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FINANCIAL PERFORMANCE OF THE U.S. FOREST-PRODUCT COMPANIES: VALUE-ADDED DETERMINANTS OF BUSINESS SUCCESS

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ABSTRACT

The purpose of the study is to determine the effects of value-added components (gross value-added and investments), size and leverage on the long- and short-term financial performance of the forest, pulp and paper companies. The empirical testing was carried out using accounting data of 37 large- and medium-sized U.S. companies spanning from 2005 to 2008. The results of the regression analysis indicate that companies which are focused on tangible investments tend to have poor performance in the short run, showing problems with liquidity measured by the current ratio. The long-term performance presented by turnover growth is found to be affected by the size and leverage factors. Thus, small firms outperform large companies in growth opportunities and are considered to be more flexible in strategic choices. Furthermore, higher leveraged firms are discovered to improve their performance by aggressive financing of their business with debt, however, leading to the volatile earnings over a longer perspective. Moreover, no evidence on the gross value-added impact on the firm's business success has been obtained.

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INTRODUCTION

Nowadays, the forest industry competes aggressively in a global market. Like other resource-based sectors, pulp and paper industry is in difficulty as it is directly affected by the housing crisis in the United States. The world's leaders in forest, pulp and paper production (FPP), such as the U.S. companies, are significantly suffering from the weak financial performance. Generally speaking, the decrease in demand for pulp and paper products, resulted from the slowdown in the world economy, caused lowering the product price.

Moreover, profitability of the industry fell during 2008. In addition to volumes, prices and exchange rates, which affect the companies' results differently depending on markets and product mixes, profitability was negatively affected by increased costs for raw materials, energy and transport. In order to improve profitability, the companies are carrying out savings and efficiency programmes.

As a result, most FPP companies are looking to the measures preventing the deep consequences of economic storm by carefully examining their strategies and operations. The crisis has obliged nearly all companies to focus on cash management of working capital and cost cutting to minimize cash outflows. Thus, the resource-based strategy started to be of the main importance for the FPP companies exhibiting different degrees of value-added component functioning in current crisis conditions.

The value-added is a measure of net output (i.e. of gross output less those purchased inputs - such as cost of materials and supplies and of energy, water and vehicle fuel) which has been embodied in the value of the product. In contrast to the measure of manufacturing revenues, value-added provides some insight into the degree of transformation which occurs within industries (Canadian Industry Statistics 2008).

Furthermore, adding value is considered to be a valuable strategy for the successfully functioning companies and national economies as a whole. It should be noted that the significant part of methodology related to value-added measurement is devoted to the

aggregated calculation of economy-wide value-added seen as a part oh the national accounting. The United Nations System of National Accounts (United Nations 2007) sets basic methodological principles for making systematic estimates of the flows and stocks of a national economy in order to provide an overview of economic activity, including value-added. Other macroeconomic methods are also available for calculating value-added at the macroeconomic level (Cassin 1996). However, such accounting is aggregate by its nature and has limited relevance toward understanding and optimizing the product manufacturing in particular company.

In the context of the wood products industry, value-added are the steps associated with turning raw timber or unfinished lumber into finished products that increases the value of the wood used to produce them (Vlosky 2009). In this case, manufacturing higher-priced value-added pulp and paper products has been stated as the main option for achieving sustainable financial performance. In the U.S. value-added trends are considered as an option for smaller forestry firms, in particular to function in the modern competitive arena (e.g., Bush & Sinclair 1991).

Yet, evidence exists showing that very large companies are more successful in producing value-added products than their smaller competitors (e.g., Smith et al. 2004). From the Canadian perspective, increased value-added components were found to be associated with growing returns to scale, as well as with network and price effects (Lantz 2005).

In addition, it should be noted that existing literature on the topic of value-added creation related to the forest-product companies is devoted either to the primary manufacturing sector, e.g. logging, sawmilling, or to secondary manufacturing sector, e.g. paper production, packaging. In this respect, the present study is focused on the secondary processing sector and the U.S. pulp and paper companies are going to be examined in particular. Yet, in order to compose the complete picture of possible factors, e.g. value-added component, size of the company, and leverage issue which can influence financial performance, an overview of previous literature is provided in the Literature Review section.

The question of performing value-added products is closely related to the strategic choice issue. The several studies conducted on the topic of the resource based view (RBV) theory effects on the financial performance of FPP companies discussed in this study showed a positive relationship between value-added production and business success.

1.1. Purpose of the study

The proposed study raises the following question: is there any impact of value-added creation, size, and leverage components on the performance of the forest, pulp and paper companies functioning on the United States market.

Generally, the paper examines the usefulness of financial information in predicting the factors of the competitiveness of the FPP companies performing in current financial crisis conditions, and its effect on the choice of the short- and long-term resource-based strategy, in particular.

The data were gathered from the official financial statements of the thirty seven large- and medium-sized U.S. FPP companies. The availability of the comparable financial information dictated the sample selection. The empirical testing was carried out using U.S. data set spanning from 2005 to 2008. This period is characterized by the fast growth of the forest industry globally and covers the current financial crisis conditions.

Moreover, the accounting data measuring the financial performance was adjusted and calculated according to Lähtinen (2007) methodology. The choice of the financial ratios for measuring financial performance is driven from the purpose of the study and availability of information, as well. Here, the performance of the FPP companies is assessed from the perspective of the traditional financial statement analysis of liquidity (Current Ratio) and turnover growth (Growth, %) (Laitinen 2000).

Since employee and material costs are an essential part of the calculation, cost efficiency component which meant to be included in the present research from the

beginning can not be ascertained for companies from the USA and other countries using US GAAP since they are not at present required to quote employee and material expenses in their financial statements. Thus, selected U.S. companies follow such consistent reporting practice and fail to disclose certain required figures. However, relying on the previous studies (Bush & Sinclair 1991; Smith et al. 2004), size and leverage factors have been chosen as expected to influence the financial performance of the sample companies.

Although the issues related to production and firm strategies in the forest industry was examined in the literature quite well, the studies on the influence of value-added and size effects on the financial performance are very limited (Lahtinen 2007; Roos et al. 2001, 2002). Indeed, there is a lack of studies related to the current development of the U.S. forest products industry. The exceptions are the several studies on the primary processing – sawmill industry that covered the last three decades (Pesendorfer 2003; Li et al. 2004; Sun 2006). In addition, there is the gap in similar research on the U.S. market of secondary wood processing – pulp and paper industry. Thus, this makes the proposed research a significant addition to the existing knowledge in its area.

1.2. Structure of the study

The study consists of seven main chapters, including theoretical and empirical parts. The first chapter is an introduction to the study, which gives the picture of pulp and paper industry existing in current conditions, and shows the relevance of value-added production. The research problem and the importance of the topic are also defined, as well as the data description and research methods are shortly provided in this chapter. The second chapter goes deeply into the empirical studies conducted on the topic of company's performance in the primary and secondary sectors of the forestry, and the successful strategies criteria. Thereby, it gives the previous research overview on the topic of the potential factors determining business success of the companies, such as value addition, size, and leverage.

In addition, chapter three is devoted to the theoretical framework of two dominant strategic theories building competitive advantage of the company – barriers to entry theory and resource-based view. Furthermore, chapter four provides an overview of the main categories of financial performance measures, while the main focus is given to the financial indicators applied in the present analysis of the company firms' financial statements information.

The empirical part of the study consists of the fifth and sixth chapter. The fifth chapter introduces the methodology and the data collecting procedure of the study starting from the pulp and paper industry overview, while chapter six presents the empirical findings of the research. It also answers the research question if there is an impact of the value-added creation on the long- and short-term financial performance on the companies. Finally, the seventh chapter summarizes the study results and presents the conclusions and ideas for the further research in the field.

2. LITERATURE REVIEW

All sectors of the forest industry have various degrees of value-added. More precisely, value-added component differs considerably from one sector to the other one (Wilson et al. 1999). For instance, primary processing – sawmilling and logging tend to have little value-added due to the materials-intensive production. Yet, secondary processing firms – pulp and paper and wood-based sectors have significant value-added production as they are relatively labor-intensive. Both, primary and secondary manufacturing sectors are going to be observed in the present section in order to examine the relationship between value-added creation and various influential factors.

Moreover, size of the company and leverage impact were found to have significant, however, controversial effect on the financial performance and competitiveness of the firms. Thus, the main findings of the previous researchers should be discussed with particular emphasis, as well.

2.1. Value-added creation impact on the company's performance

The process of added value creation in the forest industry has been analyzed by several researchers. Ringe and Hoover (1987) examined value-added component in the production of structural wood products on the United States market. They introduced the concept "marginal log" standing to maximize the value-added production to the mix of the raw materials inputs. In their analysis, value-added was a function of raw material quality and price, conversion technology, and finished product set and price examined over time.

 Lantz (2005) conducted his research on the example of Canadian logging, sawmilling, woodworking, and pulp and paper sectors. He analyzed factors influencing value-added creation. From the main findings he highlighted two positively correlated factors – scale of output production by individual firms, and price level of product shipments. According to the total results, the effects of other factors – technological innovation, the

number of separate firms in a given sector and region, and the cost of production inputs – were less significant to the value-added creation process.

Summarizing the previous research findings, several direct possibilities to increase firm's value-added component could be determined:

- introducing innovative new products and services that provide greater value to customers compared to the cost of the materials, components and services used to make them;

- selling more existing products and services, for example by improved marketing or by entering markets in new geographies, or by raising prices and hence margins;

- reducing the cost of bought-in items, for example by more effective procurement and improved design and development;

- improving productivity by reducing the unit cost of bought-in items required for each unit of output.

As it was noticed above, there are many factors that may affect value-added production. These could include the operational scale of a firm, the network scale of the industrial sector, the techniques used in production, and the price of the relevant commodities. In fact, such factors are considered to vary significantly regarding the wood processing types of production – primary (Table 1) and secondary (Table 2).

2.1.1. Evidence from the primary manufacturing sector

It should me mentioned that the primary forest products sector is currently in distress due to the U.S. economic recession and the associated rapid decline in housing starts. As a result, given increasing global competitiveness, the need to plan and execute a defensible growth strategy for the industry is more important now than in the past (Vlosky 2009).

Cohen (1992) proposed two different approaches of increasing the value of wood products; secondary manufacturing and incrementally adding value during the primary process. He stated that the majority of research is concentrated on the secondary processing, however, he suggested that when making efforts to increase the value of exports to offshore markets which cultures are different from the producing region (such as Japan), adding value at the primary processing stage is a more viable long-term strategy. His work demonstrated that combination of continuous technological innovation and increasing market knowledge leads to successfully value-added wood product exports to Japan.

The other author, Maness (1993), examining advanced sawmilling through real-time value optimization in British Columbia sawmills, identified the strategies to increase the value of the products for producers of commodity sawn lumber. He found that making sawing decisions based on the current market prices of the range of lumber sizes, preferentially producing lumber dimensions with the highest market value at the time is the key element of the business success.

Industry analysts have indicated that there is a trend toward more value-added production in the Canadian forest industry. Meil (1990) investigated the impact of technological change on value-added production and variable costs in the Canadian softwood lumber producing regions of British Columbia, Ontario and Quebec. He observed that in the period from 1970 to 1984, value-added production and variable costs followed a declining trend. The reason of such a production drop, in his point of view, was that the return to fiber was decreasing in all regions of the Canadian softwood lumber industry during this period. He concluded that product yields are not related to the increase in cost of fiber during this time period. This analysis showed the value-added and variable cost trends to technological change. Yet, he pointed in his work that there are many other factors to examine that affect value-added production.

