British Columbia's Stumpage System: Economic and Trade Policy Implications

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Les rentes et les droits de coupe dans l'industrie du bois de construction tendre en Colombie-Britannique ont joué un rôle essentiel dans la dispute entre le Canada et les États-Unis au sujet du bois de construction tendre. Le but des États-Unis a été de limiter les exportations canadiennes de bois de construction et d'augmenter les prix intérieurs américains. La théorie des rentes démontre que le système de droits de coupe de la Colombie-Britannique n'affecte en rien les exportations de bois de construction tendre et donc ne constitue pas une subvention. En utilisant des estimés des rentes existantes dans l'industrie du bois de la Colombie-Britannique, nous démontrons que le système de droits de coupe n'est pas flexible aux changements dans la valeur de la rente et suggérons des façons d'améliorer le système actuel de droits de coupe.

Rent and stumpage in the British Columbia softwood lumber industry have played a pivotal role in the Canada-United States softwood lumber dispute. The goal of the US in the dispute has been to limit lumber exports from Canada and increase domestic American prices. Rent theory shows that BC's stumpage system does not affect softwood lumber exports and thus does not constitute a subsidy. Using estimates of the rents in the BC wood products industry, we demonstrate that the BC stumpage system is not flexible to changes in the value of the rent and suggest ways to improve the present stumpage system.

Introduction

The forest industry plays an important role in the Canadian economy employing directly around 225,000 people and indirectly half a million more (Statistics Canada 1997). Softwood lumber is a major part of the industry and most of the production of softwood lumber comes from British Columbia. The BC logging and wood industry combined provided direct employment to 83,000 people in 1995 and generated shipments of $16.8 billion the previous year (Canadian Forest Service 1996*a*). Almost all of the production comes from timber harvested on provincial crown land (T.H. Thompson and Associates 1992).

Given the importance of softwood lumber, it is essential that stumpage — the amount charged to harvesters by provincial governments for trees cut on Crown land — be set correctly. If harvesters are forced to pay too much stumpage, fewer trees are harvested, and bankruptcies and job losses result. If stumpage is too low, the owners of the forests — the BC public — will not receive adequate compensation for the use of forest resources. Insufficient stumpage also makes Canada vulnerable to accusations of subsidization from the United States, a country that accounts for over 80 percent of Canadian softwood lumber exports (Statistics Canada 1997). Setting the appropriate stumpage charge requires estimating the available economic rent — the returns to harvesters over and above all their costs of production while allowing firms an acceptable rate of return on capital.

In this paper, we examine the stumpage system in BC and its implications for the ongoing trade dispute with the US over softwood lumber exports. We begin with a history of the dispute and explain the implications of rent theory for stumpage. We describe the current stumpage system and use estimates of available and captured rent to show its inflexibility to changes in the value of the rent. Our conclusions suggest ways in which public stumpage policies could be changed to benefit both BC and its forest industry.

History of the Canada-United States Softwood Lumber Dispute

The US has been the largest market for Canadian softwood lumber since before Confederation. A history of the Canada-US softwood lumber dispute, given in Table 1, indicates that from the very beginning the US has initiated tariffs and barriers against Canadian lumber imports. Following the Second World War, a new phase in the dispute began with a decline in the number of mills and employees and a fall in production in the US softwood lumber industry. The downturn in the US industry, combined with growing imports from Canada, led to three Congressional hearings on the problems faced by producers during the 1950s and a temporary tariff on Canadian imports in 1962.

The current dispute began in 1982 when the Coalition for Fair Lumber Imports (CFLI) filed a countervailing duty petition with the US International Trade Commission (ITC). The final decision on the petition was made by the US Department of Commerce's International Trade Administration (ITA), which ruled in 1983 that BC stumpage rates do not constitute a subsidy to the lumber industry at a preferential rate. By 1985, Canadian lumber accounted for 32 percent of the US market and was continuing to increase. In response, the CFLI again filed for a countervailing duty with the ITC in May 1986 and petitioned for a 27 percent tariff on Canadian softwood lumber imports. In a reversal of its 1983 decision, the ITA issued an initial ruling that provincial stumpage rates constituted a domestic subsidy that could be countervailed and recommended a 15 percent *ad valorem* tariff. Before the final ruling was due in December 1986, the two countries signed a Memorandum of Understanding (MOU) under which Canada implemented a 15 percent *ad valorem* export tax in exchange for the CFLI dropping its petition.

