (more than 100 GWe). At the same time, the Russian equipment lags behind in technologies, especially in automation and diagnostics.

We have preliminarily identified the following determinants of the clusters competitiveness:

Figure 4.2 Determinants of Competitiveness in Power Engineering



Saint-Petersburg power engineering companies are competing successfully on the domestic market. In order to succeed and increase their market share they will need to revise their strategies, to meet international market requirements for quality and effectiveness. Furthermore, industry development is defined by well-being of local generating compa-

nies. The energy tariffs should be reconsidered by the government bodies in order to stimulate the domestic demand.

4.4 Shipbuilding and Ship Repair

General description

The cluster consists of regional shipbuilding and repair yards. The main competitive advantages in this segment are the geographic location close to the large Baltic Sea ports, inherited industrial capital and professional skills.

At the beginning of XVII century Peter "the Great" chose Saint-Petersburg as a base for the Navy. During the next three centuries a city was center of domestic military shipbuilding. Saint-Petersburg shipyards also produced ships for civil purposes, but their share in the total output was insignificant. Activities of the largest Sea Port in Russia required appropriate base for repair and technical services. These activities became traditional and integrated in St. Petersburg as well.

Shipbuilding production volumes represent 5,1% of the total industrial output in St. Petersburg and engage 30 thousand people directly in the industrial production. It is worth mentioning that shipbuilding industry is an attractive employer and is offering relatively high wages (in comparison with engineering plants and municipal utilities).

Government defense orders were the main source of the local demand. This fact was partly the reason of decline in the beginning of 90's when industry suffered from falling domestic demand and arising international competition. Non-payments for government orders became typical problem for its companies.

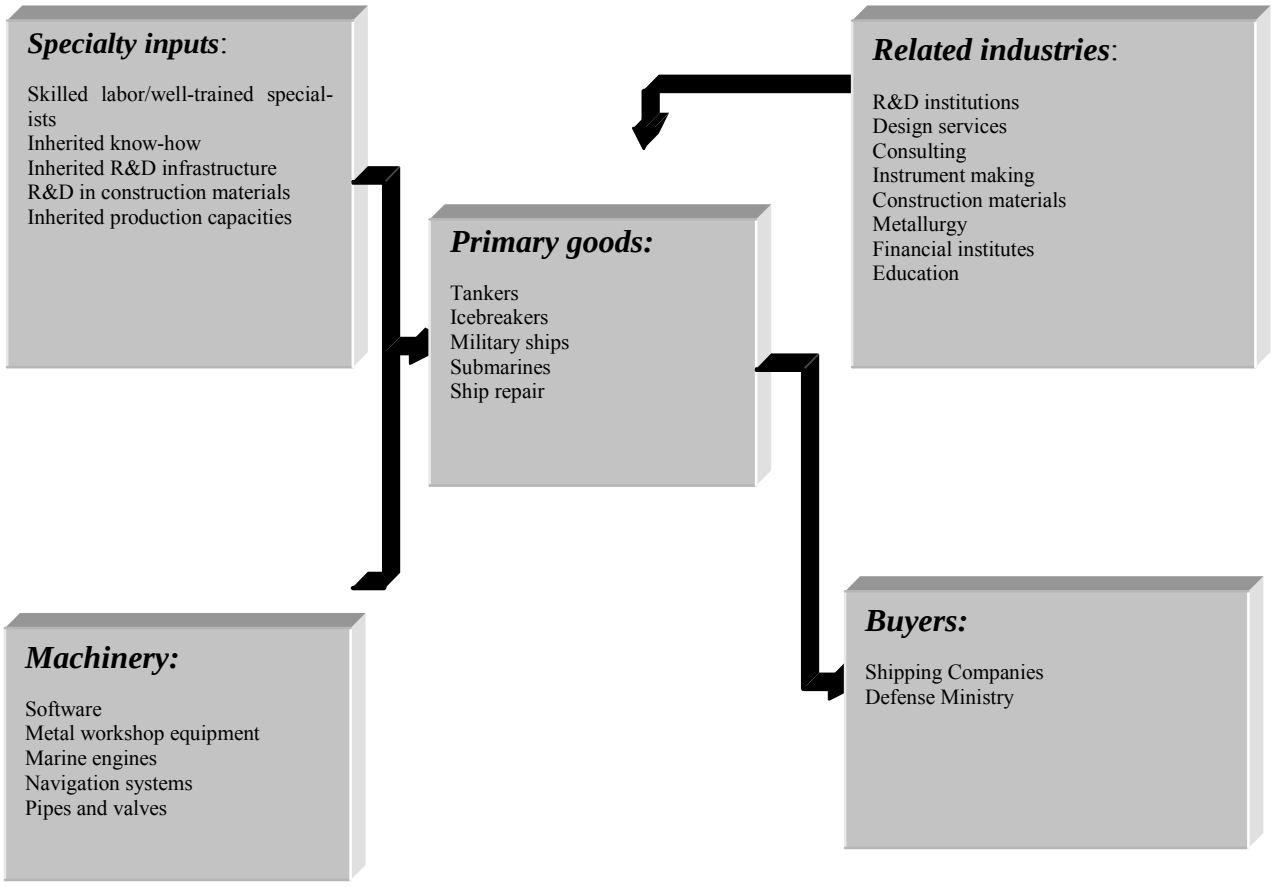
The shipbuilding companies of St. Petersburg carry out more than 70% of all R&D and produce up to 30% of the total Russian production in this sector. In 1998 a large export orders were processed at the City's shipyards, including ones for India (frigates and submarines), China (destroyer ships). The other large customer was the Russian Navy (submarines). Also tankers and other boats were launched and equipment assembling at Sea Start platform was performed.

Cluster structure

The sector includes 42 companies, including primary goods and services producers and companies providing related services and special inputs (technology development, design etc). Out of these the 19 are primary goods producers, namely the Admiralteyskie shipyard, Baltiyskiy zavod, Severnaya shipyard, Almaz shipbuilding enterprise, Sredne-Nevskiy shipyard, Ravenstvo association, Proletarsky zavod, etc.

The shipyards of St.Petersburg built a wide range of vessels, including bulk carriers, tankers, horizontal-loading ships, icebreakers, military ships (submarines), boats for ecological control, etc. The information about the largest of these yards is presented in Special Study 5 in more detail.

Figure 4.3 Preliminary Cluster Structure of Shipbuilding



Special Study 5. The Largest Shipyards of Saint-Petersburg:

Admiralteyskie Shipyards (state owned company) is an example of successful conversion of defence oriented enterprise. It is not only the oldest Russian shipyard (295 years), but also the largest one. The industrial site of the enterprise includes 2 open ship-ways, 5 slipways, 2 floating docks. It makes it possible to built ships with displacement of up to 60 thousand tons. The enterprise is capable to build also the small-sized boats (2-6 meter long). This company aims to deliver 5 ships under existing contracts: 3 submarines and 2 tankers with displacement of 28 thousand tons. Also the orders for arctic vessels (displacement of 20 thousand tons) are secured from the LUKoil company. Construction of 2 diesel-electric submarines has been started ("Amur-650" project – no analogues in the world in anti-sonar rubber). PromStroiBank and Admiralteyskie shipyards have signed a strategic co-operation agreement with this company. PromStroiBank is an exclusive investment and commercial banking partner for the shipyard.

Baltiyskiy Zavod builds various types of vessels, including nuclear-powered ice-breakers, roll-on/roll-off ships, bulk carriers, warships. This private company is a leader in nuclear-power vessels market segment in Russia. It is also manufacturing a wide range of marine equipment. Amongst the vessels in the phase of construction/launching are the Ro-Ro ship (German order), nuclear-powered icebreaker 50 Let Pobedy and nuclear-powered cruiser Pyotr Velikiy ("Peter the Great"). Financing of the icebreaker construction is now frozen (about $130 million is required to finalise the project, while it is ready for 59,9%), the customer's (i.e. the State) arrears exceed 100 billion RUR. Nevertheless the company's turnover in 1998 increased to 1,5 billion RUR. The production volumes growth was equal to 594%. The company laid off in the recent years 7,000 employees reducing its staff to 5,000. However the situation is changing now: 362 workers were signed off in 1997, this number changed to 300 in 1998, while in 1999 the staff increased by 100. Salary arrays were fully settled and the average salary is today highest in the industry (3,000 RUR).

Almaz shipbuilding company. At present the Almaz shipbuilding company has the following daughter companies: Almaz shipyard – construction of light-alloys based civil purpose high speed boat, Almaz design office – the leader in designing high speed vessels with displacement from 10 to 3000 tons. Company is certified according to ISO 9001. At present Almaz cooperates with 11 Russian and 5 foreign shipyards as well as 9 European ship equipment producers.

Severnaya shipyard. High-quality repair of warships and their equipment is the primary market orientation of the company. Orders of that kind already represent a largest share at Severnaya shipyard. Anti-submarine vessel Admiral Levchenko is now under repair, as well as Severomorsk. Another two big repair deals are expected in the nearest future. The largest single client at the moment is the Rosvooruzhenie, the state-owned weapons dealer (construction of 2 destroyer-ships), the second largest is a Hungarian company (2 bulk carriers, 6,9 thousand tons displacement). "Severnaya shipyard" is now beginning the sea trials of the first export-oriented destroyer for the Chinese Navy. At the same time another destroyer is under construction for the same client. After the long time break it is planned to start a construction of ships for civil purposes (trawlers at the first instance). The majority in this company is owned by the New Programs and Concepts venture, which announced its plans to invest $20 million in Severnaya shipyard in 2000.

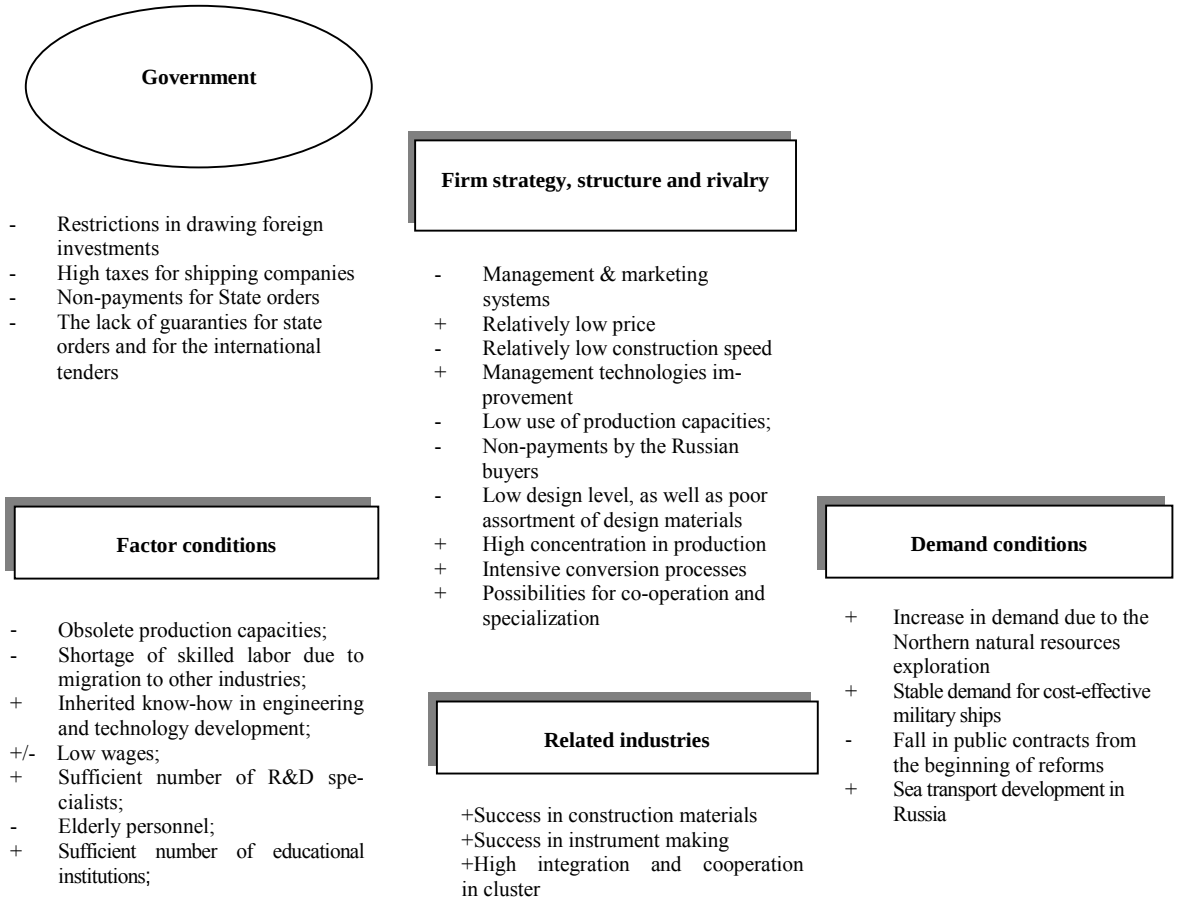
Factors of competitiveness

In spite of the fact that shipbuilding companies lost their former position on the world market, there are positive signs of resurgence in this sector. There are new contracts being made that would provide new orders (till 2003 in some cases).

