

**UNDERSTANDING THE FACTORS THAT DRIVE FIRM-LEVEL
TRANSFORMATIONS IN THE BC FOREST SECTOR**

by

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MASTER OF SCIENCE

in

THE FACULTY OF GRADUATE AND POSTDOCTORAL STUDIES

(Forestry)

THE UNIVERSITY OF BRITISH COLUMBIA

(Vancouver)

October 2014

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Abstract

Today's changing business environments pose challenges for British Columbian forest firms in sustaining long-term competitive advantages. In response to these challenges, forest firms can initiate complex transformation processes that seek to project their performance out of a conventional competition cycle. Of interest for multiple stakeholders are the questions of why these transformations ultimately occur, which type of changes can produce them, and how they can be implemented.

This exploratory research focuses on analyzing the opinions of senior executives of BC forest businesses about the transforming processes of their firm. Understanding the views of these executives is one of the fundamental pieces of making sense of the forest business transformations. Semi-structured interviews provide the data collection strategy to elicit executives' views and preferences for adopting different transformational strategies and new product portfolios.

Analyses of the transcribed interviews reveal that executives associate firm-level transformations with the execution of seven different business strategies. The findings suggest a firm-specific pattern in defining the transformation processes. Differences in framing the concept of firm-level transformations are linked to differences in the types of changes considered transformative by executives in different firms. Correspondingly, executives' preferences about adopting new product offerings in their firms also varied from one company to another, but were similar between executives from the same company. The firm-specific defining pattern is explained by a moderating role of the organizational culture of forest firms. The business culture of these companies can regulate executives' intentions to transform the firm and the decision-making processes aimed at selecting the transformational strategies. The leadership style, ownership

structure and the organizational values are elements explaining the business culture of the BC forest firms.

Results also uncover a number of forces that can trigger transformation processes in BC forest firms from the perspectives of the executives. The findings also reveal barriers to transformational change and a set of factors that facilitate the implementation of the transformation processes. To further understand the views of executives about firm level transformations, future studies would likely benefit from the decision-making model and the set of research questions drawn from the findings of this exploratory research.

Preface

This study was conducted in collaboration with Drs. John Innes, David Cohen and Shannon Hagerman. Under their supervision, I conducted most of the research design, data collection and analysis, as well as the thesis writing.

This research was approved by the University of British Columbia Behavioural Research Ethics Board (Certificate number H13-01133).

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Glossary

This thesis builds on a transdisciplinary approach. In an effort to achieve as great clarity of concepts as possible, a glossary of specialized terms is provided below.

List of specialized terms in Table 1

Advance Tissue Molding Systems (ATMOS): novel technology used for sheet formation in tissue production. This technology employs the use of a vacuum roll with a natural airflow to pull water from the wet pulp fabrics. It can significantly reduce energy consumption with respect to other technologies (i.e. Through-Air-Dried or the Dry Crepe process).

Catalytic cracking: process of biomass conversion to ethanol and other alcohols. The alcohols can be produced using pre-treated biomass in liquid or gas state. In the case of wood biomass such as sawdust and shavings from sawmills, or wood chips from sawmills or whole tree chipping, the catalytic process uses the product gases from wood biomass gasification systems as feedstock to obtain different bio-fuels.

CNC manufacturing: Computer-numerically-controlled (or CNC) is the automation of machine tools using computer-aided design (CAD) and computer-aided manufacturing (CAM) programs. CNC machines are operated by computer programmed commands as opposed to be controlled manually or mechanically. CNC technologies are used in the wood manufacturing processes to shape and cut timber and panels of various dimensions according to pre-defined designs.

Cross-laminated timber (CLT): large engineered wood panel manufactured by cross laminating lumber with adhesives or fasteners. CLT is produced with three to seven layers of lumber or planks stacked on one another at right angles and are either glued together in a hydraulic or vacuum press over their entire surface area or nailed together. Each layer is composed of softwood boards. As the CLT panels are loadbearing stable solid materials, they can be used for floor, wall, and roof systems in the construction of multi-storey structures.

Densifying wood biomass: refers to impregnate wood by-products (i.e. chips or sawdust) with additives under heat and pressure in order to achieve greater density and hardness. The densified material has uniform sized particles, which facilitates their compression into solid and liquid fuel wood products (i.e. pellets or oils).

Edging: process of trimming all irregular edges of a flitch (unfinished wood plank) leaving a four-sided lumber.

Enzymatic Hydrolysis: process in which enzymes facilitate the cleavage of bonds in molecules with the addition of the elements of water. The process converts lignocellulosic biomass to fermentable sugars, which can be used as fuels and chemicals. Micro-organisms in nature, mostly bacteria and fungi, are capable of producing biomass-degrading enzymes.

Fast pyrolysis: thermal conversion of biomass to produce energy. As part of this process, the biomass is rapidly heated to 450 - 600 °C in the absence of air. Under these conditions, organic vapors, pyrolysis gases and charcoal are produced. The vapors are condensed to bio-oil, which

are the main outputs of this process. Sawdust or barks can be used as inputs to produce these bio-oils in the forest industry.

Gasification: process of partial oxidation that converts organic biomass (i.e. wood residuals) or fossil fuel based carbonaceous materials into carbon monoxide, hydrogen and carbon dioxide. This is achieved by reacting the material at high temperatures (700 to 16,000°C), without combustion, with a controlled amount of oxygen and/or steam. The resulting gas mixture is called syngas (or synthetic gas) and is itself a fuel. The power derived from gasification and combustion of the resultant gas is considered to be a source of renewable energy if the gasified compounds were obtained from biomass (i.e. wood).

Gasification Fischer-Tropsch (FT): refers to the chemical process to convert a mixture of carbon monoxide and hydrogen into liquid hydrocarbons (synthetic fuel). The FT gasification process produces a synthetic lubrication oil and synthetic fuel, typically from coal, natural gas, or biomass (i.e. wood residuals).

Head sawing: sawing that makes the initial cuts in a log at a sawmill, turning a log into cants (unfinished logs to be further processed) or into flitches (unfinished planks).

Hydro-treating (*Hydroprocessing*): alternative technology for the production of biofuels. Hydroprocessing in the oil and refining industry is a necessary process to remove pollutants like sulfur, nitrogen and heavy metals from fuel oils. In the bio renewable industry, the process is essential to make the hydrocarbon molecules of a biofuel compatible with petroleum diesel.

LIDAR: Light Detection and Ranging –a remote sensing technology used to characterize forest attributes and other physical features of the earth’s surface with very high resolution. The method consists in emitting laser pulses to a distant target on the surface and measure the time delay between the transmission and the detection of the reflected signal. LIDAR applications in forest lands allow making estimations and measures of canopy heights, biomass measurements, leaf area index and other ecosystem studies.

Lignin-based platforms: refers to lignin derived cyclic and aromatic chemicals, such as benzene, toluene, xylene and cyclohexane. These chemicals are obtained from thermal, chemical, metallic catalytic and biological treatment of lignin. Lignin is a component of lignocellulosic biomass and a common byproduct stream from cellulosic conversion.

Lignocellulosic biomass: organic compound of carbohydrate polymers (cellulose, hemicellulose) and an aromatic polymer (lignin). These carbohydrate polymers contain different sugar monomers (six and five carbon sugars) and they are tightly bound to lignin.

LSL: Laminated Strand Lumber or LSL – an engineered wood product made from long strands, which are arranged parallel to the longitudinal axis of the billet (the formed product). LSL is most commonly shaped into framing boards for floor joists and support beams. It can also be used for door cores, sill plates, and other applications.

LVL: Laminated Veneer Lumber or LVL – an engineered wood product composed of layers of scarf-jointed veneer glued together under heat and pressure with the grain of each veneer running parallel to the longitudinal axis of the billet. The veneers are glued together under heat and pressure using waterproof adhesives (i.e. phenol formaldehyde). A continuous press is used to produce long billets, which can be cut into various sizes.

Nanocrystalline Cellulose (NCC): cellulose structures grown under controlled conditions, leading to the formation of high-purity single crystals (200 nanometers long). Different sources of cellulose are used to produce NCC: cotton, wood pulp, sugar-beet pulp, etc. When extracted from wood pulp, it can be processed into a solid flake, liquid and gel forms. Several key features such as high strength, electro-magnetic response and a large surface area provide a basis for the manufacture of new and advanced materials using nanotechnology. For instance, NCC can increase the strength and stiffness of materials it is added to, making it attractive as a high-performance reinforcing material. NCC can also alter the surface of material like paper, changing its permeability, strength, flexibility and optical properties. NCC can be used to produce new types of paper with novel applications and for paints, varnishes and advanced high-strength materials.

Wood-based nutraceuticals: the term ‘nutraceutical’ derives from the words “nutrition” and “pharmaceutical”. It refers to different flavoring agents in foods, beverages and in cosmetic products, which result from processing tree barks and wood extractives into chemicals. Examples include stanol esters from wood pulp and synthetic vanillin made from lignin wastes.

Microfibrillated Cellulose (MFC): cellulosic material, composed of expanded high-volume cellulose. It consists of aggregates of cellulose microfibrils, which have a very good ability to form a rigid network. Its diameter is in the range 20–60 nm and it has a length of several micrometers. Recent studies have encouraged the emergence of new high-value applications focused on the barrier properties of MFC used in films, in nanocomposites, or in paper coating. Wood is the most important industrial source of cellulosic fibers, and is thus the main raw material used to produce MFC. Bleached kraft pulp is most often used as a starting material for MFC production.

OSL: Oriented Strand Lumber or OSL is an engineered wood product which is produced by aligning long strands of wood in parallel and binding them together using adhesives, pressure, and heat. OSL is used in a variety of applications such as studs, beams, headers, rim boards and millwork components. TimberStrand™ is an example of OSL proprietary product being produced by Trus Joist MacMillan in North America.

PSL: Parallel strand lumber or PSL is a high strength structural composite lumber product manufactured by gluing strands of wood together under pressure. It is a proprietary product marketed under the trade name Parallam®. Because it is a glued-manufactured product, PSL can be made in long lengths but it is usually limited to 20m (66 ft.) by transportation constraints. PSL is well suited for use as beams and columns for post and beam construction, and for beams, headers, and lintels for light framing construction.

Pyrolysis oil: See also *fast pyrolysis*. Pyrolysis oil is a densified biomass obtained from residues of sawmills, which can be used as a replacement of fuel oil. Common usages include the production of electricity and heat.

Through-Air Drying (TAD): in the paper industry is the technology used for sheet formation to produce paper towels and bathroom tissue. The process covers a sequence of pressing, molding and air-drying the sheets.

Torrefaction: is a thermochemical process for removing moisture and volatiles from biomass (i.e. wood residuals). During the torrefaction the biomass is treated at temperatures ranging between 200 and 320 C. In this process, the biomass properties are changed to obtain a much better fuel quality for combustion and gasification applications. Torrefaction leads to a dry product with no biological activity like rotting (i.e. bio-coal).

Transesterification: the chemical reaction ‘transesterification’ is used in the production of biodiesels, in which organic oils extracted from biomass (i.e. wood residuals) react with short-chain alcohols (typically methanol or ethanol). The process can be adopted by industries producing significant amounts of oil residues, such as raw tall oil in the pulp and paper industry that can be converted into a biodiesel.

Others specialized terms used in this thesis

Black Liquor: Is the spent cooking liquor, or waste product from the kraft pulp process that results from digesting pulpwood into paper pulp. It is mainly composed of chemicals and lignin,

but it also contains other substances, such as hemicellulose (a part of the hemicellulose remains in the pulp however), extractives (fat and resinous acids), aliphatic acids and inorganics (i.e. Na_2CO_3). Recent studies and developments have shown its potential for conversion into valuable products, which allows using the chemical structures of complex organic compounds in the wood.

Kraft pulp: Is the most common chemical pulping process, also known as the sulphate process. This is an alkaline cooking process that uses wood chips as the raw material input. The wood chips are added to a digester where they are mixed with cooking liquor, known as white liquor, containing the cooking chemicals (NaOH and Na_2S) and water. Cellulose fibers in the wood chips are then separated from lignin (which acts as a glue between the fibers) because lignin reacts with the chemicals in the white liquor. The chemicals and lignin form so called black liquor. The fibers are separated from the black liquor in a washing step and are then screened and possibly bleached before pulp is obtained. The pulp is either dried or transported to a paper mill. The pulp produced is the strongest of the chemical pulps.

Earnings Before Interest, Taxes, Depreciation and Amortization (EBIDTA): is a financial measure that represents a company's net income with interest, taxes, depreciation, and amortization added back. The measure is used to analyze and compare profitability between companies and industries because it eliminates the effects of financing (i.e. debt cost) and accounting decisions. It can provide an indication of companies' abilities to reinvest in the business itself or to pay their interest and taxes. EBITDA is a useful measure only for large

companies with significant assets, and/or for companies with a significant amount of debt financing.

Acknowledgements

I offer my sincerest gratitude to my committee members for their patience and persistence in guiding me throughout this study. I would like to thank my supervisor Dr. John Innes for giving me the opportunity to study at UBC and for his valuable support at critical moments. I am deeply grateful to Dr. David Cohen for sharing his knowledge and perspectives with me *and* helping in crystalizing my foggy ideas. This research would have not been an interdisciplinary one without the support and great contributions of Dr. Shannon Hagerman. Her critical feedback gave to this thesis a multiple disciplinary perspective.

I am deeply grateful to all the industry executives, who kindly dedicated their valuable time to participate in this research. The interest and professionalism with which they embraced the interviews was essential in developing this study.

I also want to acknowledge the Mexican institutions CONACYT (Consejo Nacional de Ciencia y Tecnologia) and SEP (Secretaria de Education Publica) whose funding opportunities made this research possible. These acknowledgements are also extended to my supervisor Dr. John Innes.

I would like to express my deepest gratitude to my lovely companion – my wife Vanessa – for sharing this dream with me and for constantly reminding me of the important things in life. I also want to thank my family – my parents, brothers and the Harabors – for their immense love and support during this process. Last but not least, I would like to acknowledge the support and friendship of Richard Payment and the Fadyeyev family.

Chapter 1: Introduction

Maintaining long-term competitiveness is a global challenge faced by firms in multiple industrial sectors. In particular, companies from the resources-based industries may need to transform how they create value given the growing environmental and economic changes of recent years. The interest to transform the Canadian forest industry is an illustration of how multiple stakeholders recognize the competitive pressures caused by changing business environments (Natural Resources Canada, 2014b; Palma, Bull, Goodison, & Northway, 2010). However, to produce the desired transformation of the Canadian forest sector, individual forest firms will need to transform one after another and thus scale up the changes to the sector level (Cohen & Nikolakis, 2012, 2013). The questions of how firms ought to transform and what even constitutes firm-level transformation are topics of scholarly debate this research aims to explore.

This thesis underscores the need to study the views of industry professionals about the transformation processes of forest firms given its relevance for making sense of sector transformation. Considering that different fields define firm-level transformations in different manners, this research aims to improve the understanding of how decision makers of forest firms define the transformative initiatives. It also attempts to identify individual preferences of these decision makers towards adopting particular transformation strategies for their firms.

The subsequent analyses are focused on forest firms that operate in British Columbia (BC), given the economic importance of the forest industry in the province (B.C. Ministry of Forests Mines and Lands, 2010; HFHC, 2013). Historically, the BC forest industry has provided a significant amount of jobs for forest-dependent communities, which has given them the access to a reliable source of direct and indirect income (MFLNRO, 2009). Furthermore, the combined impacts of

recent environmental changes and the global financial crisis have uncovered an urgency to initiate transformative processes in BC forest firms.

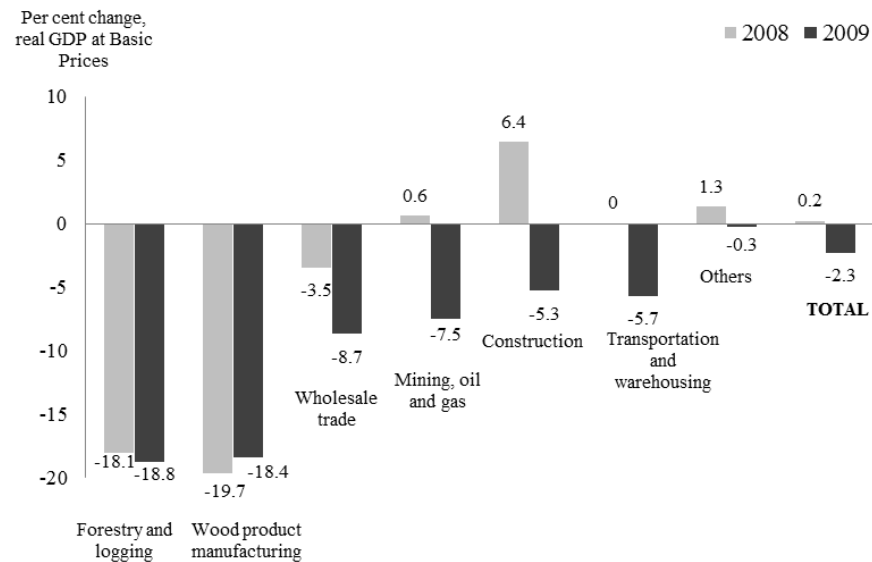
The following section provides a background of the conditions that have affected the performance of BC forest businesses in recent years.

1.1 Background

The competitiveness of the Canadian forest industry is influenced by various market dynamics as well as by global economic cycles. The performance of the industry was negatively impacted by the 2008 financial crisis, the U.S. housing collapse, and a strong Canadian dollar. On the positive side, a growing demand for wood products in Asian markets buffered the supply-demand imbalance observed during the recession years (Natural Resources Canada, 2014a).

In the case of British Columbia (BC), the slowdown in economic activity caused by the financial crisis particularly affected resource-based industries (Government of British Columbia, 2010a). This included forestry and logging operations, as well as the manufacturing of wood products (Figure 1).

Figure 1. British Columbia real GDP by industry



Source: Statistics Canada, in British Columbia Financial and Economic Review 2010.

The offshore demand for commodities and manufactured wood products from British Columbia registered a steady decline during the recession years, with the exception of Chinese markets (Forestry Innovation Investment, 2010, 2012; Government of British Columbia, 2010a). The revenue generated from BC forest products continued to decrease through a combination of reduced prices and low export volume for wood products (Figure 2). This generated low operating margins for forest businesses which, under those market conditions, had serious challenges to remain competitive and stay in the marketplace.

Figure 2. BC Revenue from manufactured wood products and logging (dollars)

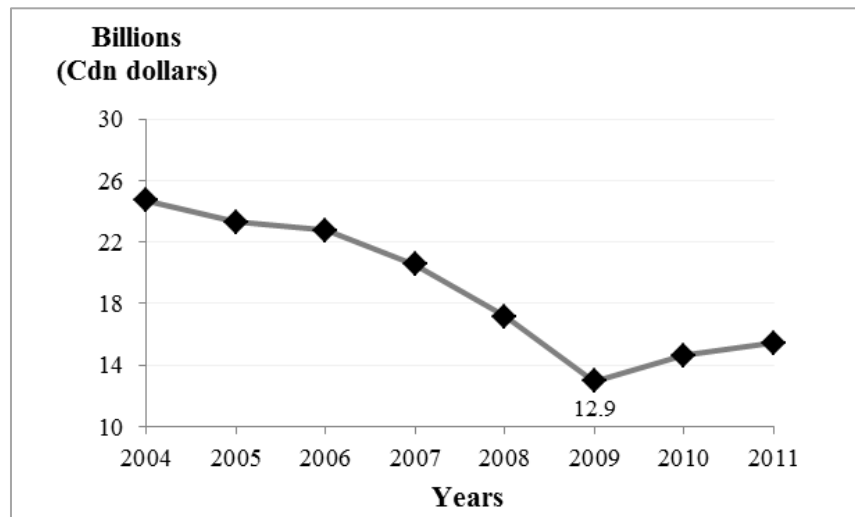


Figure 2 shows the trend in revenues from the sales of forest products in British Columbia (2004-2011). The data series includes sales from forestry and logging operations, pulp and paper manufacturing products, and wood manufacturing products. Source: Statistics Canada, March 2013

Pre-existing regional dynamics can either intensify or mitigate the impacts produced by global trends on the forest sector performance. This is illustrated by the economic and environmental conditions existing in the BC interior before the onset of the crisis. From 2001 to 2007, the forest industry dealt with the effects of a massive infestation by the mountain pine beetle (MPB) that had occurred in the interior region for several years (Government of British Columbia, 2011; Rustad & Macdonald, 2012). By 2007, the MPB outbreak had killed 13.5 million hectares of lodgepole pine (*Pinus contorta*) (Innes et al., 2009; Kurz et al., 2008). In 2012, this epidemic caused not only unprecedented ecological damage to forest ecosystems in BC, but also significant economic losses, affecting forest producers and forest-dependent communities (Legislative Assembly of the Province of British Columbia, 2012a, 2012b; MFLNRO, 2012). Within the areas affected by the MPB there were approximately ten million hectares of forest

designated for harvesting operations. Projections of timber supply within these harvesting areas indicate declines that would last up to 50 years (Legislative Assembly of the Province of British Columbia, 2012b; Rustad & Macdonald, 2012).

There continues to be an interest in improving the competitiveness of the BC forest industry, despite the progress made in dealing with some of the challenges described above. This concerns not only industry professionals but a wide range of stakeholders including provincial and federal governments, communities and research institutions that recognize the need for ongoing transformation of the sector (Adams, 2012; BC Business Council, 2010; HFHC, 2013; Kozak, 2013; MFLNRO, 2009; Parfitt, 2011).

This research aims to advance the understanding of the factors that are likely to shape firm-level transformations in the BC forest sector. An exhaustive analysis is beyond the scope of such a thesis, thus my study focuses on understanding the views of decision makers within forest firms about the transforming processes of their firm and the factors shaping these processes.

The specific research objectives (Section 1.5) are derived from the conceptual framework described in sections 1.2 to 1.4. In Section 1.2, I introduce the distinction between sector transformation and firm-level transformation that is used in this study. Section 1.2 develops a set of portfolios of products and processes that illustrates potential outcomes of forest businesses transformations in BC. A summary of the literature review on business transformation and organizational change is included in section 1.4.

1.2 Forest sector transformation and firm-level transformation

To distinguish between sector and firm-level transformation, I describe the former as the product of a series of firm-level transformations. The sector transformation can be better understood by looking at the different forest businesses as the sector's building blocks. When these building blocks are aggregated they constitute the entire sector. Ultimately, major changes that affect the structure of forest businesses will determine the scope of the transformation of the sector (Cohen & Nikolakis, 2012).