Honouring the provisions of the MOU, the BC government instituted changes in its stumpage system in order to replace the export tax. In 1991, Canada formally withdrew from the MOU and cancelled the export tax. In retaliation, the US in 1992 imposed a 6.5 percent *ad valorem* tariff. After appealing the US action to the dispute resolution panel set up under the Canada-US Free Trade Agreement, the issue was settled in Canada's favour and about $800 million in tariff revenue was returned. At the same time, Canada's share of US lumber sales increased from about 30 percent in the late 1980s to 36 percent in 1995. In response, the CFLI prepared to file suit again in February 1996 with the ITC. Subsequent negotiations between the two countries led to *The Softwood Lumber Agreement Between the*

TABLE 1
Chronology of the Canada-United States Softwood Lumber Dispute

1840-46:	Origins of Canada-US lumber trade — American Tariff of 20-30%.
1846:	New American Tariff increases duties on Canadian wood.
1854-66:	The Reciprocity Period with free entry of "natural products" and raw materials into each country's markets.
1866:	The General American Lumber Tariff of 20% is implemented. It is quickly countered by a Canadian export duty on pine saw logs of one dollar per thousand board feet.
1870:	The US puts saw logs on the free list, an early signal of the US industry's dependence on Canadian raw material.
1872:	The US changes the *ad valorem* duty on lumber (general tariff of 20%) to a specific duty of $2 per thousand board feet which has the effect of limiting entrance of poor grades of lumber.
1886:	Canada increases the export duty on saw logs to $2 per thousand board feet.
1888:	Canada raises the export duty to $3 but it is lowered back to $2 before it takes effect because of a possible trade compromise with the US.
1890:	The Canadian export duty on saw logs is removed and the American specific duty on lumber is reduced to $1 per thousand board feet resulting in increased Canadian exports of both products.
1894:	The Wilson Bill removes remaining US tariffs on lumber.
1894-97:	Virtual free trade in lumber between the two countries.
1897:	The Dingley Tariff of 1897 restores the US specific duty on lumber of $2 per thousand board feet. The US threatens retaliation if Canada restores the export duty on saw logs.
1898:	Under the British North America Act guidelines, the Ontario government prohibits entirely the export of saw logs cut on Crown lands. The other provinces follow with the same action.
1910:	US Reciprocity offer but the Laurier Government is defeated in the general election after campaigning for reciprocity.
1922:	US Tariff Commission survey finds that under existing stumpage policies and production processes, the costs of BC producers are higher than in the US Pacific Northwest.
1930:	The US issues the Hawley-Smoot tariff that has the effect of limiting the entry of low grade lumber into the US.
1932:	The US, under *The US Revenue Act*, imposes a revenue tax of $3 per thousand board feet on softwood lumber products. The rate is three times higher than existing tariff rates (which still remain in place) causing Canadian lumber exports to the US to fall back to the level of the 1890s.
1936:	US reduces the duty on spruce-pine-fir-larch-hemlock planks and boards from $1 per thousand to .50 per thousand. The revenue tax is also reduced from $3 per thousand to $1.50 per thousand. The reduced rates do not apply to Douglas fir or western hemlock imports over 250,000 board feet.
1950s:	US tariffs and taxes on softwood lumber amount to about one percent *ad valorem* for rough and surfaced lumber. Surface lumber is the principal import commodity. Canada is permitted free entry of rough lumber as well as finished ponderosa pine and redwood.
1962:	US Tariff Commission investigates the question of injury to US lumber producers from the imports of Canadian softwood lumber. US industry groups proposed a reciprocal market-sharing agreement removing existing tariffs in both countries for softwood lumber imports below 10 percent market share and the imposition of a 10 percent *ad valorem* tariff in both countries for imports over this threshold.
1986:	Canada levies an export tax of 15 percent on softwood lumber under the Memorandum of Understanding (MOU). A key provision of the MOU is that within a five-year period the tariff would be replaced by a corresponding increase in provincial stumpage rates.
1991:	Canada withdraws from the MOU by cancelling the export tax.
1992:	In response to cancellation of the MOU, the US imposes a 6.5% tariff. The revenue collected is subsequently ordered returned to British Columbia after a Canada-US Free Trade bilateral dispute panel rules in Canada's favour.
1996:	Canada imposes a three-level export tax schedule with no tax on annual export volumes up to 14.7 billion board feet (bbf), a tax of $US50 per thousand board feet on annual volumes between 14.7 bbf and 15.35 bbf, and a tax of $US100 per thousand board feet on annual volumes greater than 15.35 bbf. In return, the US promises no further investigations into Canadian softwood lumber imports for a period of five years.