As a whole, the production output of shipbuilding industry remained on the same level as in 1997. However, some enterprises have recorded a production growth (140% for Admiralteyskie shipyards and 270% for Severnaya shipyard) due to the new military orders. At present there are about 20 warships under construction in St-Petersburg shipyards.

The difficulties of this segment are common for the Russian industry: unreliability of state budget financing, restructuring difficulties related to reorientation from the state orders to operation on the open market, difficulties in gaining financial guarantees for projects, etc. Upgrading of production facilities is an urgent need.

Figure 4.4 Determinants of Competitiveness in Shipbuilding



Domestic demand could be the main driving force of the cluster's development. It is expected that increasing foreign trade and development of the Russian shipping companies will lead to increase in the local demand in the near future. Deterioration of the Russian owned fleet is on 40-50%. It is projected that replacement demand will increase due to this situation.

4.5 Metallurgy

General description

The cluster consists of ferrous metallurgy enterprises (foundries, rolling, pipe rolling, chemical-recovery, metal products of industrial use) and non-ferrous metallurgy companies (rolling of non-ferrous metals). At present 10 ferrous metallurgy companies and 6 non-ferrous metallurgy companies are registered in St-Petersburg.

The main competitive advantages of the cluster are: concentration of consumers in the same region, closeness to transport hubs.

There also problems in this sector. The most of sector companies are short of working capital and have problems of excess production capacity. A total of 40% of ferrous metallurgy and 33,3% of non-ferrous metallurgy companies recorded losses in the 3 quarter of 1999.

The data about production share of St-Petersburg metallurgy industry can be observed in the table below.

Table 4.3 The Share of Metallurgy in Gross Regional Product, %

Indicators	1996	1997	1998
Production volume of large and medium metallurgy industry enterprises in St-Petersburg, million RUR.	346.7	310.9	186.4
Production volumes of St-Petersburg, million RUR.	6725.2	6445	4695.7
St-Petersburg metallurgy industry production share in total production volumes of St-Petersburg, %.	5,2	4,8	4,0

In 1998 export volume of the ferrous and non-ferrous metallurgy amounted to $343,2 million. The volume of metallurgy products imported by St Petersburg was equal to $166,4 million. The largest share in export/import represents the international (non CIS) trade (97,4% of export and 80,7% of import). Trading with CIS countries is relatively small (2,6% and 19,3% correspondingly).

Table 4.4 Dynamics of Production Output in Metallurgy

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Steel, thsd t.	1015,7	965,5	766,1	694,2	594,6	610,6	589,9	588,3	578,9	618,6
Rolling, thsd t.	687,4	521,0	327,1	396,9	361,2	373,0	361,8	361,7	374,9	396,8
Steel pipes, thsd t.	81,1	73,7	64,2	55,9	26,3	21,3	13,4	11,8	10,0	19,3
Steel tape, thsd t.	20,5	19,0	10,5	9,1	6,7	7,2	5,0	3,9	6,6	4,7
Welding electrodes, thsd t.	20,4	16,0	14,0	12,7	7,9	10,7	7,9	7,8	6,7	7,2

One of the negative factors that limit the assortment expansion substantially is the largely worn-out and out-dated equipment and obsolete technologies (more than 50% depreciated). Capital investments are not sufficient (see table below).

Table 4.5 Investment in Fixed Assets, million RUR

Indicator	1996*	1997*	1998
Investments in fixed capital for large and medium-scale companies	1,3	2,1	0,8

** Billion RUR.*

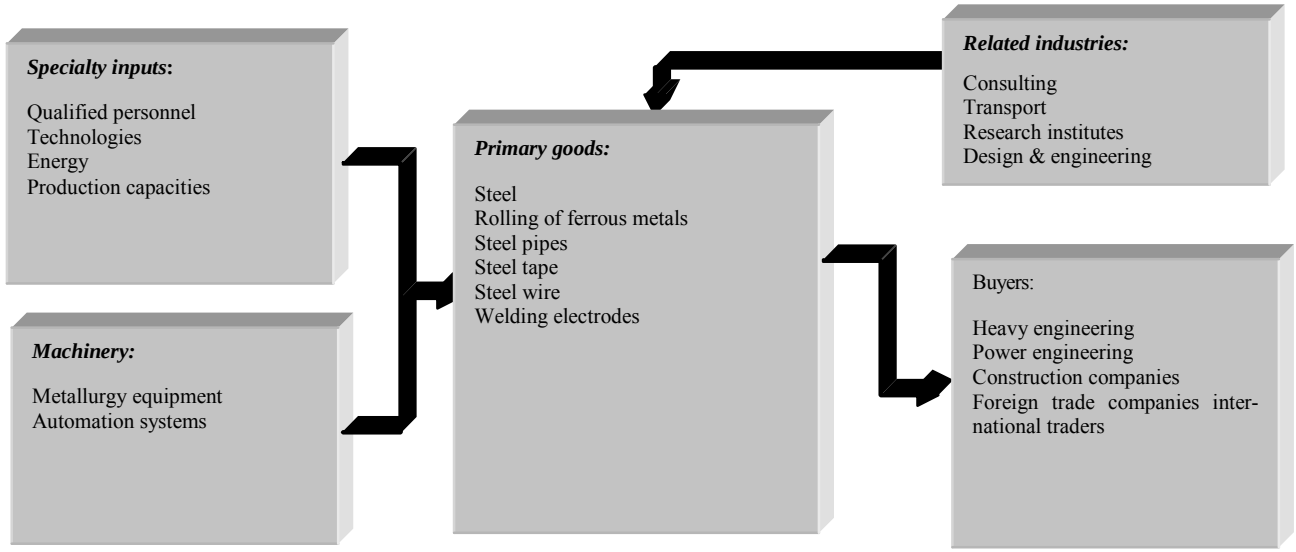
Cluster structure

In Saint-Petersburg the companies of the ferrous metallurgy sector prevail. The main consumers of their products are heavy and power engineering companies concentrated in the city and oblast.

Metallurgy companies of Saint-Petersburg manufacture a wide assortment of products. This assortment includes most of the products the industry could technically manufacture: rolled steel, steel pipes , coke production, metal (steel tape, steel wire), etc.

The region has a great potential in production output increase. In comparison with 1985, production volumes of ferrous metallurgy today are only 50% of those.

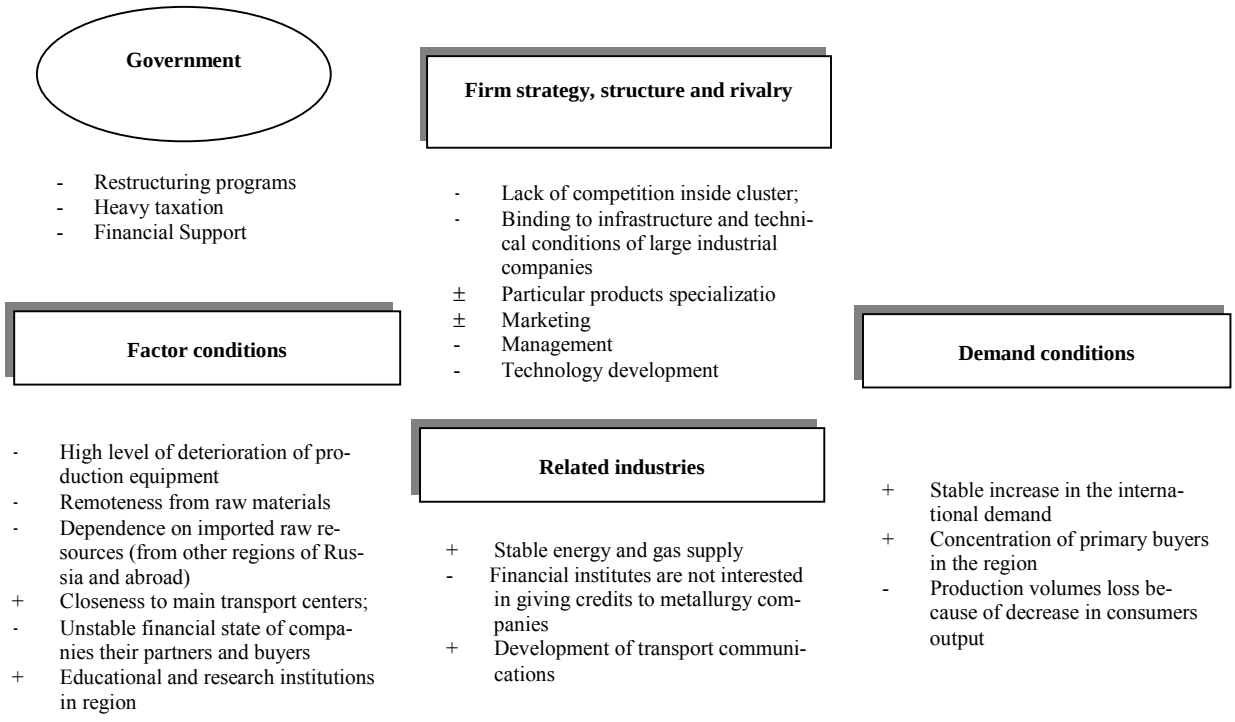
Figure 4.5 Preliminary Metallurgy Cluster Structure



Factors of competitiveness

Among the main factors that determine the cluster's development are a significant deterioration of production capacities and remoteness of raw materials' suppliers. The determinants of cluster competitiveness are presented in the figure 4.6.

Figure 4.6 Determinants of Competitiveness in Metallurgy



4.6 Food and beverages

General description

This segment of Saint-Petersburg industry is a leader in terms of industrial production output – 31,3% in 1998, and in tax revenues – 45% of the total in 1998.

Production output of the large and medium-size enterprises in this sector was equal to 13208,5 million RUR in 1998, or 139% to previous year. The share of industry in GRP for large-scale and medium-scale companies was equal to 29%. The total employment in the industry (including joint ventures) was close to 34 thousand people.

