Department of Forest Products

The Russian birch plywood industry – Production, market and future prospects

Den ryska björkplywoodindustrin – Produktion, marknad och framtida utsikter

Ekaterina Terzieva

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Master Thesis, 30 ECTS credits, D-level in Business Administration
Ekaterina Terzieva, MSc in Forestry, 04/08

Supervisor SLU: Lars Lönnstedt
Supervisor IKEA: Ulf Johansson

Foreword

The master thesis was written at the Swedish University of Agricultural Sciences, Department of Forest Products. The thesis work was conducted for IKEA of Sweden, Älmhult.

My interest for the Russian forest industry arose during a study trip to Russia, where my class visited several interesting forest companies. When it was time to select a thesis subject, I wanted to carry out a market analysis of the Russian market for wood products. Besides that, I wanted to make use of my Russian language skills. I contacted IKEA and received the challenging task to investigate the birch plywood industry in Russia. I am inspired by IKEA and as Ingvar Kamprad once said: *"Most things still remain to be done. A glorious future!"*

I would like to give my special thanks to my supervisors – Lars Lönnstedt at the Department of Forest Products and Ulf Johansson at IKEA of Sweden. I thank Lars Lönnstedt for his advice, comments and support. I am very grateful for being given the opportunity and trust to conduct this study on behalf of IKEA. During the market research I got the chance to deepen my knowledge about the Russian birch plywood industry and meet interesting people. I have learned a lot and hope that my findings have provided a useful insight into the Russian birch plywood market. In particular, I would like to thank Ulf Johansson for his confidence and for giving me this great opportunity.

I would like to thank Börje Jalgerius for providing me with useful information about the Russian plywood industry and for giving me many valuable contacts in Russia and Sweden.

I would like to express my gratitude to all the participants in this study for their time and effort, providing me with useful information and contributing with important opinions. I thank all the involved people at IKEA in Moscow for their hospitality and input.

Last, but not least, I would like to show appreciation to my parents for their support and encouragement, my boyfriend for his understanding and belief in me and my best friend who is always there for me.

Once again, *bol'shoe spasibo!*

Ekaterina Terzieva
Uppsala, May 2008

Abstract

It is expected that the Russian birch plywood capacity will increase in the near future. Thus, there is a strong competition for the birch raw material in Russia. The questions that arise and are clarified in the thesis are as follows:

- Which birch plywood producing companies are the current market leaders in Russia?
- How will the supply of plywood logs (raw material) develop in the future?
- How competitive are the other materials that can substitute plywood, e.g., OSB and what will be the dominating material on the Russian market in the next 10 years?
- What potential does the birch plywood industry have in Russia and what are the main future opportunities and threats?

The objective of the thesis is to carry out a market research of the current and possible future birch plywood capacity in Russia. The purpose is to analyze the business situation for both birch plywood producers and consumers.

Empirical data was collected using a qualitative research method, involving personal interviews. The participants in the study are Russian birch plywood producers (accounting for approximately 40% of the total production volume) and consumers in both Russia and Sweden. The scope of the thesis is to investigate the entire Russian birch plywood industry.

The results show that the there is a strong domestic demand in Russia for birch plywood. The plywood industry will continue to expand and new market entrants will establish by means of specialization and customized production. The production of large-sized birch plywood is increasing and will be demanded by the growing construction industry. The raw material supply has improved due to the implementation of higher export taxes. However, insufficient infrastructure remains a problem. The main threat in the future is OSB, which will substitute low quality birch plywood. It is expected that OSB production facilities will establish in Russia in the next 2-5 years. The price for Russian plywood is expected to increase and Swedish consumers are forced to revise their strategies by considering cheaper substitutes or new plywood suppliers in other countries.

Keywords: *Birch plywood, forestry, IKEA, market, OSB, production, Russia, wood-based panels*

Sammanfattning

Det förväntas att den ryska björkplywood kapaciteten kommer att öka inom en snar framtid. Det innebär att det finns en stark konkurrens om björkråvaran i Ryssland. Frågor som uppstår och förtydligas i examensarbetet är följande:

- Vilka björkplywood producenter är de nuvarande marknadsledarna i Ryssland?
- Hur kommer tillgången av plywoodstockar (råvara) att utvecklas i framtiden?
- Hur konkurrenskraftiga är andra material som kan ersätta plywood, till exempel OSB och vad kommer att vara det dominerande materialet på den ryska marknaden de närmaste 10 åren?
- Vilken framtida potential har björkplywoodindustrin i Ryssland och vilka är de huvudsakliga möjligheterna och hoten?

Syftet med examensarbetet är att genomföra en marknadsanalys av den nuvarande och möjliga framtida björkplywood kapaciteten i Ryssland. Syftet är att analysera affärssituationen för både björkplywood producenter och konsumenter.

Empirisk data samlades in med hjälp av en kvalitativ forskningsmetod som omfattade personliga intervjuer. Deltagarna i studien är ryska björkplywood producenter (som står för cirka 40% av den totala produktionsvolymen) och konsumenter i både Ryssland och Sverige. Arbetets omfattning är att undersöka hela den ryska björkplywoodindustrin.

Resultaten visar att det finns en stark inhemsk efterfrågan i Ryssland för björkplywood. Plywoodindustrin kommer att fortsätta att expandera och nya marknadsaktörer kommer att etableras genom specialisering och anpassad produktion. Produktionen av stora björkplywood dimensioner ökar och kommer att efterfrågas av den växande byggnadsindustrin. Råvarutillgången har förbättrats till följd av implementeringen av högre exporttullar. Däremot är otillräcklig infrastruktur fortfarande ett problem. Det främsta hotet i framtiden är OSB, som kommer att ersätta björkplywood av låg kvalitet. Det förväntas att produktionsanläggningar för OSB kommer att etableras i Ryssland inom de närmaste 2-5 åren. Priset för rysk björkplywood förväntas öka och svenska konsumenter är tvingade att se över sina strategier genom att överväga billigare substitut eller nya plywoodleverantörer i andra länder.

Nyckelord: *Björkplywood, IKEA, marknad, OSB, produktion, Ryssland, skog, träbaserade skivor*

Table of contents

1. Introduction

1.1 Background

IKEA has the ambition to refine large volumes of birch raw material and build several factories for birch components in Russia. The company's main competitor for the birch raw material is the Russian plywood industry and it is expected that the birch plywood capacity will increase in the near future. Thus, there is an interest to investigate the Russian plywood industry and study the current and future development. In order to provide the reader with a broad overview of the plywood industry, it is necessary to analyze the business situation from different perspectives. In this study, focus is laid on birch plywood producers, but also birch plywood consumers are considered. It is important to analyze the present producer-consumer business situation in order to predict the future trends.

The most common wood species used for plywood production in Russia is birch that belongs to the group of *hardwoods*. The volume of softwood plywood in Russia is negligible. In the next chapter the author presents the Russian forest and plywood industry.

1.2 Research questions

The questions that arise and have to be clarified in the thesis are as follows:

- Which plywood producing companies are the current market leaders in Russia (assessing the business situation)?

- How will the supply of birch saw logs/plywood logs develop in the future (time series of approximately 10 years)?

- How competitive are the other materials that can substitute plywood, e.g. OSB and what will be the dominating material on the Russian market in the next 10 years? How will this affect the Russian plywood industry?

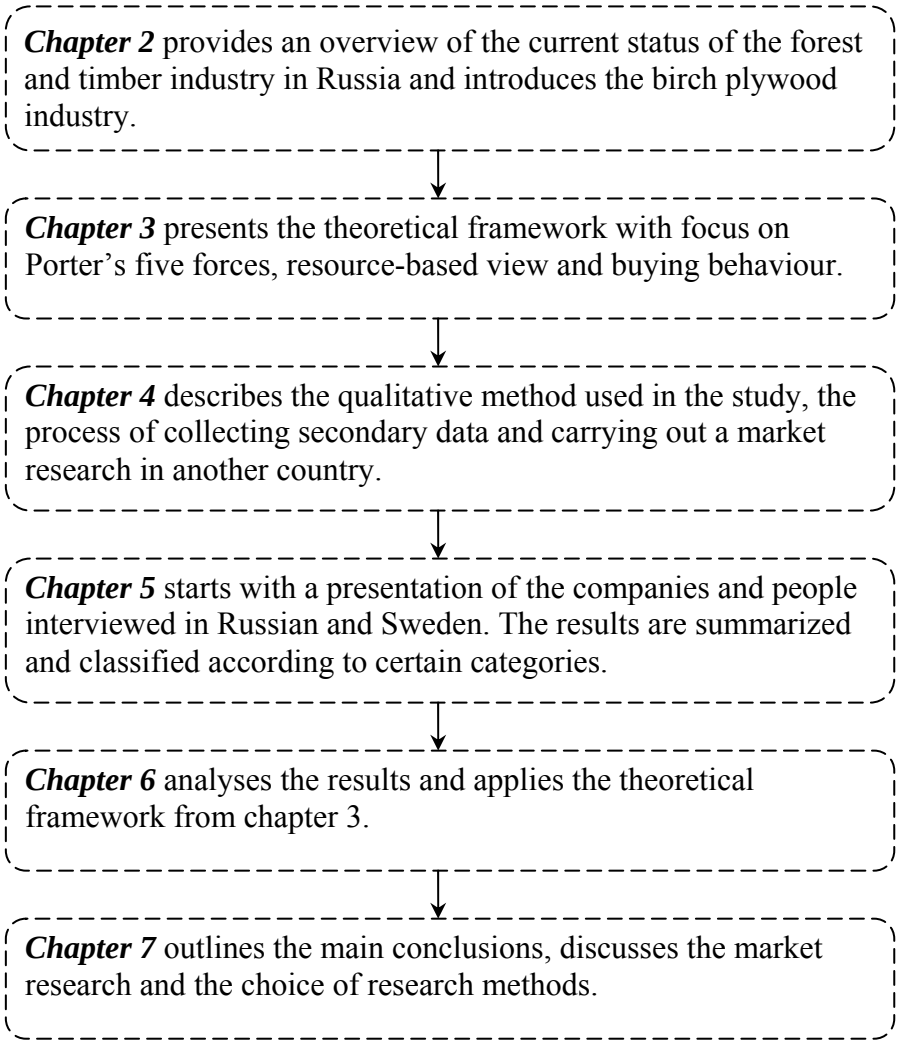
- What potential does the birch plywood industry have in Russia? What are the main future opportunities and threats?

1.3 Objectives and constraints

The objective of the master thesis is to carry out a market research of the current and possible future birch plywood capacity in Russia. More specifically, the aim of the thesis is to investigate the dynamics of birch plywood production, describe the development of the plywood industry, examine the future supply of birch raw material and analyze the business situation for producers and consumers of birch plywood. Another aim of the thesis is to reveal the main future threats and opportunities within the Russia birch plywood industry.

The study comprises the ***entire*** Russian birch plywood market in terms of production, consumption and export. The import of plywood is negligible. The thesis puts emphasis on the Russian birch plywood production and analyses the buying behaviour of birch plywood consumers in Russia and Sweden.

1.4 Thesis disposition



2. Current status of the forest and plywood industry in Russia

This chapter gives the reader a broad overview of the Russian forest and timber industry. The chapter introduces the historical plywood production and presents the current development of the plywood market.

2.1 Russia's forest resources

The Russian forest constitutes approximately one quarter (22%) of the world forest. As seen in Figure 1, birch is the most widespread deciduous species, occupying 13% of the forested area in Russia (Russian Forestry Review, 2007). The total forest land area in the Russian Federation is 882 million ha. The total average annual increment is 970.4 million m^3, with an allowable annual cut of 551.0 million m^3 (www, FAO, nr 1, 2008). Despite the large volumes of forest resources, the average level of forest utilization in Russia remains low. In the past few years, approximately one quarter of the annual increment has been harvested. As a result, this situation has created an imbalance of the forests' age structure, where over half of the forests are classed as mature or over-mature, i.e. older than 80 years (www, UPM-Kymmene, nr 1, 2008).

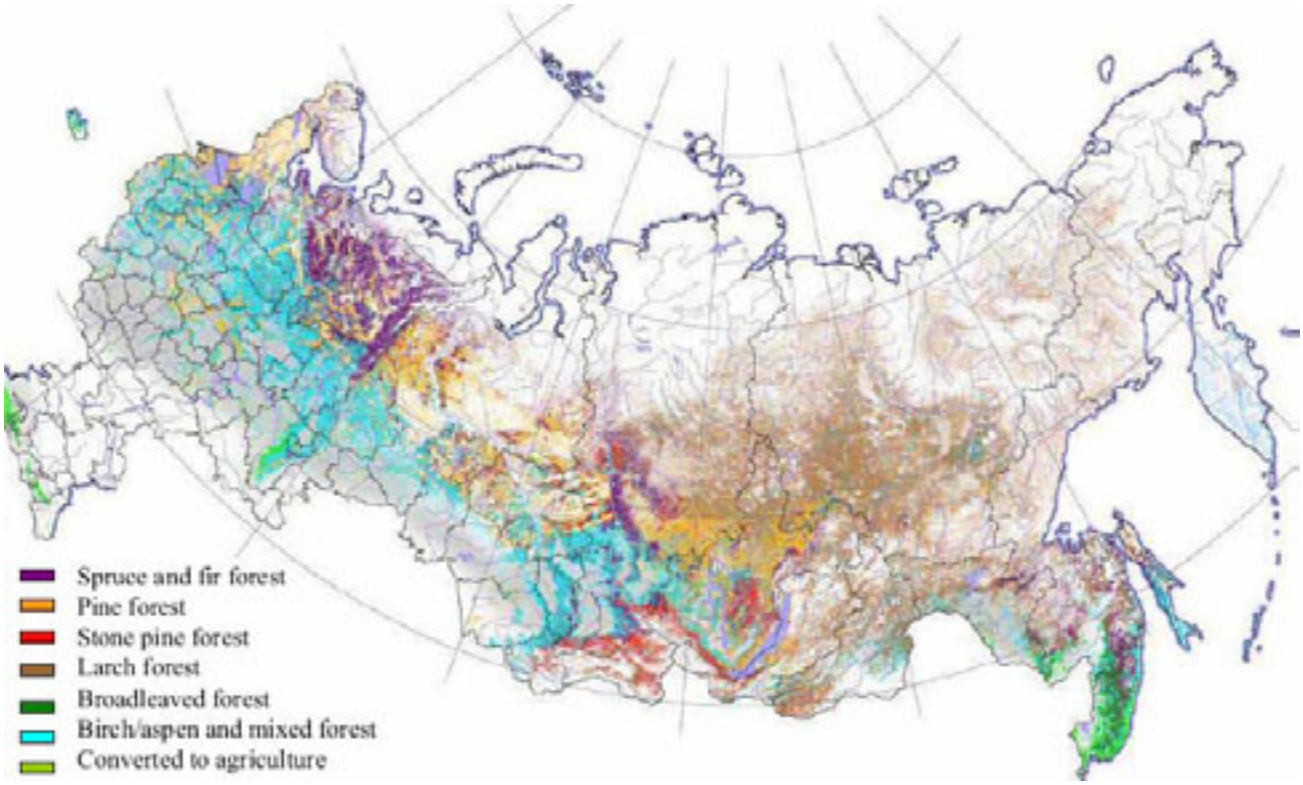


Fig. 1. Forest map of Russia illustrating the allocation of wood species. The light blue shade illustrates the birch/aspen resources, mainly found in the European part of Russia (Nilsson, S., 2006).

As a result of Russia's unique forest resources, timber, pulp, paper and wood processing industries have developed. These industries play a significant role not only domestically, but are of importance to the neighbouring countries and in the European and global trade of wood products (www, FAO, nr 2, 2008).

Russia is one of the world's largest producers and exporters of industrial roundwood. The forest industry is almost completely privatized, while the majority of forests remain state-owned. Many rural communities depend on forestry as a part of their livelihood (www, UPM-Kymmene, nr 1, 2008).

2.2 Brief historical review

> *"The forest sector of the Russian Federation is characterized by its huge potential: huge natural recourses, unique biodiversity, skilled workers and close access to the Western and Asian markets. The sector could play a remarkable role for Russia during the transition period, as the recourse-based sectors can contribute significantly to overall economic development."*
>
> Brigita Schmögnerová
> UN Economic Commission for Europe

A report by the United Nations, presents the dynamic development of the Russian forest sector over the last decade. After many years of economic and social dislocation as a result of the collapse of the Russian planned economy, the country is gradually establishing a functioning market economy (Schmögnerová, 2003). The forest sector contributes to the recovery of the economy. Despite the large forest recourses, Russia needs to improve and optimize the structure of the forest industry production by increasing the volumes of *highly processed wood products*. Compared to other countries, Russia has still low per capita consumption of sawnwood, plywood, particleboard, fibreboard and paper.

The Russian forest sector consists of forestry, logging, sawmilling, plywood, panel, furniture, pulp and paper industries (*Op. cit*.). Although the forest sector is a stable exporter, all sectors have potential for further development. Currently, 97% of the enterprises in the forest industry are privatized or converted into joint-stock companies. Management of forest enterprises at federal and regional level is abolished, external trade of forest products is liberalized and the domestic market is characterized by free prices. The majority of companies involved in the forest sector lease forest land.

Russia's economic situation is characterized by two periods: 1980-1990, *pre-reform period* of centrally planned economy and 1990-2000, *transition period* towards market economy (*Op. cit.*). During the pre-reform period, Russia was one of the leading countries in the production of sawnwood and wood-based panels as well as pulp and paper. Enterprises in the forest industry gained state support for modernization of facilities and the building of new enterprises. The demand for forest and paper products was strong and the Russia Federation supplied large volumes of products to other union republics. Strategically, logging and wood-processing enterprises were established in Siberia and the Far East in order to further develop the forest industry. However, at the end of the pre-reform decade, a decline in production took place and Russia did not manage to achieve a competitive level in the production of particularly particleboard and fibreboard. During the transition period, the following changes took place in the forest industry: reduced production, large number of insolvent enterprises, reduced domestic consumption of basic products, no investments and construction of new

production facilities, low technical level, reduced labour productivity and deterioration in the social infrastructure of forest settlements. During the transition period, plywood production was reduced by 33%. However, the economic crisis, forced the government to change the budget and monetary system, tax, credit and tariff policy. Thus, the economic and financial situation in Russia began to improve and the production of plywood, fibreboard, particleboard and paper began to grow steadily.

The European part of Russia accounts for 70% of the total consumption of forest products (Op. cit.). The technical progress contributes to expanding wood utilization. The consumption of unprocessed roundwood is decreasing while the consumption of value-added products is increasing.

2.3 Russian forest industry during the transition period

In 1992, radical economic reforms took place in the Russian Federation and the transition towards a market economy resulted in the disintegration of the USSR (Lipman, 1994). The formation of independent states created restrictions in the free transfer of goods and capital outside their boundaries. What before was a unified economic system, was now changed and individual enterprises belonged to different states. The reformation, also strongly affected the Russian forest industry – inflation reduced the economic activity, the prices of goods rose and centralized investment within the industry were practically at a standstill. Thus, the manufacturing of basic products declined. Lipman (1994) used the term "*shock therapy policies*" for establishment of a free market economy. According to Lipman, a major problem was the "lack of adequate regulations aimed at stimulating industrial development and protecting the interests of enterprises investing capital in expansion, new technologies and modernization". This resulted in gradual decrease in new logging and wood processing facilities. In the beginning of 1991, 50% of the already existing production facilities were in urgent need of renewal. The entire forest industry became technically underdeveloped.

Lipman (1994) claimed that in order to overcome an economical crisis, it is necessary to create new business forms with regard to the changed market conditions. The privatization of state-owned enterprises was an example of such policy. At the end of 1993, 1796 enterprises were state-owned, which was half of all the enterprises in the timber sector, contributing to 60.5% of the production. Privatization mainly took place in furniture manufacturing and wood-processing sectors, creating independent economic units. Companies were sold off and converted into joint-stock ventures.

A need emerged to coordinate the different sectors of the Russian timber industry and protect their interests (Lipman, 1994). Therefore, a federal program was developed aiming at stabilizing and expanding the production. In order to achieve these goals, the timber industry relied on cooperation with firms from Finland, Sweden and other countries with better developed forest industries. It became also necessary to encourage new investments in Russia.

2.4 The new Russian Forest Code

A new Russian Forest Code was introduced on the 1st of January, 2007 based on the former Forest Code from 1997 (www, Taigarescue, nr 1, 2008). All forest areas in Russia are enclosed by the Forest Code. The main purpose of the Forest Code is to provide extensive and detailed descriptions on how to manage and protect the forests (www, UPM-Kymmene, nr 1, 2008). Figure 2 below shows the major differences between the former and the current Forest Code. Currently, there is no overall strategy for the future development of the forest sector. One of the major problems is the governance of the sector (FAO Advisory Committee on

Paper and Wood Products, 2006). "There is no transparency in the real ownership of the forest industry and there is a lack of institutions for a sustainable development of the sector."

Since the 1930's, forest management in Russia was controlled by so called "*leshozes*", which are "enterprises owned and managed by the State to function at the lowest level of the sector's management and administration" (Schmögnerová, 2003). These are also referred to as forest management units. The relation between the *leshoz* and the forest land user was determined through long-term (forest lease) and short-term (auction) agreements.