Firm-level transformations are defined in the organizational change literature as radical changes produced in the structure of a firm between two points in time (Barnett & Carroll, 1995; Pettigrew, 1987). A firm's structure includes elements such as its mission, the type of products and services offered, the technology used, its geographical position and the marketing strategy followed. According to Barnett et al. (1995), transformational change is produced by radically affecting one of the elements of the firm's structure, or by executing minor changes to several elements of that structure.

The applied literature on business transformation describes the transformations of firms as processes of accelerated change to improve overall performance (productivity and shareholder returns) and create unprecedented competitive advantages (Butner, 2014; Day & Jung, 2000; Dewar et al., 2011; Isern, Meaney, & Wilson, 2009). Using these criteria, a transformation process begins when the senior leaders of a firm launch a formal transformative program for the entire organization. Davidson (1993) further describes the transformation process of firms as one encompassed by three phases: phase 1 consists on improving the operating efficiency of a firm, phase 2 implies adding new services and features to the core business of the firm, and in phase 3, companies shift from existing core competencies to new business activities and services.

Differences in defining the concept of firm-level transformations may create divergent views on the type of changes that would be considered transformative in practice. In BC, initiatives that could be considered transformative have generally focused on encouraging forest businesses to adopt new technologies for improving their production systems. If one follows Barnett's (1995) criteria, forest businesses can be transformed only if changes in their technologies are quite radical, or if more elements in their structure, besides technology, change as well. The list of potentially transformative initiatives also includes Federal programs: 'Transformative Technologies Program (TTP)'; the 'Bio-pathways project', phases I and II; the 'Pilot-Scale Demonstration program (PSD)'; the 'Pulp and Paper Green Transformation program' and the 'Investments in Forest Industry Transformation Program (IFIT)'. These industry-oriented programs were all released between 2006 and 2011 (Natural Resources Canada, 2014b). At a provincial level, the 'Wood First Initiative' is another program that seeks to stimulate transformative change. Through this initiative, the government of British Columbia has promoted the increased use of both traditional and engineered wood products (EWP) for construction purposes. Cross-Laminated Timber (CLT) is such a product, and is currently proposed as a common structural material for non-residential buildings (FPInnovations, 2011a; Government of British Columbia, 2010b; Wood Enterprise Coalition, 2011).

It is unclear if the definition of firm-level transformations from the applied business literature or the academic literature accurately describes the views of decision makers within forest firms. Differences in defining these transformations could eventually lead forest businesses to pursue multiple strategic directions in the future. In the same manner, the current strategic plans of

forest businesses in BC cannot be always aligned with the objectives of the ‘transformative initiatives’ described above, despite being subject to changing business environments. Moreover, there could be cases of forest businesses that simply do not intend to pursue transformative changes inside their organizations.

This study aims to describe which alternatives are considered transformative by senior executives of resources, commodities and value-added forest businesses in BC. The opinions of these executives as the people who lead transformation efforts on the ground can contribute to the development of sound explanations for forest business transformations. This type of data can also provide insights for future studies about the transformation process for the entire BC forest sector.

1.3 Potential outcomes of forest business transformations

As described in Section 1.2, a business transformation opens the possibility to produce radical changes in multiple areas of a firm such as its mission, the products and services offered, the marketing strategies, technologies used, among others. The conceptual framework used by Davidson (1993) underscores how a company’s existing core products and services might change as a function of the type of transformation that is pursued. In Davidson’s model, the transformative efforts can target: i) operational excellence goals, ii) the development of new services and features, or iii) moving towards completely new business activities. Drawing on Davidson’s model, I developed a conceptual set of Portfolios of Products and Processes (PoPP) to illustrate a broad range of operational scenarios and their associated mix of forest products that could be adopted by transforming businesses in BC. Table 1 below, describes each portfolio.

Table 1. Portfolio of products and processes of transformed forest businesses in BC

Portfolio Name	Description	Supply	Key Processes	Categories of Products ^{1/}
P1. Diversified land management	Refers to the management of forestlands that focuses not only on maximizing gains of every hectare, but also in creating value from environmental externalities. It significantly improves the monitoring and maintenance of long-term forest values. It might integrate on-site biomass densification from logging residuals.	Forest lands	<ul style="list-style-type: none"> – Sustainable forest management practices – Enhanced monitoring of forest values (remote sensing, LIDAR, inventory data, aerial photography) – High performance restocking – Debarking, head sawing, edging, trimming, etc. – Fibre transportation (inbound and outbound logistics) – Mechanical degradation of woody debris and densification processes (torrification, fast pyrolysis, etc.) 	<p>C1. Environmental Externalities (Carbon offsets, biodiversity, alternative harvesting methods, ecotourism, etc.)</p> <p>C2. Logs and timber</p> <p>C3. Woodchips and hog fuel</p> <p>C4. Upgraded biomass (pellets, torrefied biomass, bio-oil, etc.)</p>
P2. Extended manufacturing of wood products	Centered on the production of solid wood commodities and secondary manufactured wood products. The mix of products becomes highly diversified. Wood residuals are used efficiently to generate power or to create feedstock products. The manufacturing process is flexible for handling different lines (and volume) of products.	<p>Logs, woodchips, hog fuel, densified biomass, logging residuals</p> <p>Manufacturing inputs (glues, resins, connectors, energy, etc.)</p>	<ul style="list-style-type: none"> – Sawmilling, head sawing, edging, trimming, etc. – Wood-chipping (forming, pressing, etc.) – Drying (kiln) – Shaping, gluing, pressing – Manual and automatic processes to carve and trim wood parts – Wood finishing (sanding, planning, coating, etc.) – Power and electricity generation (i.e. by using wood fired boilers or organic rankine cycle generators) – Stress and quality tests – Transportation (outbound logistics) 	<p>C4. Upgraded biomass</p> <p>C5. Structural and visual lumber (graded, finger joined, studs, treated lumber, etc.)</p> <p>C6. Panels and Veneer</p> <p>C7. Secondary manufactured (decking, fascia, sidings, flooring, windows and doors, staircases, cabinets, etc.)</p> <p>C8. Renewable power generation</p> <p>C9. Engineered products (glulam)</p> <p>C10. Engineered products (LVL, PSL, LSL, OSL and other structural composite lumber products)</p>
P3. Advanced Building Systems (ABS)	Refers to wood-based building solutions. It provides a more sustainable alternative for construction than using steel and concrete, given its potential to reduce environmental impacts. The	<p>Timber and lumber products</p> <p>Wood composites</p> <p>Manufacturing</p>	<ul style="list-style-type: none"> – Design of products (customized 3D) – Design of building/houses – Manual and computer programed assembly of wood parts (i.e. CNC timber technologies) 	<p>C11. Engineered wood products/systems (Cross-laminated timber applications in industrial, commercial and residential developments)</p> <p>C12. Engineered wood</p>

Portfolio Name	Description	Supply	Key Processes	Categories of Products ^{1/}
	manufacturing processes of this portfolio range from the fabrication of engineered wood products, to the design and installation of end building solutions (residential, commercial or industrial).	inputs (glues, resins, connectors, energy, etc.)	<ul style="list-style-type: none"> – Heating, glued and pressing – Stress tests – Forming and pressing composites – Specialized transportation of products – Installation 	<p>products/systems (pre-engineered wall panels, roof/trusses and floors)</p> <p>C13. Engineered wood systems (pre-fabricated houses/buildings)</p> <p>*Sawdust and wood waste</p>
P4. Augmented pulp bio-based	Enhanced pulp mills that convert wood biomass into different related products. On the pulp and paper side, it moves from a predominant production of market pulp to include higher value end applications (i.e. health care or packaging). On the biomass conversion side it consolidates power generation as a revenue stream, besides commercializing medium-to-low value platform chemicals. The highest value products within this portfolio are films, nanocomposites and paper coating from nanofibres and nanocrystals.	<p>Pulpwood, woodchips and densified biomass</p> <p>Inorganic compounds and chemicals (i.e. sulphate, sodium hydroxide, sulphuric acid etc.)</p> <p>Water</p> <p>Electricity</p> <p>Enzymes and yeast for bioconversion and fermentation</p>	<ul style="list-style-type: none"> – Mechanical and chemical pulping – Combined Heat and Power (i.e. gas or steam turbine) – Gasification (from debarking and chipping) – Pyrolysis for conversion of biomass (i.e. bio-oil) – Papermaking processes (in cylinder or fourdrinier machines) – Tissue production (Through-Air Drying process or ATMOS - Advance Tissue Molding Systems) – Enzymatic Hydrolysis of lignocellulosic biomass – Fermentation processes for producing platforms (in cellulose and hemicellulose) – Acid hydrolysis, centrifugation and dialysis (for C20); homogenization, microfluidizer, defibrillation, grinding, others (for C21). 	<p>C4. Upgraded biomass (bio-oil, reducing agents, etc.)</p> <p>C8. Renewable power generation</p> <p>C14. Pulp and paper (market pulp, newsprint, and printing writing)</p> <p>C15. Pulp and paper (packaging)</p> <p>C16. Pulp and paper (tissue & towel grades, and others health care applications)</p> <p>C17. Pulping by-products (tall oil, sulphur free lignin, others.)</p> <p>C18. Platform for bio-chemicals (ethanol, furfural, lactic acid, succinic acid, etc.)</p> <p>C19. Lignin-based platforms (benzene, toluene, and xylene)</p> <p>C20. Nanocrystalline Cellulose films, composites, others.</p> <p>C21. Microfibrillated Cellulose films, pigments, composites, others.</p>
P5. New integrated bio-based	Focused on producing bio chemicals, bio materials and biofuels by the integration of bio refining processes into the pulp and paper industry. The integration of processes could also create synergies with industries that manufacture non-wood related end products (such as pharmaceuticals, auto parts, textiles, etc.). Forest operations and manufacturing of	All supply sources listed in P4, in addition to the various inputs for manufacturing end products.	<p>Processes mentioned in P1, P2 and P4; as well as:</p> <ul style="list-style-type: none"> – Transesterification, gasification-Fischer Tropsch, catalytic cracking processes and hydro-treating of liquids for bio-fuel production; – Fermentation processes for bio-chemicals; – Polymerization for producing coatings; – Manufacturing processes to create end-user products (i.e. plastic injection, 	<p>Offers the most diversified product mix. The list of products includes those found in P4 as well as end-products like fuels, pharmaceutical / nutraceuticals, textiles, surface coatings, plastics, packaging applications, etc.</p> <p>Main categories of products within this portfolio include:</p> <p>C22. Composites materials/panels (wood-plastic, wood-minerals, etc.)</p> <p>C23. New generation papers (bioactive</p>

Portfolio Name	Description	Supply	Key Processes	Categories of Products ^{1/}
	wood products are integrated to this portfolio by providing feedstock (or energy) for bio refining.		assembly of finished parts, others)	and intelligent paper) C24. Bio-chemicals (Ethylene, Xylitol, others) or end products such as membrane filters, catalysts, phenolic resins, etc. C25. Bio-plastics/textiles (end-products made from polylactic acid and fibre-polymer composites. Includes new decking, insulation, roof structures, auto parts, etc.) C26. Transportation fuels (bio-butanol, FT diesel, methanol, dimethyl ether, hydrogen, etc.).

^{1/} Categories of products: Each category of products groups together a set of related forest products. Forest businesses might not be interested in including a particular category of products to their product mix. In the same way, they might focus on manufacturing only some of the products within a particular category.

Each of the five portfolios illustrates a focus of transformation that goes beyond achieving operational excellence. By operational excellence I refer to paths that create value by means of cost reduction and increases in productivity, quality and speed of their services (Davidson, 1993). In developing these portfolios, I conceived operational excellence as the current industry standard in BC (PwC, 2010). In this sense, forest businesses would transform from their current focus on operational excellence to enhanced services and capabilities approaches (portfolios 1, 2 and 4), or to the development of new core business areas (portfolios 3 and 5). The composition of the entire forest sector would gradually change as the individual firms transform to adopt one of the PoPPs described above.

Among the sources I consulted for creating these portfolios are several reports regarding strategic pathways for the forest industry (CEPI Confederation of European Paper Industries, 2011; COFI & Forest Sector Climate Action Committee, n.d.; FPIInnovations & FPAC, 2011; O'Malley, 2013; Roberts, 2012; The Swedish Forest Industries Federation, 2013), publications about the different characteristics of emergent technologies and wood products (Crespell & Gaston, 2011; Lavoine, Desloges, Dufresne, & Bras, 2012; Mansoornejad, Chambost, & Stuart, 2010; Sandén & Pettersson, 2013), as well as a range of information describing the progress of ongoing innovative initiatives in the forest industry (Adams, 2012; FPIInnovations, 2011b; MFLNRO, 2009; Natural Resources Canada, 2012; UPM, 2013). I also incorporated information from conferences and public lectures attended during the process of creating these portfolios (Glazerman, 2013; Roberts, 2013).

The design of these portfolios takes into account that 95% of the forest land in British Columbia is provincially-owned (MFLNRO, 2006), which means that the vast majority of forest businesses

operate on public lands. Forest businesses that decide to operate within portfolio 1 would continue to be tightly linked to forest land (land-based). In contrast, businesses moving towards portfolios 2 and 3 have few or no ties with the land (consumer-based). Between the land- and consumer-based options, there is a range of forest businesses that might operate within integrated portfolios (P4 and P5 of Table 1).

Portfolio 5 is the most complex scenario encountered. It implies that forest companies become part of a web of shared processes and services among several businesses (hubs or bio-refineries). The aim of these hubs is to deliver bio-solutions (end products or high-value biomaterials) to end customers. Many types and configurations of these hubs can occur (Sandén & Pettersson, 2013); however, in this study I centered on the kraft pulp process for the core of bio-refining processes. Due to its complexity, portfolio 5 is better represented in Figure 3.

Figure 3. New integrated bio-based portfolio

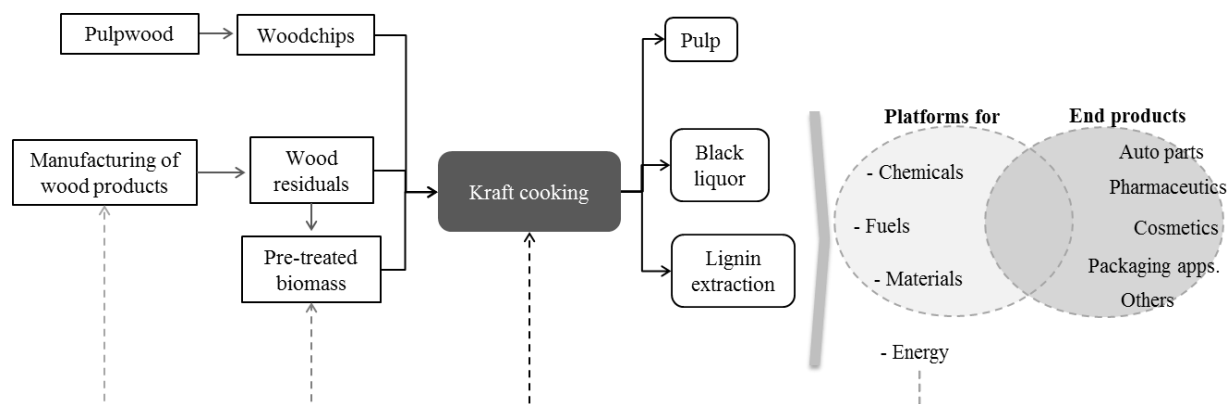


Figure 3 shows a graphical representation of the hubs or bio-refineries. The value creation goes from low (at the left part of the diagram) to high value end products (right side). The flow of energy and power closes the process like in a loop cycle.

Traditionally, forest businesses in British Columbia have relied on manufacturing wood commodities (i.e. structural lumber and market pulp) and other low value-added wood products (Kozak, 2007; Parfitt, 2011; Woodbridge, 2005, 2009). If this continues to be their focus in the

future, forest businesses could miss opportunities that would give them a significant competitive advantage in new business environments (Kozak, 2013; MFLNRO, 2009). This is particularly relevant when considering that competitors outside BC have continued to incorporate technological advances and other innovative approaches for designing, manufacturing and marketing of wood products (Futura Gene, 2011; Preem, 2014; Sandén & Pettersson, 2013; UPM, 2013).

Reshaping the portfolios of products and processes of forest businesses can be a fundamental strategy to develop more diversified and competitive business models (Glazerman, 2013). This research highlights fundamental benefits attributed to reshaping PoPPs: the development of technologically advanced operational systems, the presence of diversified product mixes as well as updated marketing strategies for serving an expanded customer basis.

The viability of forest businesses adopting an alternative PoPP in the future remains hard to predict today, despite its potential relevance for transforming the forest sector. Currently, there is very little available information concerning the factors that could facilitate the adoption of new PoPPs by these businesses.

1.4 Factors that shape firm-level transformations

Literature in the field of organizational change as well as specialized business management publications provide insights into the factors that shape firm-level transformations. According to Pettigrew (1987), studies analyzing major changes that occur in firms use three different guiding inquiries as follows. The first seeks to identify the firms' structural outcomes resulting from transformation. This inquiry answers the question of "what" has changed within the firm or what is the 'transformation content'. The second line of inquiry is centered on identifying the factors

triggering major changes across firms (the ‘why’ of the transformation). Moreover, studies targeted at managers and senior executives are mostly focused on examining the processes and tactics implicit in driving these changes (the ‘how’ of transformation).

Applied research in the field of business transformation has studied transformational changes combining several aspects of the above three guiding inquiries. These studies have focused on organizations and firms that produce consumer-end products; they have very rarely analyzed changes in commodity or resource-oriented firms (Butner, 2014; Cohen & Nikolakis, 2013; Davidson, 1993; Day & Jung, 2000; Dewar et al., 2011; Isern et al., 2009; Meyer, 2007; PwC, 2014). Although the majority of businesses analyzed in these studies lies outside the forest products sector, the conceptual and empirical foundations of this research provide clues for studying firm-level transformations in the context of the BC forest sector. For instance, the work developed by Davidson (1993) is particularly relevant for framing the potential outcomes of forest business transformations (see Table 1). In his three-phase model, Davidson describes potential benefits of executing different types of transformation strategies.

Studies focused on answering “why” firms’ transformations occur have distinguished between the external and internal factors triggering major changes in organizations (Barnett & Carroll, 1995; Isern et al., 2009; Kotter, 1995; Pettigrew, 1987). External factors refer to the social, economic, political and competitive conditions that activate transformational processes in organizations and in firms. Internal factors include aspects such as the company’s vision, the capacities and skills of the workforce and staff, leadership style and the culture of the organization. Each of the above internal and external factors can stimulate change to different degrees. However, the presence of a visionary leadership and loss of a company’s competitiveness are both factors that are consistently underscored as major influences for

initiating transformations (Butner, 2014; Cohen & Nikolakis, 2012; Isern et al., 2009; Kotter, 1995; Pettigrew, 1987; Tice & Evans, 2014).

The literature emphasizes the role of senior leadership in the design and implementation of transformative initiatives (Kotter, 1995; Pettigrew, 1987). Pettigrew (1987), for instance, placed senior leadership as a central element in choosing the type of transformation pursued by a firm, justifying the need for changes, and determining the way in which changes should be implemented. Studies in the business literature underscore the role of corporate leaders and senior executives in deciding the viability of new initiatives (Kaplan & Norton, 2008; Mintzberg & Quinn, 2002). This high level decision-making process takes place within a firm through both formal and informal strategic planning. For instance, in publicly traded firms the selection of new strategies is a shared-task between the Chief Executive Officer (CEO), the President and board members of the company, its shareholders, and other senior executives (Rock & Kahan, 2010). Each of these decision makers can have an individual preference towards the adoption of new business strategies for the firm. Transformative initiatives figure among the new strategies assessed by decision makers.

The work of scholars in the field of social psychology complements the business literature by providing theories of how individual preferences and behaviours are formed (Ajzen, 1991; Schwartz, 2006; Stern, 2000). Stern (2000) has created a conceptual framework that explains how specific behaviours depend on a broad range of causal factors. The causal variables included in this framework are: i) attitudinal factors, which account for personal moral norms, values and beliefs driving particular behaviours; ii) contextual forces, such as economic implications and costs, community and organizational expectations, public policies that support certain actions,

benefits and constraints provided by technology, etc.; iii) personal capabilities; and iv) habits and routines.

Applications of psychological theories to the field of management have studied the relationships between top executives' values and behaviors *and* different strategic options (Carpenter, Geletkanycz, & Sanders, 2004; Hambrick & Mason, 1986; Papagiannakis & Lioukas, 2012).

Similar studies are built on applications of Ajzen's theory of planned behaviour (TPB) (Ajzen, 1991) and the basic human values theory (Schwartz, 2006), to predict entrepreneurial behavior (Halis, Ozsabuncuoglu, & Ozsagir, 2007; Kautonen, van Gelderen, & Tornikoski, 2013).

Another transdisciplinary research applies theories from the social psychology and organizational behavior fields to the discipline of management (Berson, Oreg, & Dvir, 2008). In that study, Berson et al. (2008) conducted a survey research with top executives of publicly traded companies to measure: i) relationships between executives' values and organizational culture, and ii) relations between organizational culture and firm performance.

On the other hand, no study was identified that explicitly apply psychological theories in measuring executives' attitudes towards adopting different transformational strategies.