A large share of Saint-Petersburg food consumption is still being imported that presents a substitution products growth opportunity. Regional agriculture in Leningradskaya oblast is not supplying enough raw materials in quantity and quality. The food processing industry is developing intensively today due to the increase in demand[1].

The largest share in the total production output of the sector is represented by beer and beverages (27%), tobacco (22%), baking (11%), meat-processing (8%) and dairy (8%).

The most competitive part of cluster consists of breweries, meat production, frozen food, ice-cream and confectionaries manufacturing. The main factors that could create conditions for competitiveness development are, - significant domestic demand, capital and technology inflow after reforms, high demand for well-known local brands.

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[1] Actually import substitution in local demand is a key factor that motivates investments and up-grading.

Table 4.6 Production Output in Food and Beverages

		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Meat	Th. t	72,9	50,0	45,3	31,9	22,7	11,2	7,4	2,5	2,6	0,2
Sausages	Th. t	122,5	95,1	69,8	52,6	58,7	50,3	52,6	50,2	44,8	31,4
Prepared meat products	Th. t	40,7	27,6	14,7	12,1	11,6	7,4	8,4	5,0	21,4	1,3
Tinned meat	Mln. tins	7,7	8,2	6,3	6,0	5,0	5,5	7,8	7,9	7,3	8,0
Animal oil	Th. t	-	-	0,8	3,6	2,1	1,2	0,8	0,8	2,2	0,2
Milk products	Th. t	942,6	763,3	322,5	265,8	216,8	198,5	211,4	231,1	267,6	258,6
Margarine	Th. t	60,5	54,5	52,8	21,4	12,0	11,1	10,5	19,1	29,1	27,6
Confectionaries	Th. t	138,9	128,5	71,1	81,3	80,5	83,9	79,6	77,3	96,3	73,3
Macaroni	Th. t	44,7	44,8	44,6	37,4	35,1	27,6	15,9	14,1	21,1	31,3

Source: Petercomstat

Cluster structure

There are totally 76 large-size and more than 450 small-size manufacturers in 16 different sub-sectors of the food and beverages sector.

The wholesale and retailing systems are well developed and represent the wide net of distributors, shops and retail outlets. As for the end of 1998 there were:

- 30 000 retail outlets;
- 8 000 shops (including 5000 grocery stores);
- 45 supermarkets.

The present distribution infrastructure supports a rapid development of the local food processing industry. Raw materials for food processing are delivered from nearby regions and imported .

One of the negative factors that may restrict clustering of this segment is the lack of equipment producers. The equipment for breweries, confectioneries, meat processing facilities and bakeries is imported although there are first examples of import substitution.

Table 4.7 Imports of Equipment, $mln.

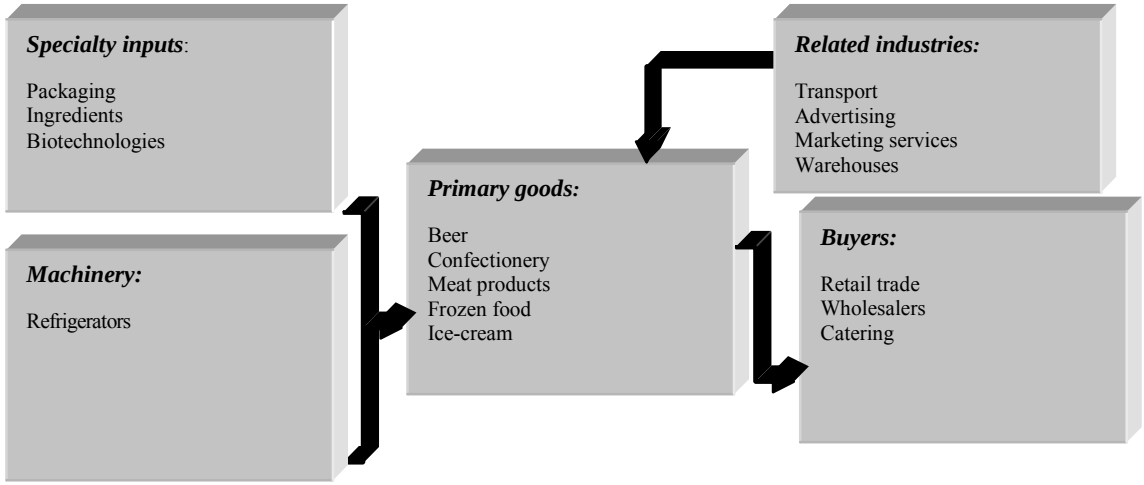
	1996	1997	1998
Bakeries	7,7	3,2	3,3
Pasta production	0,3	1,4	0,3
Confectionaries	1,6	10,4	4,0
Meat processing	8,3	6,1	2,5

Source: Delovoy Petersburg

Primary goods in this cluster are produced by the limited number of companies. The largest regional brewery companies are Baltika, Stepan Razin and Vena. There are other well-known breweries in the city, such as Bavaria and Bravo International. Among meat products suppliers Samson and Parnas-M companies are the largest by far. The main confectioneries are Krupskoy and Azart.

The potential cluster structure is presented below.

Figure 4.7 Preliminary Cluster Structure of Food and Beverages Production



Special Study 6. Breweries of Saint-Petersburg.

Brewery industry of St-Petersburg consists of the following large-size companies: Baltika, Stepan Razin, Vena, Bavaria, Bravo. Baltica brewery is the largest by sales (more than 50% of the total in September, 1998). The share of the St. Petersburg breweries in the total Russian beer production fluctuates from 16 to 18%. The main consumers are located in the North-West region and big cities of Central Russia. At present the intensive integration with breweries in other regions takes place (for instance, acquisition by Baltika of the share in the largest brewery in Southern Russia – Donpivo).

The increasing share of city breweries in the Russian production is made possible through significant investment. The breweries invest their own funds as well as resources provided by domestic and foreign investors. For example, in 1998-99 $70 mln were invested in reconstruction of Vena and during 1998-2000 Baltika invested $50 mln in malt-house construction. Bravo International is going to invest $95 mln in new production facilities in Saint-Petersburg.

These companies are able to provide high quality manufactured in St. Petersburg by using modern technologies, quality raw materials and effective equipment.

Table Special Study 6.1 Beer Production in Russia and Saint Petersburg

Beer production, mln decalitres	1996	1997	1998	1999
Total in Russia	220	252,5	352	-
including:				
“Baltika”	17,4	30,1	48,9	55,0
“Stepan Razin"	4,7	7,3	9,4	-
“Vena"	-	-	-	3

Frozen food and milk products manufactured in St. Petersburg are also highly competitive. Ice-cream is one of the success products. It is produced by Petrokholod, Talosto, Colibri, Ravioli, Piskarevsky Molochny Combinat companies.

There is a tough competition on the market created by the other Russian and foreign suppliers (primarily by the Moscow based producers). It forces to improve the quality of products and to keep effective feedback with customers.

Confectionery products of St. Petersburg companies have a great export potential. Increase in assortment and its continuous renewal, modernization of-out-dated equipment, improvement of technologies and processes – all these activities improve competitive advantages in the sector.

Table 4.8 Import of Food, mln. USD

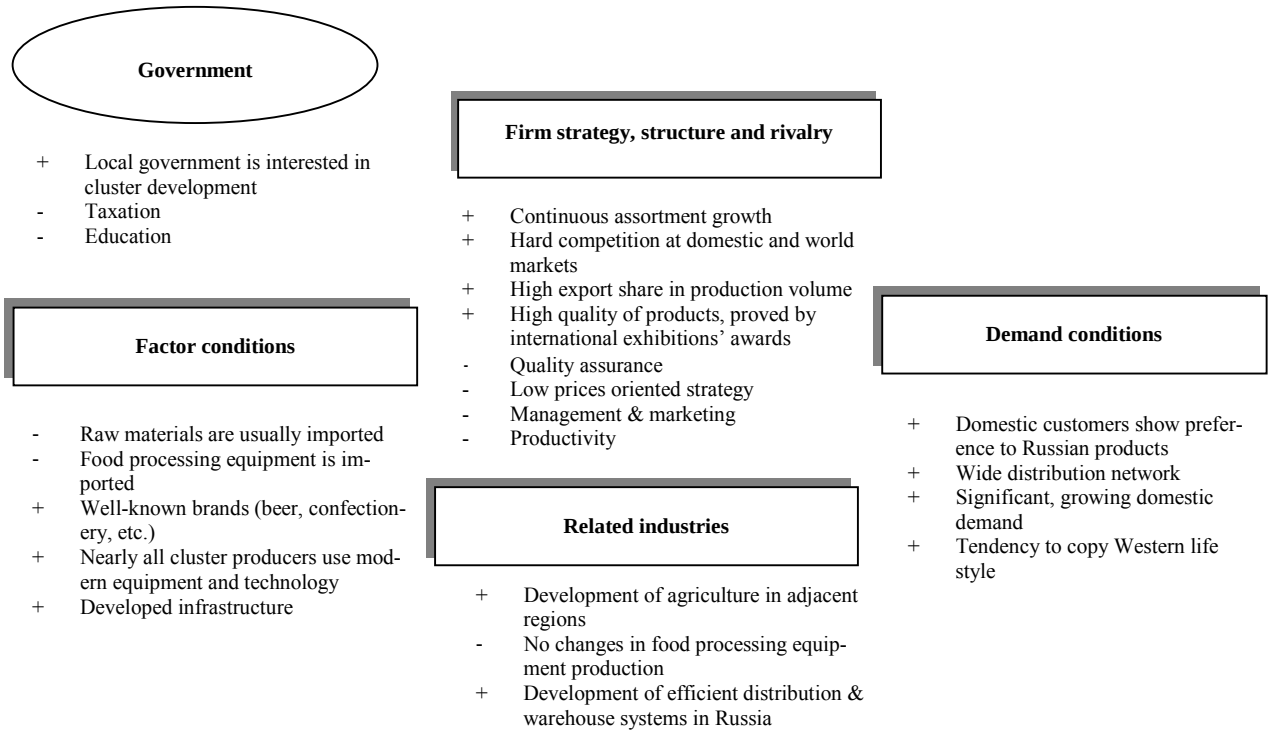
	1996	1997	1998
Bakeries	15,7	14,8	12,6
Macaroni	16,3	17,4	14,6
Confectionaries	37,0	41,3	31,1
Meat products	366	392	416,4

Factors of competitiveness

High dependence on imported raw materials and lack of local equipment producers are the main negative factors for Saint-Petersburg food sector. To lower the dependence on imported raw materials the local companies stimulate the Russian agriculture. For instance, "Baltika" plans to use domestic barley. At present barley crops have been sown in Leningradsaya and Orlovskaya oblasts for that purpose.

Nevertheless, all significant domestic producers of food have renewed their production capacities and outcompete successfully the foreign producers in price, quality and assortment.

Figure 4.8 Determinants of Competitiveness in Food and Beverages



As a result of crisis in 1998 many foreign goods disappeared from the Russian market. The significant local demand for domestic products is the main driving force of cluster development. The total market for food was equal to $1,8 bln in 1999. Taking shadow economy into account this figure could be probably doubled. That clearly leaves room for further development and growth.

Increases in the purchasing power of the population is also worth taking into consideration as a growth factor for this sector. The Russian customers are demanding and very quality conscious.

Rapid advancements in the equipment and technology upgrade and, as a consequence, increase of capacity, create a clear possibility for Saint Petersburg producers to lead not only in the region, but also in Russia. High quality of products proved at international exhibitions promotes export growth in future.