In a Nordic study, Roos et al. (2001) compared the impact of two different strategies on the economic performance of Swedish sawmills, meaning adding value to products with advanced production methods, decreasing fixed costs by grouping the production into larger units, and increasing efficiency by investing in modern technology. Value-added

component was found to increase profit margins, while the effect of cost reduction and higher efficiency on profits remained insignificant.

Similar findings were gained by Roos et al. (2002) developing the most common value-adding combinations of Swedish sawmills. According to their results, further processing of customer-oriented products and higher-priced value-added products was associated with higher profit margins leading to the competitive advantage of the company on the market.

Bush and Sinclair (1991) reported that especially for large companies in the U.S. hardwood sawmills, there has been evidence of a change from raw material and technology centered cost leadership strategies towards increased differentiation. Bush et al. (1991) presented similar results, in which cost leadership and differentiation strategies, or combinations of these, were most commonly applied. The smallest enterprises in these studies did not implement focusing strategy by concentrating on certain market segments, despite the fact that for those it might have been an option for aspiring business success in a modern market environment (Bush & Sinclair 1991, Bush et al. 1991).

Information concerning the effects of the different strategic choices on the financial performance of sawmills is scarce. However, a few studies include comparisons between strategic choices and financial performance information. These have shown positive relationship between value-added creation and business success.

The paper of Lähtinen and Toppinen (2008) presented research on the influence of value-added creation and cost efficiency on the financial performance of the Finnish sawmills. The authors measured gross value-added as the proportion of investments and value-added of the turnover. Cost components were calculated basing on the share of material and salary expenses of turnover. They evaluated financial performance of the mills applying liquidity (Current Ratio), solvency (Equity ratio, %), profitability (ROI, %) and turnover growth (Growth, %) ratios. They found that cost-efficiency parameters could better explain short-term financial performance, than value-added indicators, which affect longer-term financial performance. Thus, from the managerial point of

view, in the short run, cost-efficiency is a prerequisite for the business, while in the long run, value-added creation is also needed to support the economic sustainability of the business (Lähtinen & Toppinen 2008).

In North American softwood timber and plywood industries, adoption of innovative processing technologies was found to be linked with superior business performance measured with Return on Sales (ROS), Return on Assets (ROA), and relative market share (Cohen & Sinclair 1990, Sinclair & Cohen 1992).

Table 1. Previous empirical studies on primary processing (sawmilling) sector.

Authors	Market	Findings and Discussions
Ringe & Hoover (1987)	U.S.	Value-added is a function of raw material quality and price, conversion technology, and finished product set and price.
Meil (1990)	Canada	The impact of technological change on value-added production and variable costs is significant.
Cohen & Sinclair (1990)	U.S., Canada	Innovative processing technologies are linked with financial success measured with Return on Sales (ROS), Return on Assets (ROA), and relative market share.
Bush & Sinclair (1991)	U.S.	Sawmills experience a change from raw material and technology centered cost leadership strategies towards increased differentiation.
Bush et al. (1991)	U.S.	Cost leadership and differentiation strategies are considered common. However, focusing on certain market strategy segments is seen as an uncommon strategy. Quality, price, and customer services are prerequisites of success.
Sinclair & Cohen (1992)	U.S., Canada	Technology process is positively correlated with higher financial performance. Size of the company has negligible impact on the ability to adopt new technologies.

Table 1. (continued)

Cohen (1992)	Japan	Continuous technological innovation and increasing market knowledge are key elements to successfully expand value-added wood product exports.
Maness (1993)	Canada	Making sawing decisions based on the current market prices is the basis for the business success.
Roos et. al (2001)	Sweden	Value-added increases profit margins, while the effect of cost reduction and higher efficiency on profits is insignificant.
Roos et al. (2002)	Sweden	Customer-oriented products and value-added products are associated with higher profit margins leading to the competitive advantage of the company on the market.
Lähtinen & Toppinen (2008)	Finland	Cost-efficiency is better explaining short-term financial performance, than value-added indicators, which affect longer-term financial performance. Thus, in the short term, cost-efficiency is a measure of business success.
Smith et al. (2004)	U.S.	Large companies are more successful in producing value-added products than the smaller ones.
Lantz (2005)	Canada	Value-added components are positively associated with growing returns to scale, and price level of product shipments.

2.1.2. Evidence from the secondary manufacturing sector

Within the forest products industry, the term "added value" has traditionally been used to describe what is more accurately called "secondary wood processing," in which the output of primary wood processing operations (e.g. sawn lumber) is further processed

into more refined wood materials or manufactured wood products (Sathre & Gustavsson 2009).

Many wood industry companies are part of the value chain of major global players, and their customers expect them to take the responsibility for continually innovating and even creating new needs in the market (Karhonen 2006). For the customers, wood is just one material among others. They expect high quality, shorter delivery times, and innovative offerings at competitive prices.

In such a manner, it seems that the largest wood industry companies would have an opportunity to create competitive advantage due to their size. Large companies have wider geographical opportunities, more resources for innovation, and their customer base connects them to a wide network that can be used in market sensing (Ahuja & Lampert 2001).

Furthermore, innovativeness has been found to have positive impacts on the competitiveness and profitability of wood products enterprises (Välimäki et al. 2005). According to Korhonen (2006), creative use of information and combination of new knowledge linked to innovations are considered to be the main criteria for growth.

There are more theoretical arguments and empirical findings supporting a positive relationship between the innovation and company's size in order to create additional value. Korhonen and Niemelä (2004) also found that large forest industry companies turn their focus towards innovation in order to secure knowledge creation and sustainable growth. However, according to the other factors small firms may perform better than large firms – for example, better flexibility. In addition, it appears that the relationship between firm size and innovation depends on the specific technological and market conditions (Rogers 2004).

Such researchers as Li et al. (2004) examined the capacity growth of individual mills in the United States pulp and paper industry from 1970 to 2000. They made the model of the growth process to forecast the survival rate during analyzed time span, including the growth of the mills that survived or closed, and the resulting expected growth of a mill.

Among the potential factors that could affect mill survival and growth, they investigated the effects of mill size, age, vertical integration, diversity of output, location, and type of product. They concluded that expected mill growth was affected significantly by mill size, measured by capacity, and by the age of the mill (see Table 2).

Table 2. Previous empirical studies on secondary processing (pulp and paper) sector.

Authors	Market	Findings and Discussions
Bush & Sinclair (1991)	U.S.	Producing higher-priced value-added pulp and paper products is the main indicator of sustainable financial performance. In the U.S., value-added trends are considered as an option for smaller forestry firms.
Cohen & Sinclair (1992)	U.S.	New technologies have significant positive impact on the financial performance of the companies in the production of value-added products.
Ahuja & Lampert (2001)	Global	Large firms create better competence advantage due to its size, resources availability and wide network of customers.
Siitonen (2003)	Global	Company performance correlates positively with globalization. The main criteria of business success – cost and investment efficiency and capacity management.
Rogers (2004)	Australia	Positive link between size and innovation depends on technological and market conditions.
Li et al. (2004)	U.S.	Firm's growth is affected by its size, measured by capacities and age of the company.
Korhonen & Niemelä (2004)	Europe, U.S.	Large forest industry companies are currently concentrated on innovation in order to secure knowledge creation and sustainable growth.

Table 2. (continued)

Easten et al. (2004)	U.S.	The success of the wood building material exporters is related to the significantly higher percentage of value-added products.
Välimäki et al. (2005)	Finland	Innovativeness has a positive effect on the competitiveness and profitability.
Korhonen (2006)	Europe, U.S.	Information and combination of new knowledge related to innovations are of the main importance in case of growth.

Even if in a modern competitive environment the sources of future competitiveness and growth are more in factors supporting innovation, following and utilizing the latest technological development is still an important contributor to cost-efficiency (Korhonen 2006). Cohen and Sinclair (1992) already indicated that an increase of market share had only a small effect on the profitability of the sawmills industry that supplied material for wood building and pulp and paper industry, when the adoption of new technologies, in investment intensity and the production of value-added products had significant positive impact on the financial performance of the companies.

In the study of Eastin et al. (2004) the success of the wood building material exporters was examined to be related to the greater proportions of value-added production in their products set mix and better knowledge of their customer segments than the less successful exporting companies. Siitonen (2003), in turn, examined the impact of globalization and regionalization strategies on the performance of the world's pulp and paper companies. She indentified the development and the objectives of globalization and regionalization from the beginning of 1990 to the end of 1998, and defined the drivers that push the companies towards globalization. The study states that company performance correlates positively with globalization.

Overall, the literature review section introduced previous studies concerning the value-added creation and its impact on the strategic choices and finding competitive advantage in the field of pulp and paper industry. Furthermore, the financial leverage aspect is

going to be discussed in the following section, due to its particular and controversial influence on the financial performance of the companies.

2.2. Leverage effect on the company's performance

Recent tightening of the credit markets shows that access to finance is becoming especially critical. Some companies, particularly in North America, are having difficulties refinancing debt and finding adequate credit facilities. The PriceWaterhouseCoopers survey 2009 results show that balance sheet leverage ratio - debt as a percentage of equity for the PwC Top 100 companies in the pulp and paper industry increased sharply from an estimated 90% at the end of 2007 to approximately 130% at the end of 2008. For the U.S. companies, the debt-to-equity ratio nearly doubled over that period to reach 210%, the highest leverage level of any region (PwC 2009). The strategies of many companies are now driven by the need to reduce debt through a singular focus on cash generation.

Generally, the larger the amount of debt used to finance increased operations (high debt-to-equity ratio), the more earnings the company could potentially generate than it would have without this outside financing. Thus, it is considered that if this were to increase earnings by a greater amount than the debt cost (interest), then the shareholders benefit from the increased earnings being distributed among the same amount of shareholders. However, the cost of this debt financing strategy could overbalance the return on the debt generating by the company through investment and business activities and lead to bankruptcy, which would leave shareholders with nothing.

The question of the leverage influence on the financial performance has been rather disputable and crucial in the corporate finance literature. First, it should be noted that debt-to-equity ratio measuring leverage traditionally belongs to the solvency indicators of the firm's financial performance. Solvency measures the amount of borrowed capital used by the business relative to the amount of owner's equity capital invested in the business. In other words, solvency measures provide an indication of the business'

ability to repay all indebtedness if all of the assets were sold. Solvency measures are also regarded as an indication of the business' ability to withstand risks by providing information about the firm's ability to continue operating after a major financial adversity.

From both, theoretical and empirical points of view, the impact of the leverage on business performance is quite controversial. An overview of the empirical literature on this debate shows the lack of consensus on the link between leverage and corporate performance. Consequently, one group of researchers confirms that the firms with the higher leverage may improve their performance (Nickell et al. 1997). However, on the other side, other researchers proved that a higher leverage means higher agency costs because of the diverging interests between shareholders and debt holders which increase the total cost of the company, so that leverage may be negatively linked to performance (Jensen & Meckling 1976, Myers 1977). From there, literature provides opposite arguments on the relationship between leverage and performance, as well.