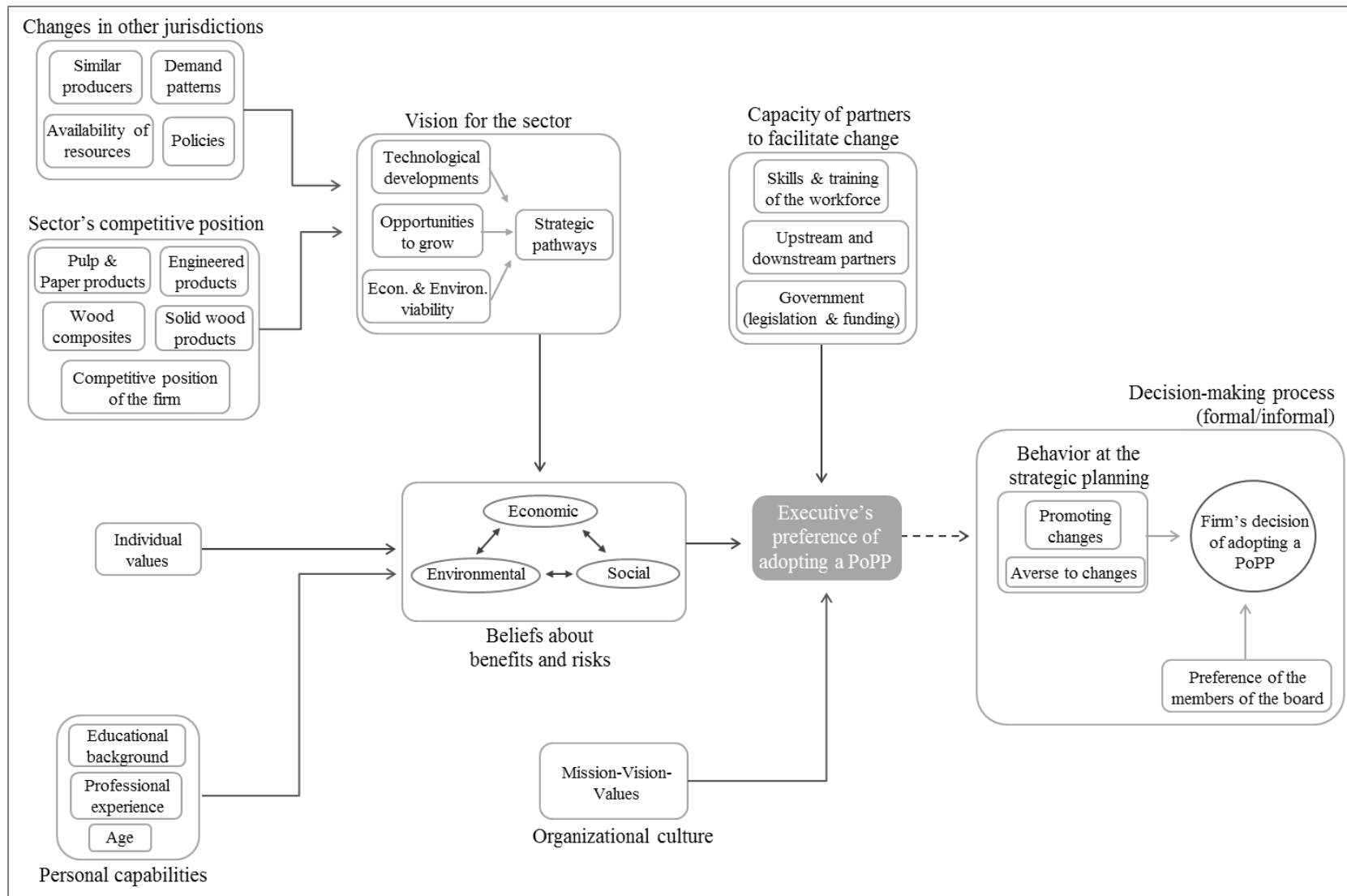
1.4.1 Conceptual framework summary

In the absence of an established theory that explains firm-level transformations in resource-based industries, I developed a conceptual model to examine the potential factors triggering forest business transformations in BC. This model is founded upon studies in the fields of business transformation, organizational change and preference formation. In this model, I placed the leadership of senior executives at the center of promoting specific types of transformations in

their businesses. The types of transformations correspond to the portfolios of products and processes (PoPPs) described in section 1.3 of this thesis.

Figure 4 provides a summary of the conceptual framework for this study. The directions of the arrows in the model indicate influences between potential factors affecting preferences of senior executives.

Figure 4. Factors proposed to influence the preference of individual executives towards the adoption of alternative portfolios of products and processes (PoPP)



1.5 Research objectives

Although research is available about firm-level transformations in consumer industries, little has been done to examine these transformations in the natural resources sector. The primary purpose of this study was therefore to examine and characterize potential factors shaping the transformation of forest businesses in British Columbia. The nature of this inquiry was primarily exploratory (Given, 2008), since there are no theories explaining the causes and potential outcomes of executing firm-level transformations in similar business environments.

The specific research objectives of this study can be summarized as follows:

- Objective I: Identify and describe preferences of senior executives of BC forest businesses on the type of transformation strategies for their firms.
- Objective II: Identify and describe potentially influential factors driving the transformation of forest businesses in BC.
- Objective III: Identify additional variables and specific research questions for further studies on firm-level transformation in resources-based industries.

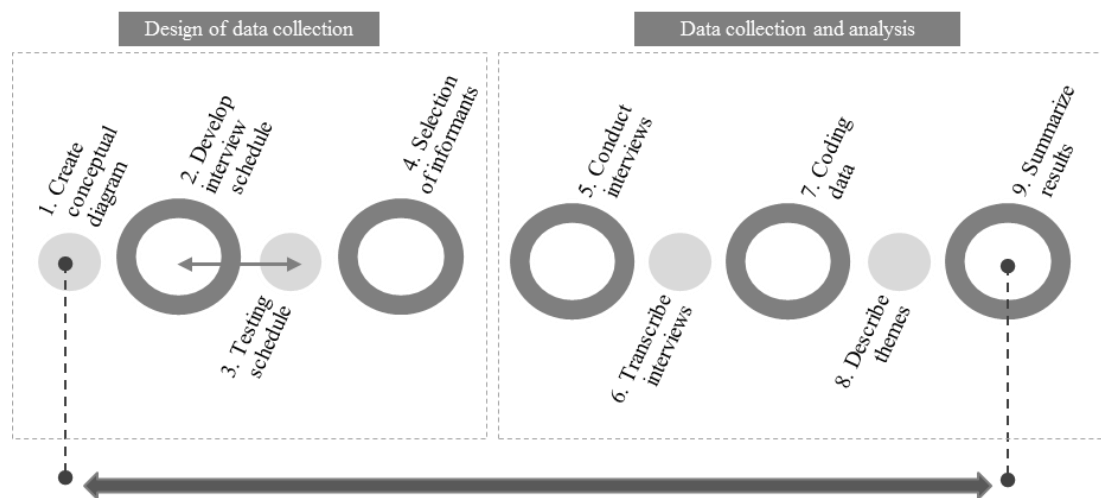
Chapter 2: Methods

2.1 Methodological approach

The exploratory nature of the specific research objectives (see Section 1.5) led to the adoption of an inductive type of inquiry. The overarching goal of using this inductive approach was to facilitate the discovery and explanations of patterns across the views of different senior executives. The grounded theory method provides a logic framework for linking data collection to the formulation of general explanations about executives' views on forest business transformations (Babbie, 2004; Charmaz, 2006)

Figure 5 provides a schematic representation of the overall methodological approach followed in this research. Steps 1 to 4 cover the stage of designing the instrument for data collection. The actual data collection is described in step 5. Finally, steps 6 to 8 comprise the procedures used for analyzing the data.

Figure 5. Methodology used in this study



The small circles shown in Figure 5 represent secondary procedures that are linked to a preceding process. The hollow circles constitute the main procedures. The circle numbered as 1 is linked to the literature review of this study (not shown in the diagram).

I adopted the individual as the unit of analysis in this study. Although the primary focus of this research was to examine organizations' transformation, the means to achieve that goal consisted of analyzing the views of individuals (senior executives) who belonged to these organizations. As insiders of forest businesses, senior executives can provide an in-depth view of the processes and outcomes of firm-level transformations.

2.2 Design data collection using semi-structured interviews

I used semi-structured interviews to elicit the views and preferences of industry executives about transforming their businesses in the future. Semi-structured interviews are characterized by their potential for balancing between obtaining specific information and leaving flexibility to include non-anticipated viewpoints (Flick, Kardoff, & Steinke, 2004). This characteristic was essential in this study, since it allowed combining open-ended questions, which are exploratory in nature, with confirmatory questions drawn from previous research.

2.2.1 Creation of a conceptual diagram

I developed an influence diagram that summarizes the conceptual framework of my study. The development of the diagram was based on key findings from: i) the organizational change literature, ii) the business transformation, and iii) the preference formation literature. The diagram is also consistent with the research questions identified for this study. The diagram (shown in Figure 4 of section 1.4.1) includes the factors suggested in the literature as influencing the preferences of senior executives for selecting transformative strategies in their firms. In addition to providing a summary of the conceptual framework (as detailed in Section 1.4 of the

introduction), the diagram helped outline the types of questions included in the interview schedule of this study.

2.2.2 Development of the interview schedule

I developed an interview schedule for guiding the semi-structured interviews. The interview schedule was comprised of three elements: 1) a set of 7 open-ended questions, which were followed by probes (or follow-up questions) and prompts; 2) one practical exercise (or card-sorting task); and 3) a set of demographic questions.

Examples of the probes used in the interview schedule include expressions such as “Can you give me an example?” Or “Just so I’m clear, by this you mean....” Four of the 7 open-ended questions included a probe to expand the content of the answers. Five of the open-ended questions were followed by a confirmatory prompt. The prompts were additional questions related to previous responses of the executives, but these questions focus on specific information (i.e. introducing the names of potential business opportunities such as bio-chemicals).

The card-sorting task was a 5 to 10 minutes exercise divided into 2 stages. In stage 1, executives reviewed a set of 26 cards, where each card represented a particular category of forest products (see ‘Categories of Products’ in Table 1 Portfolios of products and processes of transformed forest businesses in BC). For each of the cards the executives indicated if they had a ‘yes’ or a ‘no’ preference towards producing the particular product category in the year 2023. After reviewing each of the 26 cards and indicating their preference, the executives split the cards in two piles – the ‘no’ pile and the ‘yes’ pile – and continued the exercise focusing on the ‘yes’ pile only. Some of the executives asked for a third category – the ‘maybe preference’. In these cases, executives added the cards identified with a ‘yes’ and the cards selected with a ‘maybe’

preference and piled them together. This new pile was used to continue with the next stage of the exercise. In Stage 2, executives were asked to indicate the three product categories they think will be the core products for their company in the year 2023.

The application of the card-sorting exercise was followed by a set of demographic questions that concluded the interview. All demographic questions were related to the previous work experience of the executives.

2.2.3 Testing the interview schedule

The interview schedule was pretested with two research volunteers prior to the final application of the interviews. One of the research volunteers was a fellow graduate student from the University of British Columbia, and the other was a senior professional of a renewable energy company. The test run revealed the need to conduct the interview at a faster pace. The intention was to reduce its length from around 45 minutes to a maximum of 35 minutes. Others changes made to the schedule included removing one demographic question (age), and modifying the wording of one of the prompts used to verify information. The tested version of the interview schedule is included in Appendix A of this thesis.

2.2.4 Selection of informants

I used purposive sampling to identify individuals who were directly involved in the strategic planning processes of forest businesses. The list of executives that are involved in this process includes individuals in positions such as Chief Financial Officer, Chief Executive Officer, Senior Vice President and Vice President, Director and other senior executive positions in BC forest businesses.

Once I narrowed the selection of informants to this pool of executives, I then used three criteria to refine the identification of participants. The criteria I used were: 1) to include senior executives from companies that were in the marketplace for a minimum of 20 years. The rationale for this criterion is that the longer a company has stayed in the marketplace, the higher the probability it has passed through transformational processes in the past. Moreover, the firms and organizations analyzed in the comparable applied business literature often have long trajectories. 2) To include senior executives with different levels of involvement in the strategic planning processes of their companies. In using this criterion, I classified senior executives based by their roles in strategic processes. Typology A refers to senior executives who are able to vote or can initiate processes for analyzing new strategic initiatives. This includes executives who belong to the board of directors of their companies, or those who are responsible for the development of strategic initiatives in the firm (i.e. CEO or others executive positions in the area of corporate development or strategic initiatives). Typology B stands for those senior executives who can develop business cases or proposals that are later assessed by the board of the company. 3) To include executives who belong to different types of producers. The range of producers considered in this study includes: resource producers, such as timberland companies; commodity producers, such as lumber or pulp producers; integrated companies; and value-added producers, such as engineered wood products and pre-fabricated houses producers.

In an effort to achieve as great a diversity of opinions as possible, I attempted to interview two executives from each firm. My goal in testing the methodology of this exploratory research was to interview between 10 and 15 senior executives; or to stop the interviewing process when

saturation of new concepts was reached. According to Charmaz (2006), this saturation point is attained when no new descriptive codes or themes are emerging from the analysis of data.

2.3 Data collection and analysis

Data collection and data analysis of interview transcripts were independent but iterative procedures in this study. The four subsequent subsections describe how they were conducted.

2.3.1 Conducting interviews

I conducted 10 interviews during the period from December 2013 to January 2014. Nine of these were conducted in-person and 1 was done remotely. Of the 9 interviews undertaken in-person, 7 were held in the offices of the executives and the remaining two in the Faculty of Forestry, at the University of British Columbia. For the remotely conducted interview, I used a web-conferencing service with video-streaming for the entire interview. To apply the card-sorting exercise remotely, I used a desktop-sharing tool through which I manipulated a PowerPoint presentation that contained the same 26 categories of products from the physical cards. In this case, instead of creating two piles of cards, I deleted the categories that were not of interest to the executive.

Interviews ranged in duration from 28.4 to 56.1 minutes. The average length of the interviews was of 37.2 minutes. The sequence of the questions in the middle of the interview schedule was modified as a function of how conversations were evolving. However, questions 1 and 2 at the outset of the interview were always retained in order as was the card-sorting exercise at the end. This was done to provide an ‘opening statement’ for initiating conversations, and in the case of

the card-sorting task, to confirm relevant information touched on by executives in previous parts of the interview.

There were two reasons to conclude the data collection after completing the tenth interview. The first was the difficulty in scheduling additional interviews with high-level executives that already resulted in the data collection surpassing the scheduled time and budget. The second was the apparent saturation of concepts after the 7th interview conducted (see Figure 6). Although the data obtained from the 10 interviews was sufficient to address the objectives of this exploratory research, it is still possible that having access to more executives would have revealed additional insights.

Figure 6. Cumulative number of concepts encountered with an increasing number of interviews

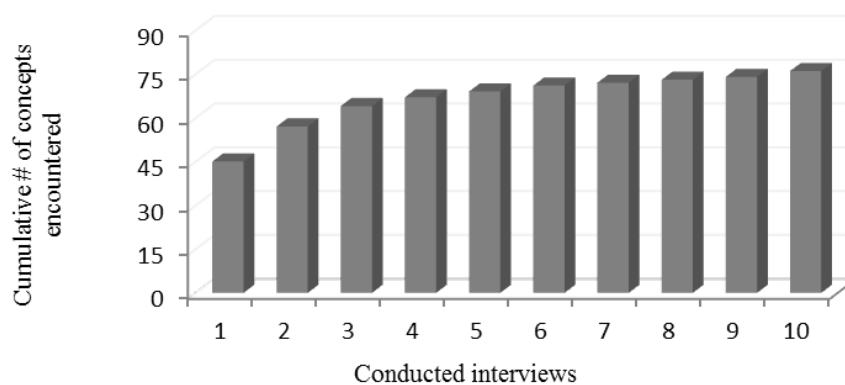


Figure 6 shows the increase of new concepts after coding additional interviews. Only 4 new concepts were encountered from coding interviews 8 to 10. These concepts expanded the themes of risks and barriers of doing transformations.

2.3.2 Transcribing the interviews

Each of the 10 interviews was recorded and transcribed for analysis. I used verbatim transcriptions to capture words and sounds produced by research informants during the interviews. In cases where executives use marked facial expressions to show their positions or

viewpoints I made notes in the transcripts indicating the type of expressions (e.g. excitement, seriousness, others).

2.3.3 Coding

Verbatim transcriptions of each interview were analyzed using the thematic content analysis tools of the NVivo 10 computer software. This software is commonly used for managing, analyzing and retrieving information in qualitative research (Given, 2008). The coding procedure I followed consists of reducing the data of the transcriptions to simplified themes of related concepts (Coffey & Atkinson, 1996). Particularly, I used the logic of 'open coding' to break the data down line-by-line in order to attach labels to emergent concepts. In parallel to the coding, I created an attribute table, which gathers both personal and firm-specific information of the executives. The table allows indexing the coded text to different attributes of the executives, which facilitated the indirect identification of patterns.

The coding analysis revealed both expectant and emergent themes. Expectant themes included comprehensive details about issues that were identified a priori during the design stage of this study (and that were explicitly asked about during interviews) (see section 1.3.1 of this thesis). In contrast, emergent themes included information and perspectives about issues that were not identified a priori to the interview process.

Table 3 presents a summary of the major themes obtained from the content analysis and their links with the objectives of this study. Each of these major themes was formed by grouping together a series of related nodes. A table that shows the entire classification of themes/nodes/concepts can be found as an appendix to this thesis.

Table 2. Thematic concepts identified in this research

Research Objectives	Themes/Nodes	Nature of themes	
		Expectant	Emergent
Objectives I and III	Position and role of executives	✓	
	Meaning of transforming processes	✓	
	Existent product mix	✓	
	Views and preferences of future products	✓	
Objectives II and III	Drivers of transformation	✓	
	Barriers to transformation	✓	
	Risks of doing transformations	✓	
	Enablers of transformation	✓	
	Organizational culture		✓
	Ownership structure		✓
	Emergence of strategic initiatives	✓	

2.3.4 Describing themes in the data

I used a series of bar charts, histogram frequencies and tables to describe the data gathered into the theme/nodes classification. To create these charts and tables, I cross-referenced the data by selecting particular attributes or distinctive characteristics across informants and then linked them to specific themes. The use of NVivo software simplifies this procedure through the function ‘nodes coding by attribute value’. The type of ownership structure of executives’ firms (public or private) and the type of producer they belonged to (resources, commodity or value added) were among the main attributes considered when generating these charts.

2.4 Anonymity and ethical considerations

Commercially sensitive information provided in the interviews was aggregated and used to highlight trends on the views held across informants (i.e. Figure 12, in Section 3.2.2), as opposed

to linking this information with individual executives or their companies. Likewise, no company affiliations or individual names were used in any of the results produced in this study.

Each participant was provided the opportunity to edit or expand on the content of the interview transcripts to improve the veracity of the information, and to approve its use in subsequent stages of the study.

Chapter 3: Results

3.1 Research informants

The sample size of this study, although small, facilitated the exploration of a diverse range of views on forest business transformation. The composition of the sample included executives from six different senior positions: Chief Executive Officer, President, Chief Financial Officer, Senior Vice President, Vice President and Director.

Of the ten executives interviewed, six were grouped in typology A. This typology refers to the executives who either sit on the board of directors of the company or who were responsible for coordinating the preparation of business cases to assess strategic initiatives. The remaining four of the executives were grouped in typology B, which encompasses senior executives who can participate in the development of business cases for new strategic initiatives. Table 3 provides a breakdown of each typology including the number of executives and details about their positions. Both typologies grouped executives in positions of senior Vice President and Vice President. The variation in the typology assigned to these executives reflects differences in the type of strategic functions defined in their job description: a senior VP grouped in typology A is more involved in the strategic planning of the firm than in typology B.

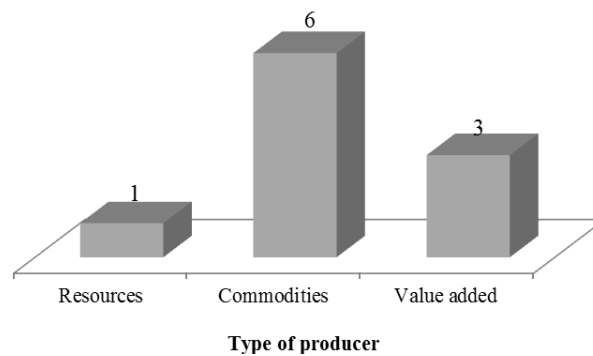
Table 3. Number of executives per typology of position

Degree of involvement in firm's strategic planning	Generic position title	Number of executives
Typology A	Chief Executive Officer-President	2
	Chief Financial Officer	1
	Senior Vice President	1
	Vice President	2
	Typology A total	6

Degree of involvement in firm's strategic planning	Generic position title	Number of executives
Typology B	Senior Vice President	2
	Vice President	1
	Director	1
	Typology B total	4
Total		10

Further description of the sample is provided in Figure 7, which illustrates its composition by type of forest producer.

Figure 7. Number of executives interviewed per type of producer (n =10)



The number of research informants from resources producers was limited by the number of firms of this type that operate in British Columbia, due to the high proportion of publically owned forest land.

3.1.1 Work experience of the research informants

All executives provided information about the areas where they gained work experience in the past, as well as the duration of such experience. Two categories of questions were asked: a)

about their work experience as executives within the forest sector, and b) about their experience gained in other industries.

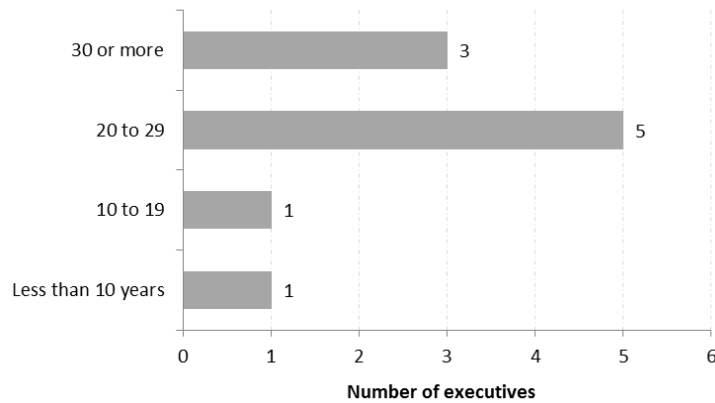
The information included in this section has been aggregated to protect the confidentiality of research participants.

3.1.1.1 Work experience in the forest sector

The experience of research participants within the forest sector covers a range of areas from forestlands operations and manufacturing of products, to management and corporate decision-making. The list of activities/areas mentioned by the executives were: forestry and logging operations (road building, planning layout, etc.), woodlands operations (i.e. managing licensees and stumpage), sawmill operations, remanufacturing of wood products, forest inventory, pulp manufacturing, inbound and outbound logistics management, marketing and sales of products, business and financial analysis.

The average time of work experience accumulated by executives within the forest sector was 24.3 years. Years of work experience of executives within the forest sector ranged from 9 to 35 years. Figure 8 illustrates the work experience of the sample of executives organized into four categories. Eight of the executives interviewed had a minimum of 20 years of work experience accumulated within the forest sector.

Figure 8. Years of work experience of informants within the forest sector (n=10)

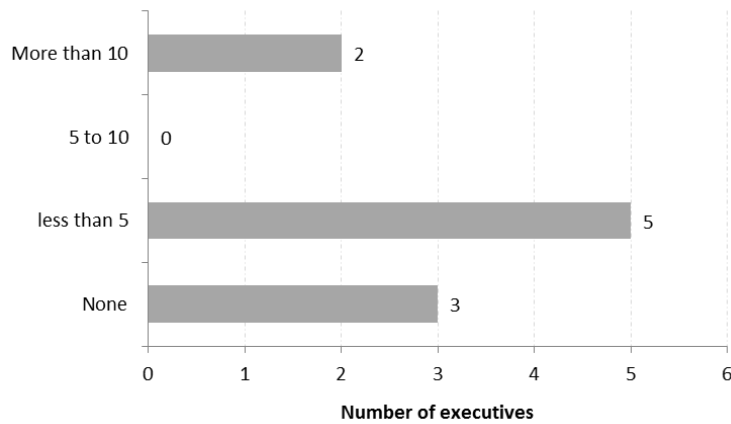


3.1.1.2 Work experience in other industries

Most informants had gained work experience in other industries apart from the forest products and paper industry. The areas mentioned by executives are listed here using the North American Industry Classification System. This more accurately reflects the informants' expertise and experience. The areas of experience mentioned by executives were: primary metal manufacturing (steel), machinery manufacturing (industrial equipment), computer and electronic product manufacturing (electronic), fishing, transportation and warehousing, management consulting services, offices of certified public accountants, recreation industries, retail trade industry and investment advice.