4.7 Woodworking

General description

This sector includes wood processing and furniture companies located in St. Petersburg. The primary products of this sector are final (paper, furniture) or semi-final (sawn timber) products.

The number of registered enterprises as of the 1st of January, 1999 amounted to 3477 with 10,3 thousand employed by the large and medium-scale companies. The production output of large and medium-scale companies in 1998 exceeded 921 million RUR ($94,2 million). Average monthly salary in July 1999 was 1073 RUR.

Timber processing represent 2,3% of the total industrial production, employing 3,3% of industrial workers in 1998. Its relative share in the total industrial production was falling during the last years.

A large amount of the North West of Russia exports and trading in raw timber is going through St. Petersburg due to its advantageous geographic location and developed logistics (a number of sea port terminals equipped to process the raw timber).

The distinctive feature of woodworking cluster formation is integration with nearby regions, especially with logging enterprises of Leningradskaya oblast.

The main factors influencing the competitiveness development of this cluster are:

- a close location to timber resources of Leningradskaya oblast, Karelia, Novgorod, Pskov regions;
- a short distance to Scandinavian and central European markets;
- the well-developed network of roads and railroads, developed water routes, including Baltic sea connections ;
- the high concentration of wood processing and heavy engineering enterprises;
- the high potential demand for final products in Saint-Petersburg (paper, furniture, etc.);
- an educational and R&D base.

Woodworking companies produced only 2,3% of GRP (Gross Regional Production) in 1998, while its share in GRP structure was reducing slowly during the last years. Moreo-

ver, the sector employs 3,3% of the total number of workers, so the productivity here is lower than the average industrial level[2]. There is a steady increase in local demand for final products of this sector. International market demand, due to increase in demand for sawn timber, may also influence positively development of this sector.

Table 4.9 Production Output in Woodworking in 1990-1999

	Units	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Paper	Th.t	95,6	81,9	55,3	44,5	25,7	21,7	11,6	11,6	14,2	27,4
Copy-books	Mln units	106,5	111,2	87,9	38,3	65,0	75,6	129,4	82,8	49,8	46,7
Sawn timber	Th.m^3	250,3	195,9	151,3	312,7	390,1	231,3	110,3	79,8	37,2	20,9
Door blocks	Th.sq.m	626,0	484,8	347,1	292,7	160,1	175,3	95,7	46,3	173,5	201,8
Sash pulleys	Th.sq.m	295,8	264,5	165,7	130,1	92,4	73,2	46,5	39,9	30,7	16,4
Furniture:	Th. units										
Tables		154,3	192,8	751,0	261,5	154,3	126,9	55,7	55,2	54,0	23,4
Chairs		773,1	642,5	557,6	404,8	161,1	155,4	65,5	100,2	25,6	83,3
Arm-chairs		179,9	143,5	128,1	83,0	57,9	35,6	23,8	16,6	15,9	11,3
Wardrobes		274,2	234,8	261,2	319,7	214,1	147,5	73,7	40,7	44,2	35,8
Sofas		13,8	8,4	8,5	9,2	3,9	4,8	6,3	10,0	10,1	3,9
Folding divans		140,0	94,5	68,0	43,5	43,0	27,8	12,2	11,5	11,3	9,7

In order to give a full picture of this sectors' development it is necessary to present the key figures for Leningradskaya oblast resources and production.

The total area of forests in Leningradskaya oblast amount to 6027 thousand hectares.

The woodworking output in Leningradskaya oblast in 1999 was the following:

- raw timber - 1.7 mln cub.m
- sawn-timber – 224,8 th. cub.m
- plywood- 11,1 th. cub.m
- cellulose - 69,3 th. t
- paper – 248,6 th. t
- cardboard – 183,6 th. t

Present production capacities of woodworking companies in Leningradskaya oblast allow to produce:

- Sawn timber - to 1 mln cub. m
- plywood - to 12 th. cub.m
- particle boards- to 56 th. cub.m
- cellulose - to 400 th. t
- paper - to 472 th. t
- cardboard - to 200 th. t

Closeness to such resources and production capacities allows further development, integration and deepening of the cluster's sophistication

[2] A true productivity and size of this sector may be substantially underestimated due to shadow economy and distortions in statistics.

Table 4.10 Export and Import of Raw Wood and Related Products, $mln

	export	Import
Raw wood and related products	102,4	124,9

Table 4.11 Domestic and Foreign Trade in Timber Products

	Export		Import		Delivered to domestic consumers	
	units	Th. USD	units	Th. USD	units	Th. USD
Paper, total	7910	162428	129837	542299	5150	67044
Printing paper	1766	16530	110861	398411	1423	13323
Saw-timber	3334	1844	40099	23110	7799	6772
Furniture, Saint-Petersburg	-	34857	-	36227	-	99002
Merchantable wood, cub.m.	-	-	92557	13483	-	-
Fiberboards, thousand cub.m.	-	-	3507	15657	-	-
Particleboards, thousand cub.m.	-	-	25194	19239	-	-
Plywood, cub.m.	45622	126136	6160	11344	17256	36256
Cellulose, tons	-	-	8433	41948	-	-

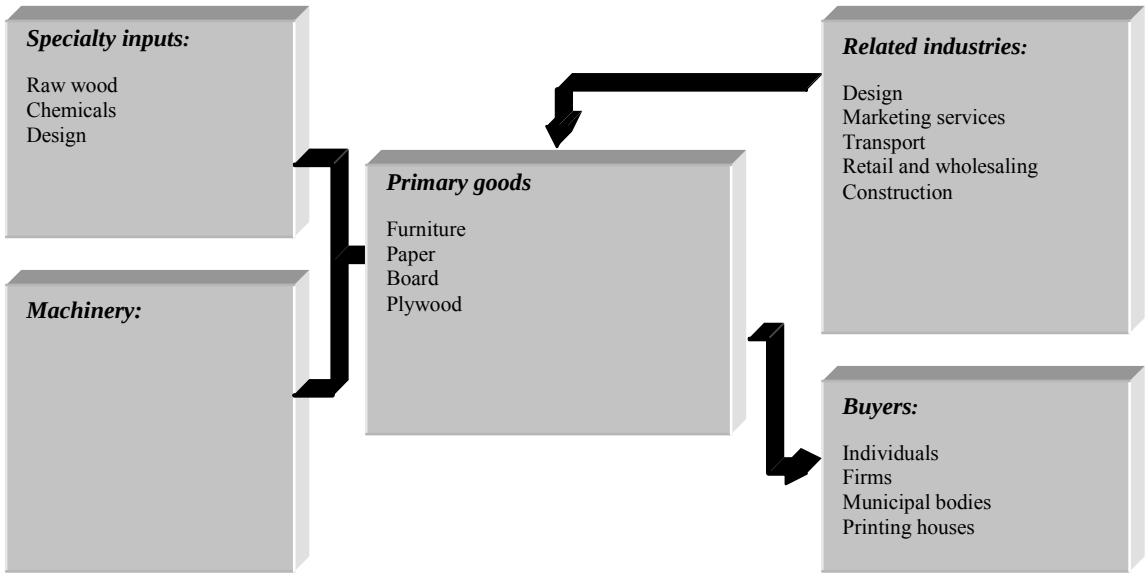
The figures presented in Tables 4.10 and 4.11 show that there is a large import substitution gap in final products of woodworking that could be filled by the local producers.

Cluster structure

The leading cluster companies are SevZapMebel, Myagkaya mebel, Pervaya Mebelnaya Fabrika, Mebelnaya Fabrika №2, Svetoch, Ust-Izhorsky plywood factory.

The main resource base for Saint-Petersburg woodworking industry is Leningradskaya oblast where 7000 logging enterprises, 20 saw-mills, 3 pulp and paper mills, and 5 paperboard plants are located. At present only 4,5 mln. cub. m are cut in Leningradskaya oblast while the annual capacity is estimated at 7 mln.m^3.

Figure 4.9 Preliminary Cluster Structure of Woodworking



Special Study 7. The largest woodworking companies.

Sevzapmebel. The company was founded in 1990. It is the main furniture manufacturer. It includes 6 production facilities, wholesaling company and 9 retailing outlets .

Pervaya furniture factory. Specializes in kitchen furniture production and in tailor-made products. It manufactures parts of office furniture as well. The parts are supplied to other Saint-Petersburg manufacturers.

Svetoch. The largest paper products manufacturer in Russia. It produces:

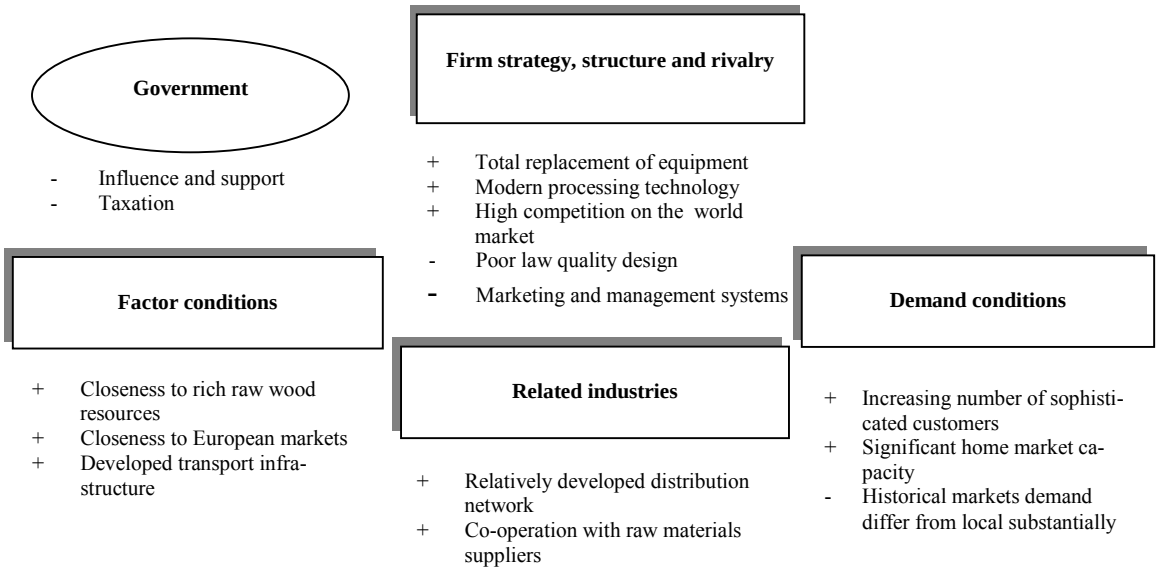
1. Paper products: copy-books, notebooks, calendars, albums, school books , etc.
2. Printing: business cards, certificates, diplomas, binding works, other orders.

Ust-Izhorsky plywood factory. One of the largest plywood companies in the North-West region. Factory specializes in plywood products: veneer sheets, water-resistant plywood, bakelized plywood, wood laminates, etc. Annual plywood production capacity amounts to 60 thousand cub.m. 8Relatively developed distribution network; USA and 25% to Europe including 1-5% export to the UK). The quality of products comply with international standards.

Factors of competitiveness

Many furniture factories import accessories, upholstery fabrics and components. There is a demand for import substitutes that could create start-ups in related industries.

Figure 4.10 Determinants of Competitiveness in Woodworking



A high concentration of trading activity in St. Petersburg created the interest of trading companies to participate in the wood processing. That lead to investment in replacement of old manufacturing equipment by high-productive equipment that meet the international market requirements. As expected it will increase productivity of the sector in the nearest future. Low labor costs are the driving forces of development.