However, such a difference in conclusions concerning leverage effect could be explained by the fact that researchers apply various measures of performance in their analytical procedures, either basic accounting ratios or other measures such as total factor productivity indicators (Mahakud & Misra 2009). In this respect, it can be argued that contradictory findings may be caused by the diversity of performance measures.

Majumdar and Chhibber (1999) have examined the relationship between leverage and corporate performance on the example of Indian companies. Adopting an accounting measure of profitability, return on net worth, to evaluate performance, they observe a significant negative link between leverage and corporate performance.

The next group of researchers Kinsman and Newman (1999) detects various measures of performance on this issue on a sample of the U.S. firms, based on accounting or ownership information (firm value, cash-flow, liquidity, earnings, institutional ownership and managerial ownership). They perform regression analysis of leverage on this set of performance measures. They conclude that there is a significant link between leverage and some of the measures of performance such as a negative relationship with

firm value and cash-flow. Nevertheless, this work has been criticized with the use of much contested performance measures such as liquidity, but also with their combined inclusion of the factors in regressions, mixing their effects.

In addition, Pushner (1995) investigates the relationship between leverage and financial performance in accordance with the analysis of equity impact on the ownership in Japan. Firm's performance is measured by total factor productivity; a production frontier is estimated, in which performance is equal to the residual of the performed ordinary least squares regression. He found a negative relationship between leverage and corporate performance.

In contrast, Nickell, Nicolitsas and Dryden (1997) observe a positive link between financial pressure and productivity growth. However, Nickell and Nicolitsas (1999) detect a weak positive impact of financial pressure on productivity. Moreover, Weill (2008) has found that the relationship between leverage and performance varies across countries, and the legal system of the country has the major impact on the determination of corporate performance.

Likewise, the effect of the leverage on the financial success of the company could be discussed regarding the firm's competitiveness issue considering the role of the managers' decisions. For example, some studies showed that there is a relationship between firm's capital structure and its investment spending as well as competitive behavior on the product markets (Rotemberg & Scharfstein 1990; Kovenock & Phillips 1997; Maksimovic 1990).

As had been revealed by mentioned researches, debt capital significantly changes the structure of motivation of management and shareholders. Hence, it was argued that on imperfect markets debt financing and investments can give corporations strategic advantage among competitors. In other words, an increase in investments can reduce marginal costs of production (see e.g. Cortazar et al. 1998) and at the same time debt commitment can increase investment opportunities and vice versa.

In this case, the rise in debt financing can lead to the growth of production level, decreasing marginal costs and by these provide advantage among competitors. Such advantage can also be obtained by guaranteed long-term debt rather than short-term loans (Clayton 1999).

3. THEORETICAL BACKGROUND

Most forest, pulp and paper companies are looking to weather the economic storm by carefully examining their strategies and operations. Current financial crisis is prompting nearly all companies to focus on cash — tighter management of working capital and cost cutting to minimize cash outflows. At the firm level, the purpose of strategic decisions is to create value with production and marketing by matching the firm's resources and capabilities to the opportunities that arise in the business environment (Grant 2005). Thus, the question of strategic choice is of great importance for each particular company functioning in the competitive environment. In the global markets forest products firms must be cost competitive but also innovative, creative and capable of combining new technologies and knowledge in order to sustain their competitiveness (Korhonen 2006).

The following section provides information concerning dominant theories in strategic management in order to effectively implement proposed ideas in business practice. Hence, the link between strategic resources and organizational performance outcomes is assumed to exist in the previous research.

3.1. Business strategies and competitive advantage of the company

The focus of the issue is to explore how to create successful competitive advantage of the company by applying the main organizational strategies. It should be noted that the scope of the strategic theories is rather diverse and expanded. McKiernan (1997) grouped all of the existing strategies into four main schools – Planning and Practice, Positioning, Learning and Resource-based.

The present research considers just the theories which claim resources to be the main source of competitive advantage of the company (McKiernan 1997). Thus, the following two theories are presented in order to answer the question of how companies

can achieve competitive advantage: the theory of barriers to entry (Bain 1956, Porter 1980, Stigler 1968) and the theory of resource-based view (RBV) (Barney 1991, Grant 1991, Wernerfelt 1984).

In order to understand the importance of creating sustainable competitive advantage, the precise definition of the discussed term should be presented (see table 3). Regarding the table, the competitive advantage of a company is defined as the degree to which it outperforms its competitors in the performance measures chosen to be benchmarked (Villalonga 2004). In order to create a competitive advantage, firms should focus on those firm-specific resources that are valuable, rare, imperfectly imitable and not substitutable (Barney 1986, 1991, 2001, Grant 1991).

A temporary competitive advantage could be obtained on the basis of the resources that add value to a company and that are not distributed across competing firms. However, to create a sustained competitive advantage, a firm must also possess imperfectly mobile resources, as already mentioned above (e.g., Mata et al. 1995).

Table 3. Definitions of the sustainable competitive advantage (SCA) (Korhonen 2006).

Authors	Definitions
Dierickx & Cool (1989)	The sustainability of a firm's asset position is based on how easily assets can be substituted or imitated.
Prahalad & Hamel (1990)	SCA results from core competences: firms should consolidate resources and skills into competences that allow them to adapt quickly to changing opportunities.
Barney (1991)	There are four indicators of the potential of firm resources to generate SCA: value, rareness, resistance to imitation, and imperfect substitution.

Table 3. (continued)

Peteraf (1993)	There are four conditions to be met for SCA: superior resources (heterogeneity within an industry), expost limits to competition, imperfect resource mobility, and exante limits to competition.
Hunt & Morgan (1995)	Comparative advantage in resources can translate into competitive advantage in the marketplace.

In particular, for the pulp and paper firms located in higher cost-level countries in Europe and North America, the ability to create value by manufacturing special products and providing customer services of high quality started to be judged as important strategic choices and crucial to business success in the last decade (e.g., Hansen et al. 2002, Smith et al. 2004, Toivonen et al. 2005, Hansen et al. 2006).

In the section that follows, barriers to entry theory and resource-based theory are discussed in relation to competitive advantage. The particular importance of the following theories is emphasized by the managers of the companies who are directly responsible for the strategic decisions leading to the creation of the long-term firm's success.

3.1.1. Barriers to entry theory

Competition describes such situation when some companies at the given moment of time will be more efficient and obtain higher performance characteristics than others. However, the capacity of the company to some extent depends on the level of entry/exit barriers existing at the market. Therefore, the suggested explanation gives the basis of understanding the idea of the theory.

Nevertheless, a close determination of the concept requires the clear definition of the key assumptions of the theory. Thus, three theoretical approaches are briefly reviewed:

1. Harvard school investigates the theory of barriers to entry based on the work of Bain (1956), who is the first researcher to recognize that entry barriers present the form of industry structural conditions that may provide advantages to established sellers over potential entrants. Bain (1956) confirms that barriers are necessary for undertakings with significant market share to acquire market power and reap monopoly profits. Under this approach, economies of scale, product differentiation, and absolute cost advantages are determined as barriers to entry (Bain 1956).

2. Chicago school controverts the previous findings holding the view that the existence of 'barriers to entry" at the markets is a myth. According to Stigler (1968), there is a difference between the desirable and undesirable entries. In this case, if a new firm entering the market is exposed to the same costs as previous firms did, and finds entry unprofitable, then such a market may have already attained the appropriate number of firms required to maintain conditions of competition and efficiency (Stigler 1968). Thus, an entry barrier is defined as a cost, which must be incurred by the firm which seeks to enter the market, however, not incurred by firms already in the market (Stigler 1968). Under this approach, economies of scale are not considered as a barrier to entry since entering firms also faced the challenge of scale when they entered the market.

3. Industrial organization (IO) theory deals with the strategic interactions inside the market. According to this theory, the entrance into a market depends on the response of the entering firm (Saloner et al. 2001). Under this approach not just entrance costs are fundamental, but also costs that cannot be recovered on exiting the industry are crucial in assessment of entry conditions (Jones & Sufrin 2001).

In addition to the above listed findings, the book of Porter (1980) on competitive strategies explains that the threat of entry into the market is one of the competitive forces that determine the intensity of market competition and profitability. In this context, barriers can be classified into the following three categories:

1. Legal (or administrative) barriers give governmental restrictions to prevent firms from entering markets and competing, for example, licensing (Faull & Nikpay 1999).

2. Economic barriers are linked to production, technology, scale or scope economies, product differentiation or banding. These barriers lead to significant cost disadvantages to the small firms, while entailing real benefits for consumers. This form includes natural monopolies. (Faull & Nikpay 1999).

3. Strategic barriers are strengthened by the firms in order to interdict entry of new firms into the market, for example, a threat to be involved in a price war or to expand output (Jones & Sufrin 2002).

Overall, the entry barriers theory is regarded as rather contradictory. However, the new entrants should be aware of the financial risk entering the potential competitive market. The rest sections of the chapter introduce the resource-based theory and describe the issues of its implementation in the real business practice.

3.1.2. Resource-based view theory (RBV)

The resource-based view (RBV) as the main methodological framework applicable for analysing empirically the links between firm-level resource usage decisions and firm-level business success is introduced in order to evaluate the factors of competitiveness of forest product firms. Penrose is the founder of the RBV presented in her book 'The theory of the growth of the firm' written in the 1950s. Generally, each particular company is considered as a pool of resources that should be organized into their best uses in order to create the basis for firm's success (Penrose 1995).

In contrast to the other strategic theories, the RBV explains performance in terms of resources and capabilities that are internal to the company rather than being influenced by the product-market conditions (barriers to entry theory). The RBV was further developed in the 1980s by the group of researchers interested in the strategic

management questions. Thus, Wernerfelt (1984) and Barney (1986) detected the crucial role of company managers in the decision to organize firms' tangible and intangible resources and the ability to coordinate those assets or inputs of production in a strategically successful way. They argue that firm managers' perceptions of the business environmental changes drive the selection of resources to be utilized and protected.

In addition to the previous researchers, Sirmon et al. (2007) confirmed the significant role or the managers by the fact that they should also be able to make fast and reliable decisions on strategic resource divestments. Furthermore, the RBV reached the top of its development at the beginning of the 1990s (e.g., Barney 1991, Conner 1991, Grant 1991) and in the 2000s, it has started to be one of the most widely used theoretical frameworks in the strategic management studies (Newbert 2007).

According to Barney (1986) and Grant (1991), the scope of resources and capabilities of each company is the source of the firm's performance in the long run. They confirm their findings by two premises. First, internal resources may be heterogeneously distributed between firms. Secondly, some resources are not elastic to supply resulting to the contradiction of the RBV and the neo-classic theories which are based on the assumption of supply elasticity. There are several reasons of the firm's resources non-elasticity:

- they can be developed only over a long time period;

- it could be unclear how to develop these resources in short and medium terms, as they could not be bought or sold easily (Barney 1991).

Following the findings of Barney (1991), Grant (1991) and Conner (1991), the RBV can be considered as the most influential strategic theory. It explains the sources of creating competitive advantage for the company, and is found to be the basis for such theoretical frameworks as neo-classical macroeconomics (Porter 1980), evolutionary economics (Nelson & Winter 1982), and dynamic theory (Grant 1991).

3.2. Empirical issues of the RBV implementation

Although, the RBV is a promising framework for gaining more accurate empirical information on the internal factors that affect the firm-level competitiveness not only in the woodworking companies but also in other industries, in order to apply the RBV in the empirical analysis of the firm-level competitiveness it is required to pay special attention to the study design and data quality (Armstrong & Shimizu 2007).