The average working time spent outside the forestry sector was 4.8 years. Across informants it ranged from zero to twenty years. Eight of the research informants had accumulated less than five years of work experience outside the forestry sector. Figure 9 provides an overview of the years of experience that executives accumulated outside the forest sector.

Figure 9. Years of work experience of informants accumulated outside the forest sector (n=10)



The following sections of this chapter report on the views of senior executives on the topic of forest business transformations. These views are reported anonymously: however, each executive was randomly assigned a number from 1 to 10 in order to facilitate the data analysis. The numbers in parentheses at the beginning of the excerpted interview quotes indicate the response of a specific senior executive. The numbering is kept anonymous for the scope of this thesis. The order in which the sections are presented follows the themes-distribution of Table 3 (Section 2.3.3 of this thesis). Section 3.2 introduces the concepts used by the executives to define firm-level transformations. The executives' preferences about adopting new products in the future are described within Section 3.2.1 and 3.2.2. A summary of the forces driving forest business transformations is included in Section 3.3. Sections 3.4 to 3.5 present a series of critical factors influencing the outcomes of forest business transformations in BC.

3.2 Defining the process of firm-level transformations

Most executives defined the process of firm-level transformations as the execution of different business strategies that have the objective of delivering significant performance improvement to the firm. The seven different business strategies executives associated with forest business transformations were: i) operational efficiency, ii) diversifying product mix; iii) entry into the bio-economy; iv) sustained growth; v) market diversification; vi) diversifying the geographic base of operations; and vii) adoption of a customer-driven focus. Opinions varied among executives regarding which of the seven strategies could deliver the desired performance improvement. Despite these variations in opinion, I identified a common set of components and conceptual distinctions that were being used by the executives to make sense of the overall transformation process.

One of the components used by the executives is the magnitude they assign to the transformational changes. All but one mentioned that transformation implies producing major changes, large-scale shifts that positively affect the firm's performance.

(5) We've added a whole new revenue stream to our organization... We've been able to successfully transform, grow, develop, radically change our organization and how it's perceived in the marketplace. It is a complete change in production.

(1) We're always trying to do things better, but we're also looking for that transformative change, the change that's really going to make a difference, like a step change.

However, three of the executives who linked transformation with producing major changes also linked transformation to executing minor changes in the structure of the firm. To these executives, transforming can be "a little or a big thing" (7).

(10) So for us it [transformation] comes in many different forms. So it's little innovations or transformations that happen on the shop floor trying to get all of our team members engaged in what they can do differently and how can we be slightly more efficient or slightly more productive. So those are minor transformations, minor innovations. We're in the middle of an initiative right now that's a little bit grander in scale ... I suspect that it would be [transformative], but we won't really know until we're all the way through.

The novelty or newness of a business strategy is a concept used by some of the executives for differentiating between more and less transformative initiatives; as one executive stated: “Yes that is [transformative], although that's less transformational because that has always been present in our business”. Similarly, executive 6 described the transformation of his company as a process of adopting ‘new’ or ‘innovative’ technologies over time. The executives who commented about this ‘novelty’ aspect of transformations referred to the execution of firm-level transformations as key strategies to differentiate the company in the long term. For instance, one executive referred to the introduction of the iPad as an example of an ‘innovative idea’ that helped to transform the way in which that company creates value.

The time-scale is another concept used by executives to make sense of transformative changes that occur in their firms. All executives consider firm-level transformations as processes of slow development, which are better explained in the long run. For instance, one executive used a 20 years time-frame to illustrate how major changes impacted the production cost of companies in the kraft pulp business. Overall, executives used a long-term focus to approach transformations.

(4) I take a long-term view to transformation. I don't think it's possible to do an abrupt change... There are things that can happen immediately, but you have to sort of have that vision – long-term, to transform your company.

(10) Now projected ahead twenty four years, there has been a constant evolution as to what we've been doing.

In the same manner, most executives describe the execution of transformative initiatives as sequential step-by-step processes. The sequence described starts by implementing first the changes that represent the lower risk to the overall firm's strategy, following later by the execution of larger changes. The process is continuous and its speed is controlled by the amount of resources available, as well as the risk-reward relationships associated with completing each step.

(4) Our approach to transformation is sort of a step change ... Our company is not prepared or interested in going down and building a brand new [plant] from scratch. It's not realistic. But a step, incremental transformation is something that we can focus on.

(7) When you talk about transformation, you can't go from 1998 to 2013 in a year. You can't do that.

The impacts produced by past transformative initiatives became evident to most of the executives five or more years after their initiation. Only two executives provided examples of transformative initiatives that produced radical or the expected changes in the firm within five years of implementation. The exact timing of a transformational process was not easy to identify given that the everyday operations always demand changes. One executive commented on this difficulty:

(3) The company has transformed ... because that was the view where the opportunity was going to be, making that transformation. Does that mean our transformation is complete? I don't know when you stop calling it transformation and when you start calling it business as usual.

While defining firm-level transformations, most executives made reference to the causes triggering such transformations. All but one executive commented that there is a constant need to improve the competitive position of their firms given the presence of changing business environments. These changing business environments constantly force executives to adapt their business tactics and to initiate transformative initiatives.

(3) We don't control product prices, we don't control currency, we don't control weather, etc. So, there is a whole bunch of external factors that we don't have any control over that we have to function within ... Recognizing there is a whole bunch of factors, including competitors, who will change the operating dynamic that you are functioning in.

Discussions about the necessity to transform the company were often attributed to the need to generate higher EBIDTA (earnings before interests, taxes, depreciation and amortization) and increasing the share value of the company. These two financial indicators were used by executives in publicly traded firms, whereas the executives belonging to privately held companies referred to other indicators such as equity value and return on investments.

Table 4, below, provides a summary of the components and concepts used by the executives to define forest business transformations. The row 'Totals' located at the bottom of the table, helps to visualize the variation in opinions across the sample of research informants. The question asked during the interview was: What does business transformation mean to this company? (See complete list of questions and prompts in Appendix A).

Table 4. Transformation process as defined by senior executives of forest businesses

Senior executive no.	Transformation triggered by external factors	Impacts of the transformation process perceived in the long-term	Transformation associated with a fixed number of business strategies*	Magnitude of changes as required for implementing the business strategies		Transformation associated with executing novel business strategies**
				Radical	Minor	
1	✓	✓	x	✓	x	x
2	x	✓		✓		✓
3	✓	✓	✓	✓	x	x
4	✓	✓	✓	✓		✓
5	✓	x	✓	✓		✓
6	✓	✓	x	✓		✓
7	✓	✓	✓	✓	✓	x
8	✓	✓	✓			
9	✓	✓	✓	✓	✓	✓
10	✓	✓	x	✓	✓	✓
Totals	9	9	6	9	3	6

The numbers in the row 'Totals' add up only the (✓) symbol. The empty boxes () indicate the executives who did not mention that particular concept/component in explaining the meaning of forest business transformation. The symbol (✓) indicates when an executive mentioned the concept/component in an affirmative manner, while the (X) marks indicate when executives expressed views against the concept/component.

*The list of the business strategies corresponds to the seven transformational paths: operational efficiency, diversifying product mix, entry into the bio-economy, sustained growth, market diversification, diversifying the geographic base of operations, and adopting a customer-driven focus.

** Of the seven business strategies, some were regarded more novel than others.

3.2.1 Views on transformational paths

Analysis of the interview transcripts uncovered seven different business strategies or transformational paths for forest firms to radically improve their competitiveness. Each transformational path focuses on changing a single or multiple areas within the structure of the firm, such as manufacturing process or marketing strategies. Overall performance of the firm could vary as a result of focusing on one transformational path, while discarding others. The transformational paths identified in the content analysis are: i) operational efficiency, ii) diversifying product mix; iii) entry into the bio-economy; iv) sustained growth; v) market diversification; vi) diversifying the geographic base of operations; and vii) adoption of a customer-driven focus.

Focusing transformation efforts on improving efficiency and reducing costs of operations were the most mentioned of the seven transformational paths identified. According to executives, this consisted of maximizing the value obtained from the raw materials used to produce current lines of products. It involved increasing productivity and focusing on making operations as efficient as possible, often through technological advancements. Key results from adopting this transformational path were the reduction of costs, as well as improving the speed of the services provided.

(4) We're continuously looking at ways to make our own existing products cheaper ... using that resource as efficiently as possible for creating materials that are competitive on their own, without subsidies.

(3) We are also investing incremental capital that is driving our costs down ... because unless you're a 'low cost' in the commodity industry, you are going to underperform.

(5) On the production side, our goal is to increase efficiency to allow us to produce more with the machinery that we have, to get obviously increased uptime and machine utilization. That drives down cost, which increases profits ... because how can we be competitive against [main competitor]? We do that by driving cost out and then creating experience [for the customer].

Diversifying the product mix of the company was the second transformational path most mentioned by senior executives. As explained by executives, this consisted of adding new revenue streams to the company by producing and commercializing new products, beyond the firm's traditional product offering. The examples provided by executives include the adoption of products already traded in by other forest businesses in BC, as well as some products that were traditionally outside the forest products industry (i.e. new engineered products or bio-chemicals).

(8) That's the type of business model we're moving towards. That comes from having diversity of products, stable and predictable cash flows from parts of the revenue stream that are not tight to commodities per se.

(5) We've added a whole new revenue stream to our organization ... We created a whole new side of our business that we did not expect.

(10) So for us, [innovation] it is our means of sustaining ourselves as we have to keep pushing ... So for us, we have to keep pushing and we have to keep expanding the products lines.

Two executives used the term 'diversification' referring to products within the same category of products (i.e. lumber, studs and J-grades such as 'green squares,' all in the category of structural and appearance grade lumber). However, in this study I considered diversification as expanding the product offering into different families or categories of products than the ones currently being produced by the companies. For instance, if company A is focused on producing market pulp, diversification can come by producing end products such as tissue or packaging. In the solid wood business, a similar example can be found when a company that traditionally produces

lumber starts to diversify its product offerings by manufacturing added-value products such as doors, flooring, engineering wood products, among others. Seven out of the eight executives who talked about this transformational path also mentioned the potential they saw for changing the core business of their companies in the future.

Another transformational path described by executives was linked to the changes that forest firms need to implement to advance into the bio-economy. Executives saw this transformation happening in their firms on two fronts. Firstly, the changes could focus on implementing bio-energy and renewable energy initiatives. Within the renewable energy business, the transformative initiatives might focus on building solar panels, windmills, geothermal stations and others developments on forestlands. With regard to the bio-energy side, transformative initiatives could focus on implementing biomass-power projects (i.e. using wood biomass to produce electricity or power) and producing wood-based biofuels.

The second front of this transformational path relates to the production of different bio-products and bio-materials. Executives highlighted the relevance of upgrading the kraft pulp model in order to further ‘refine’ pulp byproducts into new materials. One executive commented on the opportunities and meaning of this transformational path:

(4) Well, the bio-economy is a coined term and lots of people think about new biomass electricity, new bio-chemicals and different things, but if you distill it down ... the kraft pulping process, it is like a refinery. You put your feedstock in and you chemically separate out cellulose and a whole stream of other materials ... Bio-products, bio-materials ... they are virgin. They're not ... you can't say for this bio-material it's a billion dollar market yet, but you can see that if the material is as transformative as we think it is, it's a new opportunity for us.

Diversifying the geographic base of operations is a transformational path also mentioned by some executives. This consists on locating the company's operations (manufacturing facilities) in a variety of geographic areas where there are attractive supply-demand dynamics and where there is less risk of unexpected events affecting the company's operations. Some of the immediate benefits mentioned with following this path included protecting the firm against currency fluctuations and weather conditions, as well as taking advantage of moving "closer to the end markets". One executive asserted the rationale of choosing this transformation path.

(7) [That transformation] provides us geographic diversification because ... if you have all your eggs in that [one region] basket, the entire company can suffer if you are only into one of those geographic areas.

Focusing transformation efforts on market diversification is another transformational path mentioned by executives. It refers to developing new markets and entering into different regions to commercialize existing lines of products. One executive talked about the different goals of focusing on this path.

(8) The whole subject just speaks to: you want to be diversified from a market perspective. Then, within each market, you want to be diversified from a customer perspective and then even within those customers make sure that you've got different types of customers covered off within those sectors.

Another executive highlighted that new markets might need different types of products in the future, which would eventually require initiating new transformational processes, in this case diversifying the company's product mix.

The sixth transformational path for forest businesses according to the executives consisted of growing the size of their firms. This was framed by the executives in terms of augmenting the

firm's production capacity and its revenue size. Executives from private companies mostly linked 'growth' with building new infrastructure, particularly from companies manufacturing value-added products. On the other hand, executives from public companies talked about executing mergers and acquisitions. In the case of companies that had previously completed mergers or other similar transactions, the executives noted that these transformations could uncover the need to unify the culture of the consolidated firm. By the firm's culture, executives referred to the different ways of working, the work environment and management style. In the case of these companies, following one transformational path led to the initiation of other major changes in the firm.

Adopting a customer-driven focus was the seventh transformational path identified from the discussions. As described by executives, this path consists in adapting the production system of the firm to develop project-based solutions that are tailored to customers' needs. This approach contrasts with producing standardized lines of products to commercialize large volumes of finished products. One executive described it as:

(5) You can transform from being a production product, push-focus to being a market-driven, customer-focused company. That to me is transformation and that's something this company is going through and it will take years.

The information included in Table 5 further describes the transformational paths mentioned above. Table 5 gathers the most frequently used words in the seven transformational path nodes formed during the content analysis (see Section 2.3.3). These nodes collect text extracts from the interview transcripts in which executives described the transformational paths that they linked to forest business transformations. The words listed in Table 5 were identified using the 'most

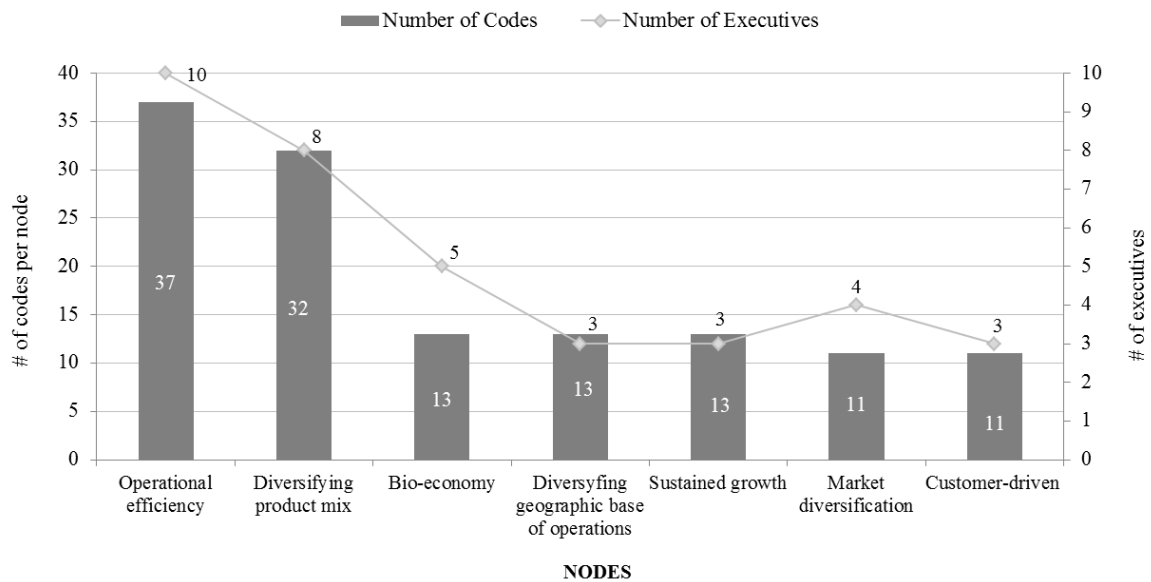
frequent words' query of the NVivo 10 software. In selecting these words, NVivo discards a series of default 'stop words,' which are words less significant for data analysis (i.e. conjunctions or prepositions). Once I identified the 10 most frequent words per each of the seven transformational path nodes, I then removed the words that could reveal information about the identity of participants or about their companies.

Table 5. Most frequently used words by transformational path node

Node name	Total words coded	Most frequent words
Operational efficiency	1,647	Energy, cost, efficient, material, side, value, business and transformation.
Diversifying product mix	998	Business, new, product, products, different, one, revenue and transformation.
Entry into the bio-economy	632	Bio, bio-product, business, energy, pulp, materials and products.
Diversifying geographic base of operations	541	Coast, geographic, regions, product, different, operations, variety, capital and company.
Sustained growth	352	Growth, transformation, company, grow, business, customer, growing, investment and size.
Market diversification	664	China, market, business, company, customers, japan, one, areas and countries.
Adoption of a customer-driven focus	412	Customer, company, cost, different, need and whole.

Figure 10 shows the number of executives who discussed aspects of each transformational path (nodes). The number of text extracts (codes) linked to each of the seven transformational path nodes is plotted in Fig. 10. The nodes 'operational efficiency' and 'diversify product mix' have the highest number of codes (53%), accounting for 69 of the 130 codes created. Similarly, almost all executives talked about the concepts coded in these two nodes.

Figure 10. Total codes and number of executives per transformational path node



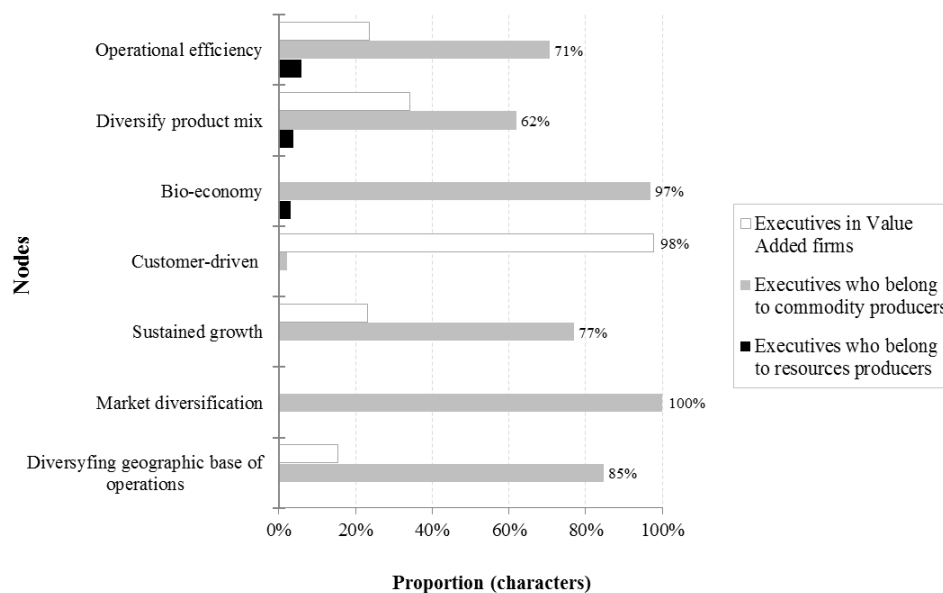
Although all executives associated forest business transformations with improving efficiency and reducing costs, most also highlighted that this path is only one component of delivering performance improvements. For these executives, in order to create sustained competitive advantages, it is necessary to combine operational efficiency focuses with other transformational paths, such as diversifying the mix of products or penetrating new markets.

Three of the executives indicated that they were ‘open’ to explore additional transformational paths to the ones currently being executed by their companies. These three executives mentioned that as the overall strategy of the business changed, their focus on developing different transformational paths could also change. According to them, one of the most challenging aspects in designing effective transformations is the selection of the transformational paths to follow. One executive commented:

(1) So the question – the big question – in transformation everybody is going to ask:
what is the right thing to do? Because there are so many choices.

Figure 11 further illustrates the variation in opinion across the sample of executives. The figure provides a node breakdown of the proportion of coded characters by type of informant. This can facilitate the identification of the transformational paths most mentioned by executives belonging to certain types of producers (resources, commodities or value added). For instance, the transformational paths named ‘customer-driven focus’ and ‘market diversification’ were mentioned almost solely by executives in value-added and commodity producers respectively. On the other hand, the transformational paths ‘operational efficiency’ and ‘diversifying product mix’ were the only two paths mentioned by all types of executives.

Figure 11. Proportion of characters in transformational path nodes by type of executives



3.2.2 Preferences on future product portfolios for forest businesses

This section describes executives' preferences on future product mixes for their companies. The data being described here was obtained from the responses of executives to questions 6 and 8 of the interview schedule (see Appendix A). Results were aggregated to protect the identity of research informants and to avoid releasing commercially sensitive information about their firms.

Question 8 of the interview schedule comprised a card-sorting exercise in which executives reviewed a set of cards describing 26 product categories. Once the executives had reviewed all the cards, they indicated the strength of preference towards producing these product categories by the year 2023. The 26 categories correspond to those listed in Table 1 in Section 1.2. Figure 12 relates each of the 26 product categories with the number of executives who expressed: 1) A solid 'yes' preference for producing products in those categories; 2) a 'maybe' preference for producing products listed in the categories; and 3) no interest (or preference) in producing the products by the year 2023. The glossary section includes definitions of the specialized terms contained in the names of some product categories.