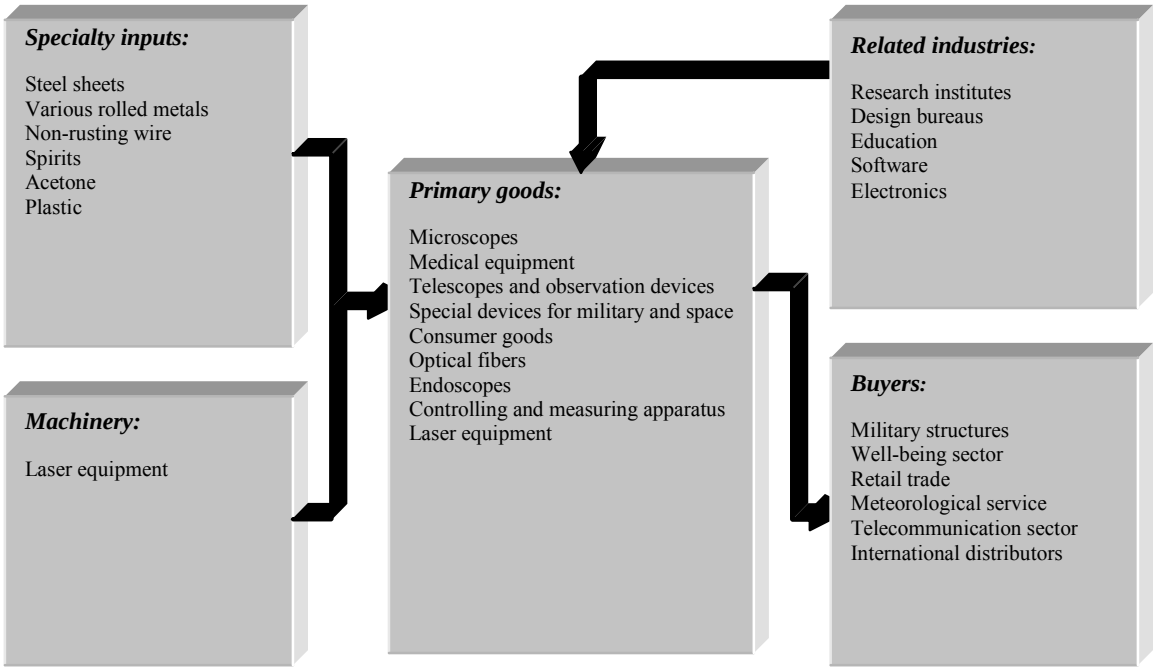
4.8 Optical engineering

General description

Saint-Petersburg is the center of R&D-intensive manufacturing. Before transition most of the technology-intensive products had been oriented on military use. Decrease in state orders significantly reduced production volumes and R&D activities. Optical engineering is the rare case of R&D intensive industry that managed to maintain some of its positions at domestic and international markets.

Cluster structure

Figure 4.11 Preliminary Cluster Structure of Optimal Engineering



The primary goods in this sector are optic devices. They are produced by a number of companies with LOMO company heading the list. Activities of these companies are supported by the research and design facilities (Vavilov State Institute of Optics) as well as educational institutions (State University For Fine Mechanics and Optics). A large number of smaller companies were created via spin-offs from LOMO.

The key player in this segment is an open joint stock company LOMO that is also a market leader in the domestic market. Production of the company represents about 65% of the Russian market of optical engineering products. The potential competitors (they don't affect the "LOMO" strategy in any way) are companies from the other regions of Russia: Zagorskiy optical engineering plant, Lytkarinsky optical glass plant, Kazansky optical engineering plant, Novosibirsky instrument-making plant, etc.

Special Study 8. LOMO

At the present time LOMO can be considered as a dynamically developing company. The production output tends to grow.

Table Special Study 8.1 Production, sales and exports of LOMO.

Indicator	1995		1996		1997		1998	
	Billion RUR	$, million	Billion RUR	$, million	Billion RUR	$, million	Billion RUR	$, million
Products sold	138	30,7	186	35,8	220,6	38,0	262,5	26,8
Including:								
• Products sold at domestic market	129,7	28,2	165,4	31,8	132,2	22,8	157,6	16,1
• Export	8,3	2,5	20,6	4,0	88,4	15,2	104,9	10,7

The Company is still heavily dependent on the military orders as the share of these products in the total production output exceeds 40%.

Equipment produced by this company is highly ranked on the international market (target seekers for missiles and antiaircraft emplacements, periscopes, night vision equipment, sights, new models of microscopes, endoscopes, laparoscopes, colonoscopes, gasteroduodenoscopes).

The important task in company's strategy is the assortment saturation. As a part of this program in 1996 the 9 new items were developed. (Scanner for voting papers and LED traffic lights are the main ones).

As the table data show, the enterprise tends to increase its production volumes. The main reason for it is the change of market priorities, i.e. the orientation on competitive output for export. In 1998 exports occupied 40% of the total production volume, while in 1999 – 60% and it is planned to increase to 80% in 2000. The production of the company is distributed now through well organized network (LOMO – America, LOMO – Europe, etc.) in more than 30 countries (mainly West and East Europe, North America, Middle East). Good performance characteristics make these products competitive and relatively low priced for export (20-30% lower than foreign competitors).

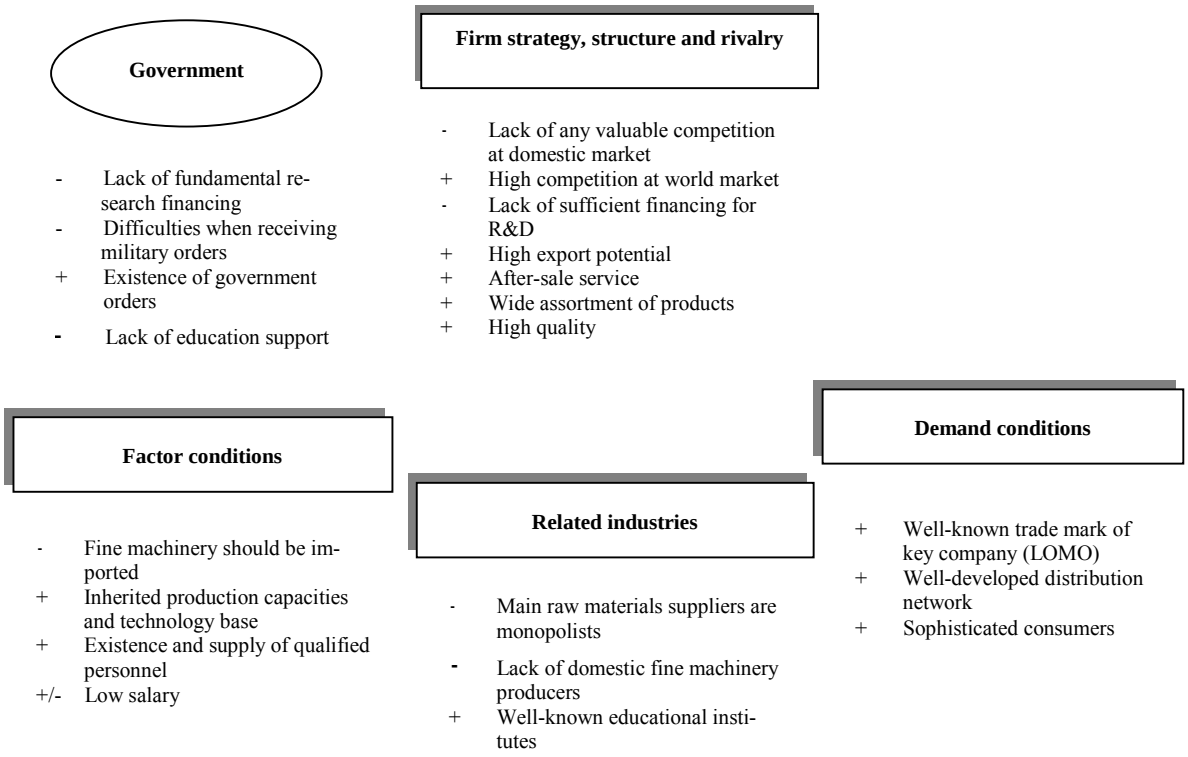
Factors of competitiveness

Inherited industrial and technological capital gives LOMO the possibility to produce competitive products not only for domestic market, but also for the international one.

R&D activities in laser equipment and fiber have significant prospects due to the constant increase in demand.

The factors influencing cluster development are presented below:

Figure 4.12 Determinants of Competitiveness in Optical Engineering



4.9 IT sector

General description

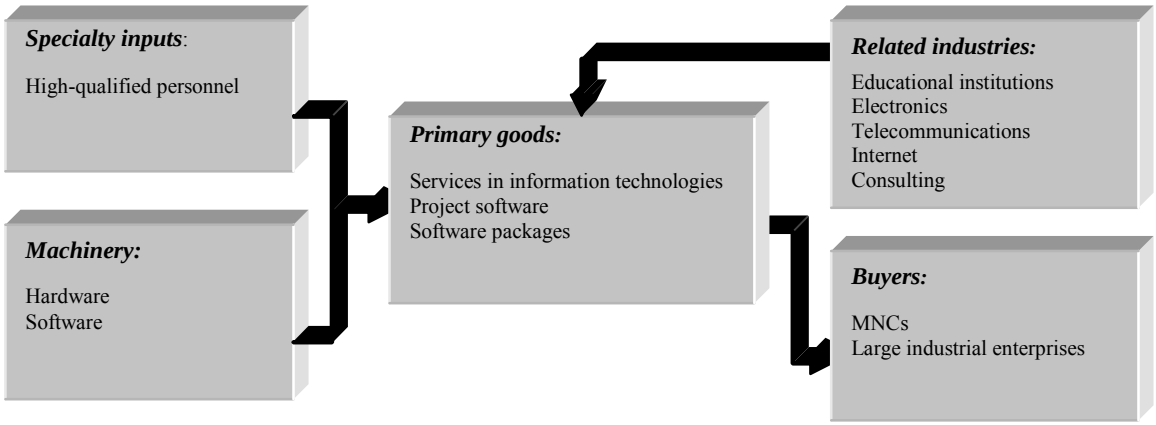
Software development sector is acknowledged to be the most productive and one of the fastest growing sectors in Russia. Although of small scale at present, this sector has a potential to grow substantially in future. According to studies, the productivity of software is comparable or, in some cases, exceeding USA levels, with most productive are being offshore software development. This productivity is achieved through employment of qualified personnel with substantially lower salaries than that of western software specialists. St Petersburg has become a centre of such activity, due to a number of certain advantages to Moscow, another IT centre in Russia.

St Petersburg provides an excellent opportunity for establishing software development business, both as independent start-up projects and as development subsidiary of established foreign technology companies. Software is in preferred position due to its low sensitivity to legislative and tax drawbacks of Russia.

Cluster structure

The cluster structure is presented below. Main cluster's driving force is the educational institutions supporting the pool of specialists. These educational establishments could act as suppliers of services in information technologies and software development.

Figure 4.13 Preliminary Cluster Structure of IT Sector



The evidence of rapid development is supported by the substantial amount of off-shore programming firms and subsidiaries of foreign players, as well as by growing consent in media that St Petersburg is positioned to become the "Russian Bangalore". It is worth noticing that the only Russian software developer which received ISO 9001 certificate is located in the city. A number of others are also preparing for certification according ISO requirements.

