I. General Introduction

Canada is endowed with a vast forest resource. According to the FAO (2005) there are over 244 million hectares of forest in the country, representing approximately 6.3 % of the world's forest estate. Roughly 200 million cubic meters of roundwood (logs) are extracted from this forest annually. Virtually all of these logs are then processed domestically into higher valued products such as sawnwood (lumber), panelling, and pulp which, for the most part, are then exported to over 175 countries throughout the globe. The value of these exports in 2004 was 44.6 billion, a figure representing about 18% of the world's international trade in forest products, making Canada the world's largest forest products exporter by value (Natural Resources Canada 2007).

Distinctly separating Canada from many other major timber producing regions in the world is its high degree of public ownership, which currently stands at about 94%. Jurisdiction over forest production and policy on these public forests has largely been granted to the 10 Canadian provinces through the Canadian constitution. Each province has its own forest tenure system which governs commercial forest activities on public land (known locally as "crown land") within its borders. In general, forest tenure is a mechanism whereby private forest companies are given rights and access to an annual harvest level on crown land. In exchange for this access, the companies are typically mandated to perform several forest management functions such as forest inventory and reforestation and are often required to operate processing facilities (this is known as appurtenancy). Furthermore, they are charged administered stumpage fees or royalties when harvesting takes place according to a set of complex pricing formulae and are encouraged, through a variety of mechanisms, to generate increased employment and value added in the forest sector.[1] In stark contrast, is the system of forest production in the United States (US), Canada's largest trading partner and the world's principal consumer of forest products. Unlike Canada, commercial forest activities in the US occur mainly on private land where production levels and stumpage prices are market determined. Furthermore, any volume that does originate on US public lands is simply auctioned to the highest bidder. These differences have been at the heart of the disputed softwood lumber trade between the two countries (Sedjo 2006). A dispute that has lingered in spite of several efforts to resolve it through international tribunals at the World Trade Organization and dispute panels put in place as part of the North American Free Trade Agreement, threatening to affect broader trade between the two countries (Biggs et al. 2006).[2]

Much focus has been on British Columbia (BC), Canada's western-most province, as it makes up over half of Canada's softwood lumber exports to the US. This province has

1 Stumpage is simply defined as the price of standing timber.

2 Biggs et al. (2006) outline the several temporary solutions which have been agreed to in the past, most of which involve voluntary export control measures (quotas or export taxes) on the part of Canada. Another temporary 7 year agreement came into force in October 2006, however there already appears to be problems and both countries can opt out of the deal after 23 months (Globe and Mail 2007)

a 95 million hectare land mass where approximately two thirds are forested, an immense area that roughly corresponds to the country of France. Due to steep terrain and low productivity, however, only about half of this forested area is suitable for commercial timber operations.

The provincial government has set up three broad administrative boundaries to govern the forest resource, within which are several sub-regions termed forest districts. The broader regions include the coastal forest region, the northern interior region and the southern interior region; each having differing geography and timber species which has led, to some extent, different forest industries. A map of the province and it's regional and district boundaries along with their associated administrative centers can be found in the appendix.

The coastal forest region spans the entire length of the province's western boundary with the Pacific Ocean and includes two large islands, Vancouver Island and Queen Charlotte Island. The eastern boundary of the region is the height of land of the Cascade Mountain range which runs in a North-South direction up to the state of Alaska and down into the state of Washington in the United States. The prevailing winds heading from the Pacific hit the Cascades and generate very high levels of precipitation – in some case over 5500 mm per year - on its western slopes. This has served to produce a temperate rainforest, of which, the coastal forest region consists. All of the major tree species in the region are commercially valuable, the most important ones being Douglas fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla*), Sitka spruce (*Picea sitchensis*) and western red cedar (*Thuja plicata*). The lack of a natural disturbance agent like fire has left many parts of this ecosystem in a state of "old growth" where trees are frequently over 500 years old and greater than 50 meters tall. As a consequence, the forest sector in the region has traditionally been geared around extracting large diameter high-valued logs, although second growth harvesting is becoming increasingly important as stocks of economically accessible old growth decline. Much of the terrain on the coast is steep and rugged which makes road building expensive and limits the use of ground based extraction equipment. The majority of timber is therefore extracted with cables and transported via waterways to a relatively centralized processing area surrounding the cities of Vancouver and Nanaimo.