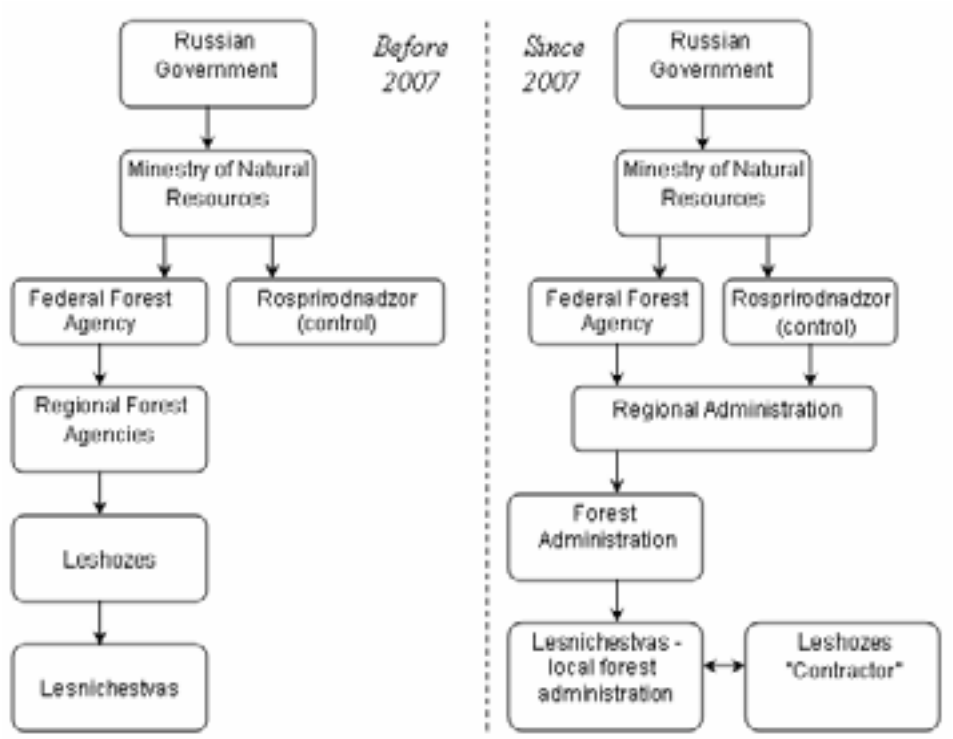


Fig. 2. Comparison between the former and the new Russian Forest Code (www, UNECE, nr 2, 2007). Modified by Terzieva, E., 2008.

To reflect the social and economic situation in Russia, it was necessary to develop a new Forest Code (www, WWF, nr 1, 2008). According to Prozorova (2007), "the adaption of the new Forest Code was an important milestone". Examples of a number of the major changes in the new Forest Code are presented below (www, Russian Forest News, nr 1, 2008):

- Forest management will be formally *decentralized*. However, the majority of the forests will be State owned. Laws and regulation will be created at a federal level.
- The former leasing period of 99 years, will be reduced to 49 years.
- It will be possible for privately owned forests to become a part of the Forest Fund (the Forest Fund comprises 95% of Russia's forests and woodlands (Russian Forestry Review, 2007)).
- Forest will be classified according to three categories: *protective*, *exploitation* and *reserve*.
- The forest management units "*leshozes*" will change name to "*lesnichestva*".
- It will no longer be required to gain a formal permission to use the forest.

2.5 Export tax on logs from Russia

On the 5th of February 2007, the Russian government announced that the export tax on logs will gradually increase over the next two years (Roberts *et. al*., 2007). The main reason is to encourage domestic wood-processing. The tax on export logs rose from 6.5% to 20% in July 2007, 25% in April 2008 and will increase to 80% in January 2009. Russia plays a significant role on the global log market and is the largest exporter of softwood and hardwood logs. The country supplies approximately 40% of the world's export of softwood logs, which is the main trade flow. Over 80% of the logs imported to Finland and China come from Russia. Roberts *et. al.* (2007), suggests that increased tax on logs will create a structural change in the global market for logs and "*shift the perception of wood being relatively abundant to relatively scarce.*" There are variations in the magnitude of the tax change, depending on the wood species and log size. It is expected that the Russian export tax will be the world's highest by year 2009 (Prozorova, 2007). The new export tax rates on softwood logs are as followed:

- July 1, 2007: 20%, but not less than 10 €/m^3
- April 1, 2008: 25%, but not less than 15 €/m^3
- January 1, 2009: 80%, but not less than 50 €/m^3

The Russian log exports have increased more than 2.5 times over the past 10 years (Roberts *et. al*., 2007). On the 6th of April 2006, President Putin pointed out that large volumes of unprocessed wood is exported to neighbour countries, which in turn earn billions of dollars on Russia's forests. President Putin claimed that few actions are taken to develop the domestic wood-processing industry despite the large forest resources. The authors argue that increasing log taxes indicate that "Russia is becoming more aggressive in asserting control over its natural resources." There are two important issues to point out. First, since only a small share of Russia's harvest is processed domestically, products are value-added by actors outside of Russia. Second, the Russian government claims that the harvest could be increased by roughly 90% in economically accessible zones, which is illustrated in Figure 3.

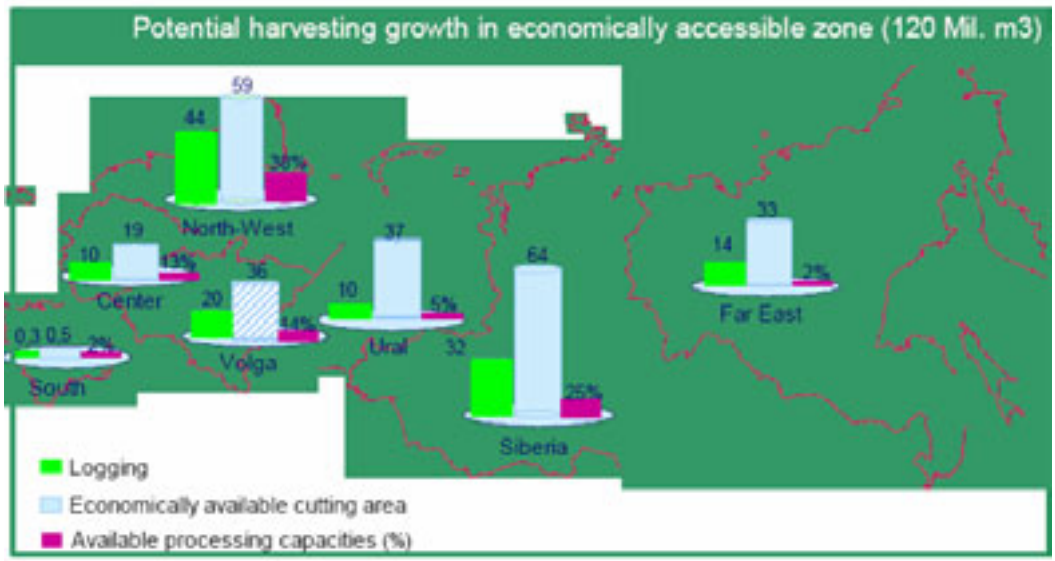


Fig. 3. Disproportion of harvesting volumes and timber processing capacities in Russia (Roberts, D. et. al., 2007).

The article suggests that, optimistically, it will take 5-7 years before a "potential increase in the export of processed products from Russia could fill the vacuum created by the reduction in log exports" (*Op. cit*.). A positive impact of the export tax is that it might result in a lower level of illegal logging within Russia.

It is suggested that the increasing log taxes will have an important economic impact on the global log market (*Op. cit.*). An example is an increase of the global prices of logs and commodities such as plywood, lumber and pulp (where logs stand for the largest proportion of variable costs). It is also expected that the domestic prices of logs will decrease due to lower export rates. The authors of the article argue that *plywood prices* will most likely benefit from export tax shock. The main reasons are:

- Logs stand for 65% of the variable cost of plywood.
- China, being the largest producer of plywood in the world, relies on Russia for peeler logs.
- In recent years, Japanese, South Korean and Scandinavian plywood producers have become more dependent on Russian peeler logs.

"The dramatically higher log exports taxes will help subsidize the domestic Russian processing industries through reduction in the cost fibre. The biggest beneficiary within Russia will likely be the *plywood industry*, which has already experienced meaningful growth in recent years" (*Op. cit.*).

An article from *Dagens Industri* (nr 75, 2008) reveals that the forest industries in Sweden, Finland and Germany import approximately 20 million m^3 timber and pulp timber from Russia. The export taxes will result in increased prices of raw material in the Nordic countries. Furthermore, the increased taxes will prevent the flow of raw material from Russia. Thus, raw material must be purchased from other places. A future scenario predicts that the Swedish pulp and paper industry will dramatically decrease the import of raw material from Russia. The reason is not solely an increase of the export taxes. Another contributing factor is the *insecurity* of raw material supply from Russia. Since the pulp and paper industry in Sweden is highly dependent on a continuous flow of raw material, there will be a constant search for secure raw material deliveries.

2.6 The Russian timber industry

The Russian timber industry has not developed rapidly in comparison to other sectors with dynamic growth (Russian Forestry Review, 2007). As illustrated in Figure 4, the output of the timber sector in 2005-2006 was strictly dependent on the activities of the major pulp and paper mills, wood-processing companies and the policies they implemented for modernizing their businesses. The introduction of new facilities for production of wood-based panels, cardboard, large-format plywood, newsprint and wallpaper resulted in growth. Russia falls behind a number of countries (USA, Canada, Finland and Sweden) in timber production figures as a consequence of inefficient management of forest resources. Russia's share of the world volume of timber production does not match the raw material potential of the country. The greatest growth rates in Russia are observed in the production of plywood, chipboard, cardboard and furniture where the average annual rate of growth is 10%.

Fig. 4. Distribution of Russian timber industry production in 2005 (Russia's Timber Industry – An Area of Uncertainty, Antanta Capital Investment Bank).

Despite the fact that Russia holds one quarter of the world's timber resources, the lack of road infrastructure inhibits adequate timber production (Prozorova, 2007). The country has 1.2 km of timber-carrying roads per 1.000 hectares. *Undeveloped infrastructure* aggravates the construction of new facilities and the transport of products (Roberts *et. al*., 2007). However, there is an announcement that the Federal government intends to invest approximately $200 million in infrastructure support for timber projects, which mainly will involve road construction.

The production of value-added goods corresponds to 20%, compared to 85% in the developed countries (Prozorova, 2007). Russia is still one of the world's lowest-cost countries and compared to Finland, Sweden and Germany, the costs for raw material, power and labour are very competitive. However, there are problems with labour availability and the biggest challenge is to attract people who can run modern processing complexes in the forest industry (Roberts *et. al.*, 2007). The Russian government has set a goal to build large production facilities in forested regions of Siberia and the Far East. Russia is witnessing a boom in housing construction and wood is a principal component in residential buildings (Prozorova, 2007).

During 2006 there was an increased production of value-added products (*Op. cit.*). Chipboard production grew by 16.9%, plywood by 1.7% and wood construction components by 14.1%. The foreign demand increased as well and exports of saw timber, plywood and lumber rose. Higher household incomes and development of the furniture and construction sectors are examples of key growth factors in the wood-processing industry. It is expected that glued structures (including plywood), OSB and wood granules will become the most attractive wood-processing investments over the next few years. The reason why wood-processing has increased in interest among investors compared to other timber sub-sectors, is because it does not require large investments and pay off occurs faster in comparison to pulp and paper. The domestic demand of certain wood-processed products exceeds the supply.

The export of roundwood will decrease, while the domestic consumption will grow (www, UNECE, nr 1, 2008). However, there will be an increased production, domestic consumption and export of *sawnwood*. This is due to the implementation of the new Forest Code, abolition of custom duties on exported sawnwood of all species, increased taxes on exported roundwood and development of wooden house construction in Russia.

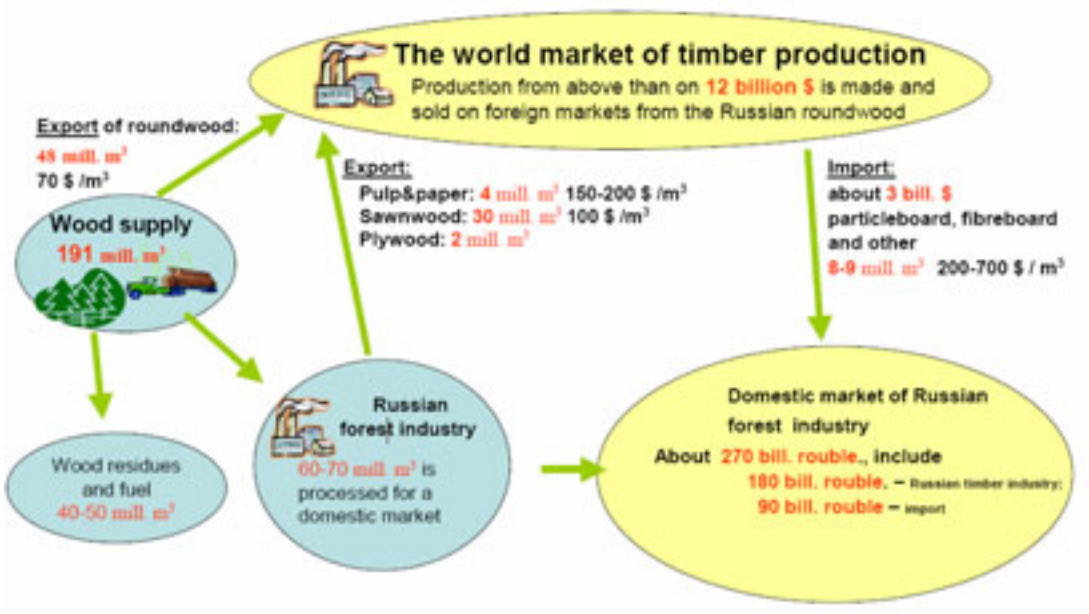


Fig. 5. Illustration of material and financial flows within timber production in Russia, year 2007 (www, UNECE, nr 2, 2007).

As illustrated in Figure 5, the Russian forest sector has a strong future potential and opportunities (Killman & Whiteman, 2006). Currently, the forest sector focuses mainly on roundwood and sawnwood production, with a low degree of processed, value-added products such as wood based panels, pulp and paper. A large share of the production is exported, a common trend for countries with large forest areas. Europe and Asia are the main importers. Although export of forest products will play a significant role even in the future, the continued growth will mainly depend on an *increased domestic demand* for industrial roundwood and forest products. The forest sector in Russia accounts for approximately 0.8% of the Gross Domestic Product (GDP), which is relatively low. Oil and gas production are the major contributors to the GDP. Sawlogs and veneer logs account for almost two thirds of the industrial roundwood consumed in Russia. Policies and institutions have a great impact on the investment climate and business cost in Russia.

2.7 SWOT analysis of Russia's timber industry

In a report by Katarina Prozorova (2007), a SWOT analysis of the Russian timber industry is presented. Here follows a summary of her analysis:

Strengths

- The new Forest Code will create a clearer regulatory environment.
- The forest industry will be stimulated by active government participation.
- Reduced investment risk due to changes in the export structure, tax incentives that stimulate modernization, strong domestic growth, changes in export tax and encouragement in the production of high-quality products.
- Infrastructure improvements.
- Joint venture between Ilim Pulp (Russia's largest pulp and paper company) and International Paper.
- Increasing consolidations in the timber industry.

- Large market players (Gazprom, Evrazholding, Vostok Nafta etc.) plan to invest in new pulp and paper mills in Ural, Irkutsk region, Trans Baikal and the Far East.
- Active implementation of international standards and certifications.

Weaknesses

- Commodity dominated exports.
- Poor business transparency.
- Slow transition to IFRS[1].
- "Critical depletion of easily accessible timber resources coupled with poor accessibility of remote area, as well as seasonality.
- "Underdeveloped power and transport infrastructure in forested areas and uneven distribution of company units".
- "Low level of technical knowledge and outdated equipment in production facilities, which work at as much as 90% of capacity".
- New pulp and paper mills are capital intensive, require significant investment ($1-2 bn), take long time to build (up to eight years) and even longer to reach break even (up to 15 years).
- Few public companies.

Opportunities

- National metal and steel companies show interest in timber assets.
- Large-scale portfolio investment and IPO's[2] by its largest players.

Threats

- Increasing energy prices to meet WTO conditions.
- Producers will struggle to keep costs down and maintain competitive positions.
- Intensifying domestic competition
- Deteriorated demographic and social situation in some Russian regions.

2.8 Export of forest products

One of the most important economic activities in the Russian Federation is the export of forest products (Schmögnerová, 2003). During the pre-reform period, forest products such as roundwood, sawnwood, wood-based panels, pulp and paper were exported through the state owned all-Union association *Exportles*. The trade association *Exportles* had many trade agencies located in countries such as Finland, Sweden, Japan, Italy, Great Britain, France and Germany. However, during the transition period, the monopoly of *Exportles* was eliminated. Currently, thousands of enterprises within the Russian forest industry are occupied with trade on the global market.

[1] IFRS - **International Financial Reporting Standards (IFRS)** are standards and interpretations adopted by the International Accounting Standards Board (IASB). Source: Wikipedia

[2] IPO - **Initial public offering**, also referred to simply as a "public offering," is the first sale of stock by a private company to the public. IPOs are often issued by smaller, younger companies seeking capital to expand, but can also be done by large privately-owned companies looking to become publicly traded. Source: Wikipedia

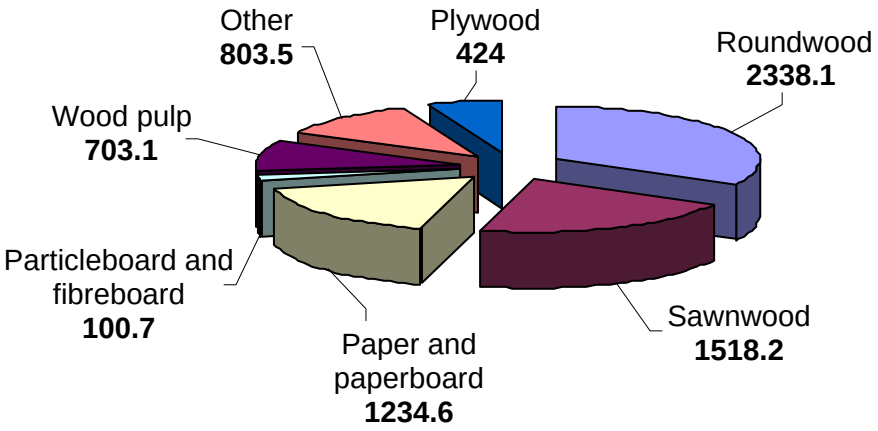


Fig. 6. Pie chart illustrating the proportion of forest products exported in million US Dollars, year 2007 (www, UNECE, nr 2, 2007).

During the pre-reform period, large share of the forest products were exported to the former Union Republics. In year 2000, the export to the Union Republics fell sharply and simultaneously countries in Europe, Asia, Africa and North America accounted for the growth of exports. According to the pie chart above, the export of roundwood accounts for the largest earnings. The Russian industrial roundwood creates a share of raw material balance in China of 17%, Japan 21%, Korea 16% and Finland 22% (www, UNECE, nr 2, 2007).

It is important to point out that, *sawlogs and veneer logs account for approximately two-thirds of the industrial roundwood consumed in Russia* (Killmann & Whiteman, 2006). It is expected that by year 2020, sawlogs and pulpwood will account for half of the total industrial roundwood consumption. As illustrated in Figure 7, the demand for industrial roundwood will probably grow three times the current level by year 2020. Despite this increase, the level of production will still remain below the level of growth in volume of the forest resources.

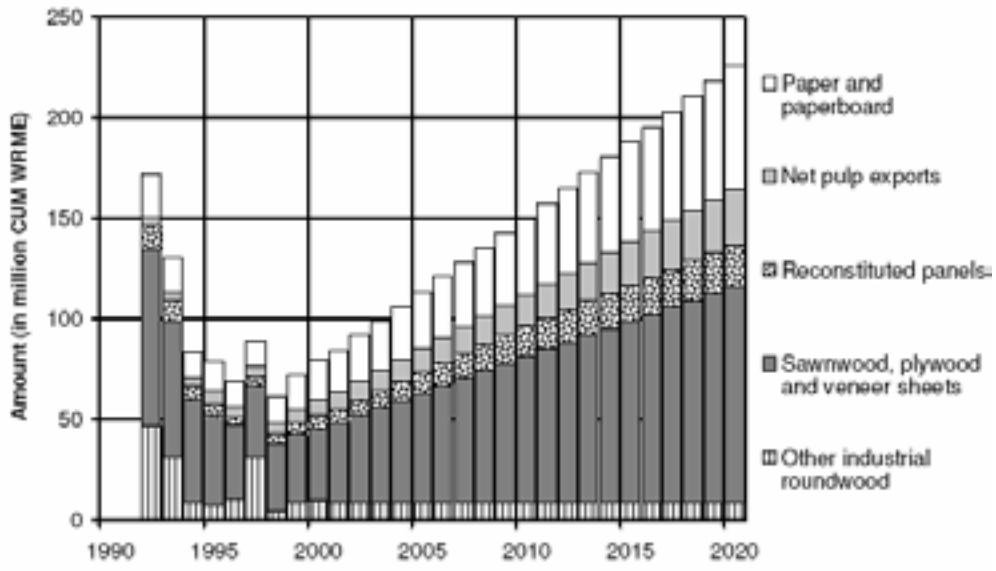


Fig. 7. Trend of industrial roundwood consumption in Russia during 1992-2020, million m^3 (Killmann & Whiteman, 2006).

2.9 Russian birch plywood industry

Wood-based panels can be described as "sheet material" where wood is found in the form of strips, veneers, chips, strands or fibres (Panel Guide, Section 1). Wood-based panels are used due to several factors; good strength compared to their weight and cost ratio, easy to work with and can be found in a range of different sizes and thicknesses. Besides that, wood-based panels are manufactured from renewable raw materials and have been used for a long time. The main types of wood-based panels are shown in Figure 8 below.

An example of a wood-based panel is plywood. Russia is the leading producer and exporter of plywood among the European counties (www, UNECE, nr 1, 2008). During year 2008, production, export and consumption of plywood will continue to increase.