Due to enormous amount of the world market for IT services and relatively low size of the Russian off-shore programming sector the demand is not going to be a limitation for growth within substantial period from now. Neither is going to be the supply of workforce: the output of the IT departments of Russian universities is high and competition for places in specialized higher education institutions is 3 to 1 on average (St Petersburg data). Excess supply of labor is currently being consumed by recruiters exporting programmers and by foreign companies (such as Microsoft, Sun and other) recruiting the Russian programmers for their overseas operations. However, the sentiment is that lower domestic salaries in Russia based development centres are acceptable by many programmers, provided they remain in their cultural and linguistic environment.

Special Study 9. Supply of workforce

Main sources of St-Petersburg's workforce in IT are special departments in St Petersburg universities. It is widely accepted that five such universities substantially outrank others in terms of quality of education. They are:

- St Petersburg State Institute of Fine Mechanics and Optics (Department of Computer Technologies and Management)
- St Petersburg State University (Department of Mathematics and Control Processes)
- St Petersburg State Technical University (Department of Technical Cybernetics)
- St-Petersburg State University of Avionics and Space engineering (Department of computer systems)
- St-Petersburg State Electrotechnical University (Department of Computer and Information Technologies)

Major educational levels in IT are:

- BSc (4 years of study)
- MSc (6 years of study)
- Engineer (5.5 years of study)

Majority of students opt for 5.5 years or 6 years of study, which positively affects the quality of graduates. St Petersburg programming school has a world wide reputation for its quality. In the International Collegiate Programming Contest, the most prestigious student programming event of the year, two St Petersburg teams, from State Institute of Fine Mechanics and Optics and from State University, ranked 3rd and 9th, respectively. The first one of these outranked such renowned US schools as Harvard or Berkeley.

Comparative quantities of students per term and comparative competition figures for the places are given in the table below:

Table 4.12 Comparative Statistics of "St. Petersburg Programming Schools"

School	Students per term in 1999	Competition*
State Technical	228	2.4
Fine Mechanics	(estimated) 200	(estimated) 3.8
Electrotechnical	310	3.2
State University	150	(estimated) 3.5
Avionics	105	3.0

* Comparative competition figures in the International Collegiate Programming Contest.

Top five schools annually train about 1000 qualified specialists in IT, with about 500 more being prepared in other schools and part time departments. A number of training centres are functioning in the city, such as certified Novell centres, Microsoft centres and more, adding more workforce, although with less qualification.

Factors of competitiveness

Russian IT sector in general developed under influence of the several major factors:

- Existence and constant supply of new educated and cheap professional workforce
- Practically no regulatory limitation of development
- No excess heritage of the soviet past, mainly due to inherent low capital requirements of the sector
- Low sensitivity to legislative and tax drawbacks of Russia

But:

- Very high degree of software piracy
- Low domestic demand for both packaged and project software
- Significant outflow of qualified personnel due to brain drain

These factors combined, as well as aftermath of 1998 financial crisis had laid the foundation to current dynamics and structure of the sector. It is now characterized by the following distinct features:

- IT services and project software dominate the sector in terms of output and productivity
- Off-shore programming is fast growing
- Domestic demand for IT and software is weak

Recent report of McKinsey Global Institute studied software industry as one of the cases in the general Russian study. McKinsey estimate that the average productivity in software industry is 38% to USA level, making it most productive sector of the Russian economy. Remarkably, project software sub-sector reached 72% of USA productivity level. Project software category includes consulting, training, implementation and, importantly, off-shore programming.

Off-shore programming sub-sector utilizes the qualified and cheap workforce supply in Russia, combined with growing market for IT services world wide. The market for IT services is estimated to be $327bn in 1997 and is projected to grow up to $1 trillion in ten years. Russian share so far does not exceed $100 million, whereas the quality and the price of Russian off shore programming is comparable or in some instances better than that of India, which exports over $2 billion of IT services annually.

Given the above, McKinsey estimates for growth of 50-60% annually in the off-shore programming segment can be regarded as pessimistic. The sector is already reaching certain visibility and scale, although remains non transparent.

Companies engaged in off-shore programming employ an estimated 5000-6000 people. This contradicts with McKinsey estimates (1600), due to low transparency of the sector and narrow sample studied by the firm.

It is worth noticing such part of the segment as foreign managed development centres in Russia. In this case western management (including project management) skills and effective marketing channels are combined with cheaper and qualified pool of programmers, which leads to substantial results: certain cases studied by McKinsey exhibit productivity of as much as 293% to USA level. This is a driving force behind the growing numbers and scales of the development centres that foreign software developments and technology companies are establishing in the region.

The major part of the Russian programming capacity tends to concentrate in Moscow and St Petersburg, with Novosibirsk and Ekaterinburg following behind. St Petersburg appears to be the most suitable for software development due to a certain set of factors such as:

- High penetration of higher education and computer literacy, equal or above Moscow levels
- Lower living costs and, hence, salary levels, than in Moscow
- Substantially smaller share in state orders for software and IT which drained IT talent from truly competitive off-shore programming into politically sensitive service of government contracts.

Special Study 10. IT-sector as an object of interest from the side of MNC's.

A growing number of development centres that blue-chip technology multinationals are opening in the city confirm the attractiveness of the sector.

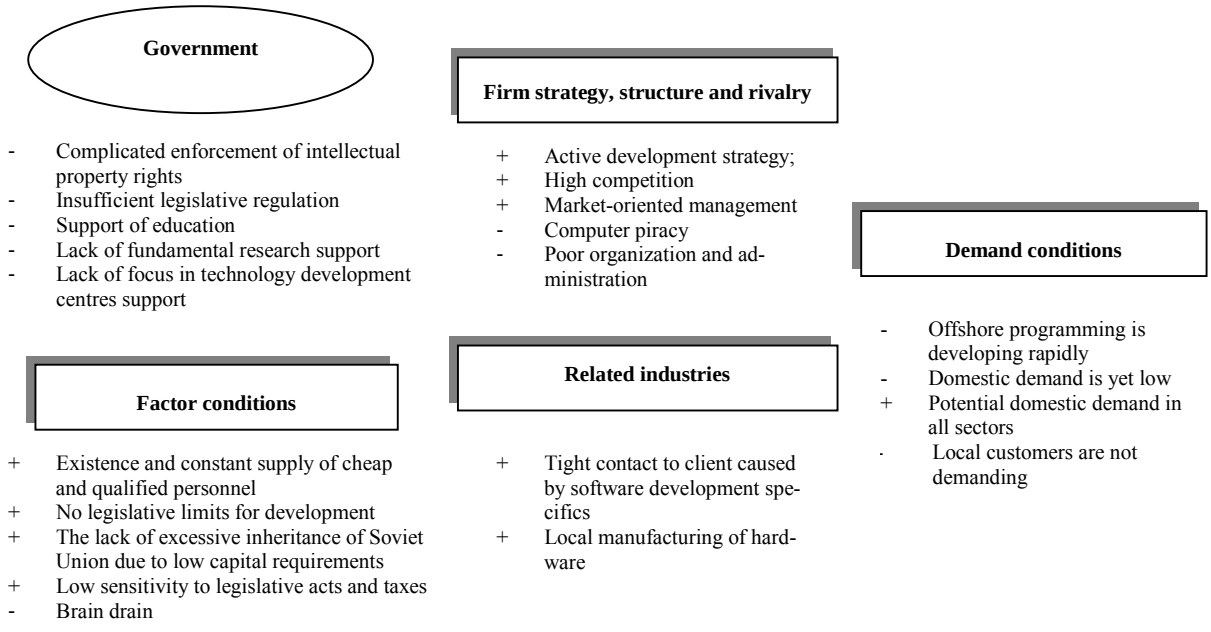
Motorola makes most remarkable evidence of the feasibility of St Petersburg based software development operations. Motorola is a leading producer of telecommunication equipment. Its operations imply significant in-house development of proprietary tailor-made software. Due to large scale of such development, Motorola seeks to establish development centres in the locations with optimal price/quality ratio. It currently operates several such centres worldwide, including China, India, Poland and St Petersburg. St Petersburg development centre was opened in 1997 with the staff of 90 programmers. Based on its performance and experience, Motorola extended this facility to what is now 200 programmers centre, developing software for the company worldwide needs.

LG Electronics established its foothold in Russia early to tap extensive Russian human resources in engineering, primarily in electronics, by employing Russian specialist for both its Korean R&D facilities, and later for specially created LG Technology Centre Moscow (LG TCM). Later it realised the significant potential of Russian programmers and created the software subsidiary of LG TCM – LG TCM Software Lab. It is remarkable that, although LG TCM is located in Moscow, LG TCM Software Lab is located in St Petersburg. Software Lab employs its own programmers, as well as cooperates with other St Petersburg based software developers.

Scala International AB is Swedish software developer with international operations, specialised in enterprise resources planning software (ERP). Scala is considered as one of the top ERP products on the market for medium to large corporations. It has a network of rep offices worldwide to sell, install and support its software, as well as to provide consulting services and localise its products to relevant legislation and language. The development of its products is mainly done in several development centres worldwide: in Sweden, USA, China, Hungary and St Petersburg.

Although there is no full information in foreign players activity in establishing software development centres in the city, estimates are that there are about 20 such companies. These include both software developers and technology companies that need in-house software development. Growing scale and number of such operations is an evidence of high efficiency of software production based in St Petersburg .

Figure 4.14 Determinants of Competitiveness in IT Sector



4.10 Transport, logistics

General description

The sector consists of companies providing transport, storage and other services related to logistics. The main competitive advantages in this sector are the geographical location and existing significant transit flow of goods.

The number of registered companies as of 01.01.99 amounted to 4053. The total employment in 1998 was on the large and medium-scaled companies 142,000. Stevedore companies of St-Petersburg handled 21,6 million tons of cargo in 1998. Average salary in the transport sector was equal to 2585 roubles(June 1999).

Location of Saint-Petersburg undermine its role in the regional transport system from the date of its foundation. 32% of the total imports and 25% of the total exports that are processed via transportation hubs of this transport corridor, are generated by industry of Saint-Petersburg and nearby regions. At present goods are delivered to more than 100 countries, including USA, Finland, Germany, New Zealand, and the Netherlands.

Developed transport infrastructure (airports, railway stations, etc.), as well as potential increase in imports and exports give a good growth prospects associated with the growth in trade, industrial output and consumption, for this cluster's development. The growth in cargo transportation during 1998-99 is a good evidence of positive trends in sector.