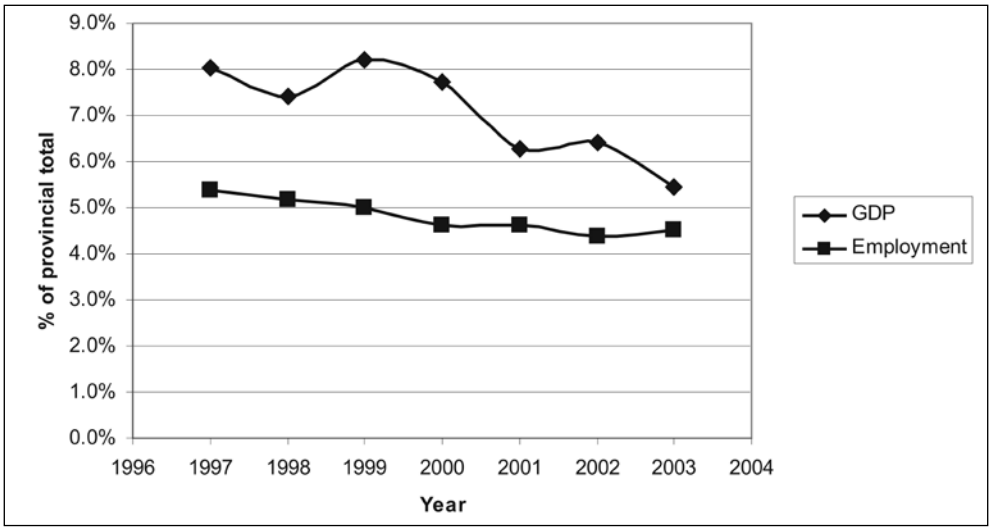
The interior regions by contrast lie on the eastern side of the Cascade Range and run up against the province of Alberta in the east. The northern interior forest region consists of ten forest districts with its headquarters located in the heart of the province at the city of Prince George. The climate in this region is primarily continental, with hot summers and cold long winters, particularly as one heads east away from the influence of the coast. Commercial forests in the region are almost exclusively boreal and sub-boreal, dominated by uniform stands of lodgepole pine (*Pinus contorta var. latifolia)* and white spruce (*Picea glauca*) on rolling flat terrain, which have been influenced by a frequent history of large natural wildfires. The western forest districts, however, retain some coastal influence and contain stands of western hemlock (*Tsuga heterophylla*) and western red cedar (*Thuja plicata*), and the mountainous areas in the region include sub-alpine species such as Engelmann spruce (*Picea engelmannii)* and subalpine fir (*Abies*

lasiocarpa). The forest industry is primarily oriented towards the mass production of low valued, commodity like, framing lumber which is almost exclusively destined for the United States housing market.

The southern interior region and its twelve forest districts are the most diverse of the three regions. The western edge is situated in the rain shadow of the Cascade Range producing a "dry-belt" forest consisting of open grown Douglas fir (*Pseudotsuga menziesii*) and Ponderosa pine (*Pinus ponderosa*) which is interspersed with native grasslands. The northern part of the region, around the cities of Williams Lake and Quesnel, resemble the northern interior forest region consisting of sub-boreal pine and spruce lying on a flat plateau. As one heads east however the terrain becomes very mountainous and more rainfall develops, producing a very productive interior "wet belt" forest at the base of the mountains which resembles the forests of the coast. This diversity is also reflected in the forest industry, as an assortment of small to medium high-valued operators are mixed with larger low cost commodity producers.

The utilization of this timber resource was initially the backbone of the province's economy. As part of his staples thesis, Innis (1967) described timber as British Columbia's staple commodity, predicting that it would generate most of the economic growth in the province. Hayter and Barnes (1990) argue that Innis' depiction was still a very accurate portrayal of the provincial economy but that the timber resource had reached its peak and economic diversification was necessary to induce further growth. Figure 1 supports the claims of Hayter and Barnes as provincial employment and GDP in the forest sector have been in a state of decline.