Source: Authors' compilation.

Government of Canada and the Government of the United States, which was formally signed in May 1996.

Under Article II of the 1996 agreement, Canada places softwood lumber on the Export Control List under the Export and Import Permits Act. A federal export permit is required for softwood lumber exported to the US that is originally manufactured in British Columbia, Alberta, Ontario, or Quebec. Upon issuing the permit, the Canadian government collects an export tax of US$11.05 per cubic metre ($m^3$) for exports between 66.5 and 69.5 million m^3 and US$22.10 per m^3 for exports more than 69.5 million m^3. (Note that 1 m^3 = 221 board feet, with the latter being the US unit of measure). Export taxes are adjusted each year for inflation and allocations are transferable between Canadian provinces. Canada may also export to the US free of export taxes an additional 416,290 m^3 in any quarter when the average price per m^3 of lumber is equal to or greater than a trigger price of US$89.51 (which rises to US$90.61 on 1 April 1998). In return for these measures, the US agreed that during the five-year period covering the agreement it would not initiate further countervailing action against Canadian softwood lumber.

The 1996 agreement confirms that the Canada-US softwood lumber dispute is not about Canadian stumpage subsidies but is a conflict about market share motivated by the desire of US producers to receive higher prices for their products. In the following sections, we examine the stumpage system in BC, the rent available and captured by the Crown, and whether the provincial government has or has not been subsidizing the industry.

The British Columbia Stumpage System

The 1986 Memorandum of Understanding and the imposition of a 15 percent tariff obliged BC to change its stumpage system.[1] Stumpage was previously calculated under a modified Rothery formula as a residual equal to the market value of timber (accounting for costs of delivery) less operating costs and an allowance for profit and risk.[2] Charges were calculated for individual species and then applied to the harvested volume within that stand. The system had a number of weaknesses (Pearse 1976; Percy 1986) and led to "high-grading" whereby firms harvest only those trees that provide a net return equal to or in excess of the stumpage, leaving trees, often damaged, behind.[3] For this reason, the province imposed utilization standards for timber stands — regulations that require companies to harvest all the timber in a stand down to specified minimum dimensions and to leave behind stumps of a maximum height.

The new stumpage system established in 1987 is called comparative value pricing (CVP). Unlike the former system, all species in the same stand are now averaged together to determine the stumpage rate, while the minimum stumpage rate is set at 25 cents per m^3 (Nelson, Grafton, and van Kooten 1994; British Columbia Ministry of Forests 1990). Most important, the CVP is an *ad valorem* approach with total stumpage determined as a percentage of lagged selling prices of lumber without consideration of logging costs.[4]

The system was modified in May 1994 with the introduction of higher *ad valorem* rates at higher lumber prices, called super-stumpage. This additional stumpage was designed to capture an additional $600 million annually over a five-year period in order to finance Forest Renewal BC, a new Crown corporation. Unfortunately, super-stumpage is based on the price of lumber that may have increased as a result of the quotas imposed on Canadian imports in the 1996 agreement. Depending on the export quotas of firms under the agreement, higher lumber prices do not necessarily represent higher revenues for firms.