Figure 12. Number of executives per type of preference for each category of products

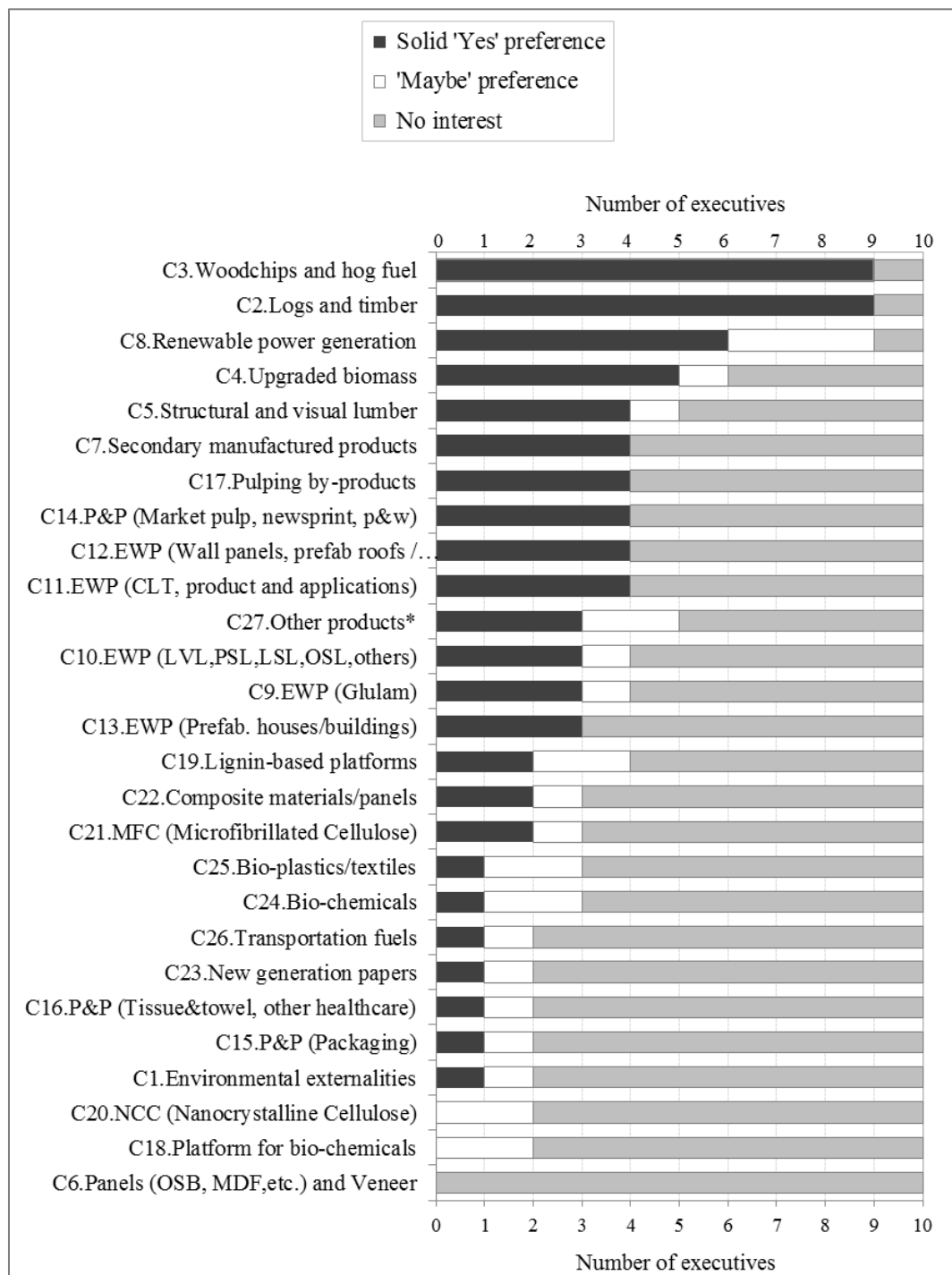


Figure 12 shows executives' preference towards adopting 26 potential product categories in their firms by the year 2023. In the graph, 'P&P' stands for pulp and paper; 'p&w' refers to printing

and writing products; EWP means engineering wood products; and ‘CLT’ stands for cross-laminated timber. A miscellaneous category was formed to include other products mentioned by executives that were outside the 26 categories (C27. Other products). The complete names and examples describing the products are provided in Table 1 of Section 1.2.

Eight of the executives who completed the card-sorting exercise indicated a solid ‘yes’ preference for producing additional product categories in the future. One of the two executives who had no interest towards producing additional products, also indicated a ‘maybe’ preference for four product categories which were closely related to the existing product offerings from his company.

As shown in Fig. 12, the top three product categories chosen by executives were: i) woodchips and hog fuel; ii) logs and timber; and iii) renewable power generation. Nine out of the ten executives showed interest in producing these three product categories in the future. Five of the nine executives who showed interest in producing woodchips and hog fuel belonged to companies that had already commercialized these products. For logs and timber, four of the nine executives who prefer these products already had them in their company’s product mix.

Producing renewable power, whether selling electricity to the grid or commercializing biomass power, is a product category in rising demand from forest businesses, according to senior executives. Six executives indicated a solid ‘yes’ preference on these products, and three more declared that they had a ‘maybe’ preference for including them into the company’s future

product mix. Five of the six executives with a solid ‘yes’ preference to produce these products belonged to firms that already sold them or that had started projects towards their production.

The three top categories mentioned above are followed, in order, by the upgraded biomass and the structural and appearance grade lumber categories. The upgraded biomass category includes products such as wood pellets, bio-oil or other forms of densified biomass. The preference of executives for this product category was commonly linked to the concept of extracting more value from the resources (or residuals) currently being used. Most of the executives who indicated a positive preference for the upgraded biomass category also referred to executing ‘minor adjustments’ to their existing waste/residual management, as an opportunity to advance its production. With respect to the five executives who indicated a positive preference for producing structural lumber products in the future, four of them currently have those products within the product mix of their companies. Two of these four executives also indicated a desire to reduce current reliance on these types of products by the year 2023.

On the other hand, the category of panels and veneer led the group of less preferred products. No executives wanted to include this category in the product mix of their companies by the year 2023. The panels and veneer grouping includes structural panel products such as plywood and OSB; non-structural panels like MDF or particleboard; and veneer sheets. Also topping the list of unpopular product categories were Nanocrystalline Cellulose (or NCC) and the platforms for bio-chemicals categories, both of which were selected only by two executives (and only with a maybe preference).

Between the most preferred and less attractive product categories, there was a range of products that executives would like to adopt given their potential to diversify the company's revenue from current core products. These are the products located in the upper-mid part of Fig. 12, and include the 'secondary manufactured products,' the four subcategories of the engineered wood products (EWP) and the pulping byproducts categories. Although these products were selected by similar numbers of executives, they were rarely seen either as core products or as disruptive products that could entirely change the competitive position of the firm.

Also in the upper-mid part of Fig. 12 is the category 'other products'. This accounts for those products mentioned by executives which were not included in the 26 product categories of Table 1. In total, five executives mentioned an interest in producing 'other products' in the future. Only one of these was a commodity producer. Three out of the five executives indicate a 'solid yes' preference and two indicated a 'maybe' preference for 'other products.' Within the list of the 'other products' category were prefabricated roof panels (non-residential applications), new engineered veneer applications, alternative harvesting methods, ecotourism, and new glued products.

Overall, the results from the card-sorting exercise were in accordance to executives' views on the seven transformational paths mentioned in Section 3.2.1. For instance, the executives who had identified entering into the bio-economy as an opportunity for improving their firm's performance also chose product categories linked to this transformational path. In the same way, the executives who were less interested in diversifying the product mix of their firm did not select additional product categories during the card-sorting exercise.

Executives belonging to the same firm chose a similar number and type of product categories. This occurred despite these executives having different professional backgrounds, both in terms of the areas and years of experience. The similarity of the product categories preferred by executives in the same firm is particularly evident in three of the four firms with two executives participating in this study. Executives in two of these three firms chose both similar type and numbers of product categories, whereas the executives from the third firm chose exactly the same number but slightly different product categories. In like manner, the executives from the same companies chose categories of products that could be clustered in the same portfolios of products and processes (PoPPs) of Table 1. In one firm, one executive selected product categories corresponding to 4 PoPPs, while a second executive chose product categories from 3 PoPPs. Table 6 illustrates the variations in the number of product categories chosen per executive. The data in Table 6 are organized by firm.

Table 6. Number of selected product categories per executive and number of corresponding portfolios per firm

	Number of product categories selected per executive		Number of corresponding portfolios of products and processes (PoPP)	
	Executive A	Executive B	Executive A	Executive B
Firm 1	14	14	2	2
Firm 2	7	4	2	2
Firm 3	8	8	2	2
Firm 4	20	14	4	3
Firm 5	5	-	1	-
Firm 6	9	-	2	-

In contrast, the type of product categories that were selected by executives varied across firms. This variation in executives' preference occurred even in cases where two companies currently trade in similar products. The portfolios of products and processes might vary in each of these

six firms given that each of the companies will produce different products in the future. In four of the six firms, the product categories selected by executives belonged predominantly to a primary PoPP, in addition to a small proportion of product categories related to a second PoPP.

Common views were held across the sample of executives, despite the differences in the types of product categories that were selected between executives from different firms. A common view expressed by executives was an interest in creating additional revenue streams through upgrading the current residuals management. This view was also evident in the high proportion of executives who indicated a ‘yes’ preference for the product categories of renewable energy, upgraded biomass and pulping byproducts.

Another common view shared among executives is the idea of maintaining control of their inputs. This view was also expressed by the executives selecting the woodchips and hog fuel category, as well as the logs and timber product category (Figure 12). Both product categories represent essential inputs for the production of pulp products and engineered wood products.

3.2.3 Changes in the core business of forest businesses

The conversations helped to identify the views of executives about changing the core business of their companies in the future. By core business, I refer to the products and services that represent the main revenue stream of a company. For instance, before transformation, one company might obtain 80-90 percent of its revenue from a single product line. After transformation, this same company might get the majority of its revenue from a different product or multiple product lines.

As part of the card-sorting exercise, executives were asked to identify and rank the categories of products that would be the core business of their firms in the future. Two executives chose the same product categories that currently represent the core business of their companies. Eight considered it highly probable that additional product categories would be included in the core business of the company by 2023. Four of these executives, however, continued to rank the current main products above the new categories of products that would be introduced by the year 2023. None of the four belonged to value-added firms. The remaining four executives who were interested in including new products into the core business of their companies assigned a greater or equal rank to these additional products than they did to their existing main products.

In general, executives had difficulty in ranking the future core products of their companies. Some attributed their difficulties in ranking to the lack of information about the market potential of new products. These executives argued that the market for some new products is still at a development stage. Despite the difficulties in ranking core products, most were able to differentiate between one or two levels of importance among the products within the core business.

(1) Well, I mean [the current main product] is going to be a core ... but there will be a big component of our business that's different from what it is today. It may be new bio-products. There will certainly be some new bio-products, but we may do something that you wouldn't anticipate that we would do, like [competitor's company name] has gone into [a specific business activity]. Why not, right? And then, these [3 product categories] are just all the questions. I'm not sure which of these [3 product categories] is going to be the right one, but you have to pay attention to all of them.

(8) I see us diversifying our revenue streams. Clearly, we have core a business ... but I do see us getting more tight into [name of an additional product category] ... So, for me, I

see us in a ten-year time frame being much more tied into that, probably in joint venture-type relationships.

Executives in the same firm ranked the product categories with potential to become the core business differently. The differences were observed in half of the firms with two executives participating in the study, despite these executives having chosen the same product categories as the company's future core business. The executives who ranked the main products in different order belonged to commodity producers.

In the case of executives from the same firm who also assigned a similar rank to the core product categories, they belonged to value-added and commodity firms, respectively.

3.3 Drivers of firm-level transformation

The interview analysis reveals six different drivers of firm-level transformation in the BC forest sector. By drivers of transformation, I refer to the forces that trigger major changes in the structure of firms. These forces can originate from within (internal drivers) or from outside a firm (external drivers).

The drivers identified through the coding process were: i) emergence of new business opportunities, ii) changing business environments, iii) pressure from competitors, iv) stagnant returns, v) product substitution, and vi) technological changes.

All the executives mentioned the emergence of new business opportunities as one of the drivers of transformation. According to the executives, forest products firms often initiate transformative processes to take advantage of fast-growing commercial areas, as well as of opportunities for

marketing their existing products in new regions. The use of wood residuals and pulp byproducts to produce energy were examples given by executives of growing business applications triggering major changes in their firms. Other examples mentioned by executives regarding the development of new markets include the rising demand for building materials, tissue and specialty papers in emerging economies.

(9) Talking about that waste that you have in the log that maybe ten years ago was considered waste and was actually a bit of an irritant, is now an opportunity. There is a developing business for that, rapidly developing business for that around the world. So really, we're in a business now where 100% of that log could be utilized in a commercial way.

(8) We know there's growing demand. We know we have a supply opportunity. We know we have an outlet that can market the products domestically there [Asian country] for us. Therefore, you create that opening.

The second most frequently mentioned driver of transformation was a rapidly changing business environment. Most executives perceived forest firms' business environment as one that is always at risk of change. To these executives, their companies can be particularly exposed to global economic cycles, changing climatic conditions, currency fluctuations, geopolitical risks and many other factors, which are beyond the control of their organization. The presence of these factors can affect the competitive position of a firm, eventually forcing the senior leadership to initiate transformative processes in the firm.

(8) Take a look at the volatility of a commodity business, which lumber and pulp both are ... We have had exposure in the past to economic cycles and we want to minimize that exposure going forward or at least have it, so that in the bottom troughs of cycles that we still continue to generate positive cash flow, versus depleting our cash reserves.

Another driving force for forest business transformation is the high level of competition that characterizes the forest products sector in British Columbia. Executives who belong to firms manufacturing solid wood products provided examples of how this subsector could have lower barriers to entry compared to other manufacturing industries. This condition can facilitate competition, which could bring challenges to sustain competitive advantages.

(10) We always view our business as a fairly difficult one to sustain. The barriers to entry are relatively low ... and so for us, [innovation] is our means of sustaining ourselves ... as everybody else just copies what we do. Some of our products are hard to duplicate, but others are easy.

Some executives in the pulp market business also mentioned that their competitors can quickly adopt the processes and technologies of the leading firms. As a result, these leading firms often need to find alternative ways of delivering value.

Eluding stagnant returns is a driver of transformation also mentioned by executives. Most executives referred to this driver as the need to deliver outstanding performance in order to continue attracting investment into their companies.

(4) It is generating higher EBIDTA. You need to. If you were just staying still and focusing on [producing the main product] while you'd have inferior EBIDTA ... It comes back to shareholders, if they see higher EBIDTA generation in a different industry: "I'm going to go invest my money there and not invest here." If we are not transforming ourselves and making us an exciting prospect for an investor to invest in, then we are not doing our jobs.

(7) [Our business] requires transformation in order to continue to provide a better return to shareholders. If you fail to transform and adjust, you will find that you lose the trust of your shareholders and your share price will suffer. That's really the ultimate test ... It comes down to your share price, what is your share price doing? When the entire sector is suffering, your share price may suffer along with everybody else, but really you are judged ultimately according to your peers and you are judged on a larger scale which is:

can you even attract people to your industry? [laughs] Public companies tend to be driven to change because shareholders don't like stagnant companies.

Product substitution is another driving force of forest business transformation. Executives provided examples of how the consumption of different wood-related products has seen declines due to the entrance of substitute products. This negative impact on the demand of some wood products has alerted executives in the past to start transformational changes in their firms. The examples provided by executives include the replacement of pulp products as well as of solid wood products.

(4) Different types of electronic media have decimated the newsprint industry. And with iPads and different things, well now you see printing and writing paper coming off significantly.

On the other hand, the possibility of using wood products as a substitute of non-wood materials is triggering transformation. Some executives mentioned examples that illustrate the potential for using wood products as a replacement of other materials.

(6) Glulam replaces steel and CLT replaces concrete ... That's starting to get some traction. There's no doubt about it.

(1) There is a whole new possibility in packaging coming with fibrils. The fibrils can displace NBSK.

According to the executives, the adoption of new technologies has also stimulated forest businesses to embark on transformational processes. The examples provided by the executives covered cases of companies from both the pulp and paper segment as well as the solid wood

area. The executives also noted that as part of upgrading the company's technology they are often forced to modify large processes of the production system of the company.

Table 8 presents a summary of the drivers of transformation identified in this study. The table relates the number of executives and the total amount of text extracts (codes) linked to each of the six drivers before described. The data in Table 7 is sorted in two subgroups: external and internal drivers of transformation. Some of these drivers, however, can have features of the two subgroups. For instance, the external drivers of 'product substitution' and 'the emergence of new business opportunities' can also be classified as internal forces driving change. This classification makes sense in cases where companies develop their own technologies and products in-house, as opposed to outsourcing them.

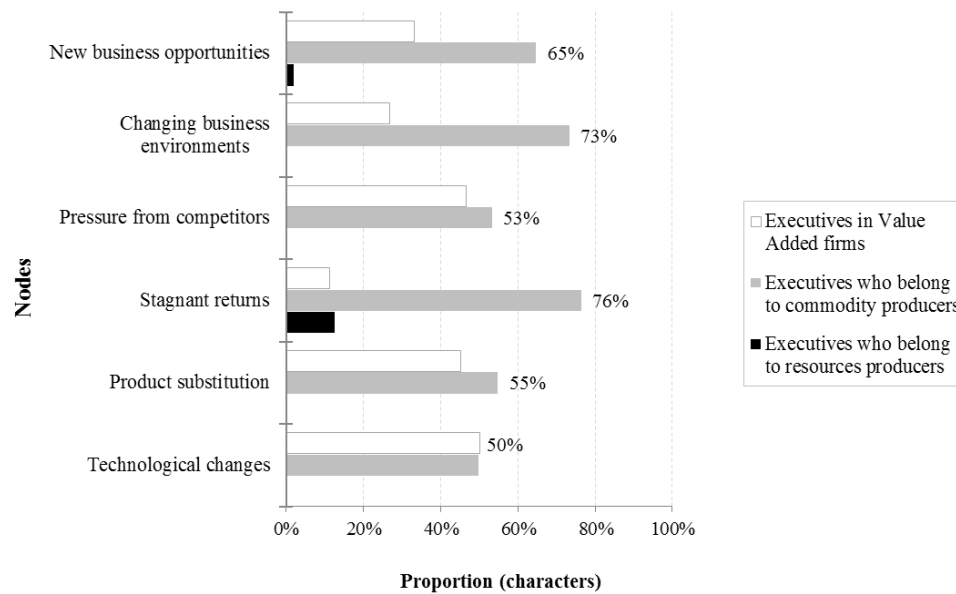
Table 7. Number of executives and amount of codes by driver of transformation

Drivers of transformation	Number of executives	Amount of codes
External		
New business opportunities	10	41
Changing business environments	9	43
Pressure from competitors	8	29
Product substitution	6	14
Technological changes	5	10
Internal		
Stagnant returns	7	23

Figure 13 shows the proportion of coded characters in the drivers of transformation nodes by type of executive. The drivers of transformation named 'emergence of new business opportunities' and 'stagnant returns' were mentioned by executives belonging to the three types of forest producers (resources, commodities and value added). Similarly, the executives from

commodity and value added firms mentioned all the six drivers of transformation. Contrastingly, executives from resources producers mentioned only two out of the six drivers of transformation.

Figure 13. Proportion of characters in drivers of transformation nodes by type of executives



3.4 Barriers and enablers of firm-level transformation

The analysis of interview transcripts reveals a series of barriers to and enablers of transformation. By ‘barriers’ here I refer to the different impediments that executives have encountered when executing transformational changes in their firms. On the other hand, the term ‘transformation enabler’ makes reference to the factors that facilitated the implementation of past transformative initiatives.

3.4.1 Barriers to transformation

The nine barriers to transformation identified through the content analysis were: i) access to capital, ii) legislation and government support, iii) attitudes towards change, iv) difficulties in making projections, v) high risk-reward, vi) limited resources, vii) skills and training, viii) lack of R&D culture, and ix) ineffective collaboration.

The most frequently mentioned of the nine barriers to transformation was access to capital.

Executives underscored that although not all the transformative changes are capital-intensive, the absence of an appropriate capital structure for financing transformative initiatives can limit transformation efforts. Some executives even commented that not having the right capital had been a decisive factor in halting transformational processes in the past.

(2) There were times in the company's history when we didn't have access to that capital, so wouldn't allow spending money investigating into these [products and partners] new options.

(7) In transformation in terms of growing the company, capital is always a constraint. So capital is precious. It's something that you don't stumble upon. It's something you have to earn. To be able to borrow from a bank and to be able to have your shareholders invest in the company, you have to earn that right.

(5) So if we're going to put in a new machine, it needs to have a payback of 'X' months or we don't do it. That drives transformation as well.

Legislation and government support was identified as another barrier to transformation. The legislation and policies in place have the potential to inhibit transformation, particularly in the areas of building code, immigration programs for hiring skilled workers, tenure and stumpage systems, and transportation perimeters in forestlands, among others. With respect to the

government's support for encouraging innovation/transformation, some executives considered that there is a substantial gap between the resources committed by the government and the needs/potential for assistance. The gap was mostly identified at the provincial rather than at the federal level.

(4) There are no programs in British Columbia for new product innovation if a company wanted to build a pilot plant to make a new product ... Having to do something that hasn't been done before, you sometimes need some government assistance to do that. And in other jurisdictions you can see very robust programs to assist with that, including in Canada. Quebec is a good example ... Quebec has some very innovative programs to assist ... It comes down to committing resources and when you look at the Province, the size of it, the province is the owner of the forest resource, okay? The Province should be investing in transformation and innovation on a scale that is commensurate with the size of their resource. And you know, they're not even in the solar system in terms [support].

Another barrier to transformation was related to people's attitudes towards change. According to the executives, the different mentalities and individual objectives of the people working in a company sometimes are incompatible with the transformational goals. One executive underscored that the resistance to change of senior managers and technical staff can represent significant barriers to transformation. Another executive stated that the real challenge of executing transformation consists of stepping people out of their 'comfort zone.'

(1) It has so much to do with people. Imagine somebody who is just sort of 'okay,' [he is] making his pay cheque, [he] is five years from retirement. Everything is good. Are you going to stick your neck on the line and go merge your company with somebody else or take on a major initiative? Unless you are under an immense amount of pressure to do that.

Some executives made comments about the constraints they face in developing forecasts for the execution of transformative initiatives. The difficulties associated with creating future scenarios

are attributed to highly unpredictable business environments and to the absence of historical trends of entrant products.

(4) The model doesn't compute because it is new. It's not like, for example, putting in a new power generation. You understand the variables and you know the standard deviations in sort of the risk. Something transformative, you can estimate it but....

Two executives highlighted the high risk – reward relationship that characterizes most transformational initiatives. The risks that accompany transformations (in terms of the size of the investment) can leave little margin of error when adjusting for deviations. This condition often impedes initiating transformational processes in forest firms.

(8) When you move from lab to a pilot plant, to a demo plant, to a full-scale operation, those full-scale operations will take hundreds of millions of dollars. So, you can't afford to make too many mistakes around those.