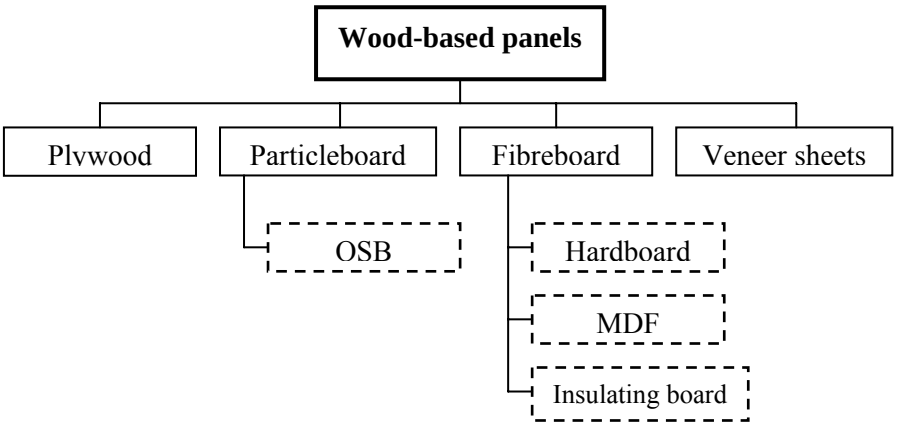


Fig. 8. Main types of wood based panels (Forest Products and Annual Market Review, UNECE 2006-2007).

2.9.1 Historical overview

The most intensive period of plywood production in Russia took place during 1951-1965 due to a rapid increase in housing construction. Large volumes of plywood were also used for furniture manufacturing. In the sixties a new building material, namely fibreboard (hardboard), was introduced in Russia. Although plywood is a much stronger material, the fibreboard was considerably cheaper. An increased production of fibreboard took place during 1976-1980 whereas plywood was mainly exported (Russian Forestry Review, 2007). In 1992 the Russian economic reform began and the plywood production decreased by 40% by year 1995. Furniture manufacturing and housing construction were the two sectors which showed the largest decrease in plywood consumption. The sudden decline of domestic plywood consumption forced many plywood producers to search for international customers. The export level rose from 20.3% in 1990 to 71.4% in 1995. After recovering from the financial crisis in 1998, a rapid increase in plywood production took place with an average annual growth of 11.3%.

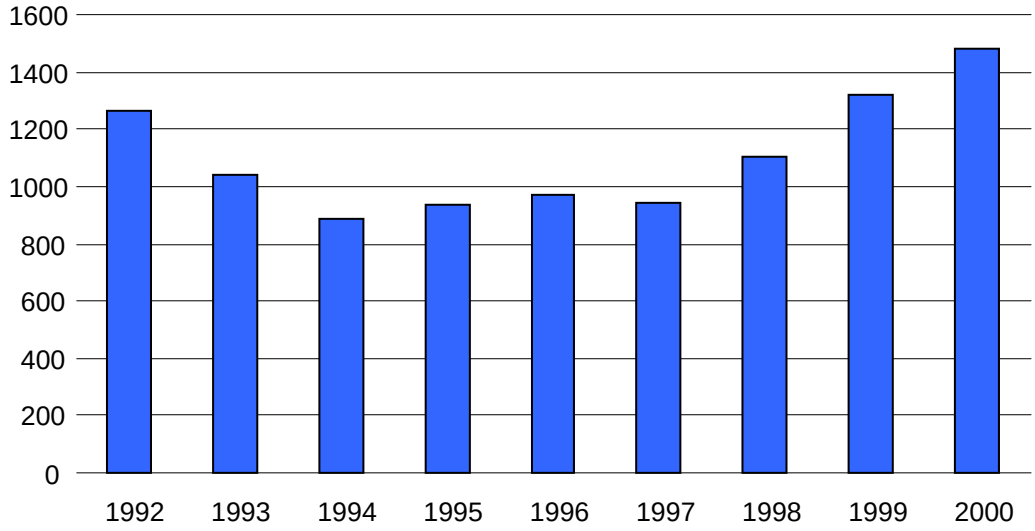


Fig. 9. Dynamics of plywood production in Russia (×1000 m^3) during 1992-2000 (www, FAOSTAT, nr 3, 2008).

2.10 Plywood production process

The construction of man-made boards is a relatively new phenomenon which is actively used by the industry and the home woodworker (Jackson *et. al.,* 1990). The constant development of these products results in improvements of quality, economy of raw materials and working effort.

A board of solid wood is dimensionally unstable and may shrink or swell (*Op. cit*.). Plywood is a board made from thin sheets of construction *veneers* which are bonded in layers to create a strong and stable board. Veneers used for plywood construction are cut from a log for constructional or decorative purposes. The two most common methods used for veneer production are called *saw* and *rotary cutting*. As illustrated in Figure 10, saw cutting requires a circular saw and the veneers are relatively thick. Constructional veneers on the other hand, are cut using the second method named rotary cutting. The knife blade peels thin sheets of wood and it is an efficient way to produce veneers, as they can be cut to any width. Plywood is most commonly made using an odd number of veneers, three being the minimum. However, the number of veneers used depends on their thickness and the finished plywood board. The veneers are bonded with an adhesive at right angles to one another to reduce the shrinkage and improve the strength.

Various species can be used for plywood production, where the face and core veneers may be made from different species or the same species can be used for the entire board construction (*Op. cit.*). The surface of the plywood board consists of veneers called *face plies*. Depending on their quality, the ply of better quality is known as the face and the other is referred as the back. To indicate the quality of the plies, a letter code is used to mark the grade. The grading system uses the letters A, B, C and D where grade A classifies the best quality and grade D indicated the poorest quality. The grades only refer to the *appearance* of the face plies and do not indicate the structural performance of the plywood board. Plywood is constructed in a wide range of different sizes (www, Timber, nr 1, 2008). The most common dimensions (mm) are: length – 2700, 2400 and 1800 and width – 1200 and 900. The thickness of plywood can range from 3-25 mm depending on the area of use.

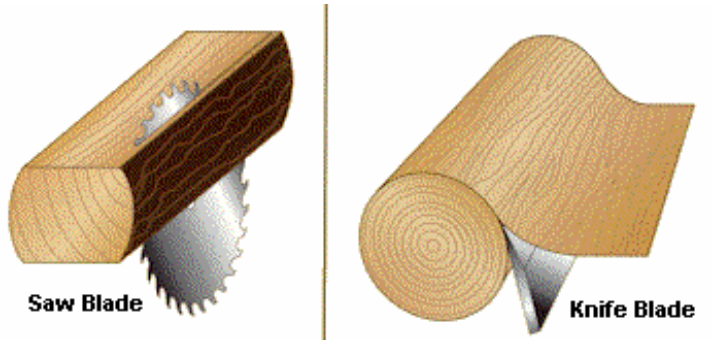


Fig. 10. Two most common methods used for veneer production known as saw cutting and rotary cutting (www, FloorMall University, nr 1, 2007).

A common adhesive is called *formaldehyde* and is composed of carbon, hydrogen and oxygen (www, Ycplywood.com, nr 1, 2008). Formaldyhyde is both a naturally existing chemical produced by plants and animals and an industrial chemical. An important characteristic of plywood is the amount of formaldehyde emitted. Contact with formaldehyde can cause short-term skin irritation. However, long-term exposure of formaldehyde can cause serious health problems (cancerogenic). Formaldehyde emissions can be rated as E1 (9mg/100g or less), E2 (9mg-30mg/100g) and E3 (> 30mg/100g).

2.10.1 Birch plywood

A common *hardwood* species used for plywood production is birch (United Panel Group, 2008). The birch plywood board is classified as one of the most popular types of plywood due to its superior mechanical properties and beautiful appearance. Birch plywood can be used for interior and exterior applications. In the plywood production process, the birch logs need to be straight with a specific dimension. Only 50% of the birch log is utilized during the production process. The core of the birch log cannot be used and therefore waste products are usually sold to other wood working industries. The advantage with birch is its fast rate of growth (30-35 years) compared to other wood species, e.g., spruce. At the same time the growth rate can negatively affect the quality of the birch logs (pers. com; Jalgerius, 2008).

2.10.2 Historical review of plywood manufacturing

Plywood production took place already in ancient Egypt where wooden products were made using sawn veneers (www, Wikipedia, nr 1, 2008). The thin sheets of veneer, which were of high quality, were glued over a substrate of lower quality. This process was common due to the lack of fine woods and the high quality veneer sheets gave the wood a nice appearance. During the 18th and 19th centuries, furniture manufacturers in England used veneers for production of the highest quality furniture.

Immanuel Nobel invented the modern technique of rotary cut veneer and the first production equipment was constructed in the USA during the 19th century (*Op. cit.*). “Plywood has been one of the most ubiquitous building products for decades.” In the beginning of the 19th century, Thomas J. Autzen was the owner of Portland Manufacturing Company, USA, which was the first plywood production facility. He contributed to the development of the plywood production by reducing the drying and manufacturing process. Thanks to his findings, the new technology had an important role of “making plywood one of the most abundant and affordable building products ever produced”.

Birch plywood packaging
(www, Nefab, nr 1, 2008)

Chairs made from plywood
(www, Advanced Interior Designs, nr 1, 2008)

Plywood used for formwork (www, Europlywood, nr 1, 2008)

Fig. 11. Images illustrating some common areas of use of plywood: packaging, furniture and formwork used in the construction industry.

2.10.3 Applications of plywood

As illustrated in Figure 11, plywood can be used for many different purposes (Jackson *et. al.,* 1990). Interior plywood comprises furniture and wall panelling, while exterior plywood is appropriate for kitchen fitments and applications around showers and bathrooms. Another type of plywood is structural plywood, which is manufactured for applications where strength and durability are the primary factors. Structural plywood is used in the construction and building industry. Most commonly plywood is used for *formwork applications* due to its strength, stability and tolerance to changes in temperature and moisture (www, Timber, nr 1, 2008). Finally, marine plywood is used where moisture resistance is needed. Plywood can also be used for transport- and boat construction and packaging manufacture (Jackson *et. al.,* 1990).

2.11 Plywood in the Russian construction industry

Currently, 76% of the houses in Russia are built of masonry, brick and concrete (Wadsworth, 2006). The knowledge and experience of building wooden houses is not extensive. However, wooden house building in Russian is often associated with "*dachi*", i.e. summer houses. A changing trend is the building of wooden houses in suburban areas for people who commute to the city centres. There is also an increasing demand for single family houses.

As presented in Figure 12, the construction industry in Russia is growing intensively (www, PMR Publications, nr 1, 2008). In order to exemplify the growth within the construction

industry in Russia, Poland can be used as an example. Poland, Russia's largest westward neighbour, has 38 million inhabitants and approximately 345.000 construction firms. In Russia, on the other hand, there are 130.000 enterprises that satisfy the building needs of over 143 million citizens. It is obvious that there is a large need to expand the construction industry. In the beginning of year 2006, over 170.00 new homes were completed, which is 12% more compared to the previous year. There is great potential for housing construction and renovation work in Russia. Above all, the demand for more affordable living is increasing. It is estimated that two thirds of the total housing stock is more than 30 years old. Approximately 60% of all housing requires renovation. Around 15% is in a critical condition and 36 million m^2 of dwelling space is officially considered inhabitable. The total demand for housing in Russia is estimated at 1.5 billion m^2, which predicts a good market potential for wood products.

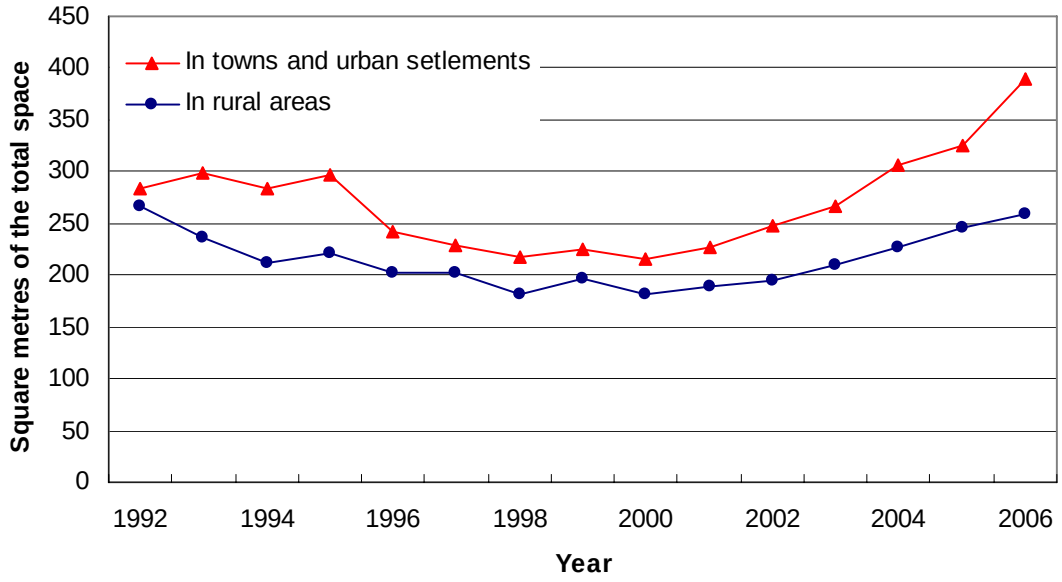


Fig. 12. Residential building commissioning in the period 1992-2006 (www, GKS, nr 1, 2006).

In the future, the quality of dwelling will rise (Schmögnerová, 2003). House restoration and rebuilding has a strong potential growth, where the demand for forest products is large. More modified wood materials such as sawnwood, plywood and wood-based panels will foremost be applied for internal and external finishing. The use of plywood will increase significantly in construction and repair, where it will mainly be used as formwork, for finishing and interior purposes.

Even the demand for forest products for furniture production is affected by the growth of housing construction and a change of living standards of the population (*Op. cit.*). Factors such as economic growth, dynamics of personal income and growth of commissioning of dwelling-houses will influence the demand for furniture in the future. In year 2000, plywood had the largest share of use in furniture production, accounting for 30%.

2.12 Current plywood market

Plywood is one of the most steadily growing sub-segments in wood-processing due to a strong demand from the construction industry (www, FAO, nr 1, 2008). Russia is the leading country among the European countries in production and export of plywood. As presented in Figure 13, the output of plywood in 2006 was 2 598 thousand m^3, of which 1 577 thousand m^3 or

60.5% were exported to USA, Egypt, Germany, Italy, Denmark, Great Britain the Baltic countries (www, UNECE, nr 1, 2008). Russia has for a very long time been a supplier of plywood to Europe and in particular birch plywood. Birch plywood is the dominating wood species for plywood production in Russia, but softwood plywood production is increasing both for domestic consumption and export. As shown in Figure 13, the plywood industry is driven by export (Wadsworth, 2006). Plywood production, consumption and export are expected to continue growing during year 2008.

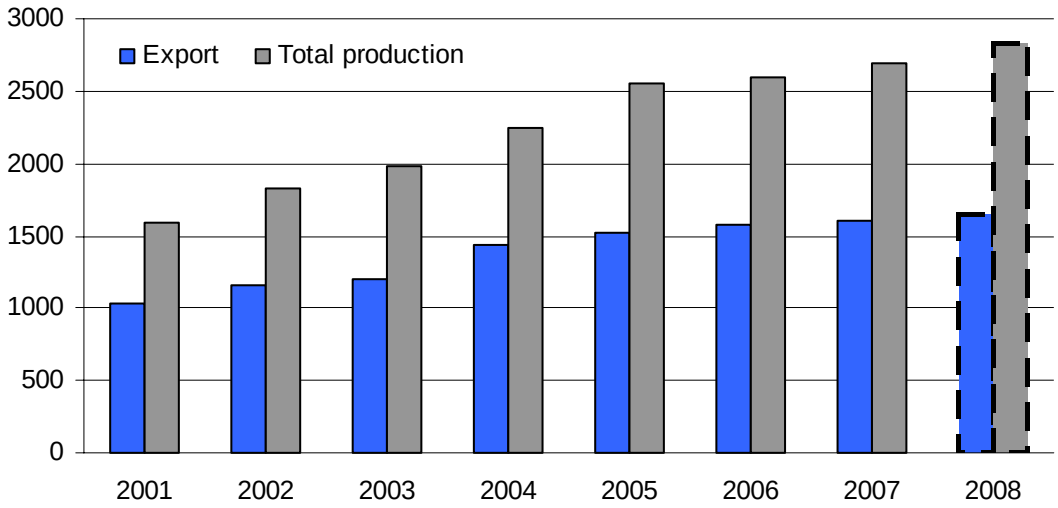


Fig. 13. Total production and export of Russian birch plywood, ×1000 m^3 during years 2001-2008 (www, FAOSTAT, nr 3, 2008 and UNECE, nr 1, 2008).

It is estimated that the plywood production in Russia will increase to 5 million m^3 by year 2015 (www, Raute, nr 1, 2007). This rapid production is a result of the export taxes on industrial roundwood. It is clear that the domestic demand for plywood exceeds the supply. The Russian forest industry also has the potential to produce softwood plywood, with focus on establishing production facilities in Siberia. The production of softwood plywood in Russia, e.g., pine, spruce and larch, year 2006 was 200 000 m^3 and is expected to increase in the future (www, UNECE, nr 3, 2008). The use of plywood in Russia is presented in Figure 14.

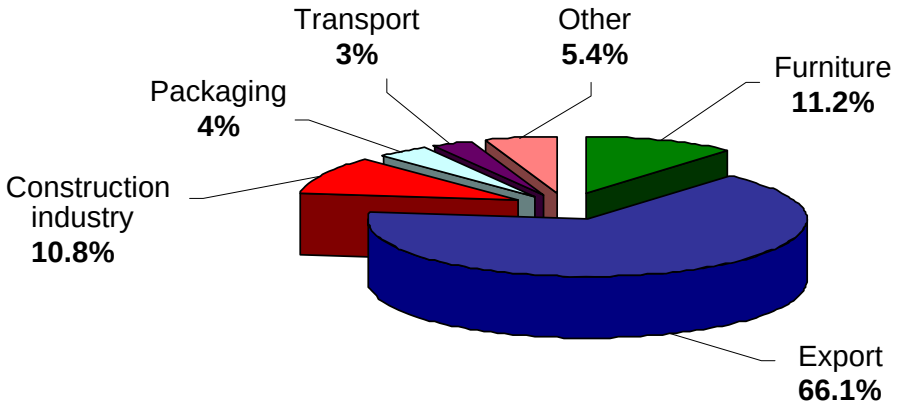


Fig. 14. Percental distribution between various areas of use of plywood in Russia (Concept Centre, 2005).

The share of plywood used for construction is growing, where it is commonly used for formwork (Concept Centre, 2005). The most rapidly increasing use of plywood is found in the furniture sector due to en increased demand for more expensive furniture. Despite this growth, it is predicted that by 2010 plywood will mainly be used for construction, accounting for 35-40%. The furniture industry uses birch plywood in the traditional dimension of 1525×1525 mm. The total production share of this plywood dimension year 2005 was approximately 53%, but is gradually decreasing. On the other hand, the production of large-sized plywood (1220×2440, 1250×2500 and 1525×3050 mm) is increasing. The production of *laminated* plywood is also growing and will have a positive future development, where a large share of the production will be exported.

The leading Russian plywood producers approximately control 50% of the market. Figure 15 presents the leading plywood producers and their share of the total plywood production in Russia.

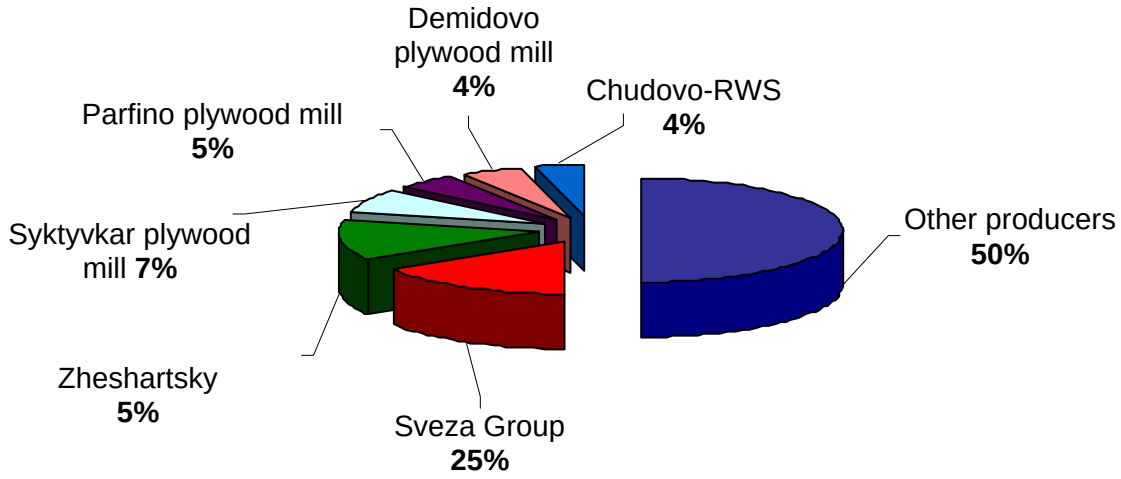


Fig. 15. Market leaders within the plywood industry in Russia (Terzieva, E., 2008).

2.13 International plywood competition: focus on China

An article from the journal "*Wood Based Panels International, Issue 6 2007/2008*" describes China's impact on the global plywood market. Plywood represents the largest wood panel sector in China, accounting for 40% of the total wood-based panel production. Currently, China is the world's largest plywood manufacturer, world's largest plywood exporter and even the largest consumer of plywood. The country is experiencing an increasing domestic demand for plywood, despite the fact that the industry faces threat of substitution from MDF and particleboard in furniture and interior decor applications. The strongest advantages in the Chinese plywood industry are *low production costs* and *price competitiveness*. Other competitive factors are access to suitable raw material (poplar), many producers and low barriers to entry, simple technology production techniques and access to large markets – both domestic and international. Despite the opportunistic conditions, the industry experiences pressure from international consumers about "*complaints of artificially low prices, fraudulent labelling and alleged widespread use of illegally harvested logs*". Quality inconsistency, such as high moisture content, low glue quality and irregular sizing, has created mistrust and many European importers have limited their import or even neglected the Chinese plywood producers. The pressure from international customers is increasing, forcing the Chinese plywood industry to improve the product quality and evaluate the production techniques.