Under CVP, the price of logs on the Coast and wood chips and dimension lumber in the Interior, as well as harvesting costs based on annual surveys,

are used to establish *relative* stumpage charges by area. The *total* amount of stumpage charged to the industry, however, is calculated only using the latest available three-month average of two indexes of lumber prices (chip and pulpwood prices are ignored) compiled by Statistics Canada, one for each region (these are called the target rates).[5] This makes the CVP insensitive to the costs of harvesters and is exacerbated by recent changes to the Forest Practices Code that have increased operating costs and contributed to a 65 percent increase in average logging costs per m^3 from 1992 to 1995 (Price Waterhouse 1993, 1994, 1995, 1996). In the view of the industry, not including operating costs in calculations of stumpage has contributed to two high-profile bankruptcies.[6]

Rent Theory and Stumpage

An understanding of economic rent is needed to determine appropriate stumpage rates. In theory, economic rent can be viewed as a surplus that can be appropriated without affecting the supply of firms. Thus, failure to capture all of the economic rent by the BC government should not affect the quantity of lumber exported to the US.

An important component of economic rent is Ricardian rent which can arise when variable inputs, such as labour, are applied to a heterogeneous factor of production, such as land, that is fixed in supply. For a factor of production fixed in supply, the extra output from additional amounts of variable inputs will eventually decline as more of the variable inputs are used. A profit-maximizing firm will, however, continue to use more of a variable input until the cost of the input equals the value of the output it produces. The sum of the value of the outputs in excess of the variable input costs, less the return to the fixed factor in its next most remunerative activity — its transfer price — constitutes Ricardian rent. The more productive or the higher the quality of the fixed factor, *ceteris paribus*, the greater will be the rent.

The concept of Ricardian rent can be applied to BC forestland that varies according to productivity or timber yield and distance from market. Ricardian rent also increases with the price of timber. If two forest sites are identical in terms of productivity, the site with the lower transport costs would, *ceteris paribus*, have a higher Ricardian rent. Alternatively, two sites may have equal access costs but one site may have a higher productivity. Thus, for the same amount of labour and capital employed, one site yields more timber than the other and will have a higher Ricardian rent. Sites may also differ according to the mix of timber so that a stand with a greater proportion of higher-valued Douglas-fir would yield a greater Ricardian rent. Where forestland has no other value than in forestry, the transfer price is zero, while the opportunity cost would be positive where there are non-timber benefits associated with standing timber.[7] In this case, a measure of the Ricardian rent is the revenue from harvesting trees less all economic costs, an allowance for risk, conservation costs, depreciation, and a normal rate of return for capital.

Ricardian rent in forestry arises from the productive nature of the land and thus belongs to the owners of the land. The rent from forestland is also determined by the price received for timber, irrespective of the quality or the productivity of the land from which the timber is harvested. This rent is unique to natural resources and may occur whenever the supply is fixed or limited by nature. In the case of BC, the timber supply is more or less fixed by nature and regulated by the Ministry of Forests' allowable annual cut (AAC).[8] Should the price of timber rise, any windfall is a rent that accrues to all forestland under production. Additional rent, called quasi-rent, also exists in the forestry sector and arises from the managerial skills of employees, capital improvements, and investments by lumber companies in replanting, thinning, or fertilizing. Quasi-rents are short-run in nature and arise from the efforts of lumber companies.

Capturing economic rent will not affect the behaviour of firms provided that it represents a surplus

over and above that which is required for firms to stay in business. Thus, if the BC stumpage system does not collect all of the rents, as has been argued by the US Coalition for Fair Lumber Imports, there is no effect on the exports of Canadian softwood lumber. Further, a failure to collect all the economic rent does not represent a subsidy in the sense that it is not a payment to the industry and neither affects the supply nor the price of softwood lumber.[9] However, stumpage can reduce the supply of softwood lumber when charges are set in excess of the available economic rent.