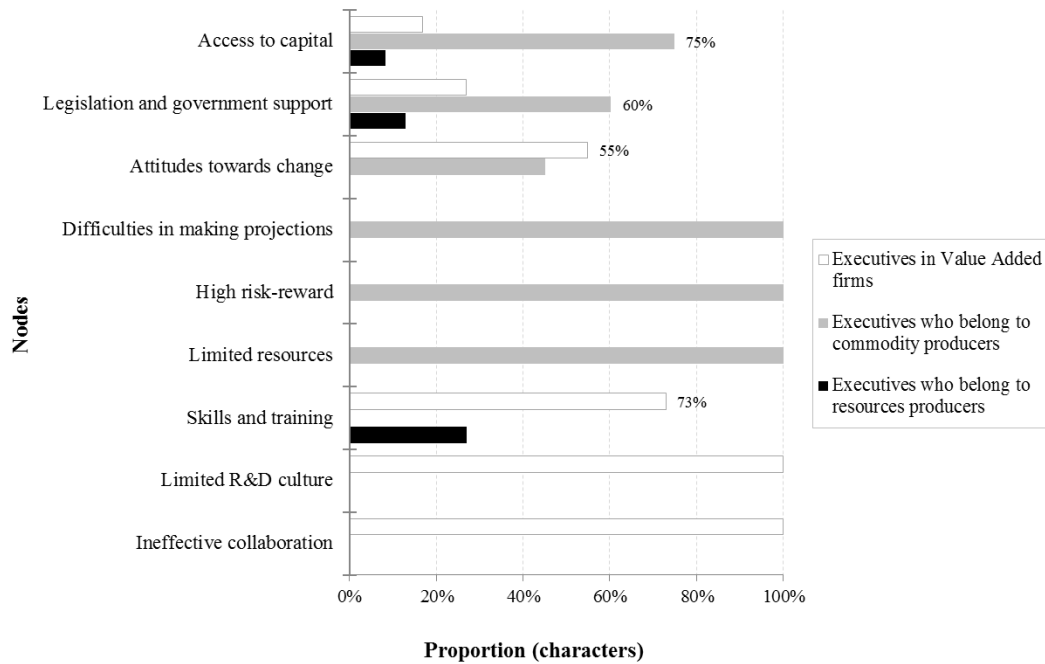
Another barrier to transformation was the limited resources that companies often had available for driving transformation efforts. This related to both the time of the personnel and the infrastructure required for executing the transformative initiatives. Executives mentioned existing technological limitations (i.e. for biomass densification or catalytic/thermal conversion of biomass), as well as the need to upgrade their IT support infrastructure. Similarly, the skillset and training of the workforce (including the senior management) can sometimes inhibit transformation efforts, especially when the transformative initiatives deal with unexplored commercial areas.

(2) So for us the bigger barrier is being in leading edge, or lack of experience in large industrial realms that we have never been before.

Other less-mentioned barriers to firm-level transformation were the limited research and development (R&D) culture that characterizes BC forest firms and the poor collaboration/networking amongst the different actors involved in the supply chain of forest products. The network of actors mentioned by one of the executives includes different suppliers, peers from other companies, and third party distributors, among others.

Figure 14 presents the proportion of coded characters in the ‘barriers to transformation’ nodes arranged by type of executive. The barriers named ‘access to capital’ and ‘legislation and government support’ were the only two barriers mentioned by executives belonging to the three types of forest producers (resources, commodities and value added). In contrast, three barriers were mentioned exclusively by executives in commodity firms and two of the barriers were mentioned by executives in value-added producers.

Figure 14. Proportion of characters in barriers to transformation nodes by type of executives



3.4.2 Enablers of transformation

The content analysis process identified a series of transformation enablers or factors that facilitate major changes in forest firms. These transformation enablers can stimulate change from within (internal enablers) or outside a company (external enablers). Most of the internal transformation enablers identified arose from an active role of the firm's senior leadership in the design and implementation of transformative initiatives. The group of external transformation enablers, on the other hand, derived from the support provided by different stakeholders in the execution of transformative initiatives. Stakeholders providing this support included among others: Provincial and Federal Governments, wood producers associations, groups of investors

and research institutions. Table 8 is a summary of the external and internal transformation enablers mentioned by forest business' executives.

Table 8. Number of executives and amount of codes by enabler of transformation

Enablers of transformation	Number of executives	Amount of codes
Internal		
Entrepreneurial mindset	9	35
Support from leadership/board	9	17
Attract the right people	8	17
Continuous benchmarking	7	15
Long-term view	5	17
Identify the right timing	5	14
Training and support infrastructure	5	6
Communicate targets-vision-values	4	8
Tolerate mistakes	2	2
Transform at incremental steps	1	4
External		
Networking	8	28
Policy and legislation	7	21
Access to attractive sources of financing	6	19
Partnerships	4	13

All but one executive acknowledged the role of encouraging an entrepreneurial mindset in the company as an essential factor facilitating transformational change. The executives described this transformation enabler as allowing the employees from all levels of the organization to constantly search for new initiatives and business solutions. It was about focusing the entire organization on “new ideas,” as one executive stated. These new ideas could be spotted from almost any source, including from within the company (i.e. other divisions), competitors, suppliers, distributors of end products, previous and research work, among many other sources.

(6) You have to constantly look. What are people doing? What are people doing better than us? What's an opportunity that's out there that we can take advantage [of] with our

equipment and our expertise? And you got to have that mindset, of always scanning the horizon for those opportunities.

In addition to seeking new opportunities, the executives underscored the importance of performing trials and pilot demonstrations prior to scaling up transformative projects. The intention of constantly performing these trials is to select only those potential projects that have attractive risk-reward relationships.

(4) Working on new concepts that get to a certain stage and then you say: well, that doesn't work. Put an 'X' through it. We know that won't work for us in transforming. Try and look at something else ... All of a sudden you might find that, yes, it's an interesting product but the capital to make it is three times more than what would be feasible, so that idea gets an 'X' and you just keep looking and looking and evaluating. It's a lot more iterative than saying, "okay we want to grow our business."

Having the support of the board of directors for proposing and implementing transformative initiatives was another transformation enabler mentioned by the executives. Four of the nine executives who mentioned this transformation enabler referred to it as an essential factor for achieving successful transformations. A supportive Board of Directors and CEO of the company can not only facilitate the startup of transformational projects but can also clear the path to reach the final stage of these projects.

(1) That trust in that having the right people in the Chairs makes a different system whether you can do things or not.

(4) Innovation starts at – it's not just a management thing. Transformation starts right at the most senior level at the board of directors. Regularly having discussions and updates on innovation and transformation with the board, it creates awareness ... So, right at the board level having an understanding of the processes and the steps that are taken by management is sort of the first step.

According to senior executives, attracting the right people to the organization can make a difference to achieving successful transformations. When firms embark on transformative processes, executives are often required to incorporate people with the specific skills and expertise necessary to deliver the changes. Some executives emphasized that the risks of not keeping up to the pace of changes are higher if companies are unable to hire personnel with new skills.

(4) There are people available that have the knowledge and skills to work in those [innovative] areas. And as we innovate and transform, we look at who's the best in that area and we bring them in either on a consulting basis initially or as an employee. So as we shift, we have people that have broad ranges and generalist type skills that can help in a new area ... It doesn't matter where they are in the world, we find the best people that can help us in that area.

(3) You need more depth and professionalism. It can't be done on the corner of somebody's desk. It needs to be a full time job, done in a very professional way. So, the breadth and depth of the people has changed ... We've really changed a lot in the last year.

Another transformation enabler identified in the conversations was the practice of benchmarking technologies and products of competitors. This practice is particularly important during the design stage of transformative projects. The benchmarking can help the team leading the transformation efforts complete the design stage by focusing on the technologies and products already tested by their competitors in other jurisdictions. The executives referred particularly to the products and technologies tested by European firms. The responsibility for allocating funds and time for performing the benchmarking lies with the senior levels of the company. Some of the executives even commented that they visit their European counterparts between one and two times a year.

(6) You have to, I think it's important for our manufacturers to get in to see other manufacturers outside, in other places in the world and see how other people are doing it. It's also the amount of ideas in terms of innovation that comes out of that is huge.

(6) That whole technology, it has improved in Europe, but no one has really adopted it here in Canada.

Another factor that facilitates firm-level transformation is the screening of potential opportunities based on a long-term view. The identification of the priorities and the goals of conducting transformative initiatives can become a straightforward process when the senior managers and the members of the Board of Directors adopt this long-term view. The executives noted that adopting this long-term view can foster the discipline to continue implementing transformational projects up to their final stage, despite not achieving attractive performance improvements in the short-term.

(2) We not only based our decisions on financial reasons. They're made on a long-term, financial, reliable rate of return over long periods of time ... Sometimes we do a project that it's going to lose money in small areas of the company, but we'll do it for the larger, more reliable rate of return.

(9) Now what one could do is take all of your product and ship it back to that market for a short term gain next quarter, but that's not a good long-term strategy. You have to have the discipline to maintain that focus ... It does take business discipline for management breakdown.

Identifying the right timing for executing transformative initiatives is an enabler mentioned by half of the executives interviewed. Being an 'early mover' was described by the executives as an instrumental factor in transforming their companies. This is particularly relevant in transformations that involve asset purchases or the adoption of new technologies.

(7) You can transform a company, taking advantage of an expectation that things will get better and the sooner you can anticipate both directions going down the wave or going up

the wave, the sooner you can anticipate those things, the better you are prepared to take advantage ... If you just work around the edges, you are not going to take advantage of an upswing.

Providing the proper equipment and training to the company's workforce is a factor contributing to successful transformations according to five of the executives. One commented that a well-designed transformational plan could become ineffective without the personnel who can "extract value of the equipment ... and [who] can make it run."

Collaboration with the various industry stakeholders was a transformation enabler referred to by most executives. Creating an access to a 'support network' can help companies with plans to transform by identifying new business solutions and assessing new technologies (R&D networking). Moreover, becoming part of a 'support network' could also facilitate finding professionals specialized in innovative business areas.

One executive commented that the benefits of collaborating can continue after the transformative initiatives are completed. For instance, this executive commented that the identification of potential customers and business partners can be faster when firms are part of a larger network of companies. Similarly, some of the executives related the success of setting up existing partnerships (i.e. joint-venture or acquisitions) to the practice of networking. Regarding the benefits of setting up partnerships, four executives underscored that these partnerships can help reduce the risks associated with moving into very specialized commercial areas, never explored by their companies in the past.

The support provided by different government policies was another transformation enabler identified in the discussions with the executives. Most executives acknowledged the suitability of recent government programs, some of them designed exclusively to stimulate transformation of the forest sector. The ‘Green Transformation Program’ is an example of the cash contributions and government grants provided by the Federal Government to forest firms. As described by the executives, these grants helped forest firms undergoing transformation to reduce the risks associated with large capital expenditures. Other supportive policies included the BC government’s efforts to establish free trade agreements with Asian countries. This policy aims to foster market diversification as a strategy for forest firms to adapt into changing business environments.

(9) The government has been very helpful in China and they just made an announcement two weeks ago. I think that they will invest some money in developing a relationship with India further. They're making progress.

(4) There was a ‘green transformation program’ announced, that was implemented by the Federal Government, a very good program. If you look, it allowed us to increase our speed of transformation.

3.5 Organizational culture of forest firms

A common pattern observed in the conversations with the executives was an inclination for describing different aspects of their companies’ culture. Although this pattern was observed across the different stages of the interview, overall it was most recurrent during the final part of the interview. For instance, the executives’ responses to question seven of the interview schedule particularly centered on explaining aspects about their firm’s culture. Question seven asked the executives to describe the origin of specific transformative initiatives and innovative solutions

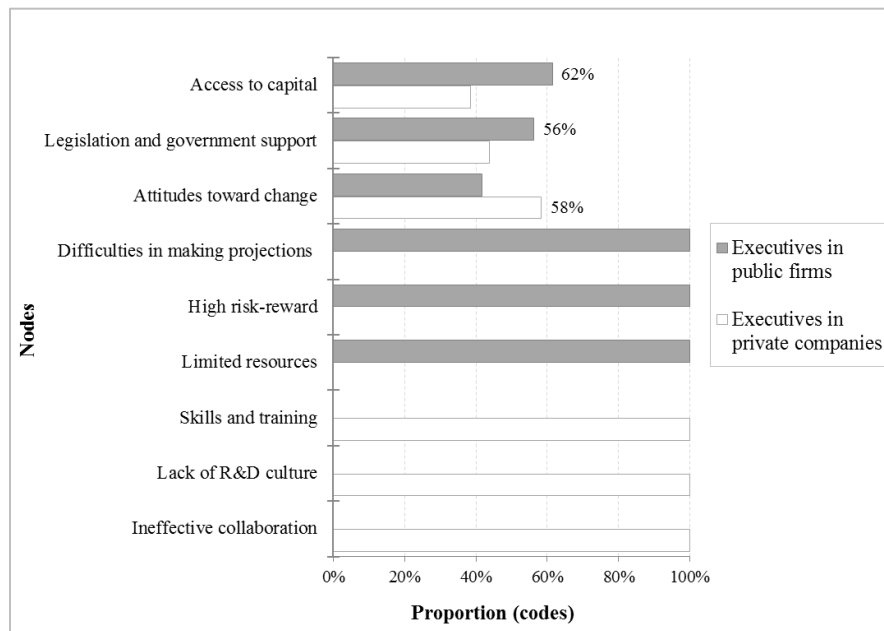
that were recently initiated or completed in their companies. The names of the initiatives were obtained from various sources available online.

Through the content analysis, I identified four different elements that comprise the culture of forest firms, as described by the executives. Each of these elements has the potential to stimulate or inhibit transformational change. The elements identified in the data analysis were: ownership structure, leadership style, organizational values and the process of generating new initiatives.

3.5.1 Ownership structure

Different types of ownership can influence forest products firms in the adoption of particular transformational paths. In the discussion, the executives provided examples in which the ownership structure of their companies was one of the elements affecting their opportunities for implementing changes. For instance, the factors impeding transformation efforts of public firms were often different from those of the private companies. Figure 15 presents the proportion of codes (text extracts) in the ‘barriers to transformation’ nodes that were mentioned by each type of executives (from public and private firms). As shown in Fig. 15, three barriers were referred to exclusively by executives in publicly traded firms and other three barriers were mentioned solely by executives in privately owned companies. ‘Access to capital’, ‘legislation and government support’ and ‘attitudes toward change’ were barriers mentioned by executives from both types of firms.

Figure 15. Proportion of codes in barriers to transformation nodes by type of executive



Six of the executives participating in this study belonged to publicly traded firms and the remaining four of the executives were from privately owned companies (60-40 proportion). In Fig. 15, the nodes ‘access to capital’ and ‘legislation and government support’ had a similar proportion on the number of codes attributed to each type of executives. For instance 62% of the total codes within the node ‘access to capital’ belong to executives from public firms and 38% of the codes belong to executives in private firms.

The difference in setting both the objectives and priorities for the firm was another element linked with its ownership structure, according to executives. Differences in the transformational paths pursued by companies could arise due to differences in the objectives established within each organization. The goals of private and public firms can vary in multiple strategic areas, for instance, in the number and size of the niche markets they target or in their interest in increasing

the size of the firm. One executive from a private company commented that the owners of the company have repeatedly decided to be “less aggressive and more risk adverse”, to avoid damaging their existing relationships with customers and employees. Another executive commented about the goals of public firms:

(7) So our job as a public company is to deliver a return to our shareholders ... Public companies tend to be a little different than private companies. Private companies often, their goals are maybe different, depends on the owner ... All public companies have one goal [laughs]: increase return to the shareholders. That's their only reason for survival.

Setting the priorities and objectives of the firm is also influenced by the proportion of shares that are owned by each of its shareholders, as described by two of the executives. This is particularly evident in firms where one individual holds a high proportion of the shares. For instance, two executives from two different public companies provided examples in which the selection of transformational paths was assisted by individuals who held a significant proportion of the shares. In both cases, these individuals sit on the board of directors and both have expertise in the area of business transformation.

Overall, some executives described their firms as results-oriented organizations, while others mentioned examples of previous decisions in which the owners/shareholders of the firm assigned equal consideration to the means of attaining an objective and to the objective itself.

3.5.2 Leadership style

The style of leadership imparted through the company was described by the executives as one of the most critical elements for shaping firm-level transformation. The role of a leader was

ascribed to individuals in different senior positions in the forest firms. Five of the executives linked the role of senior leadership with the CEO, three with the CEO *and* the board of directors, and one with the board of directors. Only one executive made no distinction.

The analysis of the transcribed interviews helped me to identify two strategic functions that executives attributed to the senior leadership of a firm. The two functions consisted of: a) setting the firm's future direction, and b) delimiting the boundaries of action in the execution of different initiatives. According to the executives, the performance of these two functions could influence the firm's transformation efforts by contributing to the formation of different barriers to and enablers of transformation (see Section 3.4).

With regard to setting the direction for the firm, most executives highlighted the importance of having a leader who was able to define and to communicate a clear vision for the company.

(4) It's also about your CEO having a vision of what he would like to see the organization looking like in the future. And it's not a vision that, "we're going to be doing this, this and that." It's a direction.

(5) He can be a visionary and say what's next? Do we vertically integrate up? Do we go and buy a forest license? Do we go and buy a machine shop? Do we...?

A narrower vision of the firm can limit the opportunities for transformation, as it can encourage the executives and staff in the organization to develop only those initiatives that are aligned with such a vision.

Two factors describing the different styles of leadership in forest firms were the leaders' willingness to modify their strategy and the risk-tolerance factor implicit in their decisions. The commitment of the managers and staff to improve the performance of the firm can be compromised as a result of the senior leadership sending a message that the strategies are not subject to change. This could be the case of firms in which only the initiatives that are aligned to the current strategy can be proposed to the senior level, as one executive commented: "Usually the situations that you put in front of the board are consistent, they should be consistent with the strategy, so there shouldn't be any surprises". Contrastingly, companies whose leaders were open to explore opportunities, which were not necessarily closely related to the current strategies, often had a larger number of initiatives under revision.

Similarly, the amount of risk that senior leadership was willing to take distinguished between different leadership styles. For instance, five executives expressed concerns at not being able to recover the capital required for transformative projects within the projected timelines. To these executives, the presence of multiple uncertainties was hindering the execution of specific transformative projects. Among the list of uncertainties mentioned by these executives were the negative response of the market to new value propositions, the reactions of competitors and the changing regulations and policies they experienced around the world.

Executives' attitudes were variable when exploring potential business activities to which they attributed the same type of risk. For instance, two executives considered policy changes (i.e. subsidies) as a risk when executing carbon offset projects. During the card-sorting exercise, one manifested having 'no interest' in including the carbon offset projects within the future portfolio

of products of the company. When reviewing the respective card (environmental externalities), this executive commented:

(3) I don't know. I honestly don't know. I hate to even make a view when something is driven [by] government policy that is ambiguous, to be determined. It is hard to know. It is hard even to handicap it.

A second executive expressed a 'maybe preference' for developing carbon offset projects in the future, despite having previously manifested a concern about the availability of subsidies to operate those projects.

(8) ... we don't necessarily want to base our business investments on subsidies, [but] we absolutely want to be active where they exist.

Another key function performed by the senior leadership of a firm is to define and maintain a set of values or principles that govern the way in which the people in the organization perform their activities. As discussed in the conversations with executives, the senior leadership of some forest firms communicated a set of principles throughout the organization. This initiative of communicating the company's principles was particularly attributed to the CEO.

(6) You got to have that mindset, of always scanning the horizon for those opportunities. I think I do a good job of that. I think I've imparted that culture here inside [name of the company] ... [to] encourage everybody else to be the same way.

3.5.3 Organizational Values

As mentioned above, the values or principles imparted by the senior leadership were seen as a fundamental aspect defining the organizational culture of a forest products firm. The executives who made comments about their company's values referred to them as influential behavioral factors as well as guiding principles in the decision-making process.

(3) One of the things we care very deeply, we got this floating around [printed flyer with the values of the company], is our core values ... Our core values go to how we operate as a company ... how we behave and how we function.

(7) The skills are important, yes, but it's more about the culture of the company and having your core values rooted and everybody knowing what the vision of the company is. The company has an absolute clear vision and with that vision, we have our core values and everybody in the company knows what the company is all about.

In the discussions, half of the executives made reference to a common set of values/principles shared by the people in their respective organizations. Three referred to the organizational values as publicly announced principles. Of note, four of the five executives who did not talk about organizational values chose the largest number of products categories during the card-sorting exercise.

3.5.4 Process of generating new initiatives

The process of generating new initiatives in the firm was a theme that emerged during the conversations. The executives described how transformative initiatives emerged and evolved in their organization. The process of generating new initiatives spanned the building of a formal project plan (business case), followed by its assessment, until it was finally approved or discarded by the senior leadership of the company. Three executives used the term 'screening

process' for the initiative generation. Most executives provided information about the roles of the executives and staff participating in this process, as well as the steps followed to complete it.

According to the executives, two types of processes generate new initiatives. Some described the screening process as a formal systematic procedure, while others linked it to a spontaneous, always changing, type of process. In companies where the process was more systematic, it was conducted regularly on an annual or biannual basis. In these cases, the screening was part of the major strategic planning process in which the board of directors, the CEO and other senior executives updated the firm's strategic plan.

Executives from three different firms provided examples of initiatives that started with the identification of new ideas at the operational level of the company. Once the ideas were identified, they were commonly investigated further by the senior management group, until they were finally approved by the board of directors. In the case of these three firms the executives described this screening process as a series of sequential steps.

(9) We have initiatives coming from literally every corner of the company. A lot from my department or my counterpart's department, in terms of new ideas ... What happens is, there's a chain, so someone would take it to their supervisor, then to a manager. A manager would bring it to me. We would decide: does this make sense? Then we would agree on what they are and we would take them and present them in our annual business plan that would be approved then by the CEO and then also would be approved by the board.

In other companies, the screening process was a straightforward process in which the executives were encouraged to investigate the different benefits and risks associated with a particular opportunity. In these firms, the process could be initiated directly by the CEO or by the senior

management team. A business case was commonly used to summarize the different risk, benefits, advantages and disadvantages identified for a particular business opportunity.

The time needed to elaborate a business case varied depending on the type of initiative being analyzed. The amount and quality of the information available on the potential opportunity was fundamental in determining the length of the process. For instance, initiatives related to unexplored, innovative commercial applications could take longer to become formal business plans than others which were linked to traditional business solutions. Three executives highlighted the importance of having access to people with specific expertise and skills during the development of these plans.