For example, to create the heterogeneity of the resource pools of the company, detailed firm specific information should be collected instead of applying industry aggregate data (Rouse & Daellenbach 1999, Silverman 1999). Moreover, research methods should be extended and combined in the analysis (Rouse & Daellenbach 1999, 2002) by including case study methodologies and qualitative methods. Since, the straightforward application of the RBV faces detected above problems, combining firm-level financial accounting information with the results of resource assessments could strengthen the link between the theoretical and practical implementation of the RBV (Lähtinen et al. 2008).

Nevertheless, applying financial accounting information in measuring the factors of competitiveness assumed by the RBV is problematic since most intangible investments are recorded as expenditures in the income statement instead of being reported as assets in the balance sheet. Hence, the impact of the intangible assets on the financial performance should be considered while using accounting information in assessment procedures in order to make reliable conclusions.

Due to the application problems of the RBV in the empirical analysis of the companies' competitive advantages, just several researchers, outside this, were conducted on forest-based industry that are at least in some case linked to the RBV - the work of Siitonen 2003; Korhonen & Niemelä 2004, 2005; Bull & Ferguson 2006; Korhonen 2006, Bonsi et al. 2008, and Lähtinen et al. 2008.

The present study makes a contribution to the existing research by presenting the combination of the financial accounting information with the assessment of the

competitive advantage factors assumed by the RBV theory examining the impacts that the resources have on the financial performance.

In order to get clear understanding of what is called financial performance of the company, the next chapter introduces the basic categories of business performance measures, such as liquidity, profitability, efficiency and solvency with a closer look on those, related to the present research analysis.

4. Financial performance assessment

Financial statements cannot directly provide information concerning the financial performance of the company in case of the comparison to the other company or industry. The reason of such a claim is that companies rarely have the same revenue and financial structure remaining permanent from year to year. Thus, various measures and techniques have been developed in order to avoid such problems. Therefore, the present chapter is devoted to the description of the main types of tools and categories, which are widely used in determining the financial performance of the companies.

4.1. Operational and financial performance concepts

In general, business performance is used to be associated with the simple outcome financial indicators. In this context, the concept of financial performance, as the dominant model in empirical strategic research, typically examines such indicators as sales growth, profitability (presented by ratios, such as return on investments, return on sales, and return on equity), earnings per share, etc. (Hofer 1983). Al these measures reflect economic goals of the strategic management. In other words, financial performance deals with issues related to a company's financial structure and ability to meet its financial obligations.

Furthermore, from the strategic management point of view, "market" or "value-based" measurements are more accurate and reliable than accounting-based measures (Hax & Majluf 1984). Thereby, some strategy studies have applied such measures as market-to-book or stock-market returns (e.g., Kudla, 1980; Montgomery et al., 1984). Nevertheless, this approach remains very much financial in its orientation and assumes the dominance of financial issues in the performance assessment.

In contrast, operational performance (or nonfinancial) is based on the different from previously mentioned indicators. However, it is considered that operational measures could work optimally just combined with financial indicators. Under this approach, it

would be logical to treat such measures as market share, new product introduction, product quality, marketing effectiveness, manufacturing value-added, and other measures of technological efficiency within the domain of business performance (Venkatraman & Ramanujama 1986). Thus, it is important to know if a company uses its assets in an efficient and profitable manner.

Overall, business performance could be measured either using financial indicators or operational ones, or even both. However, both approaches are based on the information, which sources could be determined as either primary (e.g., information collected directly from the organizations) or secondary (e.g., data collected from publicly available records).

Specifically, strategy researchers paid much attention to the contradictory nature of performance dimensions, such as long-term growth and short-term profitability, and the associated problems of combining them into one composite dimension of performance (Venkatraman & Ramanujama 1986). Accordingly, the need of different resource bases recognition was emphasized by the following group of researchers.

Thus, Schendel and Patton (1978) found the particular relevance of the resource allocation on the basis of required performance outcome, meaning return on equity, market share, and efficiency, in particular. At the same time, the empirical explanation of the discussed problem, in case of achieving long-term and short-term performance results, was given in the literature, as well (see Kirchoff & Kirchoff 1980).

Whereas Woo and Willard's (1983) discovered the multidimensional nature of business performance using financial and operational indicators, Venkatraman and Ramanujam (1985) warned that even within the domain of financial performance, indicators such as sales growth, net income growth, and return on investments should not be combined to form one particular dimension, because they seem to reflect distinct dimensions.

This particular issue has been taken into account in the present research. Consequently, the proposed methodology is aimed to distinguish the factors determining the short-term (current ratio) and the long-term (turnover growth) financial performance separately.

4.2. Classification of the financial performance indicators

The proposed section determines the main financial measures of the corporate performance in terms of the financial ratio analysis. The information recorded in the financial statements is of particular importance to various interested parties, who examine the company's business efficiency on the regular bases. Financial analysis conducted for the external users is often called "financial statements analysis".

In this case, financial statements analysis is performed in the ratios terms (or relative values). Ratio analysis involves certain tools and techniques of calculating and interpreting financial ratios aiming to monitor the firm's performance. The only data sources to ratio analysis are the firm's financial statements (Gitman 2004). There are as many different financial ratios as there are possible combinations of items appearing on the balance sheet, income statement and other financial statements, and their application is defined from an analyst point of view.

While analyzing company's performance, it is irrational and handy to count all of its financial ratios as a lump sum. Since some financial ratios have rather similar patterns, it would be illogical to take them all into consideration. Thereby, it is consistent to classify ratios into the main categories in order to avoid repeating the evaluating process on similar financial ratios.

In accounting financial ratios according to the nature and the data source (balance sheet or income statement) can be initially classified into four categories: solvency (liquidity), profitability, asset and debt turnover (efficiency), and return on investment (Wang & Lee 2008). The financial ratios that fall within these four categories are shown in the Table 4.

Table 4. Classification of financial ratios (Wang & Lee 2008).

Source	Category	Ratio	Formula
Balance sheet	Solvency	Current ratio	Current assets/current liabilities
		Fixed ratio	Stockholder's equity/fixed assets
		Equity ratio	Stockholder's equity/total assets
		Fixed/long-term ratio	Fixed assets/long-term liabilities
		Debt ratio	Total liabilities/ total assets
		Equity/debt ratio	Stockholder's equity/ Total liabilities
Income statement	Profitability	Operation cost ratio	Operation cost/operation revenue
		Gross profit ratio	(Operation revenue – operation cost)/ operation revenue
		Operation profit ratio	Operation income(loss)/ operation revenue
		Income before tax ratio	Income(loss) before tax/operation revenue
		Net income ratio	Net income(loss)/operation revenue
Balance sheet and income statement	Return on investment	Return on current assets	Net income(loss)/current assets
		Return on fixed assets	Net income(loss)/fixed assets
		Return on total assets	Net income(loss)/total assets
		Return on stockholder's equity	Net income(loss)/ stockholder's equity
		Return on operation to capital	Operation income(loss)/ average capital
		Return on income before tax to capital	Net income(loss)/average capital

Table 4. (continued)

	Asset and debt turnover	Current assets turnover	Operation revenue/current assets
		Fixed assets turnover	Operation revenue/fixed assets
		Total assets turnover	Operation revenue/total assets
		Stockholder's equity turnover	Operation revenue/ stockholder's equity
		Current liabilities turnover	Operation revenue/current liabilities
		Long-term liabilities turnover	Operation revenue/long-term liabilities
		Total liabilities turnover	Operation revenue/total liabilities

Taking the case of financial statement analysis of operating performance and financial condition, the classification of financial ratios differ from the mentioned above. However, the change reveals to the categories names while the ratios by themselves remain the same: liquidity, profitability, efficiency or turnover, financial leverage (Gitman 2004). Yet, the classification of the ratios depends on the purpose of the analyst, even though the "traditional" division is widely acceptable.

Therefore, the brief overview of the main ratio representatives of all four categories (according to Gitman 2004) is following in order to recall the basic approach of financial performance assessment:

1. Liquidity measures the ability of the business to satisfy its financial obligations as they come due, without disrupting the normal, ongoing operations of the business. Liquidity also stands for ability of a company to convert its assets into cash quickly and with lower costs as possible. Such liquid assets are necessary to cover any "financial emergencies" and play as a buffer in company's operations. (Gitman 2004)

Liquidity can be analyzed both structurally and operationally. Structural liquidity refers to the balance sheet (assets and liabilities) and operational liquidity refers to cash flow measures. There are several recommended measures of liquidity:

a) *Current Ratio* measures the relationship between total current assets and total current (short-term) liabilities. The current assets consist of cash and assets that can easily be turned into cash and the current liabilities consist of payments that a company expects to make in the near future. Thus, the ratio measures the margin of liquidity:

(1) $$Current\ ratio = \frac{Current\ assets}{Current\ liabilities}$$

The higher the ratio (usually between 1 and 2, rarely 2-3), the more liquid the firm is considered to be.

b) *Quick Ratio* is calculated in the situation of structural changes in assets – some assets are more liquid then others. For example, inventories have relatively low liquidity since their disposal may require lowering of prices. On the other side, cash, short-term securities, and bills that customers have not yet paid, are more liquid:

(2) $$Quick\ ratio = \frac{Accounts\ receivable + Cash + Cash\ equivalents}{Current\ liabilities}$$

Usually, a quick ratio of 1 or higher is healthy for a company and indicates that the company does not have to rely on the sale of the inventory to pay the bills. If the quick ratio is lower than 1, that means the company is in trouble and probably the new investors should keep away.

c) *Working Capital-to-Sales Ratio* is a measure of the amount of funds available to purchase inputs and inventory items after the sale of current assets and payment of all current liabilities.

$$(3) \quad \textit{Working capital} - to - \textit{sales ratio} = \frac{\textit{Current assets} - \textit{Current liabilities}}{\textit{Sales}}$$

Overall, the liquidity measures are just indicators of the firm's financial health, thus, it should be noted that all these measures could rapidly become outdated due to the changes in current assets and liabilities.

2. Profitability accounts for management's ability to control expenses and earn a return on the resources committed. Profitability analysis focuses on the relationship between revenues and expenses and on the level of profits relative to the size of investment in the business. In empirical studies (Johnson & Soenen 2003) return on shareholder's equity (ROE) and return on total assets (ROA) are widely used to describe profitability (for calculations see table 4).

 a) *ROA* is an asset utilization ratio that indicates how effectively or efficiently a firm uses its assets. The effectiveness with which fixed assets, working capital and other assets are employed obviously is a driver of growth. Consequently, the greater the return on assets, the higher the growth potential of the firm.

b) *ROE* indicates the amount of profits that a company is generating with the money that the shareholder has invested in them. It is widely used to compare the company's profitability with the other firms belonging to the same industry. It is an indicator that the company has sustainable competitive advantage and should lead to higher share price for the company.

Individually they tell only little, but taken together the full picture of financial health comes better providing insight into the sources and adequacy of profits, the efficiency of assets committed to the firm and liquidity risk (Johnson & Soenen 2003). Overall, profitability measures the extent to which a business generates a profit from the factors of production: labor, management and capital.