A factor which has affected the increase of plywood production in China has been the emergence of *poplar plantations*, which account for 70% of the plywood industry's log requirements. In China, poplar is also considered to be one of the most profitable crops to grow. The strong demand for poplar has caused dramatic price growth (118 EUR/m^3 for 30 cm diameter log), but for plywood production the logs used have a small diameter, which cost much less (54 EUR/m^3). The Russian export taxes on birch, poplar and pine raw material will have an impact on the log trade between these two countries.

China is gradually shifting its low quality plywood production to film-faced, engineered flooring substrate and other plywood products. There is a higher degree of product control. The Chinese plywood industry is also moving away from the North American market and focuses mainly on Europe and the Middle East. Other means used to face the competition are for instance using lower-cost wood species such as eucalyptus, implementing low- emissions glues, investing in veneer operations in Russia to source birch and implement Western quality control (CE Marking and ISO Certification). *Consolidation* in the Chinese plywood industry will result in fewer, bigger and better exporters. Quality improvement and market/product diversification gives China a strong potential in the future.

2.14 Plywood substitutes

2.14.1 Oriented strand board, OSB

Oriented strand board (OSB) appeared on the Russian market recently and its position keeps growing stronger (Russian Forestry Review, 2007). OSB is a wood-based panel which consists of wood strands bonded using adhesive (EPF – Technical Information Sheet). Both softwood, such as pine and spruce and hardwood can be used for OSB production. Debarked logs are moved longitudinally against rotating knifes resulting in wood strands. The physical performance of OSB depends on the geometry of the strands, their orientation and type of adhesive. The strands are pressed under hot pressure using wax and adhesive (www, Pathnet, nr 1, 2008).

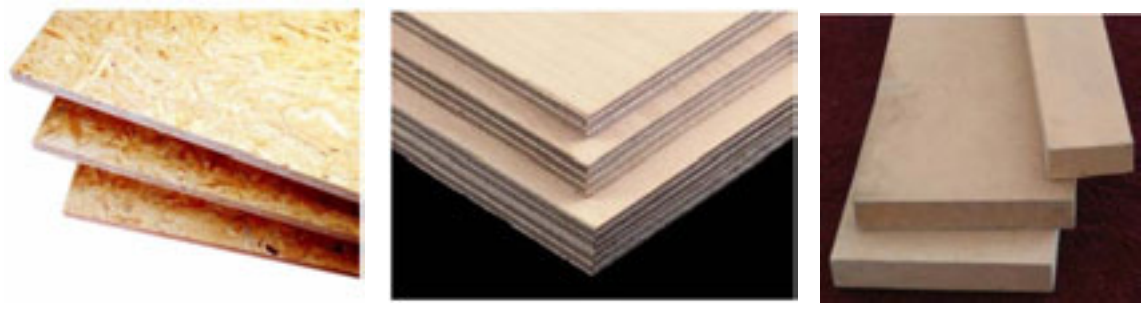


Fig. 16. Difference in appearance between OSB, birch plywood and MFD.

At present, there is no OSB production in Russia, but during year 2007 approximately 150 000 m^3 of OBS were imported (www, UNECE, nr 1, 2008). It is estimated that during year 2008, the import of OSB will increase to 200 000 m^3. The European part of Russia imports OSB from Poland and Germany, while Eastern Russia imports from USA, Canada and Japan (www, FORDAQ, nr 1, 2008). In Russia OSB is used in residential construction for wall shattering and floor underlayment (Wadsworth, 2006). OSB is referred to as "American plywood" on the Russian wholesale market. According to Wadsworth (2006), it is surprising than no OSB production facilities have yet been built in Russia. So far, there is limited knowledge of the product and its properties in Russia. However, investors are becoming

interested in OSB due to its lower production costs compared to plywood. An example of a large user of OSB is "*Podmoskovye*", a company building timber frame houses in the Moscow region. One cubic meter of imported OSB costs between EUR 380-450 (www, FORDAQ, nr 1, 2008). OSB production is one of the most promising investments (Prozorova, 2007). It is predicted that by year 2010 the consumption of OSB will increase to 600 000 m3 and five mills will be established (www, Russian American Business, nr 1, 2008).

Despite the similarities of OSB and plywood, there are several advantages with using OSB (www, Pathnet, nr 1, 2008). One of them is that OSB can be manufactured in larger sizes than plywood and the board is made using smaller trees. Most importantly, OSB is a cheaper material compared to plywood. A disadvantage with OSB is the fact that the material expands if it exposed to water or moisture. If plywood comes in touch with water, it swells evenly throughout the panel, but has the ability to dry quickly and shrink to its original size.

The Finnish forest industry group UPM and Sveza Group are intending to form a joint venture company (www, FORDAQ, nr 2, 2008). The plan is to establish an industrial complex in the Sheksna community, located in the southern part of Vologda. The industrial complex will comprise a pulp mill, sawmill and an OSB production facility. The planned OSB production capacity is 450.000 m^3.

2.14.2 Medium density fibreboard, MDF

At present, there are seven medium density fibreboard (MDF) production facilities in Russia and five of them were built since 2003 (Wadsworth, 2006). MDF is used for furniture manufacturing in Russia. Year 2006 the production capacity of MDF was 830 000 m^3 and is expected to be increased by 800 000 m^3 in the year 2006-2009. The MDF market is developing rapidly and the demand is increasing by 8% annually (Russian Forestry Review, 2007). Due to stronger competition, the price of MDF is decreasing.

MDF is made from wood fibres glued under heat and pressure (www, Design Technology, nr 1, 2008). The board contains the adhesive urea formaldehyde. MDF is a dense material, which consists of fine particles and does not have a characteristic surface grain. A drawback with MDF compared to plywood, is that it is heavier and swells easily in contact with water (www, Wikipedia, nr 2, 2008).

2.15 Birch plywood prices

Domestic log prices in Russia decreased sharply in the first quarter of year 2008 (www, Web Wire, nr 1, 2008). Pine sawlogs declined by 22%, softwood pulpwood with 20% and pulpwood from hardwood species with over 15%. The price declines are a result of improved raw material supply due to favourable logging conditions and reduced log exports. Finland, being the largest importer of logs in Europe, imported 37% less softwood logs from Russia in year 2007 compared to year 2006. Importers will be forced to search for raw material in other countries. The costs of logs in Russia are expected to increase even more in the future, thus importers must revise their raw material supply strategies.

The average price of standard format waterproof birch plywood was approximately 23.170 roubles (6.000 SEK) per m^3 in February 2008 (www, Lesprom, nr 1, 2008).

3. Theoretical framework

The following chapter presents the models and theories that could be applied to the Russian birch plywood industry. Focus is laid on competiveness, strategies and the industry environment. The theoretical framework will be used for analyzing the Russian birch plywood industry.

3.1 Analysis of national competitiveness

According to Hollensen (2004), "competitive advantage ultimately results from an effective combination of national circumstances and company strategy". Michael Porter (1990) described the concentration of firms within a specific industry as *industrial clusters*. Firms included in an industrial cluster have relations to other actors such as customers, suppliers and competitors. Industrial clusters may become international, but their starting point and location is usually in a certain country. "The most enduring competitive advantages for nations are created by those factors that have least degree of mobility" such as climate, natural and human resources, technological infrastructure and capital. The demand conditions in a specific country include an interaction between scale of economies, transportation costs and size of the home market.

3.2 Porter's Five Forces of Competition

Michael Porter (1980) developed one of the most useful and extensive models for analyzing the competitive structure for firms within an industry. Porter defines an industry as a "*group of firms that offer a product or class of products which are close substitutes for each other*". A market on the other hand, is "*a set of actual and potential buyers of a product and sellers*." The five force model presents the competitive forces which together determine the state of competition within an industry. Sometimes even a sixth force is included, namely the government. The five forces are (see Figure 17):

1. Threat of new entrants
2. Threat of substituting products
3. Bargaining power of buyers
4. Bargaining power of suppliers
5. Competitive rivalry among existing firms

The five forces model is used for investigating the *profitability of an industry* by the capital return related to its capital cost (Grant, 2005).

One of the forces in the model is the threat of **new market entrants**. The threat depends on the following factors, which indicate the barriers to market entry (www, 12 Manage, nr 1, 2008):

- Economies of scale.
- Capital/investment requirements.
- Customer switching costs.
- Access to industry distribution channels.

- Access to technology.
- Customer brand preferences and loyalty (product differentiation).
- The likelihood of retaliation from existing industry players (e.g. price-cutting, increased advertising or sales promotion) (Grant, 2005).
- Government regulations.

Fig. 17. Model illustrating Porter's five forces of competition (www, IT Strategy, nr 1, 2008).

The next force is the **threat of substitutes**. "The presence of substitute products can reduce industry attractiveness and profitability because they can put constraints on price levels. If the industry is successful and earning high profits it is more likely that competitors will enter the market via substitute products in order to obtain a share of the potential profits available". The threat of substitute products will depend on the buyer's interest to substitute, the price and performance of substitutes and the costs of switching to substitutes. How easy is it to change to another product?

Firms operate in two types of markets: markets for inputs and markets for outputs. In input markets firms purchase raw materials, components and labour services. In output markets firms sell goods and products to customers. The profitability of these two markets depends on their economic power (Grant, 2005). The factors listed below show the **bargaining power of buyers**, found in output markets. How powerful this group is depends on (www, 12 Manage, nr 1, 2008):

- Concentration and purchasing volumes of buyers. Buyers have a greater bargaining power if they are few and purchase large volumes.
- Buyers purchase a significant share of the industry's total sales.
- Degree of product differentiation. Low differentiation encourages the buyer to switch supplier on the basis of price.

- Profitability of buyers.
- Role of quality and service determines the buyers' sensitivity to price.
- Threat of vertical integration, which results in own manufacturing (do it yourself).
- Switching costs, indicating how easy it is for a buyer to switch supplier.

The **competitive rivalry** indicates the intensity of rivalry among existing firms within an industry. This is usually the main determinant of the degree of competition in an industry (Grant, 2005). The strength of this force depends on several different factors (www, 12 Manage, nr 1, 2008):

- Number and size of competitors. An increasing number of competing firms tends to intensify the rivalry.
- If the products offered have a low degree of differentiation, rivalry will increase between firms.
- Similar products encourage customers to switch products more frequently, creating low switching costs.
- If the industry is mature with a slow growing rate, the competition increases.
- Rivalry will also increase if barriers to leaving a market are high.

A firm that produces goods is highly dependent on the availability of raw materials. The final force is the **power of suppliers** and will depend on several circumstances (www, 12 Manage, nr 1, 2008):

- Groups of supplying firms have a stronger bargaining power when the supply is dominated by few companies with secure market positions.
- Another factor is when products are unique or differentiated, making it difficult for buyers to switch between suppliers.
- Role of quality and service.
- The industry is not a key customer group to the suppliers.
- Suppliers threaten to integrate forward into the industry.
- Switching costs. Is it easy for suppliers to find new customers?

The five forces model will be used to analyze the Russian birch plywood market and the environment in which the producers are competing. All forces will be taken into account and those judged to have the strongest influence on the competitive environment will be outlined.

3.3 The resource-based view (RBV) of the firm

Jay Barney is considered to be the father of the modern resource-based view (RBV) of the firm (www, Value Based Management, nr 1, 2008). The theory suggests that firms have the important task of "identifying, developing and deploying key resources to maximize key returns." Barney describes firm resources as "assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm…" (Barney, 1991). The resources within a firm can be a source of sustained competitive advantage. Barney categorizes the resources into tree main groups:

1. **Physical capital resources**, for instance the physical technology used by the firm, the geographical location and access to raw materials.

2. **Human capital resources** are the qualities of individuals working in the firm and these resources include training, experience, judgment, intelligence, relationships, etc.

3. **Organizational capital resources** describe the firm's organizational structure in terms of planning, controlling and coordinating. Organizational capital resources also comprise the informal relations within the firm and other market actors in its surrounding.

In the search for sources of sustained competitive advantage, the article assumes that an industry will to some extent be characterized by resource *heterogeneity* and *immobility*. Not all of the resources mentioned above have the ability to posses sustained competitive advantage. In order to gain this potential, the resources must fulfil four attributes: i) resources must have *value* in order to exploit opportunities and neutralize threats, ii) compared to the firm's competitors, the recourses must be *rare*, iii) the resources must be *imperfectly imitable* and iv) there should not be any strategically equivalent *substitutes*. All these relationships can be summarized in the resource-based model of sustained competitive advantage presented in Figure 18.

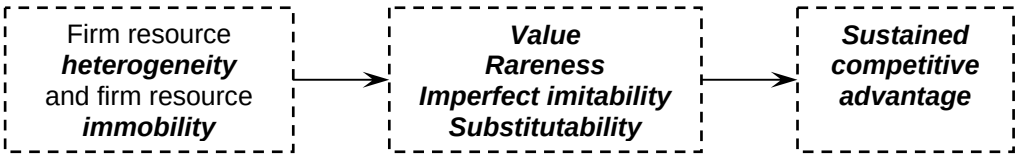


Fig. 18. Relationship between resource heterogeneity and immobility, value, rareness, imperfect imitability, substitutability and sustained competitive advantage (Barney, 1991).

Toppinen *et al*. (2007) showed that wood-working firms in North Western Russia find closeness to the main markets, good logistics connections and access to large markets, i.e. other than raw-material related factors, as the main sources of competitive advantage. The article also concluded that companies valued *intangible resources* over tangible resources. Another article by Lähtinen (2006) stated that in the wood-working industry "tangible and intangible firm resources have been found both to have crucial role in creating value-added, enhancing competitiveness, and achieving success in a modern business environment."

3.4 An overview of buying behaviour

All organizations require goods and services from external suppliers and purchasing is an activity of strategic importance (Baily *et. al*, 2005). In processing industries, large volumes of raw materials are necessary and it is important that the supply process is continuous.

Organizational buying puts emphasis on functionality and strives to achieve certain purposes within the organization (Hayes *et. al*., 1996). It is important to understand that organizational buying recognized by an "organization's demand for products and services is derived from the activities involved in supplying the customers". Businesses buy in order to *meet the need of their customers*. "For raw materials and components that directly enter the product, demand closely parallels fluctuations in demand in the final market". The demand is affected by the customer's overall business strategy. The demand for supplier's products might, for instance, be influenced by a customer who plans to enter a foreign market.

An important aspect is that buyers and seller are dependent on each other (*Op. cit.*). The supplier's degree of performance will affect the customer orders and future business. "From the buyers' standpoint, it is critical to have highly qualified suppliers capable of supplying the firm's current and future requirement economically and reliably." Relationship management is considered to be one of the key objectives of the purchasing function. Development of purchasing strategies, searching and qualifying suppliers are example of processes common to the purchasing function.

"Business purchasing is characterized as a rational process and hence unemotional" (*Op. cit.*). There are several key factors that determine the buying decision regardless of country of manufacture – *quality, availability, price, assurance of supply* and *service*. However, buyer-seller relationship, product standards, language, country laws and currency denomination are factors which can vary between countries.

It is important to understand what process buyers' use when selecting one product over another (Jeannet *et. al*, 1992). A buyer can be a consumer, business or government. This thesis work describes the *business buyers* and *industrial buyers*. Compared to consumers, business buyers are easily influenced by *costs* and *delivery* and less by social or cultural factors. Business buyers strive to purchase the *best product at the lowest cost*. The buying and the negotiation process will depend on culture and will differ depending on the country.

By making the assumption that a manufacturer wants to maximize profit, the critical buying criterion is product performance versus product cost (*Op. cit.*). This is called the *cost-performance criterion* and can be combined with other buying criteria such as service, dependability and knowledge of the selling company. *The economic situation in the purchasing country will affect the decision process*. Local cost of labour and the scale of operation will affect the cost performance. "Labour costs play a key role in the level and type of manufacturing. Countries with a surplus of labour normally have lower labour costs, as supply exceeds demand. Those lower pay rates results in a certain type of manufacturing which is labour intensive. Therefore, they will be less apt to purchase sophisticated automatic machinery because the same job can be done with the cheaper labour. A country normally moves from labour-intensive industry to capital-intensive and then to technical-intensive industry."

The level of economic development will determine the size and type of industry and is also an indicator of the type of product demanded and the sophistication of the industrial infrastructure (*Op. cit.*). The economic development of a country can be described through five stages and every stage indicates the production capability. Factors such as labour costs, technical capability of the buyers, scale of operations, interest rates and level of production sophistication are indicators of the economic development. The *stages of economic development* are as follows:

1. **Traditional society:** limited production functions, primarily agricultural.

2. **Preconditions for take-off:** societies in transition towards modernization. Infrastructure investments and modern manufacturing to some degree, but the social structure and values are old.

3. **Take-off:** forces for economic growth appear and industries start to expand using new techniques and technologies.

4. **Drive to maturity:** improved and complex technology, new industries grow while older leave the market.

5. **Age of high mass consumption:** a shift towards durable consumers' goods and services. Increased social security and skilled working force.

"In many situations a buyer will have the choice of purchasing domestic products or foreign products. The buyer's perceptions of product quality may be influenced by the product's country of origin, feelings of nationalism and the firm's competence with international transactions."

4. Methodology

This chapter describes the methods used to collect primary and secondary data. The author presents a theoretical base of the methodology, describing the advantages and drawbacks for each method. The encountered difficulties when doing an international market research are discussed and the actual working methods are presented.

4.1 Quantitative or qualitative research?

The two basic types of market research methods are referred to as *quantitative* and *qualitative* research (Cateora *et. al*., 2000). When using quantitative research, the respondent replies structured questions by either selecting an answer from a set of choices or using a specific format. Quantitative research provides the marketer with responses, which can easily be presented in percentages, averages and other statistics. The most common methods used for collecting quantitative information are by personal interviews, mail or telephone. In contrary, a qualitative research can be described as "open-ended, in-depth and seeks unstructured responses that reflect the person's thoughts and feelings on the subject". Qualitative interviews are characterised by simple and concrete questions which result in complex and informative answers (Trost, 2001). When carrying out an international market research, this particular method is suitable for gaining understanding of a market rather than quantifying relevant aspects (Cateora *et. al*., 2000). Focus groups, interviews and case studies are the most widespread methods for collecting qualitative data. Qualitative research has few respondents, but provides a large number of variables (Hollensen, 2004). The two methods often complement each other and can be combined in a study. Table 2 below summarizes the major differences between these two methods.

Table 1. Major differences between the two most commonly used research methods, quantitative and qualitative research (Hollensen, 2004). Modified by Terzieva, E., 2008.

Comparison dimension	Quantitative research	Qualitative research
Objective	Quantify data and generalize results from the sample	Gain an initial and qualitative understanding
Type of research	Description and/or casual	Exploratory
Flexibility in research design	Low (one-way communication)	High (two-way communication)
Sample size	Large	Small
Choice of respondents	Representative sample of the population	Persons with considerable knowledge of the problem
Information per respondent	Low	High
Data analysis	Statistical summary	Subjective, interpretive
Ability to replicate with same result	High	Low
Interview requirements	No special skills required	Special skills required
Time consumption during research	*Design phase:* high *Analysis phase:* low	*Design phase:* low *Analysis phase:* high

An interview can either contain *standardised* or *structured* questions. A quantitative research is commonly conducted using standardised questions. This means that the questions lack variation and are the same for all respondents. On the other hand, structured questions are adapted to the individual respondent, can be asked in no particular order and contain a high degree of variation. Thus, structured questions are appropriate during qualitative interviews.

There are several research approaches that can be used for collecting qualitative data (Hollensen, 2004). The method used in this market research is *survey research*, where the questions asked indicate both volumes and values. The questions are structured and asked in a pre-arranged order. Surveys are most commonly used for investigating customer attitudes, customer buying habits, potential market size or market trends. In this study, the survey research was conducted through *personal interviews.* The advantage with personal interviews is that it is a quick and flexible method which gives the opportunity to clarify problems and issues and gain detailed information. The respondent can demonstrate products and other material during the interview, creating a better understanding. However, due to the flexibility with personal interviews the interviewer bias is greater. Another disadvantage with personal interviews are the high costs.

In this study, the researcher considered to conduct several *telephone interviews* with plywood producers located in other parts of Russia, besides Moscow. It is a cheap method that has a higher response rate compared to mail questionnaires. The weakness with using telephone interviews is that the possibility to gain in-depth information is rather low and the number of questions asked can be limited. This is because the respondents may give short answers to speed up the interview session. However, after several attempts to reach the plywood producing companies the response rate was low. Respondents were sceptical towards answering questions over the telephone. Therefore, only *personal interviews* were conducted in this study.

4.2 Collecting secondary data

The market research was initiated by collecting relevant secondary data. According to Cateora (2000) "for almost any marketing research project, an analysis of available secondary information is a useful and inexpensive first step." However, there can be information gaps, especially concerning detailed market information, but the situation with data availability and reliability is improving. Secondary literature can be found in books, journals, newspapers, reports and government publications (Saunders *et. al.*, 2007). To be able to asses the current and future demand of a product, it is also necessary to find historical data (Cateora *et. al*., 2000). In this study secondary data were used for providing the reader with a general description of the history and current situation of the forest and plywood industry in Russia. It is very difficult to find books, which are relevant for this topic. Therefore, information was mainly found using Internet, articles and reports.

4.2.1 Availability and reliability of secondary data

Reliability of data can be described as "the degree of consistency with which instances are assigned to the same category by different observers or by the same observer on different occasions" (Silverman, 2005). A limitation of searching secondary data on foreign markets is the lack of detailed data for many market areas (Cateora *et. al*., 2000). Many countries do not have governmental agencies that collect secondary data on regular basis. Thus, the marketer must rely of private sources of data. However, available data may not be reliable, which is necessary for confident decision making. Official statistics can sometimes appear too optimistic and do not reflect the reality. Many local officials, factory managers or rural

enterprises publicate false data in an attempt to seek advantages or hide failures. A marketer, who relies on secondary data for analysing and forecasting a market, should therefore be aware of such errors. Another problem is the *comparability* of data. Accessible data can be old or no historical series can be found to compare with the current information. In general, the availability and accuracy of recorded secondary data increase as the level of economic development increases in a country.