3.5.4.1 Who drives the new initiatives?

As described in Section 3.4, potential opportunities and new ideas could be spotted from both within (i.e. divisions or units) and outside the company (competitors, suppliers, others). Similarly, ideas and opportunities could be identified by multiple individuals in the organization, including the people from operational-levels, mid-level managers, and directors, among others. In contrast, the design of business cases and the coordination of new projects were done exclusively by the senior management team, according to nine out of the ten executives interviewed. In only one company, privately owned, this strategic activity was a shared process between the board and the senior management (president).

The executives who attributed the role of generating the new initiatives to the senior management group also distinguished between two driving forces: the CEO on one side versus a

more team-centered process on the other. In the former case, it is the CEO who powers the proposed initiatives, rather than the board of directors.

(7) It's CEO-driven and the CEO derives the strategic plan and drives those higher level initiatives of the company. And he has a team of people, of course, that helps, pulls in to make it happen. But it's very much CEO-driven.

In this type of process, the role of the remaining senior executives (Senior Vice- Presidents and Vice-Presidents) is relatively limited to the formulation of the business cases, though they can also provide additional advice to the CEO concerning the implications of particular initiatives.

For the firms practising a team-centered process of generating new initiatives, other senior managers, in addition to the CEO, are actively engaged in formulating and proposing these initiatives to the board of directors. In these firms the other executives shared with the CEO the responsibility for the proposed initiatives.

(4) I guess my role in the company is being some of that conduit [for evaluating new ideas]. I have a colleague, who also does some of this too and we coordinate, but we also both report directly to the CEO. When a new concept is, a new opportunity is presented to the board, it is the CEO. The CEO will bring in the senior management team responsible to present the opportunity and to be available for the questions and answers.

The role of the board of directors in this screening process was described by all but one executive as facilitating, as well as providing final approval of the new initiatives. Between firms, the board can have different names, such as the board of directors for publicly-traded firms or, for private companies, the ownership group meeting or the advisory board. Most executives commented that their boards did not propose or were not involved in the process of taking new ideas into formal business plans.

(1) A typical board would not be giving direction. They don't know your business the way you do, but they oversee and they supervise. They provide an independent view.

(5) The board is a 'how to,' rather than 'what to do.' The board asks very good questions to make us reflect. Very, very high level: Is it right? Does it fit? Is it the right thing for your company? Does it fit with what we're trying to achieve as a company?

All executives agreed that when a business case was presented at the board meetings, it was ultimately the board of directors who were responsible for approving or rejecting it. Having a supportive board of directors is crucial for starting major strategic initiatives, such as most of the transformative projects.

3.6 Chapter summary

Executives link the meaning of forest business transformations to the implementation of different business strategies, or transformational paths. Opinions varied across the sample of participants regarding which of the seven transformational paths identified could deliver a significant performance improvement to their firms. However, despite differences in their professional backgrounds, executives from the same company indicated similar preferences toward adopting alternative products by the year 2023.

Market pressure and the organizational culture of forest products firms appear as the two critical factors driving and shaping the outcomes of forest business transformations. Between the six firms, all but one of the factors that triggered past transformative initiatives were linked to outside forces (external drivers).

Most barriers to transformation identified by executives in these six firms were different between private and public companies, as well as between the type of producers (resources, value-added and commodity companies). Access to capital *and* the legislation and support from the government appear as common barriers to transformation.

Internal and external driving factors, barriers, enablers, as well as new business opportunities, are identified and filtered by the senior management through different types of processes in order to derive transformational paths for their firm.

Chapter 4: Discussion and conclusions

This exploratory research examined the views of senior executives of BC forest businesses about the transforming processes of their firms, and in so doing it contributes to an understanding of the factors shaping forest business transformations in British Columbia. The semi-structured interviews conducted in this study provided the data collection tool to elicit the views of these executives on the following themes: i) meaning and scope of transformation processes in their firm, ii) adoption of transformational paths and new products offerings in the future, iii) forces triggering transformational change, and iv) barriers to and enablers of transformational change.

Results support the implicit assumption of this study, namely that generation and execution of transformative initiatives in forest businesses is a function ascribed to their senior management team. For all six forest products firms analyzed, potential business opportunities are identified and screened by senior executives, who interpret and integrate them as to their relevance for transforming the firm.

More importantly, the results of this thesis underscore the need for further study of forest firms' decision-making processes aimed at transformational strategies. This is particularly relevant as the views of executives varied across companies in regard to the transformational paths their firm should adopt (see Section 3.2.1). This variation in opinions occurred despite attributing the need for change to similar contextual forces. Correspondingly, executives' preferences about adopting new product offerings in their firms also varied from one company to another, but were similar between executives from the same company. This variation in the preference of executives for producing new products occurred even between companies that traded in similar products.

Overall, the differences in the professional background did not account for the variation in executives' views, nor were these variations always explained by the types of producers (resources, commodities or value-added producers). However, a tentative explanation of these variations can arise by contrasting differences in defining firm-level transformations, as well as by identifying the role of firms' culture in selecting new strategic initiatives. The following section expands on these two general themes and discuss on the additional findings of this study.

4.1 Discussion

4.1.1 Meaning and scope of transformation processes

Differences in defining the transforming processes are potential explanations of the variation in executives' preferences. The concept of firm level transformation was similarly framed by executives in a single firm, but differently by executives in other companies. Each definition considers a particular set of strategies as transformative.

On the other hand, the definitions of firm-level transformations compiled from the literature also use a range of different interpretations to explain such transforming processes. For instance, studies in the organizational change field define the transformation processes based on the content of their changes (Barnett & Carroll, 1995). Definitions of firm-level transformation from the applied business literature underscore the objective of executing the changes while downplaying their content (Day & Jung, 2000; Dewar et al., 2011; Isern et al., 2009). My analysis suggests there are limited conceptual similarities in the way executives of forest firms in BC and different scholars account for the transformational changes. Below, I provide additional clues towards framing the transforming processes of forest firms.

4.1.1.1 Interpretation of defining frameworks

Overall, most of the definitions of firm-level transformations consulted for this study do not accurately reflect the views of executives about the transforming processes of their companies. Studies from the organizational change field have adopted a linear approach in defining and measuring the impacts of firm-level transformations. When following this linear approach, the transformation content is identified by comparing the structure of the firm at two points in time: a pre-transformation moment (t_0) and a post-transformation (t_1) (Barnett & Carroll, 1995; Pettigrew, 1987). Contrastingly, senior executives on the ground referred to the transforming process as being cyclical and iterative rather than linear. To most executives, the outset and completion of transformational processes are elements which cannot always be directly identified. Results of this study suggest that senior managers sometimes start implementing a business initiative without labeling it as transformative or having the certainty that it will produce transformative changes in the firm. In this sense, most initiatives are labeled as transformational only post-intervention. Similarly, most executives had difficulties identifying the completion of transforming processes given that the implementation of a single transformational strategy often triggers additional changes in the firm. In these cases, the bundling of two or more transformational strategies occurring at the same time can make identifying the overall conclusion of a transforming process quite difficult. Linear approaches to the transforming processes become very limited if the completion of such processes is not easy to identify. Furthermore, the business environments could also evolve during the implementation of potentially transformative initiatives. When adopting a linear approach, this could create additional bias in separating the effects of transformative initiatives from those caused by the evolving nature of the business environments (i.e. currency fluctuations).

In addition to contrasting the linear and cyclical approaches described above, the results of this thesis show how executives on the ground have divergent views about the content of forest business transformations in BC. Similar mixed patterns on the content of transformative changes were found in previous empirical studies that analyze forest products firms in North America and Northern Europe (Cohen & Nikolakis, 2013). As part of this study, Cohen et al. (2013) contrast the opinions of industry executives and industry experts (former executives, government official and researchers) on the topic of business transformation. That study shows that not all changes considered transformative by industry executives are perceived as such by industry experts. Likewise, studies within the organizational change field have looked at what constitutes a core structural change across different organizations, in an effort to better characterize the content of transforming processes (Amburgey, Kelly, & Barnett, 1993; Barnett, 1994; Hannan & Freeman, 1984; Hannan, 2005). Changes on the product offerings, market shifts and technological changes are among the most recurrent core changes identified in these studies. Nonetheless, as Barnett et al (1995) have pointed out, the pattern of findings in some of these studies should be carefully interpreted given that some of the changes that were deemed as core in these studies are assessed as peripheral or minor in others.

Improving the competitiveness of the firm is the end goal of the transformation processes according to most of the definitions available in the business transformation literature (Butner, 2014; Cohen & Nikolakis, 2013; Isern et al., 2009). Perhaps these studies link the goal of the transformation processes to such a broad parameter due to the absence of agreed criteria to characterize transformation content. Arguably, this goal falls short of describing the magnitude

of the transformational changes. This is particularly so if one considers that practically all operational improvements, mid-sized projects or even some strategic initiatives implemented in a company are oriented towards that same goal. Similar to what has been expressed in the existing business literature, most executives that participated in my study referred to firm-level transformations as a means to substantially improve the firm's performance to becoming more competitive (see Section 3.2). The executives also used broad financial measures like EBITDA, earnings per share growth or equity value as proxy indicators to measure the success of transformative changes.

Few studies have attempted to unify conceptual differences on: i) the linear versus cyclical approaches to transformation, ii) the transformation content, and iii) the limitations of targeting broad transformational goals. The work of Davidson (1993), for instance, identifies specific goals for each of the three transformation phases that encompass his sequential model. Each phase in Davidson's model focuses on producing specific changes in the firm (content) and achieving defined targets. The work of Dewar et al. (2011) can be interpreted as another effort to define firm-level transformations beyond a pure focus on improving financial performance. Dewar et al. (2011) used the concept of organizational health to frame the scope of the transforming processes. According to Dewar et al. (2011), organizational health is the firm's capacity to continue to change and adapt along with its business environment.

Davidson and Dewar's definitions help to understand forest business transformation processes as a multi-level sequence of changes (3 phases). In the first phase the changes have limited operational and financial results, but during subsequent stages those changes would start creating

notable increases in market value and organizational health of the company (phases 2 and 3). However, this interpretation is not necessarily situating the transforming processes within an ever-changing context, which in the particular case of commodity producers can produce highly variable cash flows (see Sections 3.3). Taking that into account, my interpretation of the transforming processes of forest firms uses the business economic cycle to account for the variability in the context surrounding forest products firms. A business cycle consists of periodic but irregular up-and-down movements in the economic activity measured by fluctuations in macroeconomic variables (Parkin & Bade, 2012). The level of productivity fluctuates from peak (or top level of economic activity) to troughs (bottom parts). At peak points, economic activity stops rising and starts to contract, whereas in troughs, the contractions cease and the upward trend starts again.

Figure 16. Business economic cycle

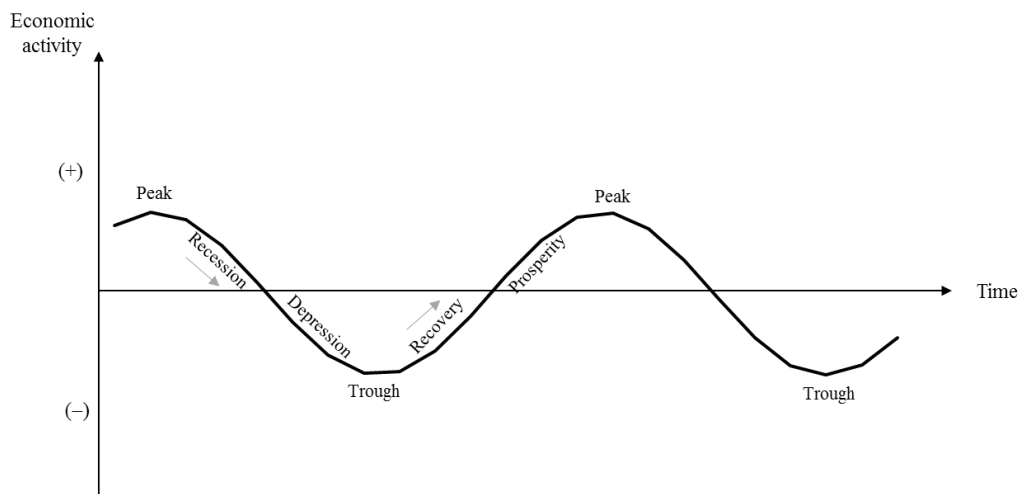
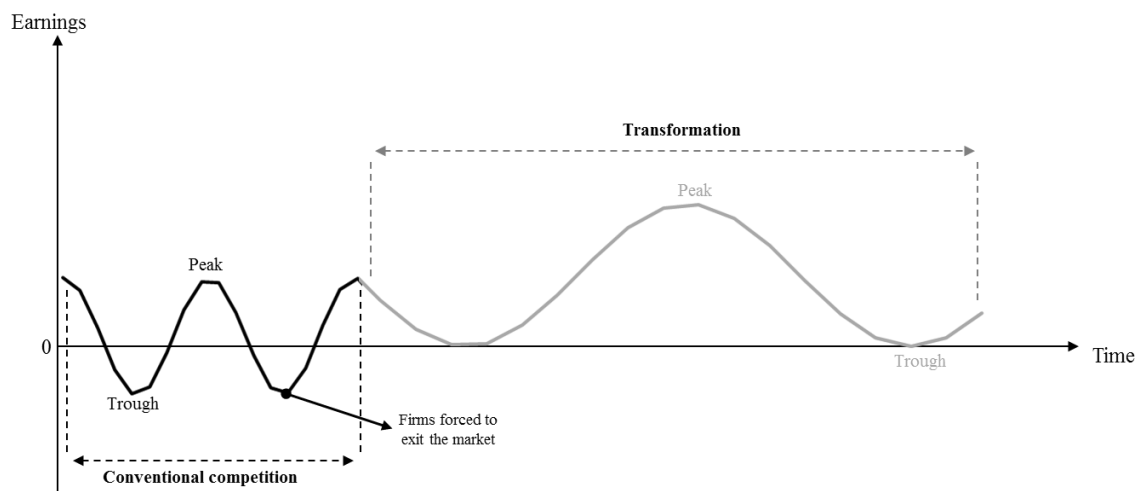


Fig. 16 illustrates the phases of a business economic cycle using a flat trend. Aggregated data can show upward or downward trends

Forest firms commercializing products at the lower end of the forest products value chain (i.e. logs, lumber, pulp, etc.) may be more prone to mimic the business economic cycle, as the prices of such products are determined by global supply and demand dynamics. Companies need to adjust their operations quickly at the lower levels of the economic activity (troughs) or they are at risk of exiting the market.

Using this cyclical approach, a firm-level transformation can be defined as a continuous process of executing changes in order to project the firm out of a conventional competition cycle. This implies moving away from highly reactive and faster changing scenarios to strategies of incremental and proactive changes. Figure 17 is a conceptual scheme illustrating the cumulative effects on firms' earnings when they shift from conventional to transformation focuses. The productivity of the firm (earnings) now fluctuates always within positive margins, even at the troughs parts of the cycle. The time to complete a business cycle is longer in transforming mode, compared with the fast pace of the conventional competition cycle.

Figure 17. Impact on firm's performance of transformation versus conventional competition



This interpretation of the firm-level transformations acknowledges that firms do constantly change when following conventional competition. However, the changes are not diversified nor aligned enough to deliver full transformations. A pure focus on operational efficiency in the particular case of the forest businesses would allow them to outperform some of their competitors; however, this approach is highly limited in moving away from the conventional competition cycle. The five portfolios of products and processes in Table 1 (see Section 1.3) illustrate potential transformation scenarios for forest firms beyond a pure focus on operational efficiency.

4.1.1.2 Practical implications of defining frameworks

Resolving the differences in defining firm-level transformations can have practical implications in the type of strategies forest firms adopt as transformational. One question is how to identify if a change is transformational or not? One answer may lie in looking at the transforming processes as a cumulative set of changes, instead of trying to find ‘the transformational type of change’. The sequence and alignment of implementing multiple types of changes in the firm becomes more important than trying to find a single solution to produce radical transformations. Other parameters enabling judgement on whether changes are transformative or not are the contextual forces shaping the performance of the entire forest sector. As a result, the assessment of transformational strategies needs to adopt longer time frames given that the transforming process is focused on the full sequence of changes.

As described above, focusing solely on operational efficiency can only produce limited benefits to the firm, especially when viewed through the lens of a broad transforming cycle (Fig. 17).

Today's business environments force forest firms to become highly efficient, as well as to use those efficiency gains in buffering unexpected fluctuations in demand and product prices. In today's conventional competition scenario forest firms need to be efficient in order to survive. Similarly, an exclusive focus on market diversification can produce limited long-term benefits for firms, if the existing base of core products does not evolve to compete against rising entrant products (i.e. low cost Chilean *radiata* pine). Excellent execution of a single transformational strategy can produce performance improvements, but it could be of limited value in taking the firm out of the conventional competition cycle.

In the case of the BC forest sector, one can argue that companies adopting a pure focus on market diversification, or those exclusively focusing on upgrading technology, have managed to remain competitive even at the bottom parts of the economic cycle. However, it is likely that these strategies would have failed without an active involvement of the provincial and federal governments. In the case of BC, the government accelerated the development of new markets in an effort to offset the impacts of the financial crisis (MFLNRO, 2013). Although these initiatives helped companies to remain in the marketplace, they create protective environments in which forest firms could be tempted to rely on a single approach to compete. This may significantly limit forest firms' performance beyond the conventional competition cycle.

One could use the cyclical transformation process depicted in Fig. 17 to analyze potentially transformative initiatives of companies in rapidly changing sectors, such as the online retail industry. The online retail business is a form of electronic commerce that allows consumers to

directly buy goods or services from a seller through the use of a web browser. In recent years, this sector has evolved from e-commerce, to mobile e-commerce (i.e. smart phones), and it is now heading into a major transformation of ‘omnichannel retail’ (McKinsey&Company, 2014). One interesting question to ask is whether product diversification is a transformative type of change in such a dynamic sector. Different viewpoints can also arise in this context, for instance, in the case of Amazon Inc., that strategy has not translated into outstanding profit increases and share value¹. An exclusive focus on short-term financial results would judge Amazon’s diversification strategy to be less transformational than when using the cyclical framework suggested in this research. Amazon, originally an online bookstore, is now an online retail firm much larger than any of the forest firms in BC. In early 2000 Amazon started to expand its product offerings far beyond the traditional line of products to sell items such as furniture, appliances, digital content like TV shows, or even groceries, among many others. However, beyond a pure focus on asset purchases and executing merges and acquisitions to expand its core business, Amazon combined these transactions with operational efficiency approaches (i.e. speeding its shipping and reducing margins from content partners) and technology development (i.e. devices and cloud computing). Although some analysts argue that Amazon’s profits have not increased at the same speed as its income, the company is now competing with well-established online retail leaders such as EBay and Yahoo. Arguably, Amazon can be considered as one of the best-positioned online retailers given its diversified portfolio and its focus on re-investing in the business.

¹ Information about the performance of that company is available at: <http://www.theglobeandmail.com/report-on-business/international-business/us-business/digital-dilemma-amazon-pushes-to-package-up-more-profit/article18831281/?page=3>.

As a parallel, results of this study show how some forest firms in BC have started to expand their product mix beyond wood commodities by commercializing green energy produced with wood residuals. Undoubtedly, this strategy has helped firms to create new revenue streams based on built-on capacities. However, companies that continue investigating new applications for wood residuals could be better prepared to compete in the long-term. This complementary focus on research and development can be particularly relevant given that selling green energy could soon become an industry standard (see Section 3.2.2). Following Amazon's example, the transformation focus should not only be about diversifying product offerings, but include ongoing research and development towards improving the value proposition of the new product lines (i.e. Amazon's Kindle and cloud services). When using a sequential view of transformations, diversifying the product mix would not automatically become a transformative strategy. This is particularly true if this strategy is not accompanied of other changes, all of which should be aligned to move from the conventional competition.

Lastly, the question of which opinion matters the most for judging the different types of transformational strategies is one of practical importance. Different stakeholders all acknowledge the need to transform the forest sector. Each of them can also have a particular view on how firms need to transform. These stakeholders can be limited in very many different ways. For instance, industry professionals who are immersed in dealing with day-to-day tactical changes might be prone to consider transformative any change that modifies their regular conditions. Scholars and consultants could propose changes that can be very difficult to translate into practice on the ground, and government officials would support the implementation of changes

on the basis of generating minimal risks. How can one find a common ground to align the views of all these stakeholders? Which viewpoint is the correct one?

The following section describes potential factors influencing the selection of transformational strategies in forest firms. Decision factors can influence the way forest businesses' executives perceive the transformational changes. These decision factors can also shape how executives assess the new transformative strategies.

4.1.2 Adoption of transformational paths and new product offerings

Results show that definitions of the firm-level transformations were similar between executives in one firm, but different when compared to those from other companies. This firm-specific defining pattern is a potential factor explaining the differences in the type of transformational paths followed by forest firms. Similarly, executives' preferences towards changing the product offerings of their firms were in accordance with their views about the transformational paths.

A tentative interpretation of the firm-specific pattern mentioned above places the role of the organizational culture of forest firms at the center of searching, assessing and selecting transformational paths and new products. Overall, the results of this study suggest a moderating role of the organizational culture of forest businesses. By moderating role, I refer to the effect produced by a variable – or set of variables, in regulating the strength of the relationship between two other variables (Baron & Kenny, 1986; Rosopa & Stone-Romero, 2008). Cultural elements of forest firms such as leadership style and organizational values are thought to regulate how the

transformative initiatives are proposed in the firm. These cultural elements can filter executives' intentions to transform the company (Figure 18).

Figure 18 is a conceptual model drawn from the results of this study. This model helps to build up an initial understanding of the direction and strength of influence between different decisional factors driving forest business transformations. More specifically, executives' interpretations of contextual forces, their intentions to transform the firm and different elements of the business culture of forest firms are determinants to choose transformational paths.