3. Efficiency of activity (turnover) measures the speed with which certain accounts are converted into sales or cash. Several ratios are available from the real analysis practices for measuring the performance of the most important elements of working capital: inventory, accounts receivable, and accounts payable.

a) *Inventory Turnover* characterizes the efficiency of the turnover.

$$(4) \qquad Inventory\ turnover = \frac{Cost\ of\ goods\ sold}{Average\ inventory}$$

Usually a high ratio indicates efficient management of inventory because more frequently the stocks are sold, the lesser amount of money is required to finance the inventory. A low inventory turnover ratio detects an inefficient management of inventory implying over-investment in inventories, dull business, poor quality of goods, stock accumulation, accumulation of obsolete and slow moving goods and low profits as compared to total investment. However, there is no standard for interpreting the inventory ratio, as its level depends on the nature of industry and business conditions.

b) *Total Assets Turnover* (see table 4) measures a company's efficiency at using its assets in generating sales or revenue - the higher the number the better.

$$(5) \qquad Total\ assets\ turnover = \frac{Sales}{Total\ assets}$$

It also indicates pricing strategy: companies with low profit margins tend to have high asset turnover, while those with high profit margins have low asset turnover.

c) *Working Capital Turnover* represents the number of times the working capital is turned over in the course of year and is calculated as follows:

$$(6) \qquad Working\ capital\ turnover = \frac{Sales}{Net\ working\ capital}$$

The working capital turnover ratio measures the efficiency with which the working capital is being used by a firm. A high ratio indicates efficient utilization of working capital and a low ratio indicates otherwise. However, a very high ratio may also mean lack of sufficient working capital which should be considered as potential threat to the firm's financial health.

4. Financial leverage (solvency) describes proportion of risk and return resulting from the use of fixed-cost financing, such as debt and preferred stock. It also measures the level of protection of the long-term funds. In this case, debt allows for the profit generation, however, creates claims on earnings.

Three widely used financial ratios to measure solvency are the debt-to-assets ratio, the assets-to-equity ratio and the debt-to-equity ratio. These three solvency ratios provide equivalent information, so the best choice is strictly a matter of personal preference.

a) *Debt-to-Assets ratio* presents total liabilities as a proportion of total assets.

$$(7) \ Debt-to-assets \ ratio = \frac{Average \ liabilities}{Average \ total \ assets}$$

The higher the ratio, the greater degree of indebtedness and the more financial leverage a company has.

b) *Assets-to-equity ratio* shows how the company uses debt to finance its assets:

$$(8) \ Assets-to-equity \ ratio = \frac{Total \ assets}{Shareholder's \ capital}$$

Generally, the purchase of assets (fixed) should be financed by shareholder's equity including reserves, surpluses and retained earnings. When the ratio is more than the 100%, it implies that owner's funds are not sufficient to finance the assets and the firm has to depend on the public debt.

c) *Debt-to-equity ratio* reflects the capital structure of the firm and the extent to which its debt capital is being combined with the equity capital. It is a measure of equity leveraging degree.

$$(9) \qquad Debt-to-equity\ ratio = \frac{Total\ liabilities}{Shareholder's\ capital}$$

The debt-to-equity ratio also depends on the industry in which the company operates. For example, capital-intensive industries such as auto manufacturing tend to have a standard ratio above 2, while personal computer companies have it under 0.5. A high debt-to-equity ratio generally means that a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense. (Johnson & Soenen 2003)

In conclusion, it should be noted that even though he ratios analysis is one of the most powerful tools of financial management, financial ratios suffer from serious limitations (see Gitman 2004). Thus, ratios should be considered only just basic indicators of performance and cannot be taken as final regarding good or bad financial position of the business.

5. DATA AND METHODOLOGY

The present chapter describes general characteristics of the current conditions and determination of the main trends of the pulp and paper industry in order to come to a definite understanding of the research topic area. Moreover, the data collecting procedure is provided with the determination of the main research methods and hypotheses.

5.1. Overview of forest sector in the U.S.

The forest products industry is the world's largest by far, and among the most competitive manufacturing sectors in the United States. It consists of the paper industry, lumber industry, and furniture industry. In a whole, the U.S. produces 28% of the world's pulp and 25% of its paper (PwC 2009).

The pulp and paper industry comprises manufacturing enterprises that convert cellulose fiber into a wide variety of pulps, papers and paperboards. Papermaking today is a large, capital-intensive industry, characterized by high-speed machines and complex systems of control for manufacturing to close tolerances thousands of products vital to education, communications, marketing, packaging, construction, etc.

Per capita consumption of paper is a widely used barometer of economic advancement. As a country's gross domestic product grows, so does its demand for paper. Growth patterns in paper products such as newsprint and office and computer papers are closely related to industrial activity, while other products (e.g., disposable diapers) are directly affected by changes in real personal income or demographic factors. In this context, the United States is the world's largest consumer of paper and paperboard products - per capita consumption is roughly 700 pounds annually (FAO 2009).

In addition, it should be mentioned that the U.S. pulp, paper, and paperboard mill industry contains about 270 companies with total combined annual revenue of more than $70 billion (PwC 2009). Major companies include Wausau Paper and units of

integrated manufacturers International Paper, Georgia-Pacific, and Weyerhaeuser keeping their world's leading positions. The industry is highly concentrated: the top 20 companies produce 75 percent of industry revenue (PwC 2009).

Considering the current global recession, the U.S. pulp and paper industry started already in 2008 facing the impact of the US housing downturn, on top of the continued suffering from relatively weak financial performance. To illustrate the impact of housing crisis on the world's top 100 leading FPP companies' financial indicators, the following graphs are presented (PwC 2009).

Graph 1 indicates that the total sales of the PwC Top 100 were $357 billion in 2008, up from $333 billion in 2007, however such increase was mainly due to the appreciation of the Euro against the US dollar. Net income dropped from positive $14 billion on 2007 to losses of $8 billion in 2008 (see Graph 2). This sharp decline is mainly due to the impact of losses realized by major players in many of the mature markets (North America, Western Europe) as a result of low demand, goodwill and fixed asset impairments, restructuring, severance and high operating costs (PwC 2009).

Graph 1. PwC Top 100 sales (US $ billions).
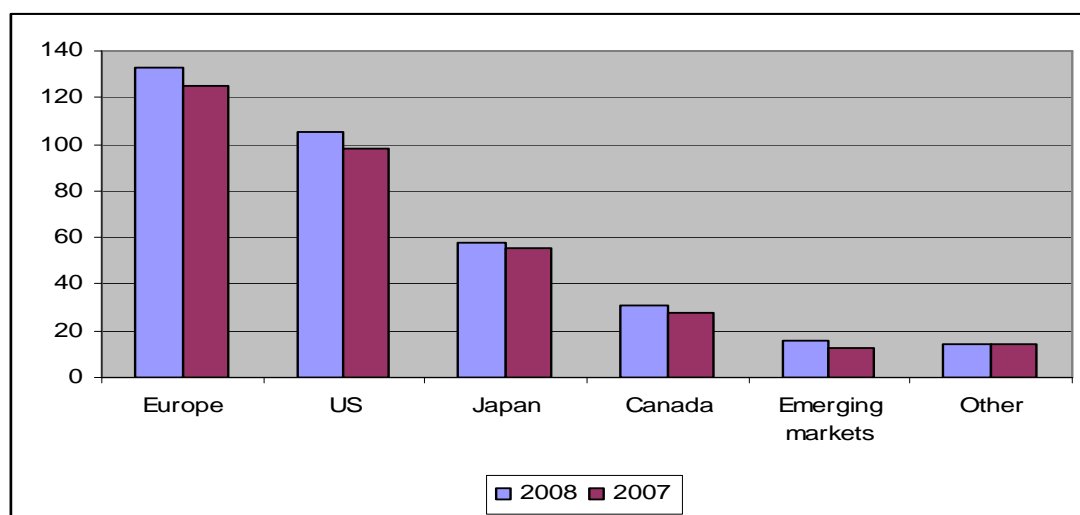
Graph 2. PwC Top 100 net income/loss (US $ billions).
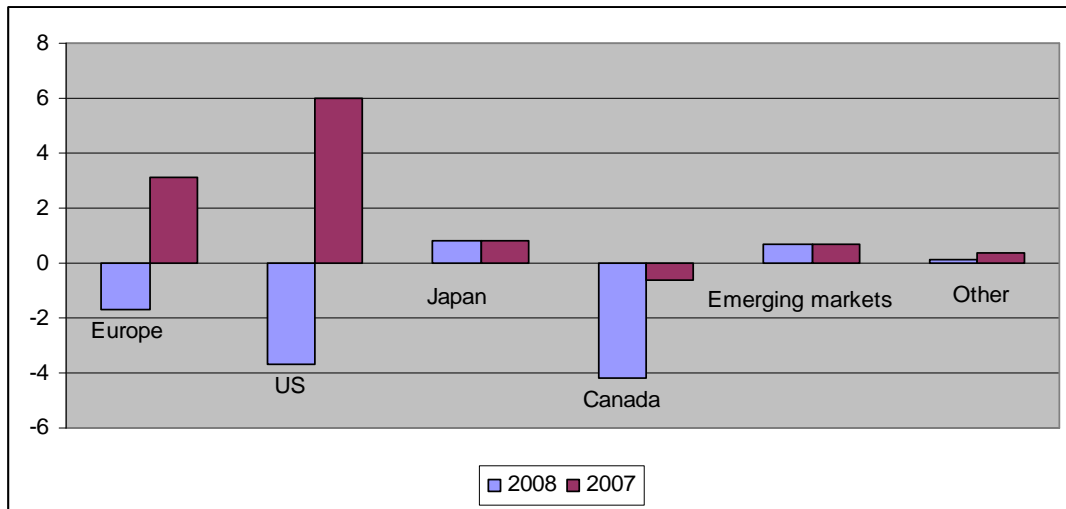
Graph 3. Gross Value-Added in FPP sector in the North America (US $ billions).
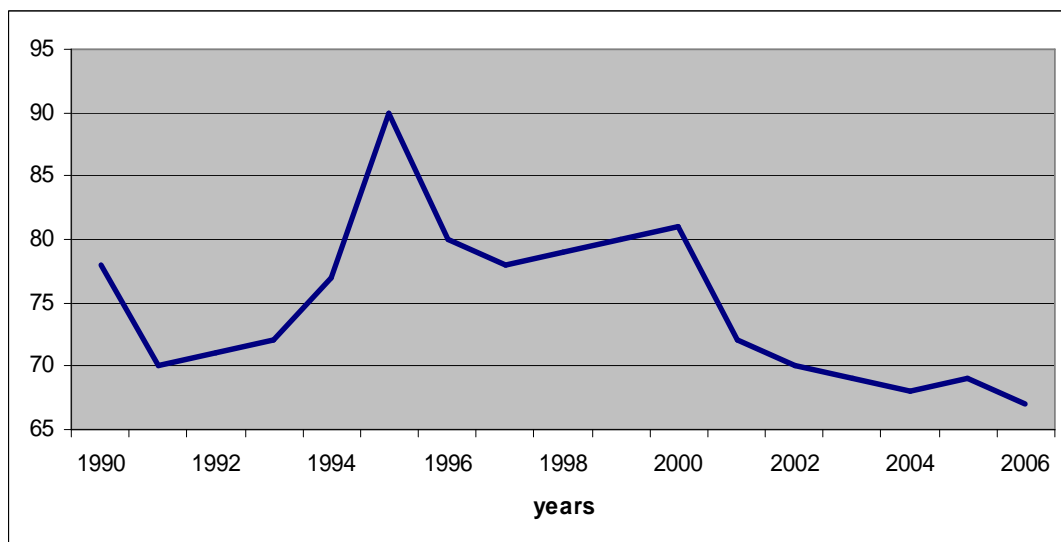
One more issue concerning forest sector development should be discussed in the context of the proposed research. According to the last statistical data, the gross value-added by the North American forestry sector has increased from about US$130 billion in 1990 to US$148 billion in 2006. Most of the increase is attributed to wood processing, while pulp and paper production has marginally declined from US$78 billion to US$67 billion in 2006 (see Graph 3). Graph 4 shows that this fact led to the decrease of gross value-added as a proportion of GDP from about 0.79 percent to less than 0.43 percent. (FAO 2009)