Estimating Rents in the British Columbia Forests

The most comprehensive study of economic rents in Canada's forest sector is by Copithorne (1979). His measurement of rent was constructed by valuing labour and capital used in primary industries at their opportunity costs in non-primary activities and then subtracting it from primary value added. The result was termed a natural resource windfall. Copithorne's results were updated by Percy (1986) who found that the total economic rent in the BC forest sector in 1979 ranged from $1.11 to 1.42 billion and that the provincial government collected up to two thirds of the available rent from the logging sector.

Using a methodology described in Nelson, Grafton, and van Kooten (1994) and Lynch (1996), estimates of rents in the BC lumber industry can be obtained. The approach measures the total rent available, which is defined as the value of wood shipments less harvesting costs and an allowance for the cost of capital, including a risk premium and a normal rate of return on capital. Direct payments made by the industry to the provincial government are included in harvesting costs and thus are added back to obtain a measure of the available rent. Estimates of the total available rent and rent captured by the province in both nominal terms and 1986 dollars for the period 1970 to 1994 are shown in Table 2.[10]

Table 2 shows that in 7 out of the past 25 years the province has collected more than the available rent.[11] If more than the available rent is collected on a consistent basis, the amount of trees harvested will be less than desired by the province. Over the entire period, the province collected about 70 percent of the total available rent. The amount of rent captured (in real or nominal dollars) was the highest in 1994 — the year that coincides with the introduction of super-stumpage.

If BC has collected less than the available rent in 18 of the past 25 years, where has this rent gone? Copithorne (1979) suggests that a share of uncollected rents may be paid out in the form of higher than expected wages to forestry workers. It has also been argued that the rent is simply returned to shareholders of lumber companies or is incurred by the firm in the form of higher corporate expenses. Studies have shown, however, that, rather than returning a higher than average rate of return, forestry companies are underachievers compared to other industries (Nordhaus 1992; Canadian Forest Service 1996*c*, p. 1986).

One likely explanation for where most of the uncollected rent has gone is that it has been spent on capital investments to help secure future cutting rights. In part, these investments have been encouraged by past government regulations that required the construction of a sawmill as a precondition for receiving timber rights (Pearse 1976). Investments in sawmills and other forms of capital may also be preemptive so as to secure future rights from potential competitors. This explanation is supported by evidence of consistently higher levels of labour productivity in BC relative to the western US (Percy and Yoder 1987) and a strong correlation between investment spending and the industry's previous year value added (Schwindt and Heaps 1996). Thus, failing to collect all the available rent may have increased capital investments and capacity in the industry beyond that necessary to process the available timber. To the extent that labour and capital are substitutes in the long run, overinvestment in

TABLE 2
Available and Captured Rent in Wood Products Industry, British Columbia

Year	*Captured Rent (Current $m)*	*Available Rent (Current $m)*	*Captured Rent (1986 $)*	*Available Rent (1986 $)*	*Rent Capture (%)*	*% from Mean*
1970	55.0	45.6	167.6	139.0	121	50
1971	78.0	147.5	230.1	435.2	53	-18
1972	144.9	357.4	404.6	998.2	41	-30
1973	263.9	587.6	676.7	1,506.7	45	-26
1974	129.4	229.9	290.0	515.4	56	-15
1975	40.4	75.4	82.4	153.9	54	-17
1976	60.4	233.8	113.4	438.7	26	-45
1977	102.0	470.3	180.2	830.9	22	-49
1978	280.1	900.2	466.8	1,500.4	31	-40
1979	562.4	992.1	852.2	1,503.1	57	-14
1980	357.2	367.7	489.3	503.7	97	26
1981	111.3	-154.1	137.6	-190.5	172	101
1982	89.3	-376.1	101.6	-427.8	124	53
1983	148.4	135.0	160.8	146.2	110	39
1984	144.9	94.0	152.3	98.8	154	83
1985	166.8	413.4	170.7	423.2	40	-31
1986	193.9	837.0	193.9	837.0	23	-48
1987	490.5	1,384.6	468.0	1,321.2	35	-36
1988	618.3	1,059.9	564.1	967.1	58	-13
1989	648.1	1,000.4	561.6	866.9	65	-6
1990	562.8	475.6	471.3	398.4	118	47
1991	597.8	517.6	484.8	419.7	115	44
1992	705.9	1,135.5	564.7	908.4	62	-9
1993	1,1019.3	2,494.8	803.3	1,965.9	41	-30
1994	1,879.4	3,424.3	1,468.3	2,675.2	55	-16

Source: Authors' compilation based on British Columbia Ministry of Forests, *Annual Reports* (various years).

capital may have reduced total employment in the lumber industry.