Figure 1. Forest Sector's contribution to provincial GDP and employment



Source: Statistics Canada - Labour force survey and CANSIM tables 379-0025 and 379-0026

This diversification however has largely taken place in urban centers like Victoria,

Vancouver and Kelowna which are located in the South island, Chilliwack, and Okanagan-Shuswap districts respectively; three districts which contain approximately eighty percent of the provincial population. As shown in table 1, outside of these urban dominated districts, the forest sector still remains the lifeblood of many rural economies.

Table 1. Direct employment and income in the forest sector by forest district, 2001.

Forest District	Employment (% of total)	Gross Income (% of total)
100 Mile House	27%	27%
Arrow Boundary	21%	18%
Campbell River	21%	20%
Cascades	24%	24%
Central Cariboo	38%	36%
Chilcotin	28%	23%
Chilliwack	5%	4%
Columbia	23%	24%
Fort Nelson	26%	33%
Fort St. James	55%	52%
Headwaters	37%	39%
Kalum	20%	20%
Kamloops	13%	12%
Kootenay Lake	13%	9%
Mackenzie	67%	74%
Nadina	48%	47%
North Coast	21%	25%
North Island/Central Coast	34%	41%
Okanagan-Shuswap	10%	7%
Peace	11%	12%
Prince George	29%	28%
Queen Charlotte	28%	36%
Quesnel	45%	45%
Rocky Mountain	14%	14%
Skeena/Stikine	25%	24%
South Island	8%	8%
Squamish	9%	10%
Sunshine Coast	26%	24%
Vanderhoof	43%	43%

Source: BC Ministry of Forests Economics and Trade Branch. http://www.for.gov.bc.ca/HET/tsr_sea/index.htm

Given the dominate position of timber in the province's rural economy, decisions as to how this immense resource should be used and by whom, have been an ongoing dilemma. Historically, provincial policy makers have generally been sceptical of markets, favouring a command and control approach to timber resource allocation, intervening

often in the forest sector and establishing a web of regulations to shape the forest industry and the communities that depend on them. This approach was particularly evident in the province's forest tenure system which grants timber harvesting rights to private firms on public forestland. Tenure arrangements are without question the government's most powerful policy instrument and throughout time they have been re-structured to meet a variety of changing goals.

Research problem

Recently, the BC forest sector has been facing increasing global competition and restricted access in Japan and the US, its most significant export markets (Bull and Williams 2006). Consequently, facilitating industrial competitiveness and innovation received an elevated status on the government's policy agenda. After reviewing the predicament of the forest sector, Pearse (2001) came to the conclusion that several aspects of the existing tenure system were too inflexible, not allowing the forest sector to adapt to amplified competition in world markets. He was particularly critical of appurtenancy conditions and regulations governing the rate of harvest, but also spoke out about the need for the administered stumpage system to become more sensitive to market conditions.

The BC government, however, faced a difficult task in crafting its policies to meet the needs of its domestic industry without compromising traditional social objectives such as regional job creation and community stability. Further constraining the design of any reform was the enduring softwood lumber trade dispute with the US. Prior tenure instruments aimed either at aiding the competitiveness of the forest sector or meeting social objectives have been the source of subsidy allegations from US producers. This frequently resulted in countervailing trade action on timber stemming from provincially owned forests, limiting BC's access to its prime export market.

In 2003, the BC government hoped it could strike a compromise by formulating a suite of market-based policies termed the Forestry Revitalization Plan (FRP). The plan calls for the increased use of auctions in the allocation and pricing of timber, the re-allocation of timber to small-scale forest tenures, and the elimination of regulations which controlled when, where and what the timber processing sector could produce. The stated goals of the plan and its associated legislation are (British Columbia Ministry of Forests 2003):

- To open the sector to new opportunities, new participants and new ideas;
- Eliminate the regulatory burden and allow the right sizing of operations to increase competitiveness;
- Allow timber to flow where/when it will be put to its highest and best use;
- Maintain a healthy forest sector and healthy communities

The extent the above goals complement or compete with one another is debatable. On the one hand, it is easy to see that these objectives had the potential to clash with one another. The elimination of regulations which constricted the size and location of

the forest industry might allow existing operators to expand and create entry barriers, preventing new participants from taking part in the forest economy; freeing timber to flow to its highest value use could make particular manufacturing facilities superfluous, putting localized jobs and communities at risk; and increasing the forest sector's exposure to market forces may well introduce uncertainty and instability leading to increased risk and capital flight.