Graph 4. Contribution of FPP sector to GDP in the North America (percentage).
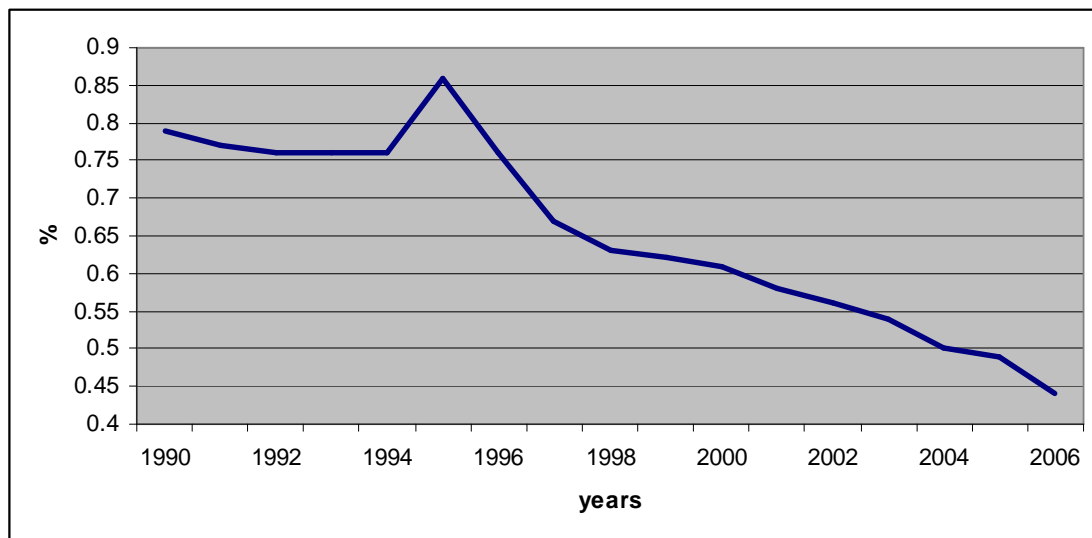
Due to the above mentioned negative global and region trends coming already in the year 2006, some factories on the territory of the U.S. were closed down, machines were turned off and production faced problems with its adoption to the market. As a result, the reduction of goods came into the market in 2008. Such a situation proves the fact that performance of the large and medium-sized U.S. forest, pulp and paper (FPP) companies is strongly influenced by the global economic environment. Overall, the U.S. wood industry is still continuing suffering from relatively weak financial performance.

For some companies, reduction of stuff salaries and selling, general and administrative (SG&A) expenses were acceptable to achieve better operating results. However, these gains were often weakened by high fiber and energy costs. Input prices started to ease in the last quarter of 2008 as the recession affected the global economy. Moreover, lower volumes also meant higher manufacturing costs per unit as the industry looked to adjust supply to match decreasing demand. Falling demand also created pressure on selling prices.

Nevertheless, some companies have been fairly successful at balancing production with demand to preserve liquidity, either by company closures or by market-related downtime. However, the problem is that proposed measures serve to improve competitiveness, but they cause a substantial negative impact on short-term results.

5.2. Data description and collecting procedure

The data used in the study were gathered from the Thomson Financial's database. The database holds information, for instance, about financial fundamentals, corporate profiles, and market quotes. The basic data analyzed in the research consist of the U.S. large- and medium-sized companies related to the pulp and paper industry. Twenty three companies were eliminated in case of missing information or wrong field of industry. Thus, the final set of data is presented by thirty seven U.S. forest, pulp and paper companies. In addition, missing information on the items "investments" was collected manually from the from the companies' annual reports and funds statements on the official sites of the relevant companies. The data provided by the companies were edited and new variables and all financial ratios were calculated.

In order to see the change in the level of strategic decision-making the information was gathered for more than just for one year. Hence, the research examines financial information about the FPP companies in the last years 2005 and 2008. It is considered to be a time period of high growth changing with financial crisis recession. As a result of collecting procedure, the amount of observations equals to 148.

5.3. Research methodology

As the main purpose of the study is to examine the impact of value-added components on the financial performance of the forest companies, several performance ratios were calculated. Current ratio and turnover growth present the main measures of financial performance computed from the accounting statements of the companies. Liquidity describes a company's ability to pay off its debt obligation in short term. Growth, as such, is not a measure of success but an indicator of competitiveness (Laitinen 2000).

For the research purposes, financial ratios were grouped according to the time characteristics of the financial performance. Turnover growth is considered as long-term performance ratio, current ratio is represented as a short-term indicator of business success.

The research method of Lähtinen and Toppinen (2008) is applied in the present research. Hence, variables gathered from the financial statements were examined. Value-added creation is measured by two components - gross value-added and investments. Yet, variables in this case are named VA and INV. Gross value-added that describes the increase in wealth created in company activities is calculated by subtracting purchases of materials and services from the sales revenues (Lähtinen & Toppinen 2008).

According to Ahuja & Katila (2004), resources are defined as those attributes of physical and knowledge-based assets that enable a firm to conceive and implement strategies that lead to differences in performance. Barney's (1991) definition is consistent with the previous one and a resource is identified as "anything that may be thought of as an advantage to a firm." Thus, these arguments resulted in the fact that economic category "investments" includes tangible resources composed like assets and intangible resources comprise assets and capabilities. To simplify the calculating procedure, by the term "investments" we assume mostly tangible investments recorded in the balance sheet.

Besides the value-added and investment variables, the model includes variables controlling for size and leverage. The size of a firm can be a determinant of performance: large firms can benefit from economies of scale, or on the opposite side they can suffer from problems of coordination. Consequently, the size (LN SZ) variable is used, measured by the natural logarithm of the total assets recorded in the balance sheets of the analyzed companies. Leverage is measured by the debt-to-equity ratio to determine how much borrowed funds are used in comparison with stockholders' investments computed as total liabilities divided by stockholder's equity. Thus, additional variables are named LN SZ and LEV.

It should be noted that there are two main types of comparison: cross-sectional and time-series analysis. In cross-sectional analysis single company information is compared to other companies in a certain moment of time. In time-series analysis individual company information is followed for a longer period of time allowing making conclusions about its financial development. This study is a mixture of time-series- and cross-sectional analysis as it exploits information about same companies for four years and analyzes the development of the industry in a whole.

Moreover, the dummy variables (years) are included in the model. In the following model observations for each year are treated as being derived from different population in order to take the effect of business cycles and other changes in the environment into account. Thus, the present model is performed by two least squares dummy variable (LSDV) regressions.

$$(10)\ LN\,CR = \alpha + \beta_1(VA) + \beta_2(INV) + \beta_3(LN\,SZ) + \beta_4(LEV) + \sum_{i=2005}^{2007} d_i(YEAR) + \varepsilon_{it}\ ,$$

and

$$(11)\ Growth,\% = \alpha + \beta_1(VA) + \beta_2(INV) + \beta_3(LN\,SZ) + \beta_4(LEV) + \sum_{i=2005}^{2007} d_i(YEAR) + \varepsilon_{it}\ ,$$

where:

LN CR and Growth,% - natural logarithm of current ratio and turnover growth presenting short-term and long-term financial performance indicators, respectively (Lähtinen & Toppinen 2008);
VA – gross value added;
INV – investments;
LN SZ – size of the company calculated as natural logarithm of total assets;
LEV – leverage of the company computed as debt-to-equity ratio;
2005 – 2007 Year Dummy Variable is 1 for each year in a sample period.

It should be noted that including all the four dummy variables (years) and an intercept causes perfect multicollinearity. To avoid such a problem one of the dummy variables (2008 year) was omitted.

Hence, presented model is aimed to investigate the existence of value-added, size and leverage factors impact on the short-term and long-term financial performance of the selected FPP U.S. companies, measured by current ratio and turnover growth, respectively.

5.4. Hypothesis

The interdependence of value-added creation and business success of pulp and paper industry is approached seldom in the previous literature (e.g., Cohen & Sinclair 1992, Roos et al. 2001, Lähtinen & Toppinen 2008). However, adding value to the product or service is considered to be the basis of future competitiveness.

In this context, investing in tangible and intangible resources generally require long time, representing relation with long-term performance of the company. Although value-added component may also be based only on, e.g., the acquirement of advanced technologies, the ability to recognize and meet costumer needs in manufacturing process requires firm-specific know-how. Hence, investments in technologies and innovations are found to be positively correlated with growth and profitability (Korhonen 2006; Cohenen & Sinclair 1992).

Nevertheless, the time span of the investments impacts on financial performance may also be shorter than ones of value-added creation. Lähtinen and Toppinen (2008) observed no significant relationships between investments and short-term performance, while Välimäki et al. (2005) found investments in innovativeness positive effect on competitiveness of companies in the short run. In this case, there is the need in testing the existence of interdependencies between investments and financial measures in the short time span.

Moreover, according to the resource-based view theory, arguing that tangible and intangible firm-level resources and the capability to coordinate those assets or inputs of production in a strategically successful way, size of the company gains its particular importance. Nevertheless, previous studies on the subject are rather contradictory, confirming either the fact that the larger size companies perform better in case of creating value (e.g., Ahuja & Lampert 2001, Smith et al. 2004) or that small firms are more successful in their resource allocation flexibility leading to financial success (e.g., Rogers 2004, Bush & Sinclair 1991).

Furthermore, the relation between debt financing and financial performance is rather controversial, as well. Thereby, it was argued that on imperfect markets debt financing and investments can give strategic competitive advantage to the company and positively affect the growth opportunities (Cortazar et al.1998; Clayton 1999). However, on the other side, a higher leverage means higher agency costs because of the diverging interests between shareholders and debt holders which increase the total cost of the company, so that leverage may be negatively linked to performance (Pushner 1995; Kinsman & Newman 1999).

Concluding these arguments, the following hypotheses can be formulated:

H1: An increase in gross value-added has a positive effect on the financial performance of the companies, in the long-term, in particular.

H2: An increase in investments has positive effect on the long-term performance of the companies.

H3: An increase in investments has either positive or negative impact on the short-term financial performance.

H4: The firm's size and leverage factors have either positive or negative impact on both short- and long-term financial performance.

Next chapter provides empirical results of the present model implementation and hypothesis tests.

6. EMPIRICAL RESULTS OF THE STUDY

The following chapter provides empirical implementation of the theoretical assumptions on the value-added creation, leverage and other factors' influence on the business success of the sample companies. Multiple regression analysis is performed in order to test the significance of the factors effects.