A disturbing observation from Table 2 is that the CVP system instituted in 1987 does not appear to be flexible enough to adjust to reductions in the available rent. For example, the available rent fell by more than a half from 1989 to 1990, yet the amount of rent collected fell by just 13 percent so that the province collected more than the available rent. In part, this inflexibility is explained by a stumpage system that is based on lagged price data for lumber. Thus, if lumber prices fall rapidly over the year, the assessed stumpage will be higher than it should be. An inflexible stumpage system is particularly worrying because when the rent is falling most rapidly firms are least able to make payments that include returns that they need to stay in business.

Data has not yet been released to enable us to estimate the available rents in 1995 and 1996. Nevertheless, we can calculate the net surplus in the wood products industry that is the total value of wood shipments less logging costs and stumpage charges. According to this measure, stumpage as a proportion of the gross surplus (net surplus plus stumpage charges) in the industry rose from 13 percent in 1992 to 26 percent in 1995.[12] This suggests that the rate of rent capture in 1995 is considerably higher than the 62 percent appropriated in stumpage in 1992, as given in Table 2. Further, the total stumpage (including the small business program) collected for 1995 was $1.768 billion, or 26 percent higher, in nominal terms, than the previous year, falling slightly to $1.703 billion in 1996 (British Columbia Ministry of Forests, various issues).[13] Increased rent capture, however, has coincided with higher logging costs which rose, on average, from 1994 to 1995 by as much as 15 percent per m^3 (Price Waterhouse 1996), while shipment values declined, falling from $10.775 billion in 1994 to $10.669 billion in 1995 and $10.45 billion in 1996. As further evidence of potentially excessive rent capture in 1995 and 1996, the current price of wood chips — a valuable joint product — has fallen to less than a third of what it was in the summer of 1995. This has reduced the combined revenue of all sawmills by several hundred million dollars (Nelson 1997).

Policy Conclusions

The history of the Canada-US softwood lumber dispute suggests that, no matter what the stumpage system, US lumber producers will lobby for countervailing duties whenever the Canadian share of the US lumber market rises above a given level. Despite the claims of US lumber producers, economic theory suggests that even if less than the total available economic rent is being collected in stumpage this will have no effect on Canadian lumber exports and cannot be viewed as a subsidy. Thus, the government of BC should do its best to devise a system that meets the needs of BC and its producers rather than to try to appease US lumber producers.

The American accusation that BC was subsidizing its industry by not collecting enough stumpage, and the resulting 1986 Memorandum of Understanding, directly led to the imposition of the CVP system. In terms of total stumpage, this system considers neither the costs of producers nor the joint product of wood chips produced with lumber and is inflexible to reductions in the total available rent. Further, the current system continues to average all the value of timber within a stand despite considerable variation in individual species. This approach, coupled with increasingly strict utilization standards, which include a full stumpage charge on the volume of wood left behind, exacerbates the problems faced by the industry and forces firms to harvest some timber at a loss.

The comparative value pricing stumpage system, along with super-stumpage introduced in 1994, have resulted in more rent being collected in 1994 and 1995 than in the entire decade of the 1980s. The industry's view that current stumpage fees collect more than the available rent is supported by (i) the substantial increases in logging costs in recent years; (ii) a dramatic decline in wood chip and pulp wood prices from 1995 to 1996; (iii) a 100 percent increase from 1992 to 1995 in stumpage as a proportion of the gross surplus in the industry; and (iv) two high-profile bankruptcies in the past few months, as well as other sawmill closures.