It is always necessary to be critical even when a qualitative method is used in order to find out if the answers are reliable (Jacobsen, 2006). One way to control the validity of the answers is by confronting the interviewed person by taking specific examples from previous research and secondary data. Another method which can be used is to compare the interview conclusions to other data or experts opinion.

To summarize, there could be several problems associated with the collection of secondary data, namely 1) lack of necessary data, 2) level of accuracy of the data, 3) lack of comparability and 4) age of the data (Jeannet, 1992).

4.3 Collecting primary data

The difference between domestic and international market research is the broader scope necessary for research in a foreign environment. Information such as economic growth, profitability analysis for a specific industry, a review of conditions affecting a business, detailed analysis of market conditions and data about competitors' market shares, product and strategies are just some examples of relevant topics for investigation.

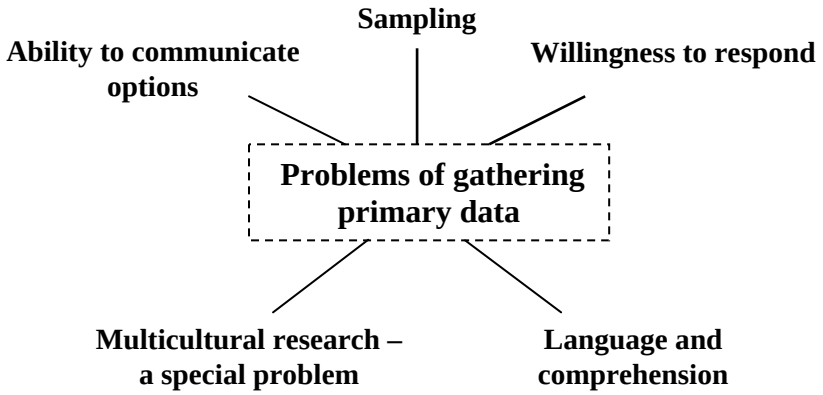


Fig. 19. Various problems a marketer might encounter while conducting a market research in a foreign country (Cateora et. al., 2000).

Problems that can occur when collecting primary data are shown in Figure 19. When performing an international market research, one can find problems which do not encounter on the domestic market, in this case Sweden. One main obstacle with sampling is the lack of lists needed for finding necessary samples. The most common source used by the researcher to find information about existing Russian plywood producers was Internet. Unfortunately, many enterprises do not have a homepage or the current homepage is out-of-date. The effectiveness of communication methods such as mail and telephone contact can also be limited. "*Cultural differences offer the best explanation for the unwillingness or the inability of many to respond to research surveys*".

According to the model above, the language barrier is a very common problem in foreign countries. Difficulties in providing the respondents with exact translations and interpreting the given answers can create problems. Luckily, the researcher did not encounter any language barriers during the interviews carried out in Moscow. Another problem can arise when conducting a study in several countries. The research methods used in one country may not be appropriate in another country, thus the research method must be adapted. "In collecting data from different countries, it is more important to use techniques with equivalent levels of reliability than to use the same techniques".

Some of the main challenges with international research are 1) complexity of research design, 2) lack of secondary data, 3) costs of collecting primary data, 4) coordination of research and data collection across countries and 5) difficulty in establishing comparability and equivalence (Jeannet, 1992).

4.4 Sampling procedure and interview design

It is impossible to collect or to analyse all the available data due to restrictions such as time, funds and access (Saunders *et. al*., 2007). The use of *sampling techniques* makes it possible to reduce the amount of data by considering data from only one subgroup. By collecting data from a smaller number of cases also allows the researcher to collect more detailed information. There are two types of sampling techniques:

1. **Probability or representative sampling:** the chance of each case being selected from the population is known and is usually equal for all cases.

2. **Non-probability or judgemental sampling:** the probability of each case being selected from the total population is unknown.

This thesis work uses the second method, *non-probability or judgemental sampling* as a sampling technique, which is particularly useful when qualitative data are collected (*Op. cit.*). Non-probability sampling is most commonly used when adopting a case study strategy. This method provides a range of different techniques which can be used to select a sample based on the researcher's subjective judgement. The technique used in this study is called *purposive sampling*, where the sample size will be dependent on the research questions, what one finds useful to find out, what will have credibility and what the available resources allow one to do. Purposive sampling is suitable when very small samples are used and when the researcher wants to select informative cases. It is important to point out that this method is *not considered to be statistically representative for the total population*. Purposive sampling is useful during studies where the researcher wants to focus on the key themes, gain in-depth understanding and provide the reader with an illustrative study.

A small sample size is very common when conducting a quantitative research in *transition countries* like Russia (Mockaitis *et al*., 2006). According to the author of the thesis, this problem also refers to the use of a qualitative research method. Companies in transition countries often show unwillingness and hesitation when asked to participate in research. It can also be difficult to receive answers to certain questions.

This market research focuses on interviews conducted with Russian birch plywood *producers* and birch plywood *consumers* in Russia and Sweden, creating two perspectives. In this study the sample size was determined with regard to the available time and budget. Currently, there are no official lists of Russian birch plywood producers and the *identification of plywood*

producing companies was initially the main issue. Company names and their contact information were found using Internet and by the help of Börje Jalgerius. Jalgerius worked as a purchasing manager at the Swedish packaging company Nefab for 31 years. He was responsible for finding contacts in the Soviet Federation, where he travelled to deal with birch plywood suppliers. Gradually, Jalgerius established a strong net of contacts in Russia and ordered plywood from several production facilities. Currently, Jalgerius is retired but has an own company, Ply-Consult East, where he works as a consultant. However, identifying the producers was a time consuming process and it was a challenge to find the needed information. Many websites were out-of-date and a large share of the Russian plywood producing companies do not have a public homepage. Fortunately, the researcher succeeded to *interview the largest plywood producing companies that contribute to approximately 40% of the total production volume in Russia* (see Table 3).

After selecting the Russian plywood companies, the producers were reached by mail. The mail provided information about the researcher and the aim of the study. The mail encouraged the companies to suggest a day most suitable for conducting the interviews. Since no company replied after one week, the companies were contacted by telephone, which apparently was more effective.

During the first visit in Moscow, the Russian plywood producers helped by finding birch plywood consumers on the domestic market and abroad. Table 3 presents birch plywood producers and consumers interviewed in Russia and Sweden.

Table 2. Presentation of the participants in the study; 5 Russian birch plywood producers, 2 Russian and 3 Swedish birch plywood consumers and 2 other participants

Birch plywood producers	Birch plywood consumers	Other participants
Demidovo, Moscow	Agrisovgaz Fasadnye Sistemy, Moscow	Institute of Forest Economics, Moscow
Zharkovsky DOK, Moscow	PERI, Moscow	Börje Jalgerius (Ply-Consult East), Bollnäs
Sveza, Moscow	Bo Andrén, Stockholm	
Fancom, Moscow	Lamiflex Board AB, Nyköping	
UPM-Kymmene (Chudovo), Moscow	Nefab Packaging, Runamo	

The interview questions very initially designed in English and translated into Russian (see *Appendix 2* and *3*). The questionnaire focused on a couple of main themes such as birch plywood production, raw material situation, market demand and development, substitutes, domestic and international competition and future prospects. During the design of interview questions, sensitivity and willingness to answer certain questions were taken into account. The interviews started with a couple of concrete questions about the company, production or purchased volumes of birch plywood. The questionnaire integrated several multiple-choice questions and open-ended questions about market expectations, future development and company goals.

4.5 Data analysis and presentation

The first step in the data analysis process was to prepare the qualitative data by *transcribing* the audio-recorded interviews, described as a written account using the actual words of the respondents (Sounders *et. al*., 2007). Transcribing is time consuming process. An advantage with recording the interviews is to avoid misunderstandings. It enables the researcher to listen to the recorded information several times if necessary. There is no standardized approach when analysing qualitative data, but mainly the focus is laid on discovering regularities, comprehending the meaning of text and action and reflecting. An aspect, which is common when organizing large amount of qualitative data is that the information is classified into meaningful *categories*. The next activity is unitizing data, which means that different parts of the data are applied to the appropriate category. Further, one needs to recognize relationships, develop and test theories to reach conclusions.

Qualitative data can be analysed using *deductive* or *inductive* approaches (*Op. cit.*). By using the deductive approach, already existing theory is used during the qualitative research and data analysis. The inductive approach is used when one wants to create an own theory based on the collected data. In this study, the data analysis is based on existing theories, found in *Chapter 3*. The advantage with this method is that "it will link your research into existing body of knowledge in your subject area, help you to get started and provide you with an initial analytical framework".

5. Results

This chapter presents a summary of the empirical information obtained by qualitative interviews with birch plywood producers and consumers. The chapter starts with a brief presentation of the participants in the study. The topics concerning the plywood producers are: supply of birch raw material, development of birch plywood production, future price trends, areas of use and consumers, new market entrants and entry barriers and substitutes. The main topics for birch plywood consumers are: birch plywood supply and future demand, development of birch plywood production, future price trends and consequences, areas of use with increased demand, new market entrants and entry barriers and substitutes.

5.1 Presentation of the participants in the study

5.1.1 Birch plywood producers

Demidovo Plywood, Moscow, Russia

- The company's main business is production of birch plywood solutions for various areas of use. Demidovo Plywood uses only birch for large-sized plywood production.
- During year 2008, the company is expected to produce approximately 100 000 m^3 of plywood.
- Demidovo Plywood mill is located in Demidovo, Vladimirskaya region.
- The main consumers are companies within industrial construction and house building (60%), container and trailer manufacturing (30%). The remaining 10% is sold for small-scale construction.
- Formaldehyde emission class E1.

Zharkovsky DOK, Moscow, Russia

- During year 2007, Zharkovsky produced approximately 24 000 m^3 of birch plywood. The company has specialized in waterproof plywood, formaldehyde emission class E1.
- Zharkovsky's production of birch plywood increases up to 5-10% annually.
- The company produces bed slats as a subsidiary business, which corresponds to 20% of the total production.
- In year 2003 Zharkovsky was acquired by the company Felix, one of the leading office furniture manufacturers in Russia.
- Currently, Zharkovsky renews 95% of the industrial equipment.
- The company's customers comprise all segments. Some examples of applications are shipbuilding, packaging, furniture manufacturing and transport industry. It is difficult to estimate the percentage breakdown between the segments because the sold volumes depend on the season.

Sveza Group, Moscow, Russia

- Sveza is the largest birch plywood producer in Russia. During year 2007 Sveza produced approximately 600 000 m^3 birch plywood. During year 2008, the plywood production is estimated to reach 700 000 m^3.
- The company also produces white and laminated particleboard, which additionally contributes with 300 000 m^3 to the production volume. There is also a subsidiary production of bed slats.

- The Sveza Group consists of five plywood production facilities; Ust-Izhora (Leningrad region), Fanplit (Kostroma region), Perm (Perm region), Fankom (Kostroma region) and Novator (Vologda region).
- Sveza uses the waste from plywood production for chipboard manufacturing, fuel or sells it for pellet production.
- Sveza sells plywood mainly to the construction industry, transport and furniture manufacturers and small volumes are sold for packaging production.
- Formaldehyde emission class E1.

Fancom, Moscow, Russia

- The company Fancom was established year 2004 and produces birch plywood in the standard dimension of 1525×1525 mm. The production takes place in the cities Kaluga and Sokol.
- Fancom owns three production facilities with a total annual output of approximately 72 000 m^3. Since the establishment of the enterprise the production of birch plywood has doubled.
- Fancom's main customers are furniture manufacturers (50%) and the construction industry (50%). The share of sales depends on season and demand.

Chudovo (UPM-Kymmene), Moscow, Russia

- UPM's Chudovo plywood mill was established in 1995 and produces regular and laminated birch plywood.
- The annual production volume is 100 000 m^3. The production volume has been stable for several years, but an increase by 20 000 m^3 took place in the recent two years.
- The end-customers are mainly building companies, where laminated plywood is used. Approximately 90% is sold to the construction industry and 10% to furniture and transport manufacturers.
- Chudovo's main export market is Europe.

5.1.2 Birch plywood consumers

Bo Andrén AB, Stockholm, Sweden

- The company Bo Andrén imports wood-based boards, which are sold to different retailers in Sweden.
- Wood-based boards are mainly bought from Brazil, Indonesia, China, Poland, Russia, Finland and Norway.
- The company purchases approximately 7 000 m^3 birch plywood from Russia annually.

Lamiflex Board AB, Nyköping, Sweden

- Lamiflex Board business is packaging manufacturing, where wood-based boards are the main component.
- One of the main products is the "lamiflex board" that can be described as a "bendable packaging", where the organic material hardboard (fibreboard) is used. Approximately 50% of the company's turnover (2007: 320 million SEK) comes from the lamiflex boards.
- The imported plywood from Russia is used for packaging manufacturing, but is also sold to Swedish retailers and wholesale dealers. Plywood accounts for 60 million SEK whereas 15 million SEK is Russian plywood. The company purchases all qualities and dimensions of plywood.

- Lamiflex Board has production facilities in Estonia and Germany and purchases approximately 5 000 m^3 birch plywood annually from Russia.

Nefab Packaging AB, Runamo, Sweden

- Nefab's main business is packaging manufacturing from wood-based boards, which are joined with steel components to form a box. .
- The production facility in Runamo uses 18 000 m^3 of plywood annually; 90% are purchased from Russia. The remaining 10% are purchased from Sweden and Finland.
- **Nefab Supply** in Estonia provides the entire Nefab concern with raw material.
- The production facility in Runamo has plywood storage for 3-4 months due to unsecure supply of plywood. The storage in Estonia is used for Nefab Europe.
- Nefab Supply has 6-7 Russian birch plywood suppliers, e.g., Perm, Ust-Izhora, Parfino and Murom.

PERI, Moscow, Russia

- The company PERI is a world leading producer of formwork and scaffolding, where plywood is used for formwork production. The company uses only birch plywood. The PERI office in Moscow was established year 2001.
- PERI uses high quality plywood and purchases approximately 2 000 m^3/year large-sized, laminated birch plywood from Chudovo plywood mill (UPM-Kymmene).

Agrisovgaz Fasadnye Sistemy, Moscow, Russia

- The mother company is named Russian Timber founded in USA. Agrisovgaz Fasadnye Sistemy is a *trading company*, which sells plywood to the building industry in Russia.
- The company started to export plywood year 1992, but due to favourable market conditions in Russia the export rate has decreased.
- Agrisovgaz Fasadnye Sistemy imports OSB since 2 years ago. The company purchases approximately 2 000 m^3/month of OSB from USA and Canada and XXm^3 of plywood annually from several different Russian suppliers.

5.2 Birch plywood producers

5.2.1 Supply of birch raw material

Demidovo: The company has not experienced any major problems in obtaining birch raw material due to well-developed logistical solutions, where birch logs are purchased from adjacent regions.

Zharkovsky: Despite the favourable conditions for wood-processing in Russia, the lack of infrastructure is still the main obstacle for constant raw material supply. Many forests are over-mature due to difficulties to access and transport the birch logs out of the forest. However, currently Zharkovsky does not experience any difficulties in obtaining birch raw material. The company's strategy is to acquire raw material from various geographical locations depending on the weather conditions. In some regions the winter is longer, allowing the ground to freeze and making it easier to transport the birch raw material.

Sveza: Sveza have experienced difficulties in obtaining birch raw material because large volumes of birch logs were exported to Finland. By selecting birch logs with a large diameter (30-36 cm), considered to be the best kind for plywood production, the Finnish plywood producers had a great advantage. Currently, this is no longer a problem after the

implementation of the export tax on logs. Raw material is purchased within a radius of 150-180 km from the production facilities. Due to bad forest roads, the producers buy birch logs during winter and summer to secure the production during spring and autumn respectively.

Chudovo: Since the implementation of the export taxes, there are no problems in obtaining birch raw material. However, the lack of infrastructure still remains a problem.

Fancom: The company leases forest land in order to have greater influence on the raw material supply. Parts of the log, which Fancom does not use for own plywood production, are sold to other wood-working industries in Russia. Even other wood species found on the forest land, besides birch, are sold.

5.2.1.1 Export taxes

Demidovo: According to the interviewed person, the development of birch raw material supply in the next 5-10 years will depend on the export taxes. A major problem which the company experienced *before* the export taxes were implemented was the supply of raw material. As an example, competing birch plywood producers in China had full accessibility to Russian raw material. Large volumes were exported, but the increasing export taxes on birch logs will stimulate domestic plywood production.

Zharkovsky: An optimistic view of the Russian plywood industry predicts increased production due to the export taxes. Further refining of wood in Russia is a prerequisite for an expanding plywood industry.

Chudovo: The interviewed person predicts that the production of plywood will, thanks to the export taxes, continue to grow in the future. Chudovo plywood mill and other plywood facilities will expand their production to meet the strong domestic demand.

5.2.1.2 Infrastructure

Demidovo: Only 20% of the total volume of allowed logging is utilized due to lack of infrastructure. The participant in the study has pessimistic thoughts on the future development of Russia's infrastructure. Improving the infrastructure requires money. *Better infrastructure will increase the supply of birch raw material and the prices of plywood will decrease*. Therefore, there are no incentives for private enterprises to invest money in improving the roads if it will lead to lower birch plywood prices. Instead, governmental actions must take place in order to improve the country's infrastructure.

Zharkovsky: Despite the favourable conditions for wood-processing in Russia, the lack of infrastructure is still the main obstacle. Many forests are over-mature because of difficulties in accessing and transporting birch logs out of the forest.

Sveza: The interviewed person is optimistic about the future plywood production, but mentions that one of the largest threats in the future is the lack of infrastructure. The person claims that the government has made announcements about investing in road construction.

Fancom: The interviewed person recons that increased birch plywood production and governmental actions to improve the infrastructure come hand in hand.

Chudovo: The participant in the study thinks that the infrastructure will improve – the aim of the export taxes is to attract new investments in Russia, something which will not be possible if

the infrastructure does not improve. There will be an equal share between the government and private owners in improving the infrastructure. The person predicts that the birch raw material supply will also develop in the next five years due to better infrastructure. There will also be a greater selection between different qualities of birch logs.

5.2.1.3 Competitors for birch raw material

Demidovo: The main competitors for birch raw material are companies, which have customized production and plywood of traditional dimensions (1525×1525 mm). So far, there are only a few companies which offer customer solutions and they also appear to be market leaders. The competition is driven by increasing the plywood production volumes. Consequently, companies with large production capacity sell large volumes.

Zharkovsky, Chudovo and *Fancom:* The competitors for birch raw material are other producers of plywood. The interviewed person from Fancom explains that the pulp industry uses another part of the tree trunk, which is of lower quality and cheaper. Producers of other wood-based panels also use cheaper birch or waste from the plywood industry.

5.2.2 Development of birch plywood production

Demidovo: Demidovo made an analysis of the future production by comparing the potential plywood capacity and new entrants on the market, to the future demand. The results showed an increased production to approximately 5 million m^3 by year 2010. This corresponds to an increase by 100% compared to the current production volume in Russia. The main reason is the increasing demand for birch plywood and larger production capacities. The construction industry grows rapidly and the overall trend indicates future growth. Transport manufacturing is also a segment that will probably also expand in the future.

Zharkovsky: The interviewed person points out that it is very difficult to predict the future development of birch plywood in Russia. This is due to the resent implementation of the *New Forest Code* and the governmental actions that encourage domestic wood-processing. The person definitely thinks that wood-processing will increase in the future, but he does not know what the final product will be (board, plywood, etc.).

Fancom: The participant in the study considers that the plywood market in Russia is very stable, despite the fact that the prices fluctuate. The person thinks that the Russian plywood production and the *further refining of plywood* will increase in the future. Production facilities will manufacture *plywood components* to a higher extent.

Chudovo: The interviewed person predicts that the plywood production will continue to grow, but not considerably. The growth will be directed towards an increasing demand in Europe. The person thinks that the domestic demand will be *stable or even decrease* due to alternative materials such as OSB and MDF. It is difficult to quantify the increase in plywood production due to political factors such as the export tax, investments and if importers will continue to purchase birch plywood from Russia.

5.2.2.1 Plywood dimensions

Demidovo: Why is the export of birch plywood so high in Russia? The main reason is the traditional plywood dimension of 1525×1525 mm, which until now was adjusted according to the European standards. This dimension is still produced in Russia for furniture manufacturing. Even Demidovo started its production by manufacturing this size modified for the European market. However, domestic birch plywood consumers are gradually starting to use large-sized

plywood used in the construction industry where it is suitable for formwork. The Russian construction industry is "imitating" the Western standards and the demand for large-sized plywood will increase.

Sveza: The standard plywood dimension (1525×1525 mm) will be replaced by a new and larger format, 2440×1220 mm. This larger dimension is more demanded on the market and new, modernized equipment is adjusted according to this size. Historically, Sveza's main customers were the furniture manufactures, which demanded the standard dimension of 1525×1525 mm. Currently, large-sized plywood is produced to a higher extent and Sveza sells mainly to the construction industry (40% of the company's total plywood production).

Fancom: The interviewed person points out that many customers are used to the traditional dimension, 1525×1525 mm and have adjusted their industrial equipment according to this size. Therefore, the person does not believe that other dimension will be demanded in the future. However, plywood producers will manufacture *customized boards*, but standard sized plywood will dominate on the Russian market.

Chudovo: The participant in the study claims that there will be no future production of 1525×1525 mm plywood. The price for this dimension is constantly decreasing and the production facilities will be modernized and large-sized plywood will be produced instead. The majority of the customers, which buy the traditional dimension, are furniture manufacturers and they have a wide choice of alternative materials.

5.2.2.2 Production costs

Demidovo: According to the interviewed person, the production costs depend on the individual production facilities. Companies strive to continuously reduce the production costs. Demidovo's increasing birch plywood production, gives the company the benefit of *economies of scale*. The person does not believe that there will be any attempts in Russia to increase the automatization of the plywood production process, due to cheap working labour. Despite the fact that Demidovo's plywood mill is modern, the interviewed person claims that it is not profitable for the company to modernize the facility any further. Cheap labour is more profitable in the long run. *In resent years, the production costs have grown due to increasing prices on birch raw material and the implementation of the export tax.* The reason for that is lack of infrastructure.