6.1. Descriptive statistics

The data consist of 37 companies belonging to the pulp and paper industry. Most of the companies were involved in paper and packaging business. Also pulp producers were well represented in the data. Tissue and mechanical forest product producers and companies that had other FPP-related businesses were in a minority.

The descriptive statistics of the variables is reported in table 5. The most commonly used statistical averages in corporate analyses are the mean, median, standard deviation, upper quartile and lower quartile. The calculations are made based on time-series averages for each firm separately during the sample period and then averaging across companies.

Table 5. Summary statistics of variables.

Variables	Mean	Median	Standard Deviation	Minimum	Maximum
ln CR	1.79	1.66	0.87	0.10	6.43
Growth,%	9.43	5.79	30.96	-100.00	147.31
VA (in mln.dollars)	1797.95	313.05	6057.00	-0.02	42808.00
LN SZ (in mln.dollars)	7653.66	1951.31	20648.39	0.10	143992.00
LEV (in mln.dollars)	1.87	1.56	3.33	-24.74	18.28
INV (in mln.dollars)	216.60	0	812.12	0	6792.00
Number of observations	148				

The data show that FPP companies had a wide range of gross value-added (VA varied from -0.02 to 42808 mln. dollars per year) and explained by the size of the firms measured by the total asset (variable LN SZ). Value-added figure shows to what extent the company has been able to increase the value of acquired material and third-party services by its own operations, employee contributions and available equipment. It can be regarded as a general rule that the more service a product involves, the higher the added value. Thereby, increasing the added value usually increases profitability and efficiency, as well.

Furthermore, companies' financial structures are analyzed using debt-to-equity ratio which shows how the company's assets have been financed, as well as how much loans and own funds are involved. The more secure the company's operations, the lower the debt-to-equity ratio. When debt increases, sensitivity to business cycles and other changes in the operating environment is higher. Table 5 presents descriptive statistics for the debt-to-equity ratio (LEV) showing that, on average, the debt-to equity ratio of 1.87 is considered to be optimal for FPP companies.

The next variable, investments, refers to the acquisition of long-term factors of production, for instance, territories, buildings, machinery, intellectual property, etc. In this respect, they reflect the company's future objectives. In the long run, maintaining and improving the company's productive capacity always requires investments. However, some companies of the present sample are shown to have no investments during the examined time period (variable INV). The reason of this fact could be explained by the annual changes of investments level as investment decisions can accumulate on specific years. Hence, major investments carried out during the previous years reduce the company's interest in investments during the following years.

In the observed table 5, the intensity and stability of the operational volume development has been described with the growth rate average and standard deviation. The smaller the standard deviation, the more stable the growth. A stable turnover growth creates the best opportunities for developing the company operations. In contrast, unstable, wildly fluctuating growth strains the company's resources and funding. Here, the variable Growth,% detects the turnover average increase in sales of

approximately 9%, however, differs considerably from the decrease of 100% to the growth of 147%. However, the observed average unstable growth may also be caused by the radical deviation of a single accounting period owing to, for instance, corporate acquisitions or major investments.

The last figure reported in the table 5 is natural logarithm of the current ratio. The idea of this key figure is to compare the company's quickly inflowing assets to the company's short-term liabilities. In other words, the summed liquid and current assets are compared to the short-term liabilities. The higher the current ratio value, the stronger the company's liquidity buffers. In this respect, analyzed companies have the current ratio between 1 and 2, on average. This value detects companies' overall satisfactory stability and quite adequate cash flow from operations. However, the lower (0.1) and higher (6.43) values described in the table 5 are rather volatile showing that some companies have poor liquidity, nevertheless could still manage even with smaller liquidity buffers.

6.2. Correlation analysis on financial performance measures and influence factors

Before starting the regression analysis procedure, the existence of multicollinearity problem should be examined. This is one of the most frequent issues observed when two or more of the independent variables are highly correlated to one another. According to the Lähtinen and Toppinen (2008) methodology, two-tailed Pearson correlation analysis on both, dependent and independent variables was adopted. The table 6 presents a correlation coefficient matrix for dependent variables, table 7 – for independent variables.

Table 6. Two-tailed Pearson correlation between dependent variables

	LN CR	Growth,%
LN CR	1	
Growth,%	-0.01	1

Table 6 provides information on the interdependence between short-term and long-term financial measures. The result gives indication of low and negative correlation between liquidity and efficiency measures (-0.01), which contradicts the findings of Lähtinen and Toppinen (2008) confirming positive relationship between all analyzed financial measures. In this case, the alternative indicators of business performance, such as profitability ratios should be additionally applied to see the linkage effects between different financial measures.

Table 7. Two-tailed Pearson correlations between the independent variables.

	VA	INV	LN SZ	LEV
VA	1			
INV	0.155	1		
LN SZ	0.453	0.312	1	
LEV	-0.021	0.239	0.155	1

The next table 7 shows that all calculated correlations between independent variables are rather low. Thus, for example, investments are positively correlated with all other factors with coefficients between 0.155 and 0.312, however, these rates are not critically high for causing multicollinearity problem in the multivariate analysis. Another interesting fact from the correlation panel is that debt-to-equity ratio (LEV) has low but positive dependences with all factors accept value-added. Nevertheless, this is not a matter of any concern regarding rather low value of the coefficient (-0.021).

Notably, two variables – value-added and size have relatively higher correlation coefficient compared to the other results. Basically, they could be considered to measure the same phenomenon. When one of detected variables enters into the regression equation, it tends to explain most of the variance in the dependent variable that is related to that phenomenon. This fact leaves little variance to be explained by the second independent variable. In order to determine the existence of a multicollinearity problem, two different regressions including/excluding one of two highly correlated variables are going to be tested in the next section.

6.3. Multiple linear regression analysis of the short-term performance determinants

The primary interest in the relationships between the short-term firm performance presented by the natural logarithm of the current ratio and all four factors (value-added, investments, size and leverage) are examined by two types of time-series regressions. First regression model includes multiple dummy variables (years) in order to take the business cycles into account. Using dummy variables in regression analysis is useful to capture fixed/random effects. This technique is able to explain how group/time differences affect models.

Yet, in the present research different years were modelled with fixed effects. As none of the years were found to be statistically significant, the second regression excluding dummy variables was performed as well. The regression results on both models are reported in table 8.

First, column A of the table 8 is related to the first model testing the business cycles effect. As it was already noted that all sample years are not statistically significant, the assumption on the existence of such an impact could be rejected. However, it could be proposed to enlarge the sample size by more than four years data in order to examine the influence of business cycles and other changes in external environment on the short-term performance of the companies with more accuracy.

Second, column B provides information on the relationships between current ratio and factors affecting business success in short run excluding dummy variables. Thus, just one of four potential factors was found to be statistically significant at the one per cent level in explaining short-term financial performance measured by liquidity. Hence, investments are suggested to be negatively related to the financial success of the firm in the short run. This result supports the hypothesis H3, consequently, statistical evidence on the negative effect of investments on the financial performance in the short run is gained.

In addition, the rest estimated coefficients for gross value-added, size and leverage do not show any significant relations with current ratio and could not be associated with financial performance with any level of confidence.

Table 8. The estimation results for testing the impact of the factors on the short-term financial performance of the FPP companies (standard errors in parenthesis) [ab].

	Current Ratio	
	Coefficients	
	A	**B**
Intercept	0.604[***]	0.582[***]
	(0.076)	(0.045)
VA	0.00001	0.00001
	(0.00003)	(0.00003)
INV	-0.0004[***]	-0.0004[***]
	(0.0001)	(0.0001)
LN SZ	-0.00001	-0.00001
	(0.00001)	(0.00001)
LEV	0.001	0.001
	(0.002)	(0.011)
d1	-0.058	-
	(0.106)	-
d2	-0.016	-
	(0.105)	-
d3	-0.015	-
	(0.105)	-
Adjusted R square	0.311	0.341
F	10.494	18.535
Number of observations	148	148

[a] *, ** and *** denote coefficients significant at the 10%, 5% and 1% levels, respectively.

[b] Independent variables are defined as follows: VA – gross value-added, INV – investments, LN SZ – firm size, presented by the natural logarithm of total assets, LEV – leverage, calculated as debt-to-equity ratio, d1 - d3 – dummy variables for years 2005-2007, respectively.

Moreover, in table 8, the coefficients of determination for both regression models of 0.31 and 0.34 respectively, are considered to be adequate. As compared to the similar studies in the same industry (eg. Lähtinen & Toppinen 2008), the magnitude of the explanatory power of both models is rather consistent. Therefore, the regression models result could be regarded as reliable.

The second part of the analysis is devoted to the testing of the multicollinearity problem discussed in the previous section.

Table 9. The estimation results for testing multicollinearity for the short-term financial performance of the FPP companies (standard errors in parenthesis) [a][b].

	Ln Current Ratio		
	Coefficients		
	A	**B**	**C**
Intercept	0.604[***]	0.599[***]	0.593[***]
	(0.076)	(0.077)	(0.076)
VA	0.00001	-	0.00001
	(0.00003)	-	(0.00003)
INV	-0.0004[***]	-0.0004[***]	-0.0004[***]
	(0.0001)	(0.0001)	(0.0001)
LN SZ	-0.00001	-0.00004	-
	(0.00001)	(0.00004)	-
LEV	0.001	0.001	0.001
	(0.002)	(0.011)	(0.012)
d1	-0.058	-0.05	-0.047
	(0.106)	(0.105)	(0.105)
d2	-0.016	-0.01	-0.012
	(0.105)	(0.105)	(0.105)
d3	-0.015	-0.016	-0.017
	(0.105)	(0.105)	(0.105)
Adjusted R square	0.344	0.314	0.312
F	10.494	12.231	12.101
VIF	-	1.458	1.453
Number of observations	148	148	148

[a] *, ** and *** denote coefficients significant at the 10%, 5% and 1% levels, respectively.

[b] Independent variables are defined as follows: VA – gross value-added, INV – investments, LN SZ – firm size, presented by the natural logarithm of total assets, LEV – leverage, calculated as debt-to-equity ratio, d1 - d3 – dummy variables for years 2005-2007, respectively.

In order to detect if value-added and size factors measure the same phenomenon, two more regressions have been performed. Column A in table 9 repeats the original regression results (see column A in table 8). Column B provides results of the regression model with all variables except value-added, whereas column C presents an output of the regression which include all independent variables omitting size variable.

Signs of multicollinearity include:

1) none of the p(t)-ratios of the coefficients are statistically significant, but the F-test for the equation as a whole is significant;

2) including/excluding an independent variable to the equation radically changes the size or the sign (plus/minus) of the coefficients associated with the other variables.

3) the standard errors of the regression coefficients will be large if multicollinearity is an issue (however, that large standard errors can be caused by things besides multicollinearity). (Allison 1991)

As noticed from the table 9, none of the main multicollinearity signs have been discovered. In order to eliminate any possibility of redundant information in the final regression output the variance inflation factors (VIF) have been calculated for both examined variables (eq. 12).

$$(12) \qquad VIF_i = \frac{1}{1 - R_i^2} \; ,$$

where:

R_i^2 - coefficient of determination of the model that includes all predictors except the i-th predictor.