Table 4.13 Cargo Transportation in Saint Petersburg, million tons per km

	1999	Comparing to the year 1998, %	1998 figures comparing to the year 1997, %
Total	134087,6	108,5	95,2
including:			
railroad*	96000,7	112,4	95,1
Motor transport**	971,0	100,1	81,2
Water transport (domestic)	9700,0	91,6	91,6
Air transport	15,9	109,7	74,6
Pipelines***	27400,0	102,6	98,7

* through Oktyabrskaya railroad
** including individuals
*** "Lentransgas" and Peterburgtransnefteproduct" alltogether

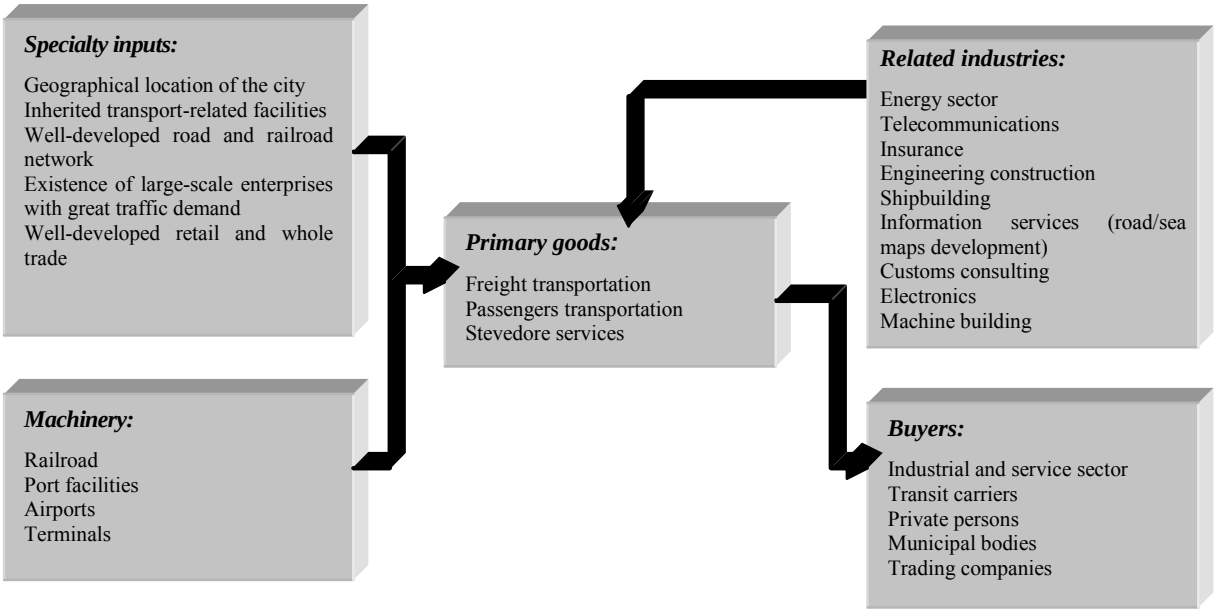
Source: Petrersbugcomstat (1999)

Cluster structure

Transport companies of Saint-Petersburg deliver goods, passengers and provide services related to loading/unloading, warehousing, sorting, packing, stevedore services. The two groups of services, transportation and stevedore services, are the key elements in cluster formation.

The cluster structure is presented below:

Figure 4.15 Preliminary Cluster Structure in Transport and Logistics



The important feature of the cluster that defines its competitiveness at the world markets is the present state and potential of Machinery block. Fully equipped transport facilities, such as railroad stations, port facilities, airports were defined as the elements of the block. Saint Petersburg based companies are also able to supply such important machinery as cranes, railroad cars etc..

Special Study 11. Saint-Petersburg Sea Port

The Sea Port of Saint-Petersburg began to function at the beginning of XVIII century. At present it is the largest transport center of North-West region. The port is capable of receiving vessels of 60,000 tons displacement, length to 260 m and draught to 11 m. Navigation period last all year long. However, in winter the vessels should have an ice protection .

There are 53 berths at the port territory and about 1mln square meters of storage facilities (105 thousand square meters are storehouse facilities). The capacity of port equipment is equal to 20 million ton-vessels a year, but it is still not used at its full capacity today. In the nearest future the port will be able to deal with 70-150 mln ton-vessels annually.

The share of Saint-Petersburg sea port in total cargo transportation amounted to 73% in 1999 or 20,567,200 tons of the total in transport volume that is 31% higher in comparison with 1998.

Table Special Study 11.1 Dynamics of the Port Turnover of Goods (including associated stevedore companies), mln tons

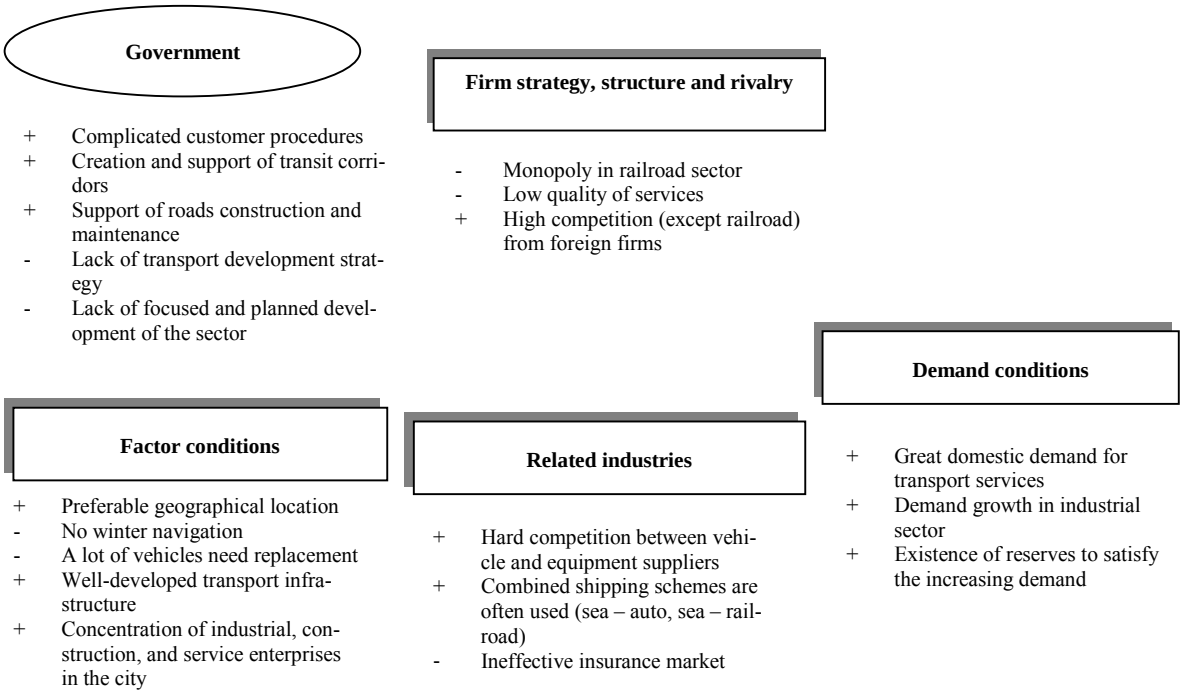
	1993	1994	1995	1996	1997	1998	1999
Pouring	0,7	1,75	2,93	2,14	5,76	4,64	4,92
General	4,03	5,01	5,53	6,13	7,8	8,35	8,1
Loading	6,39	2,97	3,4	2,97	2,8	2,63	7,53

The capacities of its terminals are the actual limitation in development of the Saint-Petersburg transport sector. There are 24 custom terminals in region and more than 60 bonded warehouses. Due to increase in turnover, the region suffers from the lack of warehouses capable of forming freights in assortment and finding attendant goods for transportation to other regions in containers.

Factors of competitiveness

The following factors of competitiveness were distinguished:

Figure 4.16 Determinants of Competitiveness in Transport and Logistics



The development of international trade, integration of Russia into the global markets, favorable geographical location and developed transport infrastructure will promote the future growth of the cluster. However, at present stage, the main barrier in utilizing advantages at full is inactivity of the government , especially in customs and facilitating measures. High custom duties in conjunction with long duration of paperwork and “red tape” slows the flows of freight. The positive interaction between local and federal governments is needed to form the unified transport policy.

4.11 Tourism

General description

Tourism and related services (hotel, catering, cultural, leisure, recreation, sports facilities) represent a strong cluster of competitiveness, which plays a significant role in St-Petersburg economy. The cluster has an excellent growth potential due to unique cultural,

historical and architectural assets of St-Petersburg attracting tourists from more than 170 countries every year. According to UN rating St-Petersburg is the eighth amongst the most attractive cities in the world. It is expected that current 6-8% of annual growth in the tourist sector could be sharply increased in the coming years through the proper positioning of the city in the target markets and development of supporting and related branches. The active support and involvement of the City authorities is a key factor for the cluster formation.

In 1998 about 1,75 million foreign citizens and 1,8 million during the 3 quarters of 1999 visited St-Petersburg. More than 500 thousand Russian and CIS citizens visited the city in 1998 as well.

Table 4.14 Dynamics of Tourist Visits to Saint-Petersburg

Year	Foreign tourists (mln.)	Russian and CIS tourists (mln)
1994	0,7	0,14
1995	0,8	0,2
1996	1,2	0,4
1997	1,9	0,5
1998	1,8	0,5
1999	2,0	0,6

There are 221 museums in the city. The largest museums (maintained by the Federal Government) are the Hermitage, Russian museum, Peterhoff, Pushkin's museum, etc. A total of 6 million people visited Saint-Petersburg museums in 1999. There are 45 exhibition halls located in the city, providing about 400 exhibitions annually, 80 theatres are available for city guests. There are 30 private night clubs and more than 1000 café and restaurants in the city.

There are about 100 tourist accommodation sites in the city (about 27000 beds). Health and holiday resorts add another 43 units (more than 13000 beds). This sector of industry directly involves about 90 thousand people.

The main income source in this sector comes from the foreign tourism. The main stream of tourists is coming from Finland, Germany, USA, Sweden, France, UK, Italy, Latvia, Lithuania, and Estonia. The most popular counteragents of city's tour operators are the following countries: Finland (28% of respondents) and Sweden (23%), then Germany and Estonia (both 13%), Denmark(11%), Latvia (5%), Lithuania (4%), Poland (3%). The most popular among Saint-Petersburg tourists are the following countries: Finland (47%), Sweden (28%), Germany (15%).

The following annual tourist exhibitions are held in the city: "Intourfest", "INWETEX C.I.S. Travel Market". Saint-Petersburg is the member of many world tourism organizations (ASTA, PATA, ICCA, FIGET, FITEC).

The government considers tourism as one of the priority sectors. However, the measures for tourism development were not efficient enough.

Cluster structure

The structure of tourism cluster is the following:

Figure 4.17 Preliminary Tourism Cluster Structure

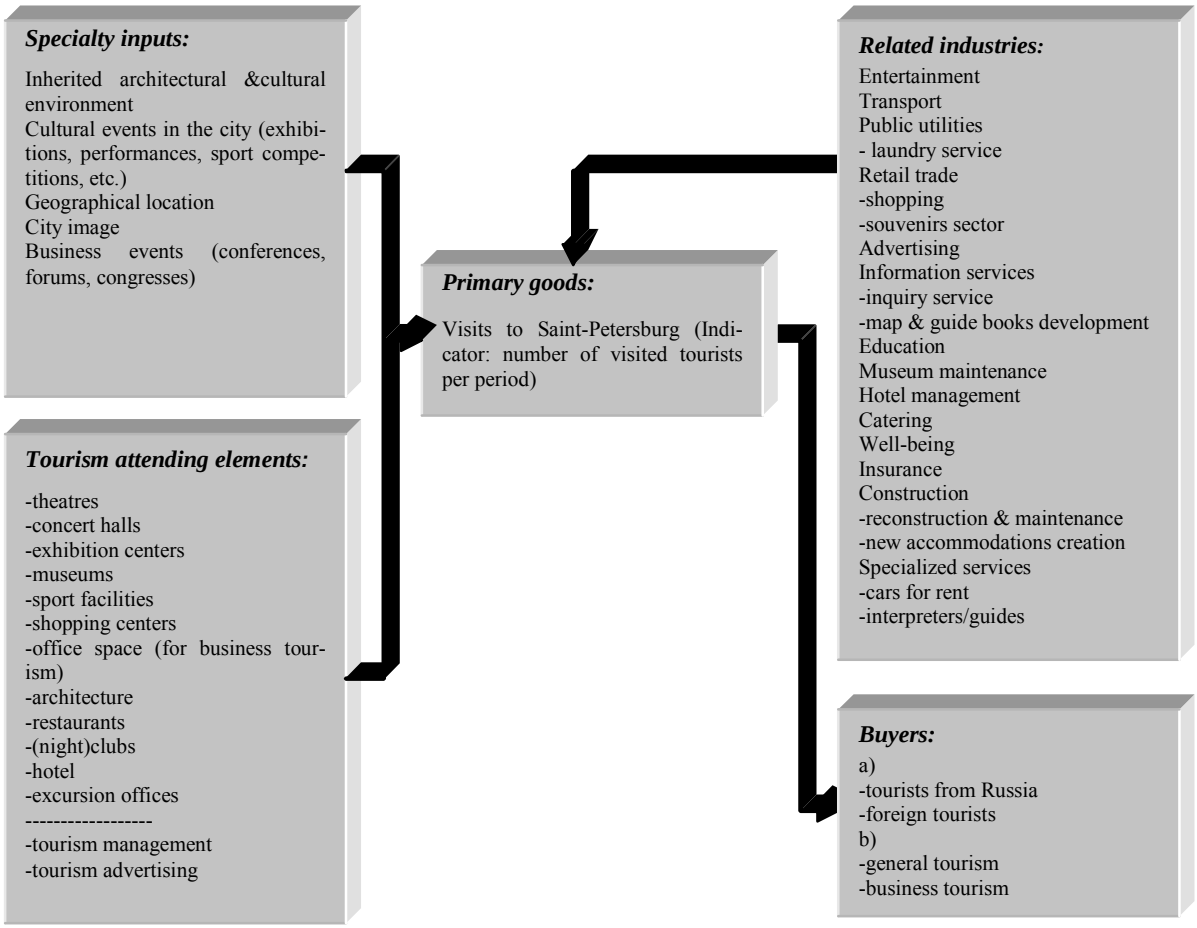


Table 4.15 Structure of the consumers, served by St-Petersburg travel agencies in 1998 according to country of origin, in %