Zharkovsky: The production costs for birch plywood production in Russian have increased due to *growing prices on birch raw material* and *energy costs*. The factor which will affect the future development of the production costs is *inflation*.

Sveza: The interviewed person discusses the advantages and disadvantages with modernizing the industrial equipment. Automatization creates fewer working places, savings on labour and lower risk in making errors. *Russia has a negative demographic development and there is a lack of working labour.* However, modernizing the production equipment will require qualified working labour, which is difficult to find. On the other hand, one should not forget that the energy prices are also growing continuously in Russia.

Fancom: The production costs have increased due to increased prices of energy and birch raw material. A factor that will influence the development of production costs is logistics.

Chudovo: Plywood production costs are growing due to increasing prices for birch raw material and labour costs. The prices of fuel and electricity are also increasing. In the future, production costs will not increase more than in Western Europe.

5.2.2.3 Future opportunities and threats

Demidovo: The interviewed person claims that the future opportunities of the plywood industry will be to *specialize the birch plywood production according to the needs of end-users*. This gives companies the possibility to find a new niche where plywood can be further refined. Thus, new market segments can be conquered. Currently, Russian producers sell standardized birch plywood according to given dimensions. The end-user buys birch plywood of a certain dimension and must adapt the product according to the needed sizes. *In the future, producers will strive adding more value to the birch plywood by offering customized products.*

Zharkovsky: The opportunities and threats of the plywood industry in Russia will depend on the possibility to introduce *alternative products* that can substitute plywood. If the alternative products have the same properties as plywood, a decrease in birch plywood production will take place.

Sveza: The future opportunities of birch plywood production are related to the export taxes. This is an instrument, which encourages domestic wood-processing. The interviewed person considers this to be very favourable for the Russian birch plywood market. Increased wood-processing in Russia will simultaneously *increase the domestic competition* within the plywood industry. Countries, such as Finland, Estonia and Lithuania, which rely on the import of birch raw material from Russia, are now forced to find alternative ways of obtaining raw material for plywood production. It will also be very difficult for these countries to find other wood species, which can compete with the properties of birch. *Thus, the production volumes of plywood in these counties will decrease resulting in a larger production capacity in Russia.*

Fancom: The interviewed person does not believe that the Russian plywood industry will experience any major threats in the future. Birch plywood production in Russia is a *very traditional industry with a long history*.

Chudovo: The opportunities and threats are difficult to predict. However, it is expected that the plywood industry will have a bright future due to dynamic growth of the construction industry, transport and furniture manufacturing. On the other hand, the interviewed person mentions the threat of substituting materials, foremost OSB and MDF. Therefore, he predicts that the growth of plywood production will be *stable* or the production will be directed towards more narrow segments where *specialization* will be a key factor for success.

5.2.3 Future price trends

5.2.3.1 Birch raw material prices

Demidovo: The prices for birch raw material fluctuate every season depending on the weather conditions. The company compensates high raw material prices with cheap costs of working labour, economies of scale and high demand for plywood. These conditions allow Demidovo to increase the price of plywood. The interviewed person points out that it is difficult to predict how the prices for birch raw material will develop in the future. Historically, the prices have shown seasonal fluctuations, depending on the accessibility of birch raw material.

Zharkovsky: The prices for birch raw material will depend on the inflation and how successfully the *New Forest Code* will operate.

Sveza: The participant in the study predicts that the prices will not grow with more than 7-10% annually, under normal weather conditions. Trends indicate decreasing prices for birch raw material during winter and increasing during spring and autumn.

Fancom: The price for birch raw material depends on several factors, e.g., infrastructure. The prices change depends on the season and weather conditions.

Chudovo: The price for birch raw material will continue to grow.

5.2.3.2 Birch plywood prices

Demidovo: The prices for birch plywood depend on economical fluctuations. Historically, the prices for birch plywood have always shown a growing trend. *In recent years, the prices have doubled, but currently a price reduction is expected.* However, it is very difficult to predict how the prices will develop in the future.

Sveza: The interviewed person thinks that the prices for birch plywood will grow in the future due to factors such as raw material prices, inflation, energy and working labour costs.

Fancom: The prices for birch plywood depend on the Russian plywood industry. *If the production volume will increase in the future, the plywood prices will decrease.*

Chudovo: The prices for plywood will continue to grow due to increased production costs.

5.2.4 Areas of use and consumers

5.2.4.1 Dealers

Demidovo: Demidovo's sales channels are yet not well-developed and large volumes of birch plywood are sold with the help of *dealers*. This method is very common in Russia and the majority of Russian plywood producers sell their products in this way. Currently, Demidovo sells 10% of their total production directly to the end-user, but the aim is to increase the share to 50%. It is not always more expensive to sell plywood using dealers. A prerequisite for selling plywood directly to the end-used, is that *the company must be located near the consumer*. Thus, sale offices need to be established and recruitment of new staff must take place. On the other hand, the interviewed person claims that with increase production volumes, it is no longer profitable to have many dealers.

Sveza: Sveza do not sell their products directly to the end-user because they lack the ability to provide the end-customer with the needed service, e.g. just-in-time deliveries. The products are sold as commodities through dealers. The interviewed person informs that the company will continue to use dealers and will not establish representative offices. In order to sell directly to the end-user, the company must first learn to produce the demanded qualities and dimensions. The plywood market in Russia has shown an *increased demand for quality and service* and Sveza strives to improve their customer relationship and alter their satisfaction.

5.2.4.2 Greatest increase in demand

Demidovo: The construction industry has shown the greatest increase in demand for plywood. House construction is growing rapidly in Russia and will continue to increase in the future as well. According to the interviewed person, 60 m^3 of laminated plywood is needed for building a residential house.

Zharkovsky: The boom in the construction industry, which began in year 2004, is the main segment that shows the largest increase in plywood demand. The interviewed person cannot predict which category of buyers will increase their future demand because the market situation is very dynamic in Russia.

Sveza: Compared to other segments, the Russian construction industry has shown the largest increase in demand with up to 45% between the years 2006 and 2007 while the transportation industry has increased with 12%. The interviewed person discusses these two segments in a long-term perspective. Increased construction leads to an increased demand of different goods by the people living or working in the buildings. Increased demand for goods will require improvement and establishment of new bridges and roads in Russia. This will lead to increased accessibility and transportation of goods within the country. Thus, the transportation industry will also expand. The person points out that the growing amount of residential houses will require furniture, which in turn will result in growth within the furniture industry. To summarize, it is clear that the different segments interact and are dependent on each other.

Fancom: Due to *a growing economy* and *better living standards in Russia*, the interviewed person thinks that all segments will increase their demand for birch plywood in the next 5-10 years. The person predicts that the market segments for furniture manufacturing and house building will increase the most in the future.

Chudovo: The interviewed person predicts that the construction industry will increase its demand for plywood in the future. In the furniture industry the demand for birch plywood will be stable, since there are many alternative materials that can be used. The person claims that the transportation industry will also increase its plywood demand. The materials used before were of very low quality, but both cars and trucks will improve in quality in the future.

5.2.5 New market entrants and entry barriers

Sveza: Sveza has developed a five year analysis of the birch plywood market in Russia. According to the participant in the study, many new producers will enter the market and there will be an increased production of *laminated plywood*.

Chudovo: The interviewed person is convinced that new plywood facilities will establish in Russia in the future. There are currently many announced building projects and several of them will soon be implemented. The person does not think that *leading plywood producers will be a threat for new market entrants*. *The market is open and geographically fragmented*. New entrants will produce large-sized plywood and will therefore not encounter any problems in selling their products. The person predicts that plywood production facilities will be built in Siberia as well.

5.2.5.1 Strategies to reach the growing market

Demidovo: The company strives after further development. Demidovo will increase the production capacity and the product assortment. The company also aims to increase customer solutions, i.e., *customized production*. Demidovo will search for new customers and invest in wood-processing equipment. The aim is to target new market segments and geographical areas.

Zharkovsky: Zharkovsky's growth strategy is increasing the product assortment and further refining of products. The company continuously searches for profitable customers in Russia and abroad.

Sveza: Sveza's has three main growth strategies; acquisitions of other companies, renewing the industrial equipment and increasing the plywood production capacity at a specific production facility. In the next two years, Sveza will establish three new plywood facilities with production capacity of 90 000 m^3 each. The company will also produce laminated plywood for the construction industry. Currently, Sveza cannot offer customized plywood, but will probably invest in additional equipment with the ability to cut-to-size. High competition forces the plywood producers to come closer to the end-user and offer higher degree of service.

Fancom: Fancom's strategy is to expand the production capacity. The company will also increase their plywood assortment and consolidate with other companies. Recently, Fancom carried out a modernization of the production equipment. In the future, Fancom will continue to target new markets and customers.

Chudovo: A *fusion between UPM-Kymmene and Sveza* in the areas of cellulose, OSB and sawn materials is expected.

5.2.6 Substitutes

Demidovo: According to the interviewed person, the main competing materials are OSB, plastic and laminated plywood. Plastic and laminated plywood have the same areas of use as birch plywood, but are 2-3 times more expensive. The benefit with laminated plywood it that it can be re-used more times compared to birch plywood. However, the person does not believe that these materials have any future potential due to unskilled working labour. Instead of re-using these boards, many of them will simply be thrown away. The development of laminated plywood will be slow due to its higher price and the fact that it is used for high quality construction. *Birch plywood will always be used, because of its properties, price and its long tradition.* The properties of birch cannot be compared to other species, e.g., spruce and according to the interviewed person spruce is not even considered to be a substitute.

Sveza: The participant in the study points out, that *cheaper materials such as OSB and low quality Chinese plywood have to some extent replaced Russian birch plywood.* OSB mainly substitutes low quality plywood (class C). This results in a negative development of the packaging industry where low quality plywood is most commonly used. Birch plywood for furniture has even more substitutes compared to the construction industry. Some examples are MDF and particleboard. However, the person mentions that there are no materials that can substitute birch plywood by its properties. The choice of material used within different segments depends on customer preferences.

Fancom: The competing materials depend on which segments birch plywood is sold to. Within the construction industry OSB and MDF are the main substitutes. Fibreboard is a substitute within furniture manufacturing. The interviewed person claims that *birch plywood will be difficult to replace because it has always been a traditional material in Russia.*

Chudovo: OSB production will develop in the future. However, OSB is a new material, which requires promotion in Russia. During the last three years, there have been a number of announced projects to build OSB plants in Russia. So far, none of them have been implemented. The main obstacles are the *administrative barriers*. OSB will mainly be used in the furniture and wooden house building industry. However, the interviewed person does not think that wooden houses have a high potential in Russia. The explanation is that many people still prefer stone houses as a more *secure* alternative.

5.2.6.1 Substitute with strongest future potential

Zharkovsky: OSB as a substitute to plywood has the strongest future potential. OSB is cheaper and more ecologically favourable. The adhesive used in plywood production, phenol formaldehyde, can cause health problems if the emissions are high.

Sveza: According to the interviewed person, OSB has the strongest future potential and the company has plans to build the *first OSB production facility in Russia.*

Chudovo: Despite the fact that there is no OSB production in Russia, the interviewed person thinks that this material will show a *very dynamic development in the next two years*.

5.2.6.2 International plywood competition

Demidovo: Chinese producers of plywood are the main international competitors. Chinese birch plywood is cheap and of low-quality. Chinese producers use birch only for the face plies, while the inner plies are made of spruce, thus explaining the low price of plywood.

Sveza: The Finish plywood producers have always been strong competitors, stimulating Sveza to continuously improve and develop their enterprise. The interviewed person thinks that it is necessary to always have a strong competitor. Sveza strives to imitate the Finnish plywood production, business philosophy, customer service and have even bough equipment from Finland. China produces large volumes of plywood, but it is challenging to find segments in Russia which buy low-quality plywood. The person does not believe that Chinese plywood has a future potential. The main reason is the *difficulty for Chinese producers to obtain birch raw material* and the *increased demand for certified products.*

Chudovo: The participant in the study thinks that the quality of Chinese plywood will improve rapidly, but currently Chinese plywood is of the cheapest kind. The price reflects the plywood quality.

5.3 Birch plywood consumers

5.3.1 Birch plywood supply and future demand

5.3.1.1 Purchase of birch plywood

Bo Andrén: The suppliers in Russia offer high quality birch plywood according to European standards. In recent years, the company has experienced problems in purchasing the needed volumes, due to high domestic demand for birch plywood in Russia.

Lamiflex Board: The company has experienced difficulties in purchasing plywood from Russia and has decreased its volumes of birch plywood imported from Russia. Instead, Lamiflex Board imports plywood from China and Brazil. The company purchases plywood from Brazilian coniferous wood species. This is due to *increased prices and domestic consumption of plywood in Russia. The domestic competition in Russia has caused a dramatic price increase.* The Russian suppliers can also be unreliable and it is difficult to predict when the ordered plywood will arrive to Sweden. Russian plywood producers are *conjecture sensitive* and have *short-term production plans*. Further complications are caused by the political trading obstacles. Therefore, Lamiflex Board is constantly searching for *plywood substitutes* or *cheaper plywood in other countries*.

Nefab: Birch plywood of desired quality can only be found in Russia. There are no other markets, which can offer birch plywood of required volumes, quality and price. Nefab has

adapted their packaging concept and construction in accordance to the Russian plywood quality (class C). Since Nefab produces packaging there is no need of higher grade plywood. The imported volumes of birch plywood from Russia to Nefab in Runamo are currently half as less compared to year 2001. This is due to the establishment of production facilities in Estonia and Slovakia. The purchased volumes for Nefab Supply in Estonia have, on the other hand, increased since year 2001. This is because the company has expanded and has larger market shares.

PERI: PERI does not experience any difficulties in obtaining birch plywood from their supplier, Chudovo plywood mill. The company has a written contract, guaranteeing monthly deliveries of birch plywood. A long and strong relationship explains the reason why PERI has Chudovo as a plywood supplier.

5.3.1.2 Infrastructure

PERI: Compared to the growth of the construction industry, the development of infrastructure is left behind. The interviewed person does not believe that new forest roads will be built because it is not profitable for private owners.

Agrisovgaz Fasadnye Sistemy: A major problem is the supply of birch raw material and only 20% of the birch log is utilized during the plywood production process. The forests located near the roads are already harvested. It is expensive to build roads in order to reach new forest areas and there is no forest reproduction – all these factors create scarcity of raw material.

5.3.1.3 Demand for birch plywood

Bo Andrén: Bo Andrén's future demand for birch plywood will depend on the price of the product. Currently, the company purchases larger volumes of plywood from Brazil, due to the lower price.

Lamiflex Board: The interviewed person predicts that the company's demand for Russian birch plywood will be relatively constant in the future, but OSB will play a more significant role in the coming years. The Russian market for birch plywood is very large and strong, thus the exports might decrease in the future. Therefore, importers will be forced to search for alternative products, other plywood qualities and new markets.

Nefab: The participant in the study predicts that Nefab's demand for birch plywood in Runamo will be constant in the next 5-10 years. From which countries Nefab will purchase plywood in the future is unclear. It all depends on *price* and *availability*. The person believes that Nefab in Runamo will use *MDF corresponding to 20-30% of the total volume in the next 10 years*. The interviewed person thinks that Nefab will purchase other materials from Russia in the future, for instance *aspen* plywood, which is a cheaper substitute to birch plywood. The company must have *alternatives to secure their supply of plywood*.

Agrisovgaz Fasadnye Sistemy: The interviewed person points out that there is lack of plywood in Russia and even *additional production facilities cannot cover the demand*. Currently, there is a high domestic demand for plywood and this trend will continue until the Olympic Games in Sochi, year 2014. The boom in the construction industry will continue until the Olympic Games and every cubic meter of plywood will be sold until then. How the market will develop after that is difficult to predict, but the interviewed person is optimistic about the future production and consumption of plywood.

5.3.1.4 Russian birch plywood suppliers

Bo Andrén: The company has a good and long relationship with their Russian birch plywood suppliers. According to the interviewed person, it is very difficult to find reliable suppliers.

Lamiflex Board: Russian plywood suppliers *lack long term thinking* and *produce for the moment*. It is necessary to create long term customer relationships and establish a stable customer base, which corresponds to 80% of the total sales. It is not always possible for buyers to negotiate for plywood prices, since the producers have own regulations. The flexibility which Lamiflex Board has is to reject a price offer. The company has collaborated with their suppliers for 15-20 years. Many Russian companies have changed owner or have consolidated. A consultancy firm in Russia helps Lamiflex Board with contacts and other issues. Currently, Lamiflex Board has five Russian birch plywood suppliers.

Nefab: Recently, Nefab bough a production facility in Spain, which uses eucalyptus as raw material. This was done in order to reduce their dependency on Russian plywood. The intent to create lower dependency has to do with *vulnerability* and *availability*. Russian plywood producers can be *unreliable* and factors such as weather conditions and price fluctuations affect the supply of plywood to Nefab. Currently, the company experiences difficulties in purchasing plywood of the needed thickness (6 mm). The plywood supply to Nefab is also affected by the Russian construction industry, which has a strong influence on which plywood dimension should be produced. Hence, the plywood dimension demanded by Nefab becomes more expensive.

Agrisovgaz Fasadnye Sistemy: The interviewed person points out that the current suppliers of plywood are a result of a long relationship. The company does not search for new suppliers, instead tries to maintain a good relationship to the current ones. The main problem is to receive the ordered plywood in correct volumes and qualities.

5.3.1.5 Competitors and other suppliers of plywood

Lamiflex Board: The Chinese plywood market is a strong competitor. The Chinese production and quality will improve in the future. The most common wood species used for plywood production in China is *poplar*, which has significantly lower properties than birch plywood. Another strong competitor is the Brazilian plywood market. It is necessary to have alternatives when Russian plywood prices tend to increase. There are approximately 10 Swedish companies, which import birch plywood from Russia and appear to be Lamiflex Board's competitors.

Nefab: The Swedish competition for birch plywood is small while on the Russian market the competition is for the right size of plywood. Russian birch plywood is demanded by other European importers, which Nefab Supply competes with. Since Nefab is such a large buyer, they have the possibility to negotiate for the price. The interviewed person describes China as a competitor. Nefab thinks that the Chinese quality for plywood is low and the variations in quality are too large. Another problem with the Chinese plywood is *high adhesive emissions*. Nefab purchases poplar plywood from China. The company does not want to purchase any tropical wood species from South America, Malaysia or China, due to environmental reasons. Therefore, Nefab must find plywood made of birch, poplar, pine or spruce.

PERI: The interviewed person thinks that the plywood production will continue to develop in Russia, but it is difficult to predict in which pace. One of the reasons is the *flow of Chinese plywood*. The plywood quality constantly improves and within 2-3 years Chinese plywood will

reach the quality of leading Russian producers such as Sveza, Perm and Chudovo. Currently, Chinese plywood in Russia is used in the construction industry for formwork and has a short life span (can be reused 3-4 times).

Agrisovgaz Fasadnye Sistemy: The interviewed person has a negative opinion about Chinese plywood and points out that professional and well-established Russian companies are not interested in buying Chinese plywood. The only segment where Chinese plywood can be applied is within furniture manufacturing. The price difference between Russian and Chinese plywood is not significant.

5.3.2 Development of birch plywood production

Bo Andrén: The participant in the study thinks that the birch plywood production in Russia might increase in the future.

Lamiflex Board: The interviewed person thinks that the domestic plywood production will maintain stable volumes, but a *modernization process* will take place among the plywood production facilities. Russian plywood production will soon be comparable to the Finnish production. Russian producers strive to *further refine their products in order to set higher prices*. In turn, cheaper plywood used for packaging manufacture will be more difficult to purchase.

Nefab: The interviewed person thinks that the Russian plywood industry will expand in the future, foremost due to the large volumes of birch resources. By improving the infrastructure and investing in better industrial equipment, the plywood industry can be expected to continue its development. The export taxes will encourage domestic wood-processing.

PERI: Plywood production will continue to develop, but it is difficult to predict in which pace. The interviewed person recons that the production will continue to grow due to an expanding construction industry. The person predicts that until the Olympic Games in Sochi year 2014, the Russian construction industry will continue to grow. The main growth will take place in different regions, “oblast”, in Russia.

Agrisovgaz Fasadnye Sistemy: Plywood production will increase 3-4 times in the next 10 years. Currently, most of the investments are related to the construction industry, where the return of capital is high compared to investments in plywood production. It takes approximately 1.5-2 years to build a plywood production facility, while building a house is a significantly faster and more profitable process. This is the reason why there is a *lack of plywood production facilities* in Russia. It takes 2-3 years after the establishment of a production facility to gain any earnings. The interviewed person claims that a medium-size plywood facility costs $40 million.

5.3.2.1 Plywood dimensions

Bo Andrén: Many plywood facilities in Russia, which produce standard plywood dimensions, will gradually adjust their equipment according to European standards. The interviewed person predicts that the old facilities will either shut down or modernize the equipment.

Lamiflex Board: The traditional (1525×1525 mm) plywood dimension will remain in Russia. Currently, there are few companies that produce European sizes (1220×2440 mm) due to the price differences between small and large dimensions. Many importers have adapted their production according to the traditional plywood size. An example is Lamiflex Board’s

production facility in Estonia, which joins the imported Russian plywood creating larger boards.

Nefab: The interviewed person points out the investments in the Russian plywood industry are focused on large-sized plywood instead of the traditional size. *Large-sized plywood is highly demanded by the domestic construction industry*. The difference in price between these sizes is 10-15%, but it depends a lot on conjecture and demand. However, the person thinks that it is good that different sizes of plywood are available in sense of *optimatization*. The traditional plywood dimension will gradually disappear. Nefab prefers large-sized plywood, but when it is not available the company joins small-sized plywood.