On the other hand, a re-structured industry could emerge that is more cost-effective, diversified, and consequently resilient to fluctuations in the global marketplace. This would feed down to the community level resulting in new jobs and greater stability. Furthermore, a new regulatory regime with a greater role for markets might finally put to rest the softwood lumber dispute, providing unfettered access to the world's largest consumer of forest products.

Objectives and methodology of thesis

The aim of this thesis is to examine some aspects of the political economy shaping the design and evolution of timber policy in BC currently. Analysis will primarily focus on the FRP, its intent and some of the effects it has had thus far. For in doing so much of the crucial issues facing policy makers in the province will be revealed and the economic matters surrounding the softwood lumber dispute will be exposed. This will include issues pertaining to timber utilization, the rate and timing of harvesting, and timber pricing. However, my analysis will also seek to uncover why the policy changes stopped where they did. To do so I will draw upon the results of previous studies and will rely heavily on evidence from transactions in the marketplaces for timber and capital. It is hoped this work will highlight areas of future research and influence the direction of future policy.

Thesis outline

One cannot understand the regulatory changes in the FRP and the constraints to further change without having some knowledge of the historical and institutional background of forest policy in BC. I therefore provide a comprehensive historical overview of the political economy which has shaped the development of timber tenure in the province in chapter 2. This chapter culminates by providing a more detailed description of the FRP and a dialogue about notable tenure reforms which had been advocated in the past that did not enter the plan.

In Chapter 3 my empirical investigation into the impacts of the FRP begins. The goal of this chapter is to gain some idea about how the competitiveness and health of the existing forest industry in BC was influenced by the policy changes. To do so, the security prices of 13 publicly traded forest companies operating in British Columbia are analyzed using event study techniques. Such a technique being chosen as it can

convey how the regulatory change has influenced each firm's expected performance from a capital market perspective (in both the short and long run) through actions in the stock market (Binder 1998).

A central component of the new regulatory regime, and a key element of the proposed resolution of the softwood dispute with the US (Spelter 2006), is the expanded use of auctions in the allocation and pricing of timber in BC. A hedonic stumpage model based on interior timber auction results is therefore developed in chapter 4. This model is used to examine the influence of differing regional competition levels on the bids for standing timber. The results are used to discuss the extent to which reduced levels of competition are an obstacle in the design of a market-based stumpage pricing system and the role such a system could play in the dispute resolution process.

Traditionally, the award and operation of forest tenures in British Columbia have been constrained by several regulations designed at meeting a number of regional socio-economic goals. These goals included both the promotion of employment and value added in the forest sector as well as the provision of opportunities for small scale producers and new market entrants. No work however has been done to quantify the efficacy or cost of such constraints. Given that the FRP reduced or eliminated several of these restrictions and that it increased the observable market transactions for several types of tenure, a dataset, pre and post FRP, with varying degrees of tenure conditions and their associated market value became available. This allowed for the estimation of several shadow prices associated with the different tenure conditions. This estimation, as well as the distributional impacts of the tenure changes, is the subject of chapter 5.

In chapter 6, the hedonic model developed earlier is adapted and used to develop the rent gradient for forestland in the interior of the province. This gradient is used to shed light on the institutional framework governing forestland management and silviculture investment in BC. These institutions, while being touted as being severely inefficient (Haley 1985) and at the root of the softwood dispute (Sedjo 2006), have somewhat puzzlingly remained in place after the FRP. This chapter questions and clarifies the results of prior studies which criticised these institutions. While still highlighting the need for change, timber institutions based on the productivity and geography of the land is advocated.

The final chapter summarizes my findings, highlights areas of future research and presents my conclusions and policy recommendations.