Region of the world	Received	Sent
Total	100,0	100,0
Europe	65,6	70,4
Asia	5,5	21,7
Africa	0,3	1,8
America:	28,5	6,1
Northern and Central	27,9	6,1
Southern	0,6	0,0
Australia and Oceania	0,1	0,0

Table 4.16 Distribution of visitors in terms of travel goals in 1998, in %

	Received	Sent
Total number of visitors	100,0	100,0
Leisure, recreation, vacation	86,5	77,3
Business and professional	2,6	3,4
Health	0,0	9,1
Cruise tourism	10,9	9,7
Other goals	0,0	0,5

Source: Petrocomstat

A total of 161 enterprises is registered in St-Petersburg in the hotel activity. The 61 out of 119 are functioning and paying taxes. Three of them are 1st class hotels: "Astoria", "Sheraton Nevsky Palace" and "Grand Hotel Europe" with total number of beds of 2014. There are 27 middle class hotels in the city (*** and **** category) with total number of accommodations equal to 11920. The economy class hotels are represented by 36 objects (including * and ** category hotels and hostels).

The annual average occupancy rate for all hotels equals to 50,5 and fluctuates depending of the season from 25 to 100% (51,1%for 8 months of 1999). The month of June is the peak for hotels with occupancy up to 70,3-75,8%. Hotels of *** category and above are usually in the highest demand by the foreign tourists (77%).

Factors of competitiveness

Analysis of insufficient tourist flows to the city allows to pick out global and local problems related to a tourism industry.

Global problems:

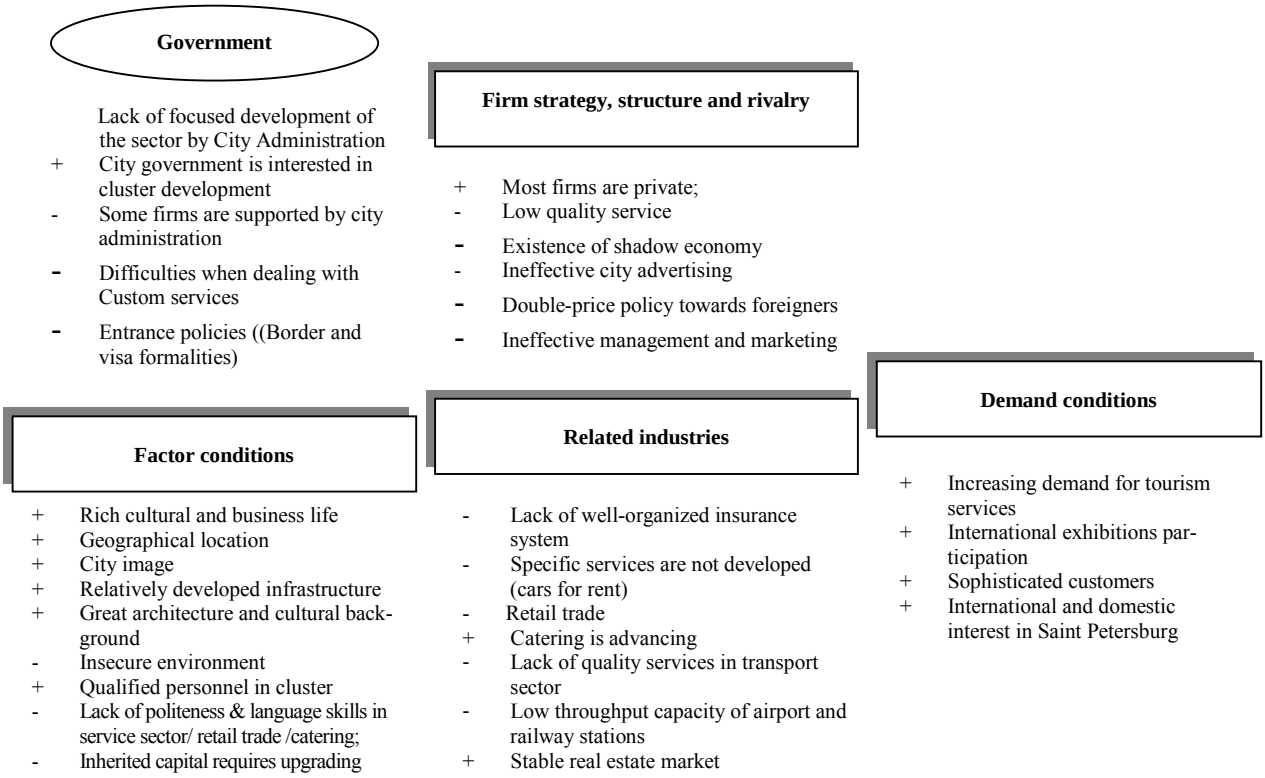
- Economical and political instability
- The lack of tourism support in Russia
- Negative information about Russia in foreign mass media
- Seasonality factor in tourism
- High level of custom duties

Local problems:

- Lack of government commitment
- Lack of appropriate legislation
- Lack of middle class hotels
- Lack of financial resources and skills to advertise of Saint-Petersburg on the world market

According to the positive and negative trends in sector development the following determinants of competitiveness were formed:

Figure 4.18 Determinants of Competitiveness in Tourism



Special Study 12. Tourist firms of Saint-Petersburg.

Number of companies in sector:

- ✓ Licensed tourist firms (as for 01.01.2000) – 1051;
- ✓ Hotels – 149;
- ✓ Sanatoriums – 82 (including 43 for children);
- ✓ Rest homes/recreation departments – 12.

All firms private .

In 1998 a local operator organized on average 369 tours involving 2055 tourists.

The largest company today is Neva Its main competitors are: Moskva-tour, Intourist-Spb, Eurotour, Prima-Travel.

The status of official tourist agents of Saint-Petersburg administration was introduced by the Governor's Resolution . At the present moment 10 firms hold such status: Saint-Petersburg board for tourism and excursions, Saint-Petersburg , Neva, Cosmos Ltd., Arthur travel , Hotel "Saint-Petersburg", Intour auto-service, City, Intourist – Saint-Petersburg, Nika.

10 largest firms by employment (as for 01.02.2000):

- ✓ «Pribaltiyskaya» hotel – 1200 .
- ✓ «Sovetskaya» hotel – 770.
- ✓ «Pulkovskaya» hotel – 721.
- ✓ «Oktyabrskaya hotel» – 572.
- ✓ «Saint-Petersburg» hotel –536.
- ✓ «White nights» pension- 385.
- ✓ «Zarya» resort – 270.
- ✓ «Saint-Petersburg board for tourism and excursions» tour operator - 127.
- ✓ «Central bureau for travels and excursions" tour operator – 54.
- ✓ "Resort agency plus" tour operator – 30.

5 FURTHER RESEARCH

There are several possible ways to continue this study. The future direction, we believe, will be based on the information and perceptions that researchers now have acquired and the social needs that will be defined by the other participants in the project. We are seeking to continue our work along the following lines of research:

Saint Petersburg in a world and Russian context

Competitive edge of Russia in world markets: We have worked with detailed export-import data of the OECD. We will produce information about Russian revealed comparative edge in world markets as a whole and in different areas (EU, North America and Asia). Preliminary results confirm our conclusion that the current comparative edge of Russia lies in its factor base (i.e., raw materials, cheap labour force and inherited production facilities). We will outline on a detailed level in which products lies St. Petersburg's comparative edge.

Future clustering and the new labour division of Russia: We will make projections of the future labour division of different areas and point out crucial factors behind the development. This information is necessary to understand more deeply also the development of Saint Petersburg. The hypotheses are that the proximity to western producers and markets, scientific and educational resources, rich culture and ability to produce end products determines the development of Saint Petersburg.

Deepening of Saint Petersburg's cluster studies

More detailed mapping of cluster relationship: Here we will concentrate on the material relationship (input-output relationship) between firms and industries within the clusters. The human capital content of clusters is another research topic, i.e., what kind of labour force do clusters need, what kind of vocational education would be optimal, and does the education of schools and universities match the needs of firms. In a similar way it is necessary to map the core technologies and their sources cluster by cluster.

Factors of Competitiveness: We now have listed the preliminary factors of competitiveness based on the experts' opinions. During the second phase of the study we will run a great number of firm leader interviews in all clusters and also among experts of universities, research institutes and among political decision makers. As a result, we should obtain a much deeper understanding of factors of competitiveness as well as projections about how they will change.

Connections to competitive Finnish clusters: Here we will analyse the overlapping areas between Finnish successful clusters and outstanding industries, research institutes and educational units of Saint Petersburg. An objective is to produce relevant information and also promote concrete co-operative contacts in order to stimulate the forming of cross-border clusters. In order to get optimal results, we have to bring together business leaders and experts from Finnish clusters and their counter partners from Saint Petersburg to work for the project.

Develop industrial policy targets and tools

Develop targets and tools for federal and local industrial policy makers to promote regional clusters: For Russian project financers, the ultimate results are of course strategic

material for industrial policy. This includes visions about further development, i.e., the competitive clustering of industries, factors of competitiveness and, finally, the tools needed to hasten the development. An analysis of the interrelation of the government (input-output) and corporate sector in transition, including a qualitative model that will help to track the patterns of industrial and competitiveness development from the political decision making perspective, will be carried out. It is important to notice here that the possible selection of tools is much wider in Russia than in western countries, but so is the range of outcomes (positive and negative). A lot of new thinking is needed. There is, for example, a need to get good guidelines (principles) on how to utilise further privatisation potential or how to optimally outsource public functions (like energy and water utilities and transportation). The same also applies to foreign direct investment. What investments are needed for effective cluster building and what are the most effective ways to attract this investment?

In a positive case, the project we are now carrying out could be a valuable feasibility study for Russia in its transition towards a market economy. Similar cluster studies are needed for other regions, too, to understand their clustering development. In all regions it is possible to run dual federal and local industrial polices to promote development.

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