5.3.2.2 Production costs

Bo Andrén: Growing production costs are caused by higher cost for working labour, raw material, adhesives and transports. The price for adhesives depends on methanol and phenol prices. The interviewed person does not think that the labour costs will increase further. Cheap working labour is a competitive advantage in Russia.

Lamiflex Board: The production costs have increased, but the production process has *rationalized* thanks to new and better equipment. The interviewed person thinks that the production costs will increase in the future due to *improved living standards* in Russia. The costs for working labour will increase and people will become more demanding. Environmental problems will become more significant - an issue which currently is more or less neglected in Russia.

Nefab: The production costs will most likely decrease in the future due to increased investments in *better production methods* and *modern equipment*.

Agrisovgaz Fasadnye Sistemy: The production costs will change only slightly in the future due to higher labour and electricity costs.

5.3.2.3 Future opportunities and threats

Bo Andrén: The greatest opportunities in the future are Russia's birch resources. The threats, on the other hand, are eventual substitutes. The company is constantly searching for substitutes because Russian birch plywood does not any longer have a competitive price level.

Lamiflex Board: The opportunities that the plywood market will face are the large birch resources followed by a long tradition of plywood production in Russia. The working labour costs are competitive and the production will approach the Finnish production. Companies will continue to further refine their products – specialization, production of laminated plywood and even coniferous wood species will be used for plywood production. The biggest threats are the incapability to access the birch raw material. When the price for birch plywood reaches a certain level, substituting materials will also act as a threat.

Nefab: The future opportunities are improving the raw material accessibility by investing in infrastructure. Rationalizing the forest industry creates great opportunities for the plywood industry. On the other hand, Russia's population development is negative and there is a higher degree of urbanization due to poor infrastructure in the countryside. The future threats are related to political instability in the country and corruption. The flow of capital should remain in Russia and money should be used for public benefits, e.g. infrastructure investments, instead of flowing only to one capital owner.

5.3.3 Future price trends and consequences

5.3.3.1 Birch raw material prices

PERI: The interviewed person predicts that the prices for birch raw material will continue to grow. The forest recourses are finite, but also other factors such as energy cost will influence.

Agrisovgaz Fasadnye Sistemy: The prices for birch raw material will increase in the future. The increasing prices depend on the scarcity of raw material.

5.3.3.2 Birch plywood prices

Bo Andrén: The interviewed person predicts that the price for birch plywood will be *constant or decrease* in the next two years. Since the prices have been high, *companies* which import birch plywood from Russia have started to search for substitutes. China and Latin America are potential plywood suppliers.

Lamiflex Board: A change in plywood consumption may force the prices to fall in the long run. The participant in the study predicts that the price for birch plywood will decrease and remain stable in the next 1-2 years, due to a period of dynamic price raises. Historically, the prices for birch plywood have been stable for many years before *perestroika* took place.

Nefab: The price for birch plywood is related to the energy prices. The interviewed person thinks that the *prices will fall in the short run, because many plywood consumers have started to search for substitutes*.

Agrisovgaz Fasadnye Sistemy: The prices for plywood will increase. This has a logical explanation; *high demand and lack of plywood on the domestic market*. Even if the prices will continue to increase, plywood will still be demanded.

5.3.3.3 Strategy to meet the increasing prices

Nefab: Nefab adapts to the increasing prices by searching for substitutes and inventing new packaging solutions.

PERI: If the prices for birch plywood will increase, PERI will anyhow be forced to purchase plywood from Chudovo plywood mill. If one variable changes, other variables will change simultaneously. In other words, PERI will increase the price for their products.

5.3.4 Areas of use with increased demand

Bo Andrén: The demand for *laminated plywood* has increased in the Russian construction industry where it is mainly used for formwork. Improved living standards in Russia have resulted in increased demand for higher quality houses where plywood is needed. The construction will continue to expand even in the future.

Lamiflex Board: The construction industry has shown an increased demand for birch plywood. The interviewed person thinks that the construction industry will grow in the future, due to a strong need of housing renewal and increased living standards.

5.3.5 New market entrants and entry barriers

Bo Andrén: There will be new market entrants in the future, including both domestic and foreign investors.

Lamiflex Board: Many of the plywood producing companies in Russia have merged, creating *fewer and bigger enterprises*. For instance, Sveza has purchased several production facilities, thus making it more difficult to find alternative suppliers. Lamiflex Board searches for new suppliers in Russia. However, the interviewed person does not think that new Russian production facilities will establish in the near future.

PERI: Plywood manufacturing is a complicated business. The market leaders are defined – Sveza, Chudovo, Perm, Demidovo. The interviewed person thinks that these market leaders will prohibit the development of smaller or new established plywood producers. The person also points out the influence of Chinese plywood, which will contribute to tougher competition in the future.

Agrisovgaz Fasadnye Sistemy: There is no need of establishing large production facilities, instead small plywood producers (2 000-3 000 m^3 of plywood/month) are necessary, to cover certain geographical areas. Small production facilities are mobile, can be modernized quickly and most importantly the *plywood production can be specialized*. Thus, market leaders are not a threat for small scale producers, because they can specialize their production. It is not profitable for large plywood producers to customize their production. The interviewed person gives an example with plywood needed for formwork, which is demanded in different sizes. A small producer can quickly adapt the production and respond to market changes and customer demand. New production facilities can be established in regions of St. Petersburg, Tverskaya, Vologotskaya, Arkhangelsk and Komi.

5.3.6 Substitutes

Bo Andrén: In Sweden, OSB is used to a higher extent. Compared to plywood, the properties are the same, but OSB is heavier. The demand for OSB will increase and OSB production facilities will be established in Russia.

Lamiflex Board: Birch plywood is difficult to replace and there will always be a high demand for this product. Birch plywood is a *concept* with a long tradition in Russia.

Nefab: The company uses other substituting materials in order to reduce their dependency on Russian birch plywood. The interviewed person would prefer to use *hardboard* (masonite) for packaging production, but this product has a negative development. Therefore, MDF is a potential competitor to birch plywood. The disadvantage with MDF is that it is a heavy and brittle material. One cubic meter of birch plywood cost twice as much as MDF.

5.3.6.1 Substitute with strongest future potential

Lamiflex Board: An alternative material used to a higher extent is OSB. It can especially replace birch plywood used for packaging manufacturing. *The lower the quality of birch plywood, the easier it is to find a substitute*. If a substitute can fulfill the same function as plywood, the price will be the defining factor. It is cheaper and easier to purchase OSB (production facilities located nearby), creating a more even flow in the supply chain. There are many OSB producers in the USA and since the US currency is low, this market is attractive for importers. The interviewed person thinks that there is a great potential for OSB production in Russia in the future. The person estimates that there will be approximately 10 OSB production facilities in Russia in the near future. OSB does not require high quality raw material and different wood species can be used.

Nefab: The interviewed person does not consider the substitutes as a threat to the plywood industry. However, the person thinks that OSB has a future potential. OSB does not have the right properties in Nefab's packaging manufacturing. It is more difficult to nail steel components in OSB compared to birch plywood. The interviewed person predicts that OSB production facilities will be established in Russia in the future. One reason is the *higher degree of utilization* of the birch log. It is easier to automatize the production process, but more adhesives are needed.

Agrisovgaz Fasadnye Sistemy: The interviewed person believes that OSB will fully replace plywood in the near future. On the other hand, he points out that plywood will always have a strong position within certain areas of use where OSB cannot be used. The main segment is expensive furniture and flooring, where only plywood is used. OSB has a positive development within the construction industry. An OSB production facility should, at least, produce 250 000 m^3 annually. The main problem is to obtain raw material and find a suitable geographical area. Another issue is lack of skilled labour and experts who can manage the production equipment. The person explains that this is a risky business. There must be a continuous flow and storage of raw material to run the production facility in full capacity.

5.4 Additional findings

During the meeting with Börje Jalgerius (*Ply-Consult East*) and a person from the Institution of Forest Economics in Moscow, a couple of additional aspects about the Russian plywood industry were taken into account. Here follows a summary:

Jalgerius explains that the reason why Nefab chose Russia as a birch plywood supplier was due to *the price and their ability to sell low quality plywood*. He points out that the Russians were unsecure suppliers – the production facilities could stand still for several weeks or even months. The forest roads were too muddy for timber transportation. Jalgerius was forced to switch suppliers more frequently to secure the product supply. At one point, Jalgerius was interested in buying only *veneers* from Russia, which turned out to be practically impossible. The Russia plywood producers do not sell half-fabricate and produce along the entire supply chain. *It is not economically profitable to produce only veneers*. Thus, in order to obtain maximum utilization, Russian plywood producers have facilities for the entire plywood production process. Therefore, it is extremely expensive to purchase veneers from Russia.

Jalgerius predicts that the domestic competition in Russia has increased, which results in decreased export volumes. Increased competition is a result of improved *living standards* and *increased economical development*. Russian plywood producers can now gain capital in Russia equivalent to other countries. The interest in export has therefore decreased. However, a key issue in Russia is the lack of infrastructure. According to Jalgerius, *if the infrastructure will improve, Russia will become unbeatable in the future*.

According to Jalgerius, the Finnish plywood producers are superior. The plywood industry in Finland is strong with a few market leaders. Finland develops technology for plywood production (e.g., Raute) which is sold to Russia. The Russian plywood producers have almost reached the Finnish quality – both in terms of strength and appearance. He predicts that Russia will even in the future invest in plywood production. Jalgerius thinks that the two expansion strategies within the Russian plywood industry will be *consolidation* and *smaller producers will specialize their production*. He thinks that there will be new entrants on the market, which will expand in the future as well.

Compared to other wood-based boards, Jalgerius is convinced that birch plywood will *maintain its position as a very strong material, but might become very expensive in the future compared to other boards.*

The main task of the Institute of Forest Economics in Moscow is, in collaboration with various regions, to develop a long term program (until year 2020) for the Russian forest industry. The interviewed person explained that the new export taxes on the 1st of January year 2009 will benefit the Russian plywood producers. Birch raw material for plywood production will remain in Russia. The person describes that traditionally, plywood production takes place in the European part of Russia. Currently, 93% of the total plywood is produced in the European part, while the remaining 7% are produced in the Asian part of Russia. The person believes that the plywood industry will continue to grow in Russia, but the production volumes will not reach more than 5 million m^3 by year 2020. The main obstacles are obtaining birch raw material and insufficient infrastructure.

The interviewed person discusses the use of *softwood* for plywood production. In recent years, the prices of softwood plywood have grown, due to an increased demand. However, softwood plywood is *20% cheaper than hardwood plywood.* The participant in the study predicts that the production of softwood plywood will increase in the future. It is primarily used in wooden house building, where birch plywood properties are not needed and it is a cheaper material as well. The person predicts that *spruce plywood production will increase by year 2020* due to growth of wooden house building, where spruce is used to a high extent.

6. Analysis

This chapter analyses the empirical findings using the theoretical framework described in chapter 3. The chapter is divided into the following areas: general analysis, industry analysis based on the five force model, application of the resource based view and buying behavior.

6.1 General analysis

The main findings concerning the Russian birch plywood ***producers*** are:

- The producers do not experience any problems in obtaining birch raw material for plywood production. This is explained by the implementation of the export taxes in Russia. However, all the participants agree that the lack of infrastructure remains a major problem.
- The competition for the birch raw material is only among the plywood producers.
- The respondents are optimistic about the future development of birch plywood industry. The production of large-sized plywood will increase. However, production costs will definitely continue to grow. High birch raw material prices, increasing energy and labour cost are the main reasons.
- The future opportunities for the plywood industry are related to specialization, further refining (value-adding) of plywood and the export taxes, which stimulate the supply of birch logs for domestic wood-processing. Substituting materials, mainly OSB, are the main threats in the future.
- Future birch raw material prices are difficult to predict due to their fluctuations.
- The greatest increase in demand for birch plywood is within the construction industry.
- New market entrants are expected.
- The main strategies used to reach the growing market are increasing the production capacity and the product assortment. Some producers intent to consolidate with other companies.
- OSB has the strongest future potential and will probably develop in the next 2-5 years. However, the producers agree that the birch plywood properties are better than those of OSB and plywood has a well-defined market position in Russia.
- China is the main international competitor offering cheap but low quality plywood.

The main findings concerning the birch plywood ***consumers*** are:

- The Swedish importers find it more difficult to purchase birch plywood from Russia. The main reasons are the high prices and increased consumption of plywood in Russia. Importers demand for Russian plywood will be constant in the future. However, importers are continuously searching for substitutes and new suppliers.
- The Swedish buyers of birch plywood consider the Chinese plywood production (alternative supplier). The quality of Chinese plywood will improve in the future.
- The majority of the consumers think that the plywood production will increase in Russia. The construction industry will have a great impact on the future development.
- There is no common agreement among the respondents about the production costs. Some think that costs will increase as a consequence of higher labour and energy costs, while others predict that the costs will remain stable or even decrease.

- The Russian plywood industry relies on domestic birch resources. This is what makes the Russian plywood industry unique and in favorable position compared to the competitors. Cheaper substituting materials are the main threats. OSB has the strongest future potential.
- The prices for birch raw material and plywood will continue to grow.
- New market entrants are expected and small-scale producers will fill certain market gaps.

6.2 The five force model – industry analysis

Based on the data collected through qualitative interviews it is possible to apply Porter's model (1980) to the Russian birch plywood industry. Each force is rated according to the following scale: weak, relatively weak, moderate, relatively strong and strong. *The following ratings are the author's own opinion.*

The ***threat of substitutes*** is a ***relatively strong*** force. The motives for this assumption are as follows:

- The Russian market for birch plywood is experiencing a threat of alternative materials and OSB is considered to have the strongest future potential. Currently, OSB is imported to Russia, but many investors are showing increased interest in establishing OSB production facilities in the country. Sveza and UPM-Kymmene will certainly form a joint venture company that will have a great impact on the future development of OSB production.
- The consumption of OSB is increasing in Russia, thus ensuring demand for OSB in the next decades.
- The area of use where OSB can substitute birch plywood is within the construction industry. It is important to point out that OSB will mainly threaten the market position of low quality birch plywood. OSB is 20-30% cheaper than birch plywood and its properties are also in line with the area of use. Besides this, the raw material does not need to be of high quality and the logs can be utilized to a higher extent than birch plywood logs. Consequently, OSB becomes price competitive if the material can fulfill the same function as birch plywood.
- OSB requires more adhesives than plywood.
- OSB is predicted to have a strong influence on the future birch plywood production and competitors will probably enter the market by means of this substituting material.
- In a long run, birch plywood producers may be forced to reduce their prices due to the increased interest to cheaper substitutes.
- However, OSB is a relatively new material that is less known on the Russian wood-panel market. The production of OSB will require skilled labour and further promotion on the market. Investments in OSB production are capital intensive and require production capacity of minimum 250 000 m^3. Obtaining raw material for OSB production will also be a major problem due to insufficient infrastructure.
- Despite the optimistic future prospects of OSB, it is necessary to mention that birch plywood has much stronger market position in Russia. Plywood is a reliable, appreciated material with a long tradition in Russia. It is difficult to replace birch plywood within certain areas of use (furniture, interior joineries, laminated panels, etc.).

Summary: The conclusion is that OSB has a strong future potential and will act as a threat to the birch plywood production, but *only to low quality plywood*. There is no domestic production of OSB, but investors are aware of the benefits with this material and such facilities will be established in the coming years.

The ***threat of new market entrants*** for the existing Russian plywood companies is considered to be a ***moderate force***. The reasons are presented below:

- The threat is moderate due to an increased domestic demand for birch plywood and the comprehensiveness of the Russian birch plywood industry. The market can comprise more producers to meet the increasing domestic demand for plywood.
- The market for birch plywood is geographically fragmented and new market entrants will probably produce large-sized plywood that is highly demanded.
- Even small-scale birch plywood production will be profitable due to the need of flexible producers that can serve the local market and satisfy specific needs.
- There is a need for deeper specialization of the birch plywood production in Russia. New market entrants will have the opportunity to *customize* and *adapt* the production according to the customer's specific needs. Thus, new producers will find own market niches and customer segments. Since product differentiation is very low within the plywood industry, new market entrants will be able to compete through *specialization* and *further refining* of birch plywood.
- Supply of birch raw material will be the main difficulty for the new entrants. The high prices for raw material consequently lead to high prices for plywood.
- Establishing a plywood production facility requires large capital investment and it takes several years to reach break-even or gain return of capital. The complicated administrative rules aggravate the situation. Other industries in Russia (e.g. construction industry) ensuring quicker earnings attract new market entrants more than the wood working industry.
- Large plywood producers dominate the Russian plywood industry. They have well-established market positions, customer relations and possess the benefit of economies of scale. In addition, large producers have secured their supply of raw material and can easier handle the fluctuations of birch log price.

Summary: The threat of new entrants to established plywood producers is moderate. The entry barriers are high and large market players have strong and well-defined market positions. New entrants will probably compete by means of local, small-scale production and specialization. However, in a long run, new market entrants might force current producers to reduce plywood prices and intensify the domestic competition.

The ***competitive rivalry among existing firms*** is a ***relatively weak*** force.

- The Russian market for birch plywood is geographically fragmented and each production facility serves its own segment of the market. The existing Russian birch plywood producers expand their production and have well-defined positions.
- Birch plywood has a low degree of differentiation, but producers will specialize their production.
- Despite the fact that birch plywood production is traditional in Russia, industry growth is dynamic and the domestic demand is escalating. Thus, the demand exceeds supply and companies serve a large market. This status explains the high price for birch plywood.

- The implementation of export taxes has a strong influence on plywood producing companies in other countries (e.g., Finland). Birch raw material will remain in Russia, i.e., it is of favour for the domestic plywood production. The competitive rivalry for raw material caused by foreign companies has decreased already.
- However, the main competition among domestic plywood producers is for the birch raw material. Insufficient infrastructure creates difficulties in accessing and transporting birch logs from the forest.

Summary: At present, the Russian birch plywood producers are experiencing favourable market conditions. Demand exceeds supply, the construction industry is the main customer and the future prospects are optimistic. Currently, the rivalry among the existing domestic plywood companies is mainly arisen by competition for birch raw material.

The ***bargaining power of buyers*** is classified as a ***relatively weak*** force.

- The customers have various needs in plywood quality, size and service. Currently, the *domestic demand is very high* in Russia and producers cannot constantly provide their foreign customers with the needed volumes or plywood dimensions. Producers focus on the domestic market.
- Russian plywood consumers have high solvency, which makes it profitable for the producers to sell plywood domestically. Therefore, the export rate might decrease in the future.
- It can be assumed that large plywood producers sell their products to many consumers both domestically and internationally. The plywood customers in this study purchase relatively small volumes of plywood compared to the producers' total sales.
- Usually, long-term customer relationships explain the choice of supplier.
- The Swedish birch plywood consumers are price sensitive and constantly search for new plywood suppliers and alternative materials. Importers of birch plywood are inclined to find substitutes and the price for birch plywood is the determining factor.
- However, it is difficult for the consumers to find reliable suppliers of plywood and there are no other wood species that can replace the properties of birch plywood.
- Importers of birch plywood struggle to create an even flow in their supply chain and decrease their dependency on Russian plywood suppliers. This is a fact that probably does not threaten the producers, due to high domestic demand in Russia.
- The fact that China is a strong competitor should not be neglected. Chinese production of plywood will continue to improve and many buyers are showing greater interest.

Summary: Birch plywood importers in Sweden are inclined to decrease their dependency on Russia as a birch plywood supplier. Thus, buyers are looking for cheaper substitutes and new markets. However, the Russian market for birch plywood is expanding rapidly and the domestic demand is very high. Producers will not have problems to find plywood customers. Besides that, the customers in this study buy relatively small volumes of plywood. Therefore the producers are not highly dependent on these customers.

The ***bargaining power of suppliers*** is a ***relatively strong*** force. The suppliers in this case are the Russian birch plywood producers, which are suppliers of raw material to their customers. The reasons why it is a relatively strong force are revealed below:

- As mentioned previously, the birch plywood industry consists of a few, large market players with secure market positions. All the producing companies involved in the market research, aim to increase their birch plywood production.
- The producers constantly look for profitable customers, which are easily found. Due to Russia's favourable geographical location, new customers can easily be reached in Europe and Asia.
- In some segments, such as the construction industry, customers are highly dependent on the supply of birch plywood. An example is formwork, where it is very difficult to find a replacing product.
- However, the producers are threatened by OSB. In addition, plywood is an undifferentiated product and the switching costs for plywood consumers are low.

Summary: The above mentioned conditions define the suppliers as a strong group, which will probably continue to grow in the future.

6.3 The resource-based view

According to Barney (1991), companies have the task of "identifying, developing and deploying key resources to maximize key returns." Resources can create competitive advantage and can be classified into three groups: *physical capital resources*, *human capital resources* and *organizational capital resources*. In this analysis, the mentioned resources are applied to the plywood industry in general and not to specific plywood producing companies.

Physical capital resources have been the most distinguishing resources in this study. An important competitive advantage is the availability of *forest resources*. The Russian plywood industry has large volumes of birch raw material and the participants in the study agree that the birch resources are a great asset. To protect and utilize these resources, the export taxes have been the most efficient tool. However, *insufficient infrastructure* in Russia negatively influences the flow of raw material and the forest resources become economically and physically inaccessible. Plywood consumers in Sweden are aware of this problem and it has affected their reliability and confidence for the Russian plywood suppliers. Accessible birch raw material is harvested, while the remaining raw material is difficult to obtain. It is also important to mention *softwood* as a physical capital resource. There is an interest in producing softwood plywood in the future. However, due to underdeveloped infrastructure, Siberia and the Far East are very isolated parts of Russia. Another vital resource is the *technology* used in the plywood production process. An interesting observation made during the interview sessions with plywood producers is that they have or are going through a phase of modernization. New market entrants are faced with the problem to find good geographical locations for establishing production facilities where raw material can be easily accessed and transported.