Figure 18. Potential decision factors influencing the selection of transformational paths in forest businesses

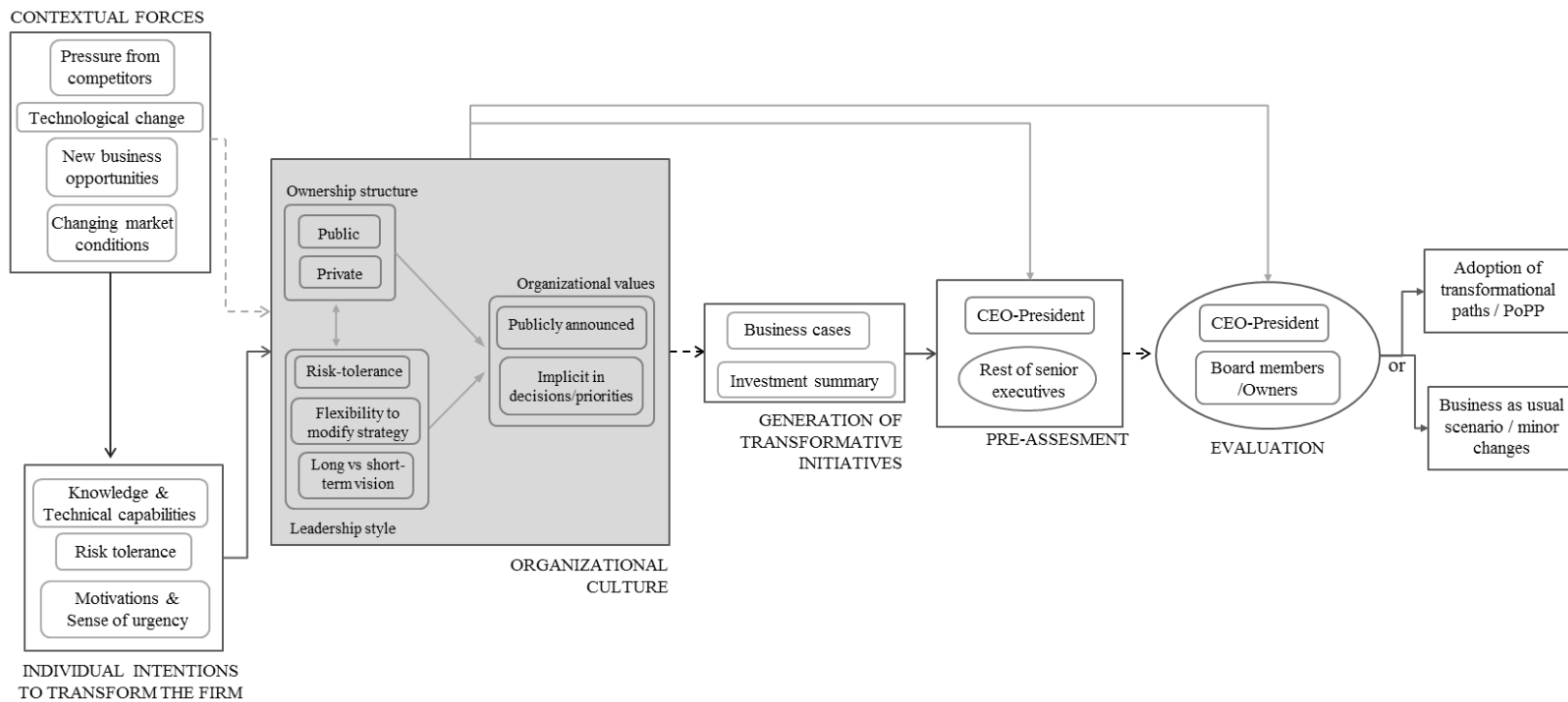


Figure 18 shows a relationship between different decision factors influencing the adoption of transformational strategies and PoPPs. The direction of the arrows in the diagram indicates influences between themes and variables. Doted black arrows indicate loss of information in the process.

The moderating effect of the organizational culture implies narrowing down the concept of transformative initiatives to those initiatives that are compatible with the leadership style and the organizational values of the firm. If the potential initiatives are perceived as incompatible with these cultural elements, executives would discard them completely or they might need to adjust their scope when translated into business cases. An illustration of this compatibility/incompatibility pattern can be observed in the case of the executives who clearly recognized the organizational values of their firm and who also chose a well-defined set of product categories during the card-sorting exercise. In the case of those executives, a clear focus in organizational values could be linked to a clear focus in preferences for product categories (see Section 1.5.3). This pattern of organizational values and preferences for strategies concord with the Attraction-Selection-Attrition model originally proposed by Schneider et al. (1995), and later used by Berson et al. (2008) to predict organizational performance. Results of the study by Berson's et al. (2008) suggest that behaviour and priorities of the people in the organization can resemble the value system imparted by the leaders of the firm. Additional patterns or dichotomies explaining the role of the organizational culture of forest firms are linked with the ownership structure. For instance, executives in public firms made a more straightforward connection between increasing financial performance and executing specific types of transformational paths (see Section 3.5.1).

In the sequential process of Fig. 18, once senior executives had filtered the incompatible initiatives they moved on to focus solely on researching those initiatives that fit with the organizational culture of their firm. These compatible initiatives are translated into business cases and then presented to the CEO and the board of directors of the firm to determine their

viability. The main criterion in evaluating business cases is financial viability and profitability of a transformative initiative. However, given that more than one transformative initiative can ‘look’ financially viable, the adoption of the initiatives would be limited to those that are compatible with the goals, priorities, organizational values and other cultural aspects of the firm.

The outcomes of the decision-making process depicted in Fig. 18 could lead to two possible scenarios: 1) the adoption of a transformational path/new product offerings, or 2) the rejection of the proposed initiative to continue operating as usual. The development of new product categories in the firm will depend on the type of transformational paths selected. This potential causal relationship between the transformational paths and the type of portfolios of products is a pattern that was observed in this study. For instance, the executives who link forest business transformations with diversifying product mix expressed their interest in producing additional product categories to those currently produced in their firms. On the other hand, executives who were not interested in diversifying their firm’s product mix continued selecting the same product categories in the card-sorting exercise (see Section 3.2.2).

Besides using the patterns identified in this thesis, the model also integrated findings of previous studies within the applied business literature. These studies have underscored the central role of the organizational culture in the execution of successful corporate transformations (Day & Jung, 2000; Kotter & Schlesinger, 2008; Kotter, 1995). Kotter (1995), for instance, identifies that in successful transformations the senior leaders of the firm expend sufficient resources to develop strategies for communicating a vision, as well as fostering new attitudes and behaviours of the people in the organization. In his study, Kotter (1995) also highlights the importance of creating

a sense of urgency among the senior managers of the firm in order to spur change. In a more recent study, Kotter and Schlesinger (2008) identify four common internal barriers to transformational change; two of these barriers are closely linked with the type of organizational values and leadership style imparted through the company. The study of Day and Jung (2000), which analyzes transformation efforts of different corporations, point out the dichotomy of CEO-driven versus a decentralized transforming processes.

4.1.3 Influential forces triggering transformative initiatives

The results of this study revealed a number of factors triggering transformative initiatives in BC forest businesses. The factors or drivers of transformations identified in this thesis lend support to the findings of previous research in the fields of business transformation and organizational change. Isern et al. (2009) classify the causes triggering transformations as either reactive (response to external shocks and market pressure) or proactive (internally planned). Barnett et al. (1995) have distinguished between external and internal forces driving changes in firms. Barnett et al. (1995) also identified the nature of changes as either action-oriented (finding new opportunities in responding to the environments) or inertia-oriented (trying to avoid failure). Five of the six transformation drivers identified in this study qualify as external forces; while only one corresponds to an internal driver (see Section 3.3). This predominance of external forces triggering transformations in BC forest businesses concurs with the prevalence of external drivers of change identified in previous studies of firm-level transformation (Cohen & Nikolakis, 2013; Isern et al., 2009; Kotter, 1995). In the particular context of the forest sector, Cohen et al. (2013) identified that all executives from their sample of 33 forest firms associated the emergence of transformative initiatives with responses to external pressures. On the other hand,

the results of my interviews indicate that ‘avoiding stagnant returns’ and ‘taking advantage of new business opportunities’ were the only two drivers mentioned by executives from the three types of producers (resources, commodities and value-added). In my study, avoiding stagnant returns is classified as an internal driver of change. This internal driver is linked with the way the senior leadership of a firm reacts to the pressures of multiple stakeholders (i.e. owners or shareholders) concerning the financial performance of the firm. For instance, some leaders can set more challenging performance and financial goals than those of their direct competitors, as a direct consequence of the pressure of these stakeholders. In this sense, each leader can interpret in a different manner the urgency of always increasing financial returns. Executives from public firms could be particularly susceptible to try to address this challenge, given that investors and market analysts can use short-term financial metrics to judge firms’ performance. However, the evidence from this study shows that both types of executives (from private and public firms) are very aware of this particular driver of transformation. Additional studies are needed to provide further insights on the significance of ‘avoiding stagnant returns’ as a driver of transformation for public and private firms.

4.1.4 Barriers to and enablers of transformational change

Nine barriers to transformation and fourteen transformation enablers (or factors facilitating change) were identified in the content analysis of this study. Five of the nine barriers to transformation identified in this study coincide to the ‘transition barriers’ described by Davidson (1993). Davidson’s study (1993) analyzes the outcomes of past transformations efforts of 50 firms from a variety of industries. The following list relates Davidson’s transition barriers with the corresponding barriers to transformation (shown in parentheses) identified in my study:

financial justification (difficulties in making projections), legal and regulatory (legislation and government support), human resources (skills and training), corporate culture (attitudes toward change) and technical feasibility (limited R&D culture). Similarly, five of the nine barriers to transformation concur with the factors impeding successful transformations identified by Cohen et al. (2013). Specifically, the five barriers to transformations of my study can be grouped within the three the most important ‘barriers to successful transformations’ identified by North American executives in Cohen’s study. These three barriers are: organizational inertia/risk aversion, access to capital *and* complexity and competencies.

The findings of this thesis are also in line with a series of management recommendations and best practices for leading corporate change (Blackburn, Wood, Ryerson, Weiss, & Wilson, 2011; Day & Jung, 2000; Kotter & Schlesinger, 2008; Kotter, 1995). In particular, the internal transformation enablers identified in this thesis are linked to the principles for guiding successful transformations developed by Kotter et al. (Kotter, 1995). His eight principles for transforming corporations are targeted to senior leaders whose firms have plans to initiate transformational processes. The transformation enablers ‘long-term view’, ‘identify the right timing’, ‘support from the board’ and ‘communicating targets/vision/values’ are directly linked to four of Kotter’s eight principles (creating a vision to help guide the change, communicating the vision, establishing a sense of urgency and empowering employees to act on the vision).

In addition to concurrence with the findings of previous research, my results suggest the presence of patterns between the different types of barriers and the characteristics of firms. Only two barriers were common to executives from all three types of firms (resources, commodities

and value-added). Similarly, only three of the barriers were mentioned by executives from both types of ownership structure. These results suggest that commodity producers face capital-dependent barriers, whereas executives in value-added firms mentioned human resources/skill-dependent type of barriers. A similar pattern is observed when the data are organized by ownership structure. With the exception of the barrier named ‘access to capital’, the rest of the capital-dependent barriers were mentioned by executives in public firms. Likewise, with the exception of the ‘attitudes towards change’ barrier, all the human resource/skill-dependent barriers were mentioned by executives in private firms.

Another pattern observed can be stated as: the larger the firm, the more capital-dependent the transformation. The size of the firm here refers to its production capacity (i.e. board-foot/year, tons/year, etc.)

A tentative interpretation of the above described patterns is tight to the differences in defining firm-level transformations. As described before (see Section 4.1.1), differences in framing the transformation concept influence the type of changes considered transformative. According to the views of executives, different transformational paths can be linked to different types of changes. In the same way, the implementation of a particular transformational path would require overcoming particular barriers and developing specific transformation enablers.

Additional research with larger population samples could confirm the patterns identified in this study, as well as formulating a set of policy recommendations to address common barriers to transformation. The following subsection discusses the limitations and advantages of the methodological approach of this study

4.1.5 Future research

Further empirical studies with larger population samples could test the validity of the proposed model to predict the selection of transformational paths in forest firms (Fig. 18). These studies could contrast how executives of companies in more rapidly changing sectors such as online retail or biotechnology industries select the transformative initiatives. These studies could expand the geographic reach to other jurisdictions, as well as to analyze the views of multiple stakeholders beside those of industry executives. Including a broader range of stakeholders can more accurately reflect the diversity of opinion regarding the meaning of firm-level transformations. Additionally, these studies can contrast how executives of companies in more rapidly changing sectors such as online retail or biotechnology industries select the transformative initiatives. Table 9, is a summary of potential research questions that can guide the application of future studies on forest business transformations.

Table 9. Research questions for future studies on forest business transformations

Defining framework of firm-level transformations

- Are there any differences in the way executives from private and public firms frame the objectives of the transformative initiatives?
- Are there any differences in the way executives from forest firms and other stakeholders frame the objectives of the transformative initiatives?
- Are there any differences in the way executives in forest firms and executives in others types of companies frame the objectives of the transformative initiatives?
- Does the type of changes identified as transformational vary as a function of the ownership structure?
- Does the type of changes identified as transformational vary as a function of the type of product categories of companies (resources, commodities, value-added)?
- What kinds of changes are considered transformative by executives in companies from other sectors and how these relate with those identified by executives in forest firms?

Organizational culture

- What is the role of the company's values in determining the type of strategies for change?
- Do companies that have changed their product portfolios have a clear set of organizational values?
- Is there an organizational culture typology which can describe the different forest product firms (traditional, risk-averse, innovators/game changers, etc.)?
- Does the organizational culture of forest firms vary as a function of the type of product category of the company (resources, commodities, value-added)?
- Does the organizational culture of forest firms vary as a function of the ownership structure of the company?

Strategic planning and contextual forces

- Are there any similarities in the process of selecting strategic initiatives between public and private companies?
 - Are there any similarities in the process of selecting strategic initiatives between forest firms and companies in others sectors?
 - Is there any relationship between the style of screening the strategic initiatives (CEO-driven, team-oriented, etc.) and the changes to product offerings?
 - Is there any difference in the type of forces (internal or external) triggering radical changes between companies from other sectors and the forest firms?
-

4.2 Study limitations

4.2.1 Limitations

There are four limitations of this study: i) extent to which the findings can be generalized (exploratory nature), ii) small sample size, iii) access to potential research participants (senior executives), and iv) constraints in presenting the data due to anonymity considerations.

The nature of this study is exploratory; therefore, its findings cannot be used to explain transformational changes of companies beyond the ones analyzed here. The study did not test any explicit hypothesis, nor did it use a randomized sample design. Instead, the study followed a logic qualitative approach to understand the views of BC forest businesses' senior executives about the factors shaping transformations in their firms. The results of this study open new research avenues to continue analyzing firm-level transformations with larger population samples.

Limitations (ii) and (iii) are closely related to each other. Access to high-level senior executives is difficult to obtain. Difficulties in scheduling interviews with these executives resulted in surpassing the scheduled budget and time. This limits the inclusion of additional research participants, thereby affecting the sample size of this study. In particular, I faced difficulties in scheduling interviews with executives belonging to resource producers. The data from the 10 interviews was sufficient to address the objectives of this exploratory research, but it is likely that having access to more executives from a greater range of companies would have revealed additional findings.

Lastly, most of the questions and topics covered in the interviews dealt with commercially sensitive information about the executives' firms. This information was treated with extreme

caution, which in many occasions limited how the findings and patterns could be presented in the thesis.

4.2.2 Strengths of using the methodological approach

High-level executives are the industry professionals whose main job is to make sense of the transformation processes of their firm. The semi-structured interviews designed in this study could be further used to elicit sufficient and valuable information from these types of executives about firm-level transformations.

Overall, the application of this method produced analyzable data and facilitated the identification of a wide-range of viewpoints. Particularly, the design of the interview schedule (open-ended questions, followed by prompts and finalizing with a card-sorting exercise) proved to be useful in engaging this particular type of participant, as well as in exploring their opinions in considerable detail. The application of the card-sorting exercise (Build your 2023 portfolio of products, see Section 2.2.2) was particularly well-adopted by all the executives during the interviews. The application of the card-sorting exercise facilitated the discussions about sensitive topics such as the company's strategic initiatives (past and future). In fact, two of the executives after completing the exercise praised the technique and wanted to replicate the process with their peers in the senior management team. There were executives who share their thoughts and made comments on every card they reviewed as part of the exercise.

Another advantage of using this framework was the possibility to have two different executives from the same firm. This allowed identifying individual biases of executives, as well as separating between the views of individual executives and the company's perspectives.

Additionally, the narrative style used to present the results of this thesis can facilitate getting the

message across to a broader set of lecturers, who have no science background. The field would benefit from the replication and extension of these methodologies to additional organizations in other jurisdictions.

4.3 Conclusions

Understanding what firm-level transformations are, why these processes occur and how they can be better implemented is fundamental in helping BC forest businesses create long-term competitive advantages. My study used semi-structured interviews to elicit the views of forest business' executives about the transformational strategies adopted by their firms. Understanding the views of these executives is an essential step in making sense of the forest business transformations.

Analysis of the transcribed interviews shows that executives associate firm-level transformations with the execution of seven different business strategies. These strategies or transformational paths are: operational efficiency, diversification of the product mix, entry into the bio-economy, sustained growth, market diversification, diversification of the geographic base of operations, and adoption of a customer-driven focus. Opinions varied among executives regarding which of the seven transformational paths are essential to produce radical performance improvements in their firms. However, executives belonging to the same firm expressed preferences for the same or similar transformational paths. This occurred despite the executives having different professional backgrounds. In like manner, executives' preferences about adopting new product offerings in their firms also varied from one firm to another, but were similar between executives

from the same firm (see Section 3.2.2). These findings reveal a firm-specific pattern in defining the transformation processes.

Differences in framing the concept of firm-level transformations were linked to differences in the types of changes that were considered transformative. Each transformation path can be linked to specific types of change in firms. Similarly, the implementation of a particular transformational path would require overcoming specific limitations (capital, technological, skills, etc.) and other challenges (cultural and behavioural). The limitations or barriers to transformation identified in this study were similar with Davidson's (1993) transition barriers, and expanded on the findings of Cohen's barriers to successful transformations (Cohen & Nikolakis, 2013). The findings also revealed a number of transformation drivers or forces that can trigger transformation processes in BC forest firms. Most executives linked the transformative efforts of their firms to respond to external forces rather than internal. This predominance of external transformation drivers concur with the findings of previous research (Cohen & Nikolakis, 2013; Kotter, 1995).

The firm-specific defining pattern was explained by a regulating effect of the organizational culture between executives' intentions and the selection of the transformative initiatives. The firm's leadership style, ownership structure and the organizational values were three main elements explaining the organizational culture of forest firms (see Section 3.5). Considering the insights from previous studies on transformational change and drawing on the patterns and findings described above; I developed a conceptual model and a set of research questions that can guide future research of forest business transformations (see Section 4.1.2). These studies could also take advantage of the methodological approaches of this thesis, given their potential to obtain strategic information and to identify individual biases (see Section 4.2.2).

The study of forest business transformations continues to be context- and firm-specific: however, further studies with larger population samples would likely benefit from the methodologies applied in this study and from the findings on the organizational culture theme. These findings could progress in the development of testable hypotheses and general explanations on firm-level transformations in the forest sector.

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Appendices

Appendix A Interview schedule

The following questions were used as a general guideline for conducting interviews in this study. Questions 1 and 2 were always retained in order to start the interviews. Similarly, the card-sorting exercise and the three demographic questions were always asked at the final part of the interviews. The sequence of the remaining questions varied as a consequence of how each conversation evolved.

“Understanding the Factors that Drive Firm-level Transformations in the BC Forest Sector”

Set of Questions

Q1. What is your title and role in this company? Probe: How can you explain that ‘X’ function in simple terms?

Q2. People in the industry often talks about the transformation of their companies, but what does transformation means to this company?

Probe: Can you give me an example? Prompt: Is this the same as [becoming more efficient/productive, changing product mix, moving up/down into the value chain, expanding operations into other sectors, others]?

Q3. In your company what (if any) are the major factors driving business transformation?

Prompt: Speaking personally, what should be the motivations for pursuing those transformations?

Q4. What risks/barriers do you see in the way of transforming your company?

Q5. What would facilitate business transformation in your view?

Prompt: You mentioned before ‘X’ factors, what about [knowledge/skills/legislation changes], is there any particular [_] that [you would need to develop/ will need to occur] to facilitate this process?

Q6. I would just like to confirm that these are the categories of products your company is currently producing.

-The interviewer lists them according to the information available at the company's web site. Categories include: pulp, newsprint, softwood lumber, logs, timber, structural and non-structural panels, structural composite lumber, others.

Is this information correct? Does it need to be expanded? Thanks for this information. I would like to ask to you: What kind of forest products do you think your company will be producing ten years from now?

Probe/prompt: If the forest management is at one end of the value chain and consumer products are at the other end, where do you see your company creating its value 10 years from now?

Q7. In your company, what is the process by which new business initiatives arise or are implemented?

Prompt: Say for instance, 'X' initiative: how did that come about?

Probe: So as I understand, it would be the CEO/the board/senior management who usually leads new initiatives?

Probe: Let me just to confirm this, in your role as a CEO (or CFO/VP), you are able to formally participate within the process of proposing new initiatives. Is that right?

Q8. Exercise: Build your 2023 portfolio of products.

DQ. We are just about done; I just have a couple of Demographic Questions (DQ) for you.

DQ1. How many years have you worked in the forest industry?

DQ2. What other areas have you worked during these years?

(such as forest operations, human resources, resources conservation, marketing and sales, finance, wood products processing, forest resources management, etc.,)

DQ3. If you have worked in a sector different from the forest sector please let me know which one and for how long?

Appendix B Complete theme/nodes classification

Theme/Node	Number of executives	Amount of codes
Position and role of executives		
Formal title	10	10
Role	9	21
Meaning of transforming processes		
Examples of transformations	8	25
Transformational paths		
Operational efficiency	10	37
Diversifying product mix	10	32
Entry into the bio-economy	5	13
Customer-driven focus	4	11
Sustained growth	3	13
Market diversification	4	11
Diversifying geographic base of operations	3	13
Magnitude of changes	9	41
Temporal scale of transformations	10	34
Drivers of transformation		
New business opportunities	10	41
Changing business environment	9	43
Pressure from competitors	8	29
Stagnant returns	7	23
Product substitution	6	14
Technological changes	5	10
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Access to capital	7	13
Legislation and government support	5	16
Attitudes toward change	5	12
Difficulties in making projections	5	11
High risk-reward	2	2
Limited resources	2	2
Skills and training	2	7
Lack of R&D culture	1	3
Ineffective collaboration	1	2
Risks of doing transformations		
Failure to implement	6	13
No improvement or competitive advantage	5	8
Capital risk - undercapitalization	4	6
Short-term underperformance	1	2
Losing trust of shareholders	1	2
Enablers of transformation		
Entrepreneurial mindset	9	35
Support from leadership and board	9	17
Networking	8	28
Attract the right people	8	17

Policy and Legislation	7	21
Continuous benchmarking	7	15
Access to attractive sources of financing	6	19
Training and support infrastructure	5	6
Long-term view	5	17
Identify the right timing	5	14
Partnerships	4	13
Communicate targets-vision-values	4	8
Tolerate mistakes	2	2
Transform at incremental steps	1	4
Current product mix		
Company 1	2	9
Company 2	1	13
Company 3	2	14
Company 4	2	10
Company 5	2	10
Company 6	1	11
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