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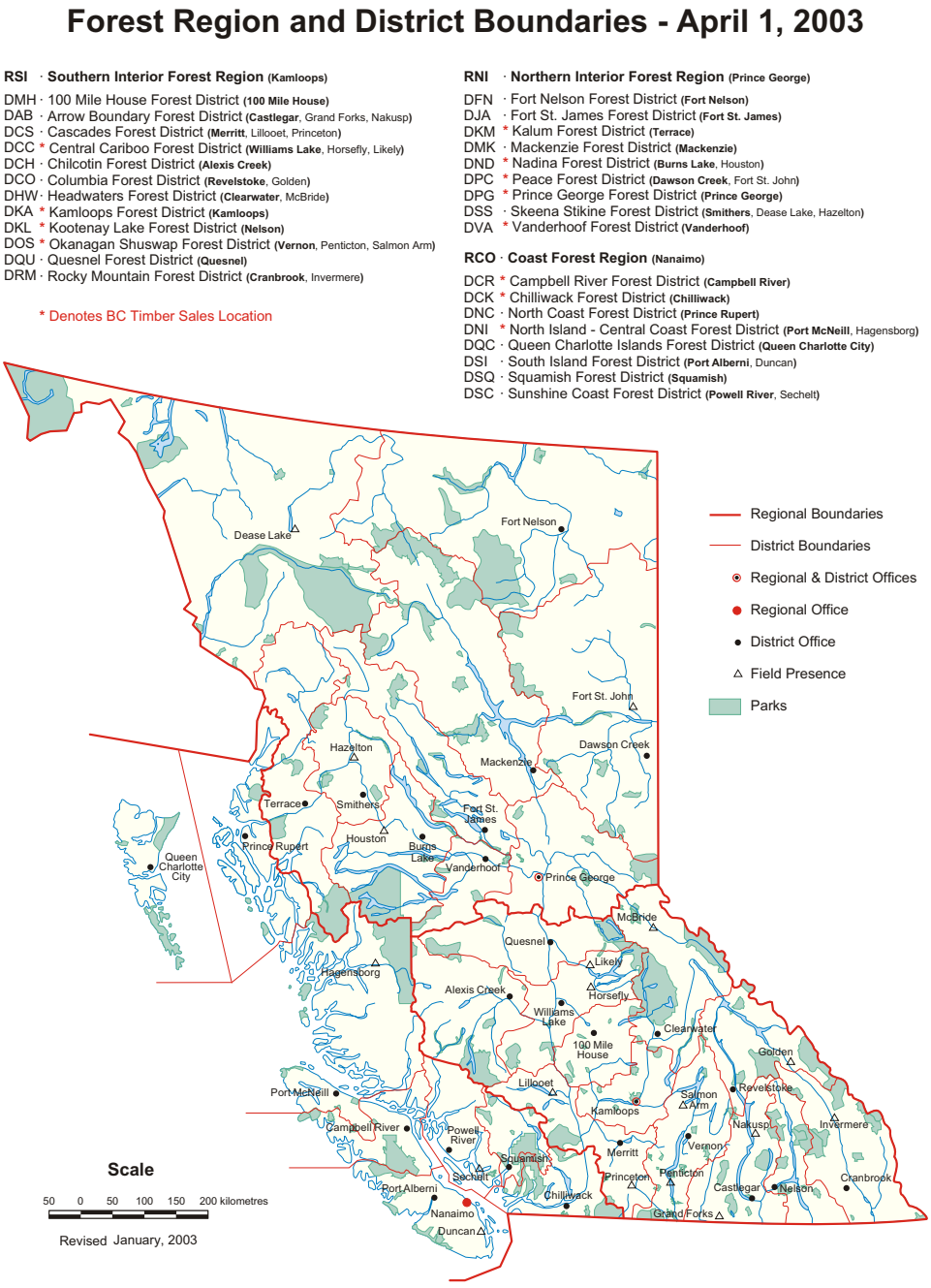
Appendix. Forest Regions and Districts in British Columbia



Source: BC Ministry of Forests and Range website http://www.for.gov.bc.ca/mof/maps/regdis/