Many of the plywood production facilities undergo a process of modernization and automatization. Thus, *human capital resources* play an important role. Despite the fact that the working labour is still a competitive advantage in Russia, it is to be *difficult to find skilled labour*. Thus, the new equipment requires people with higher competence. In the future, it will be necessary to provide the personnel with education or even seek help and experience from West. Many participants in the study predicted that new market entrants will establish plywood production facilities in the near future. However, a drawback with investing in plywood production is the slow return on capital. Currently, it is a challenge to find people who are willing to invest money in the plywood industry.

Finally, *organizational capital resources* can be taken into account when analyzing the Russian birch plywood industry. It is important to put emphasis on the process of building relationships between producers and customers. In this study, the consumers of birch plywood have established a long and strong relationship with their suppliers. The buying behaviour of plywood consumers is analysed under the next headline.

6.4 Buying behaviour of plywood consumers

It is easier to analyse the future development of the plywood industry in Russia by taking into account the buying behaviour of consumers. After all, consumers are a prerequisite for further consumption of wood products. According to Hayes (1996), "the supplier's degree of performance will affect the customer orders and future business". The main finding in this study is that Swedish birch plywood consumers are *price sensitive.* The increasing prices have forced Swedish plywood importers to revise their strategies and start searching for cheaper alternatives. The consumers also face the problem in finding reliable plywood suppliers, which is also a process common to the purchasing function. Despite the popularity of Russian birch plywood, suppliers have shown difficulties in providing the customers with the ordered volumes of plywood. Weather conditions, insufficient infrastructure, unavailability of certain plywood dimensions are some factors, which have influenced the deliveries. Increasing domestic demand and consumption of plywood in Russia are another reason. However, a common trend observed during the interviews with birch plywood consumers is that they have a long and stable relationship with their suppliers. The importers have had the same plywood suppliers for many years and strive to maintain a good relationship.

The economical situation in a country will also have an impact on the purchasing process. For instance, labour costs affect the cost performance of a product. The empirical findings in this study, suggest that the raw material and labour cost in Russia have increased in recent years. Thus, the prices for birch plywood have also grown dramatically. It is predicted that Russia's economic development is in the "*take-off*" stage, where "forces of economic growth appear and industries start to expand using new techniques". The industrial equipment is modernized, requiring skilled working labour. How do these factors affect the buying behaviour of the plywood consumers? For a long time, Russia was distinguished as one the world's lowest-cost countries. This trend has already changed. Increased living standards, more demanding citizens and technological improvements are just some examples of factors, which indicate a positive economic development. Thus, plywood will no longer have the same competitive price level as before. Besides that, Russian plywood suppliers want to produce high-quality plywood and will set higher prices. On the other hand, new up-to-date production will reduce the labour intensity. Swedish consumers are forces to search for new plywood industries or substituting materials in order to adapt to the changing market conditions in Russia. OSB will probably become a more important material in the future. The study showed that the Russian plywood consumers are more dependent on their plywood suppliers. If the prices for plywood will continue to grow, the Russian consumers will still continue to purchase plywood. Consequently, they will increase the prices for their products as well.

7. Conclusions and final remarks

The aims of this final chapter are to provide the reader with a discussion about the thesis work, reflect upon the analysis and give some final thoughts. The author assesses the study method and the reliability and validity of the thesis.

7.1 Main conclusions

The aim of this study was to carry out a market research of the current and possible future birch plywood capacity in Russia, both for domestic production and consumption. Another purpose was to reveal factors that will influence the development of the birch plywood capacity in the future. The main conclusions of the study are as followed:

1. Using Porters five force model it is clear that the forces, which have the greatest impact on the Russian birch plywood industry, are the threat of substitutes and the bargaining power of suppliers. The threat of new market entrants is moderate, while the competitive rivalry among existing firms and the bargaining power of buyers are considered to be relatively weak forces.

2. The birch plywood market in Russia will continue to expand and new entrants will gradually win own market segments by means of specialization and customized production. Both production and consumption of plywood show a strong and steady growth in Russia.

3. Established plywood producers aim at expanding their production capacities and assortment to meet the high domestic demand in Russia.

4. The production of large-sized plywood according to Western standards will increase, while the production of the standard plywood dimension (1525×1525 mm) will decline.

5. Currently, the construction industry in Russia grows very dynamically and birch plywood is highly demanded. A continued expansion of the construction industry guarantees a significant demand for plywood.

6. OSB has a strong future potential and is the main substitute to low quality birch plywood. OSB production facilities will be established in Russia in the next 2-5 years and will have a considerable impact on the plywood industry in Russia.

7. Swedish importers of birch plywood are price sensitive and are inclined to find cheaper substitutes or new plywood suppliers in other countries.

8. The prices for birch raw material show seasonal fluctuations. The prices for birch plywood have increased dramatically, but are expected to maintain a stable level or decrease in the short run.

9. The implementation of the export tax is in favour to the Russian wood-processing industry. The export taxes facilitate the supply of birch raw material and Russian birch plywood producers gain a competitive advantage. Producers will strive to further

refine their products - a value-adding operation. However, the supply of raw material will be influenced by weather conditions and inefficient infrastructure.

10. The favourable market conditions in Russia will probably affect the export of birch plywood. Increased domestic demand and high solvency are the reasons why plywood producers will focus their attention on domestic customers.

7.2 The market analysis

The most difficult phase of the market analysis was to identify birch plywood producers and consumers. It is self-evident that more time and resources are necessary to represent a larger sample, which would have provided a deeper insight into the Russian plywood industry. However, the interviewed producers cover a large market share (40%), making the study more reliable. The essence of the thesis is reinforced by providing a two sided perspective - qualitative interviews were held with both birch plywood producers and consumers. This approach has contributed to a better understanding of the Russian plywood market. One could notice that the producers are very optimistic about the future development of the industry. The buyers, on the other hand, provided a more balanced view of the industry and discuss aspects, which are not as obvious when interviewing the producers.

A drawback with conducting a market analysis in Russia is the difficulty in constraining the scope of the study. Russia is a *comprehensive market* and there are many interesting aspects that can be taken into account when carrying out a market analysis. It was also difficult to find reliable information about the Russian birch plywood market. Most of the information found describes the Russian forest industry in general. It was difficult to find price trends for birch plywood, valuable data that enhances the study.

It is important to consider the trustworthiness of the information received by the respondents in this study. During several occasions, participants showed unwillingness towards giving out certain information. This affects the results and can be noticed in the analysis, which to some extent lacks consistency. Respondents answer very differently to the interview questions. Some give very extensive and useful answers, while other participants were concise or refuse to answer some questions. Therefore, it has been somewhat difficult to compile the results in a consistent and fair way. Despite the variations during the interview sessions, a general understanding and interpretation of the Russian plywood industry could be achieved. However, the overall impression is that respondents were very helpful and provided the auther with valuable information.

The researcher did not encounter any language barriers and it has been a great advantage to know Russian when conducting the market research. Another important aspect worth mentioning is the dependency on other people during the research process. Often it is necessary to gain help or information from people who are involved in the study. Sometimes it is difficult to proceed without the needed information, creating a dependency on other people.

7.3 Choice of method

The choice of method in this thesis is considered to be appropriate in order to gain a broad view of the Russian plywood market. The qualitative research has allowed the researcher to be flexible during the interviews and gain a deeper understanding of each company.

Before travelling to Russia, it would have been relevant to test the interview questions on any company (pilot study). This would have provided the researcher with opinions and

suggestions about the questionnaire, making it possible to revise and improve certain questions. During the first interviews in Moscow, some errors were noticed in the questionnaire and could have been avoided if the questions were preliminarily tested. The interview questions are designed with respect to the theoretical framework. However, main attention was laid on analysing the industry using Porters five forces. Therefore, the resource-based theory and theories about buying behaviour have not been applicable to the same extent.

To give the thesis work a more in-depth insight into the Russian plywood industry it would have been necessary to gain practical experience by visiting a Russian plywood production facility. By observing the production process, a better technical understanding would have been achieved.

7.4 Further research

It would be interesting to investigate how the producers work with raw material supply strategies. Raw material supply is a necessary process in every enterprise and it would be relevant to enhance the importance and understanding of this process. It would also be useful to learn more about how plywood producers work with environmental issues, customer relationships and marketing. Since the plywood market in Russia will become more customer-oriented in the future, it would be interesting to investigate the industry by applying theories of relationship marketing.

Further research could also include investigating about other wood species that have a future potential within plywood production in Russia. Softwoods, mainly found in Siberia, are used for plywood to some extent. It would be interesting to examine whether larger volumes of softwood will be used for plywood production.

7.4 Final comments

It was very interesting to study the Russian market for birch plywood, recognizing the future trends and possible production and consumption outcomes. The Russian forest sector is growing quickly and has many advantages, but a lot remains to be done.

The objectives of the study are fulfilled. The researcher has provided the reader with a broad understanding of the Russian plywood market including production capacity, market segments and future prospects. The Russian forest industry has a strong future potential and wood-processing will continue to develop. The implementation of the export taxes will stimulate further refining and value-adding of wood products. The traditional birch plywood industry will continue to expand, but new wood-based panels such as OSB will create tougher competitive circumstances. Plywood producers will strive to improve their enterprises by modernizing the equipment and adjusting the production according to customer demands. One should not neglect the fact that softwood plywood production might expand in the future. Russia has a strong economical development and the living standards are constantly improving. People are becoming more demanding, requiring better quality and service – factors that encourage producers to evaluate and develop their enterprises. The boom in the construction industry and within other sectors reflects the strong purchasing power. An improved economic situation will also stimulate new investment in the forest industry and more effective forest management. There are opportunities to increase the forest reproduction and create a better balance between harvested and allowable cutting volumes. The new Forest Code will hopefully provide a sustainable and effective forest management, not only concentrate on regulations within the forest sector. Thus, the government has an important role in securing the future development of the Russian forest industry.

The competition within the Russia plywood industry is gradually increasing, hence producers will not only focus on cutting production costs, but also fulfilling customer demand. Currently, the domestic demand is strong and the consumption of forest products will be dynamic in the future. Competitiveness in the Russian plywood industry is a key factor of success. Russia is competitive on the international roundwood market, but it is predicted that increased wood-processing will create new market conditions on the Russian and global market.

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Appendices

Appendix 1. Interview questions, Börje Jalgerius

1. General background information about Börje Jalgerius, his career and contacts in Russia.

2. Describe the current birch plywood market in Russia. How strong is the domestic competition? How strong is the foreign competition?

3. Describe the Russian birch plywood market development over time. How has the market changed and what are the underlying factors?

4. Which are the main consumers of birch plywood in Russia? How was it 10 years ago?

5. Which consumers have shown the greatest increase in demand since 2000? What are the underlying factors?

6. Which consumers do you think will show the largest increase in demand in the future? What is the reason for this?

7. How will birch plywood consumption develop the next 10 years?

8. Which strategy will the birch plywood producers use to respond to the growing domestic demand?

9. How has the export of birch plywood changed over time? Has it increased or decreased? How will it be in the future?

10. Production costs for birch plywood: how have the production costs changed over time?

11. Can you mention a couple of opportunities and threats for the birch plywood production in the future?

12. What are the competing materials to birch plywood?

13. Which material do you think has the strongest future potential?

14. What are the main competitors for birch raw material in Russia?

15. How has the price of birch plywood changed over time? How will the price develop in the future?

16. How have the prices for birch raw material changed over time? Will the prices increase or decrease in the future?

17. What do you think are the reasons for difficulties in gaining access to birch raw material?

18. How will the supply of raw material develop in the future? New and better roads?

Appendix 2. Questionnaire: Birch plywood producers

Company information

Company name:…….

Company postal address …….

Company telephone number…….

Company e-mail address: …….

Name of respondent:…….

Position/profession:…….

Date for meeting:…….....

Part 1. Birch plywood production

1. What is the main business of your company?

   ☐ Birch plywood production……...% of turnover 2007

   ☐ Plywood production of other wood species ……% of turnover 2007

   ☐ Chipboard production……..% of turnover 2007

   ☐ Fibreboard production……% of turnover 2007

   ☐ Other: ……..……..% of turnover 2007

2. Is your company a subsidiary to another company or concern?

   ☐ Yes, which?

   If yes, how many subsidiaries are included?

   How many plywood mills are included in you own company?

   ☐ No

3. Write, roughly, the ***total annual volume of plywood*** production during 2001-2008 (if company uses other wood species than birch for plywood production).

   2001 ……m^3

   2002 ……m^3

   2003 ……m^3

   2004 ……m^3

   2005 ……m^3

   2006 ……m^3

2007 ……m^3

2008 ……m^3 (estimate)

4. Write, roughly, the total annual volume of ***birch plywood*** production during 2001-2008.

2001 ……m^3

2002 ……m^3

2003 ……m^3

2004 ……m^3

2005 ……m^3

2006 ……m^3

2007 ……m^3

2008 ……m^3 (estimate)

5. How do you think the birch plywood production will develop in the next 5-10 years?

☐ The production will increase with approx. ……..... m^3 per year

☐ The production will decrease with approx. …… m^3 per year

☐ The production will be constant

6. New entrants: Estimate the amount of new plywood production facilities that will establish in Russian in the next 5-10 years.

7. How easy is it for new entrants to establish on the market? High entry barriers? What are the main obstacles when establishing a plywood production facility in Russia?

8. Birch plywood ***production costs***: How have the production costs changed over the past 10 years?

☐ Increased production costs with approx. ……% per year

☐ Decreased production costs with approx. ……...% per year

☐ Constant production costs

9. Estimate how the birch plywood production costs will develop in the next 5-10 years:

☐ Increased production costs with approx. ……% per year

☐ Decreased production costs with approx. ……...% per year

☐ Constant production costs

10. Which type of glue is used in the birch plywood? Emissions?

- ☐ Urea formaldehyde
- ☐ Polyvinyl acetate
- ☐ Melamine formaldehyde
- ☐ Phenol-formaldehyde
- ☐ Resorcinol-formaldehyde
- ☐ Other

11. What do you consider to be the two greatest possibilities and the two greatest threats for your birch plywood production in the future?

Part 2. Birch raw material supply

12. Write, roughly, the total annual volume of ***birch logs*** purchased for plywood production.

2001	……m^3
2002	……m^3
2003	……m^3
2004	……m^3
2005	……m^3
2006	……m^3
2007	……m^3
2008	……m^3 (planned purchase)

13. Is it difficult to find birch raw material of good quality?

☐ Yes

If yes, explain why

☐ No

14. From which geographical region(s) do you buy birch logs from?

15. How do you think the ***price of birch logs*** will develop in the next 5-10 years? Estimate the increase or decrease of price compared to today.

16. What will the consequences be for your company? Will you revise your supply strategy in order to meet the increasing raw material prices?

17. Has the company currently experienced difficulties in obtaining birch raw material for plywood production?

☐ Yes

☐ No

If yes, what have been the main reasons?

18. How do you think the supply of birch for plywood production in Russia will develop in the next 5-10 years? Explain why. What are the influencing factors?

19. Which of the following categories of buyers are your main competitors for ***birch raw material***?

☐ Pulp mills

☐ Other birch plywood producers

☐ Producers of other boards (e.g. MDF, OSB)

☐ Sawmills

☐ The international market

☐ Other

Part 3. Market situation

20. What are the ***main categories of buyers*** of birch plywood and the volumes they purchased during year 2007?

☐ Construction industry ("structural plywood") …… m^3

☐ Indoor exposure ("decorative plywood") …… m^3

☐ Furniture manufacturers …… m^3

☐ Packaging manufacturers …… m^3

☐ Transport- and boat construction …… m^3

☐ Other ……m^3

21. Which of the above mentioned categories of buyers has shown the greatest increase in demand for birch plywood since year 2000?

22. What do you consider have been the most important contributing factors to this increase in demand?

23. Which of the above mentioned categories of buyers do you think will show the greatest increase in demand for birch plywood in the next 5-10 years? Explain why.

24. What are your main strategies to reach the growing market?

- ☐ Expand the plywood production
- ☐ Expand the product range
- ☐ Consolidation with other companies
- ☐ Establish new production facilities
- ☐ Other

25. Does your company export ***birch plywood*** to other countries?

- ☐ Yes, which countries and what share?

If yes, how many % is exported in relation to the total birch plywood production?

- ☐ No

26. Since year 2000, has your export of birch plywood:

- ☐ Increased with approx. …….% per year
- ☐ Decreased with approx. ……% per year
- ☐ Constant

27. Describe the ***current birch plywood market*** in Russia; what are the common trends? How strong is the domestic competition for birch plywood? Foreign competition?

28. Describe the birch plywood market 10 years ago. In what way has the market changed and developed over time?

29. What are the main competing materials and substitutes for birch plywood?

- ☐ MDF
- ☐ Fibreboards
- ☐ OSB
- ☐ Chipboard
- ☐ Particleboard
- ☐ Other material

30. Which of the above mentioned competing material(s) has the strongest future potential according to you? Explain why.

31. How do you think the ***price for birch plywood*** will develop in the next 5-10 years? Estimate the increase or decrease of price compared to today.

32. What future potential does the birch plywood market have in Russia?

Part 4. Miscellaneous

33. What are the company's future prospects? Will you expand your production? Will you try to find new customers – in Russia or in other countries?

34. How have the Russian export taxes on roundwood influenced your birch plywood production?

Appendix 3. Questionnaire: Birch plywood consumers

Company information

Company name:……

Company postal address ……

Company telephone number:……

Company e-mail address: ……

Name of respondent:……

Position/profession:……..

Date for meeting:……..

Part 1. Purchase of birch plywood

35. What is the main business of your company?

- ☐ Packaging manufacturing ……% of turnover
- ☐ Furniture manufacturing ……% of turnover
- ☐ Construction industry ……% of turnover
- ☐ Chipboard production ……% of turnover
- ☐ Fibreboard production ……% of turnover
- ☐ Other: ……..……% of turnover

36. Is your company a subsidiary to another company or concern?

- ☐ Yes, which?

  If yes, how many companies are included?

  How many production facilities are included in you own company?
- ☐ No

37. Write, roughly, the total annual volume of ***birch plywood*** purchased during 2001-2008 from Russia.

2001 ……m^3

2002 ……m^3

2003 ……m^3

2004 ……m^3

2005 ……m^3

2006 ……m^3

2007 ……m^3

2008 ……m^3 (estimate)

38. Write, roughly, the share (in percent) of competing materials purchased during 2001-2008 from Russia.

39. How do you think that your own demand for birch plywood from Russia will develop in the next 10 years?

- ☐ Our demand will increase. Explain why.
- ☐ Our demand will decrease. Explain why.
- ☐ Our demand will be constant. Explain why.

40. How do you think the Russian birch plywood production will develop in the next 5-10 years?

- ☐ The production will increase with approx. …….... m^3
- ☐ The production will decrease with approx. …… m^3
- ☐ The production will be constant

41. Birch plywood ***production costs***: How have the production costs changed over the past 10 years?

- ☐ Increased production costs with approx. ……%
- ☐ Decreased production costs with approx. ……...%
- ☐ Constant production costs

42. Estimate how the birch plywood production costs will develop in the next 5-10 years:

- ☐ Increased production costs with approx. ……%
- ☐ Decreased production costs with approx. ……...%
- ☐ Constant production costs

43. What do you consider to be the <u>two greatest possibilities</u> and the <u>two greatest threats</u> for birch plywood production in Russia in the future?

Part 2. Birch plywood supply

44. Is it difficult to purchase birch plywood of needed quality?

    ☐ Yes

    If yes, explain why

    ☐ No

45. From which companies/regions do you buy birch plywood from?

46. How do you think the ***price of birch plywood*** will develop in the next 5-10 years? Estimate the increase or decrease of price compared to today.

47. What will the consequences be for your company if the price for birch plywood will increase? Will you revise your supply strategy? What actions will be taken to meet the increasing birch plywood prices?

48. How have the prices for birch plywood developed in the last years? Do you consider that birch plywood is keeping a competitive cost level?

49. Has the company currently experienced difficulties in purchasing birch plywood from Russia?

    ☐ Yes
    If yes, what have been the main reasons?

    ☐ No

50. Which of the following categories of buyers is your main competitor for ***birch plywood***?

    ☐ Packaging manufacturers

    ☐ Construction industry

    ☐ Other segments that need plywood for own production

    ☐ Producers of other boards (e.g. MDF, OSB)

    ☐ The international market

    ☐ Other

51. How strong is the competition between Russian birch plywood buyers? Can your company affect the prices?

Part 3. Market situation

52. Which segments that use birch plywood have shown the greatest increase in demand for birch plywood since year 2000?

53. What do you consider has been the most important contributing factors to this increase in demand?

54. Which segments do you think will show the greatest increase in demand for birch plywood in the next 5-10 years? Explain why.

55. Describe the ***current birch plywood market*** in Russia; what are the common trends? How strong is the domestic competition for birch plywood? Foreign competition?

56. Describe the Russian birch plywood market 10 years ago. How has the market changed and developed over time?

57. How do you predict the future will be like for birch plywood in Russia?

58. What are the main competing materials and substitutes for birch plywood?

- ☐ MDF
- ☐ Fibreboards
- ☐ OSB
- ☐ Chipboard
- ☐ Particleboard
- ☐ Other material

59. Which of the above mentioned competing material(s) has the strongest future potential according to you? Explain why.

60. Describe which materials you have used in the past 10 years. How has the demand for birch plywood changed over time comparing to the other materials?

61. What other materials that can substitute plywood will become interesting to buy in the future? Explain why.

62. Compare the m^3 price of plywood to other materials (substitutes).

63. What factors influence your decision to buy birch plywood or substituting materials?

- ☐ Price
- ☐ Customer demand
- ☐ Service
- ☐ Physical properties of the material

64. Has the number of Russian birch plywood suppliers increased or decreased in the past 10 years? How will it be in the future – many new market entrants?

65. In an attempt to predict the future demand, will you continue to buy birch plywood from you supplier? Explain why.

66. Is it easy for you to switch to another supplier of birch plywood? Is your company price sensitive?

Part 4. Miscellaneous

67. What are the company's future prospects? Any new investments?

68. How have the Russian export taxes on roundwood influenced your birch plywood import from Russia?

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