If more than the available rent is consistently collected, less than a desirable number of trees will be cut, curtailing lumber production, and the industry will be affected leading to job losses and other consequences. If not enough rent is captured, the potential exists for it to be spent on excess investments that ultimately reduce employment. To avoid imposing further distortions on the industry, a new stumpage system should be introduced that is flexible to both increases and declines in available rent and is responsive to the current price of wood chips

in the Interior and pulp wood on the Coast, as well as operating costs.

Given the ability of stumpage to influence the number of trees harvested, capital investments, and even employment, changes to the stumpage system should reflect the multiple objectives of forest policy. Implementing a new stumpage system that tries to capture only economic rent, while considering the impacts on the industry, would generate considerable benefits for both British Columbia and its forest industry.

NOTES

The authors' names are listed alphabetically not in order of seniority. The authors wish to thank Casey van Kooten for helpful comments and suggestions on an earlier draft.

[1]In British Columbia all licensees are required to pay either a fixed annual charge based either on the licensed volume or area within the tenure. These payments are substantially less than the payments for harvesting trees.

[2]In the Interior lumber and wood chip values, less manufacturing costs, were used to calculate stumpage.

[3]This problem arises with any levy where charges are based on the volume harvested.

[4]The government also withdrew allowable cut from licensees and redirected it to the Small Business Forest Enterprise Program. At the same time, the deductibility of costs changed dramatically as major licensees assumed responsibility for management costs, road-building, and reforestation — the latter two previously treated as dollar for dollar credits against stumpage. Silvicultural and development costs are now incorporated in stumpage values, but are no longer fully deductible. Finally, in a more recent change, royalties on public forest land that falls under older tenure arrangements, that typically ran at 40 percent of stumpage charges (Scarfe 1995), are now scheduled to rise over a period of six years until they equal stumpage charges for equivalent timber.

[5]This has prompted Fred Lowenberger, senior vice-president of forestry and land use for Interfor to observe that the CVP is "...totally insensitive and ... fundamentally flawed. It is based on an index that is based on the price of lumber. Chips and pulpwood, basic products of the industry, are not included in the index. Additionally, the fact that costs go up by $10 or $15 has no bearing on what stumpage you pay. ... [S]tumpage paid is totally out of line with the value you attribute to the resource rent" (quoted in *Truck Logger* October/November 1996, p. 9).

[6]The industry view is epitomized by the trade journal *Wood Technology* (March 1997, p. 18) "Spiraling logging costs in British Columbia may force some of the province's mills to shut down, industry leaders have warned. Major forest companies have taken the unprecedented step of offering to show their books to an independent study commission to prove their case."

[7]This would include the provision of recreational opportunities and environmental benefits, some of which may be in conflict with timber production.

[8]Harvesters are obliged to cut the AAC although the Ministry of Forests does permit flexibility in cutting patterns within a five-year period.

[9]See Samuelson (1970) for a description of how rent differs from an individual perspective as opposed to a firm perspective, while Uhler (1991) discusses why the supply of timber is unaffected by the amount of rent retained by firms.

[10]Data needed to calculate the rent available in 1995 and 1996 are not yet available. Up until 1980, both the available rent and that captured were based on a calendar year. Since 1980 the rent collected has been reported based on a fiscal year. From 1987 onward neither road-building nor silvicultural investments have been deductible from stumpage payments for companies that hold long-term cutting rights.

[11]The estimates do not include the countervailing duty paid to the US by BC companies of $140 and $260 million in 1992 and 1993 nor the amount reimbursed to the industry following the ruling of the dispute resolution panel of the Canada-US Free Trade Agreement.

[12]A report recently released by KPMG analyzed changes in harvesting and stumpage costs between 1992 and 1996, and found that harvesting costs in the Interior had increased approximately 47 percent while on the Coast they had increased 54 percent over the four year period. Using their figures for harvesting and stumpage costs, stumpage as a proportion of gross surplus rose from

14 percent in 1992 to 29 percent in 1996 (McIntosh *et al.* 1997).

[13]These figures include all stumpage payments (including royalties) but exclude other fees such as ground rents. As such, they will differ slightly from the charges reported in Table 2.