VIF measures the impact of collinearity among the variables in a regression model. A commonly given rule of thumb is that if $VIF_i \geq 10$ then there is a problem of multicollinearity. According to Allison (1991) VIF over 2.5 may indicate the presence of multicollinearity. Thus, calculations presented in the table 9 reject the existence of the multicollinearity problem as VIF values of both regressions (1.458 and 1.453, respectively) are lower than the critical one.

In general, obtained results show the significant negative impact of the investments on the short-term performance of the FPP companies in the U.S. Nevertheless, it should be noted that only tangible and intangible investments recorded in the balance sheet have been analyzed in the present research. Thus, the great majority of intangible investments are not included in the balance sheet but reported in the income statement as expenditures (e.g., in human resources). In this case, the clear conclusion on the role of intangible and tangible investments in creating business success in the short run cannot be made. Consequently, the other factors, including value-added, size and leverage, do not show any significant relations with the current ratio as the representative of the firm's liquidity.

The next section is aimed to estimate the regression results measuring the impact of the potential factors affecting the long-term performance of forest-product companies. In addition, the problem of multicollinearity is going to be tested, as well.

6.4. Multiple linear regression analysis of the long-term performance determinants

This section is devoted to the determination of the factors that can explain the long-term performance success of the FPP companies and growth measure, in particular. In this case, two types of regressions have been performed: multiple regression with dummy variables (years) considering business cycles influence, and one in which dummy variables have been omitted.

As it is seen from the table 10 which presents both regression outputs, there is no any significant difference in the results of two regressions. In other words, column A does not provide statistical evidence of the impact of changing business environment on the growth of the companies during analyzed years. Thus, the conclusion on business cycles effects is consistent with the previous section results.

However, a certain degree of non-confidence should be assumed considering the present sample size and short time span of the examined phenomenon. Moreover, the

coefficient of determination is not generally high enough (0.117), nevertheless, compared to the similar studies on modeling accounting based panel data (eg. Lähtinen & Toppinen 2008) the explanatory power of the model is adequate.

Table 10. The estimation results for testing the impact of the factors on the long-term financial performance of the FPP companies (standard errors in parenthesis) [ab].

	Growth,%	
	Coefficients	
	A	**B**
Intercept	30.613^{***}	29.818^{***}
	(11.181)	(10.001)
VA	0.001	0.001
	(0.001)	(0.001)
INV	-0.001	-0.001
	(0.003)	(0.003)
LN SZ	-2.922^{**}	-2.943^{**}
	(1.42)	(1.406)
LEV	0.465^{***}	0.471^{***}
	(0.117)	(0.114)
d1	1.043	-
	(7.568)	-
d2	-0.757	-
	(7.567)	-
d3	-3.909	-
	(7.503)	-
Adjusted R square	0.117	0.132
F	3.773	6.598
Number of observations	148	148

[a] *, ** and *** denote coefficients significant at the 10%, 5% and 1% levels, respectively.

[b] Independent variables are defined as follows: VA – gross value-added, INV – investments, LN SZ – firm size, presented by the natural logarithm of total assets, LEV – leverage, calculated as debt-to-equity ratio, d1 - d3 – dummy variables for years 2005-2007, respectively.

The table 10 shows that two from four potential drivers of business success – leverage and size are found to be statistically significant. Furthernore, the signs of the coefficients are in particular interested, such as leverage is found to be positively related (at one per cent level) to the growth of the company, when size exhibits negative influence (at five per cent level) on the long-term performance measure. However, these results cannot be considered as totally unexpected.

In this respect, leverage is detected to confirm Cortazar's (1998) and Clayton's (1999) results demonstrating that the higher the leverage the more competitive is the company. In addition, small companies are widely considered to be more flexible in growth opportunities and resource allocation issues (e.g., Rogers 2004, Bush & Sinclair 1991). Accordingly, estimated interdependencies could be regarded as still discussable in literature and need even closer examination with respect to the differences in industries and countries' development.

Table 11. The estimation results for testing multicollinearity for the long-term financial performance of the FPP companies (standard errors in parenthesis) [ab].

	Growth, %		
	Coefficients		
	A	**B**	**C**
Intercept	30.613[***]	26.976[**]	10.463[*]
	(11.181)	(10.598)	(5.456)
VA	0.001	-	0.0001
	(0.001)	-	(0.0001)
INV	-0.001	-0.001	-0.003
	(0.003)	(0.003)	(0.003)
LN SZ	-2.922[**]	-2.294[*]	-
	(1.42)	(1.28)	-
LEV	0.465[***]	0.473[***]	0.508[***]
	(0.117)	(0.116)	(0.116)
d1	1.043	0.958	1.457
	(7.568)	(7.568)	(7.651)
d2	-0.757	-0.729	-0.273
	(7.567)	(7.568)	(7.65)
d3	-3.909	-3.898	-3.917
	(7.503)	(7.504)	(7.589)
Adjusted R square	0.159	0.116	0.096
F	3.773	4.227	3.613
VIF	-	1.132	1.107
Number of observations	148	148	148

[a] *, ** and *** denote coefficients significant at the 10%, 5% and 1% levels, respectively.

[b] Independent variables are defined as follows: VA – gross value-added, INV – investments, LN SZ – firm size, presented by the natural logarithm of total assets, LEV – leverage, calculated as debt-to-equity ratio, d1 - d3 – dummy variables for years 2005-2007, respectively.

The next stage of the present analysis is an examination of the multicollinearity problem discussed in the previous section. As already mentioned, when two independent variables are highly correlated, they both convey essentially the same information. In other words, neither may contribute significantly to the model after the other one is included. But together they contribute a lot.

Hence, column A in table 11 presents results of the original regression model (see table 10), column B shows the coefficients from the regression, omitting value-added variable, column C provides output from the model excluding size component. Thereby, the coefficients of other independent variables do not change the signs (minus/plus) and the size, indicating the absence of the main multicollinearity signs. Nevertheless, the large standard errors (for dummy variables), which measure the extent to which the estimates can be trusted, should be kept in mind. Furthermore, the level of coefficients significance changes from five per cent to ten per cent for the size variable performed by the regression where value-added factor is excluded (column B table 11).

Moreover, variance inflation factor (see eq.11) measuring collinearity proves to be lower than critical value 2.5 for both regressions, being 1.132 and 1.107, respectively (see table 11). In addition, it should be noted that the explanatory power of the regressions without one of two highly correlated variables is detected to be lower (0.116, 0.096) comparing to the original model result (0.159). However, the difference is not so big to have a great concern on this fact.

Summarising this chapter, it is possible to make certain conclusions. Firs of all, the companies particularly interested in investing money in their business tend to have lower liquidity, which leads to the certain financial performance problems in the short run. Second, small size companies are detected to experience higher turnover growth due to their flexibility in changing environment. Finally, higher leveraged firms are more successful in their long-term financial operations and are concluded to have significantly positive relationship with growth opportunities. The more detailed explanation of results is going to be given in the conclusion section of the present research.

7. Conclusions

The present research is aimed to investigate the relationships between value-added components and short-term/long-term financial performance of the companies, measured by the current ratio and turnover growth, respectively. Business success of the forest-product companies is widely regarded from the external perspective, i.e. business strategies are analyzed in accordance to the business environment (e.g., Saloner et al. 2001; Jones & Sufrin 2001).

As a comparison, the internal perspective of the firm's competitiveness basis, i.e. tangible and intangible resources role in achieving management goals is not of a prime focus in the existing literature. Thus, only few empirical studies have been conducted on the topic of the resources crucial role in creating value and building competitive advantage of the forest industries (e.g., Toivonen et al. 2005; Lähtinen & Toppinen 2008). Therefore, for lack of studies on the proposed topic, the sample of thirty seven large- and medium-sized U.S. forest, pulp and paper companies was chosen in order to make conclusions on the purpose of the present research. The time span of four years (2004-2008) makes this study one of the most recent in this area covering current financial crisis stage.

Based on the previous literature findings and common sense, four hypotheses are proposed: 1) Value-added has a positive effect on the long-term financial performance of the companies, in particular. 2) Investments have positive impact on the long-term financial performance. 3) Investments have any impact on the short-term performance measures. 4) Firm's size and leverage have any effect on business success in whole.

In fact, in most cases value-added creation is totally related to the growth opportunities of the company (e.g., Lähtinen & Toppinen 2008; Roos et. al 2001). However, in this study regression analysis does not show a significant correlation between proposed variables, detecting no impact of the examined factor on the performance success in the long run. In part the absence of a clear-cut relationship between value-added and performance measures is the result of the complexity of value-added calculations, as the matter of the US GAAP disclosure requirements, which considerably differ from the

IFRS ones. In this respect, the present analysis could be extended by distinguishing the differences between these reporting standards, which are concluded to have significant impact on the calculation of value-added.

Consequently, investments judged as the component of value-added creation do not prove to play the major role in long-term competitive advantage development. Thus, the second hypothesis has been rejected, as well. The present findings do not show support to Sinclair and Cohen (1992), Cohen (1992) conclusions on the positive relations between business success and investments in the long run.

However, the results of testing the third hypothesis provide strong evidence that companies focused on the investments have on average problems with liquidity leading to poor performance in the short run. Therefore, such conclusion contradicts the main findings of Välimäki et al. (2005) stating positive relationships between investments and short-term performance of the companies and Lähtinen & Toppinen 2008 rejecting any interdependence between tested variables. In total, as an outcome of both findings it should be concluded that information that is beyond the income statement and balance sheet is needed in order to identify the effects of tangible and intangible resources on the financial performance of forest-product companies and to have more inside-firm information on the drivers of competitiveness.

Furthermore, the other factors included in the analysis as controlled variables show statistically significant correlations with the long-term performance measure. Hence, small firms are found to have superior financial performance and more growth opportunities than large-size companies. It could be regarded as reasonable due to the fact that small firms that have a consistent record of success make fast strategic choices on resource allocation, have effective and flexible business processes. Such conclusions are congruent to Rogers (2004), Bush and Sinclair (1991) studies and give controversial evidence to the findings of Ahuja and Lampert (2001), Smith et al. (2004) confirming that large firms create better competence advantage due to its size and wide network of customers.

Moreover, highly leveraged companies outperform the firms concentrated on their own sources in the capital structure. The presence of a strong positive relationship between debt-to-equity ratio and long-term financial measure, growth, is not, however, surprising. This is consistent with the fact that companies are aggressive in financing its growth with debt (Cortazar et al.1998; Clayton 1999). This phenomenon is caused by the current credit markets tightening that made access to finance especially critical. For the analyzed U.S. companies, the debt-to-equity ratio nearly doubled from 2007 to 2008 to reach 210%, the highest leverage level of any region (PwC 2009). This could lead to volatile earnings from the additional interest expense in subsequent years.

Although the certain significant results have been obtained, future studies should be extended in several ways. First of all, the time frame is needed to be enlarged in order to see the influence of the business cycles on the corporate performance and increase the statistical reliability of results. Second, managers of the companies should be interviewed to receive more internal information on intangible resource usage and strategic decision-making process. Third, as it was mentioned above, the differences in IFRS and GAAP disclosure of financial issues are to be examined regarding their influence on the value-added calculation procedure. Moreover, additional types of financial indicators of corporate performance, such as profitability and financial leverage should be included in the regression as dependent variables. Finally, the impact of material and salary expenses should be investigated to measure the cost-efficiency components effects on the business success of the forest-product companies.

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