References

British Columbia Ministry of Forests (various years). *Annual Report* (Victoria: Ministry of Forests).

____ (various issues), *Summary of Stumpage Billings* (Victoria: Ministry of Forests).

____ (nd), *Comparative Value Timber Pricing*. Stumpage Appraisal Paper No. 1 (Victoria: Ministry of Forests).

Canadian Forest Service (1995), *Selected Forestry Statistics* (Ottawa: Supply and Services Canada).

____ (1996*a*), *Compendium of Canadian Forestry Statistics* (Ottawa: Supply and Services Canada).

____ (1996*b*), *Selected Forestry Statistics* (Ottawa: Supply and Services Canada).

____ (1996*c*), *The State of Canada's Forests: Sustaining Forests at Home and Abroad* (Ottawa: Supply and Services Canada).

Copithorne, L. (1979), Natural Resources and Regional Disparities, report prepared for the Economic Council of Canada (Ottawa: Supply and Services Canada).

Government of Canada and Government of the United States (1996), *Softwood Lumber Agreement Between The Government of Canada and the Government of the United States*. (Ottawa: Supply and Services Canada).

Lynch, R.W. (1996), *The Canada-US Trade in Softwood Lumber*, unpublished Master's thesis. (Ottawa: Department of Economics, University of Ottawa).

McIntosh, R.A., M.L. Alexander, D.C. Bebb, C. Ridley-Thomas, D. Perrin and T.A. Simons (1997), *The Financial State of the Forest Industry and Delivered Wood Cost Drivers*. Report prepared for the British Columbia Ministry of Forests. (Vancouver: KPMG).

Nelson, H.W., G. Delcourt and B. Wilson (1997), "Pulp Fibre Availability in British Columbia: A Case-Study of the 1995 Price Spike," FRDA II Working Paper 97.03 (Victoria: Canadian Forest Service).

Nelson, W.H., R.Q. Grafton, and G.C. van Kooten (1994), *Estimating Economic Rents in the British Columbia Forest Sector*. FEPA Technical Paper #10 (Vancouver: FEPA).

Nordhaus, W. D. (1992), *The Impact of Stumpage Charges on Prices and Trade Flows in Forest Products, Appendix A to Memorandum Concerning Alleged Subsidies and Preferentiality in the Matter of Certain Softwood Lumber Products from Canada*, INV. C-122-816 (Washington DC: International Trade Administration, US Department of Commerce).

Pearse, P.H. (1976), Timber Rights and Forest Policy in British Columbia. Report of the Royal Commission on Forest Resources (Victoria: Queen's Printer).

Percy, M.B. (1986), *Forest Management and Economic Growth in British Columbia*, Report prepared for the Economic Council of Canada (Ottawa: Supply and Services Canada).

Percy, M.B. and C. Yoder (1987), *The Softwood Lumber Dispute and Canada-US Trade in Natural Resources* (Halifax: Institute for Research on Public Policy).

Price Waterhouse (various years), *The Forest Industry in British Columbia* (Vancouver: Price Waterhouse).

Ricardo, D. (1817, 1977), *Principles of Political Economy and Taxation* (London: J.M. Dent and Sons).

Samuelson, P. (1970), *Economics* (New York: McGraw-Hill).

Scarfe, B. (1995), *An Independent Review of Timber Royalties in British Columbia* (Victoria: Canadian Forest Service).

Schwindt, R. and T.L. Heaps (1996), *Chopping Up the Money Tree: Distributing the Wealth from British Columbia's Forests* (Vancouver: The David Suzuki Foundation).

Statistics Canada (1997), *CANSIM DATA*, Catalogue numbers 65-202 and 72-000 (Ottawa: Statistics Canada).

T.M. Thompson and Associates (1992), *Ownership Status of Land in British Columbia by Forest Region* (Victoria: BC Ministry of Forests/Forestry Canada).

Uhler, R. (1991), "Canadian Public Timber Pricing in the Great Timber Subsidy Debate," in *Canada-United States Trade in Forest Products*, ed. R. Uhler (Vancouver: University of British Columbia Press).