AN EXAMINATION OF CANADIAN LOG IMPORT AND EXPORT DATA AND THEIR POTENTIAL USE FOR LOG PRICE COMPARISONS

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Industry, Economics and Programs Branch
Canadian Forest Service
Natural Resources Canada

Forward

This report was one of a number of reports prepared by the CFS as part of Canada's legal defence during the fourth Canada/US Softwood Lumber Dispute. It formed part of the legal record used in the NAFTA and WTO dispute resolution proceedings.

Introduction

This note has three purposes. First, it examines the various data sets on Canadian log exports and imports submitted to the U.S. Department of Commerce (the "Department," "DOC," or "Commerce") as part of the Department's administrative review proceedings in the case of softwood lumber from Canada. Second, it reviews the theoretical comparisons that could be made between the data sources and Canadian domestic log prices, and demonstrates that no such comparisons would be valid. Third, it reviews the allegations made by the Executive Committee with regard to log export restrictions resulting in an alleged stumpage subsidy to Canadian lumber producers.

Log Quality and Value

Logs are produced when standing timber is felled and the boles of the trees are delimbed and cut into various lengths. As such, logs are not a homogeneous product; rather, they are highly heterogeneous with respect to the wood quality inherent in each individual log. The wood quality varies with species, with the length and diameter of the logs, the density of the wood,[1] and the presence or absence of wood defects.[2] All of these factors affect the value of each log.

In addition to the inherent qualities of the wood contained in the logs, there are a host of other conditions that affect the price paid for a given bundle of logs. Among other things, these will include:

- sales conditions;
- location of sale;
- sale transaction costs;
- local supply and demand conditions; and
- for export sales, the presence or absence of tariffs on logs or the forest products produced from the logs.

Price comparisons made between domestic log prices and imported or exported log values must also control for variations in species, size, and numerous other adjustments in order for valid comparisons to be made. Failure to do so will result in attribution of a price difference that is not market-based.

Export and Import Log Price Data Sources

The following log import and export data have been provided to the DOC in response to the DOC's administrative review questionnaires:

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[1] Not only does the density vary by species, it also varies by the rate at which the trees of the same species grow. In assessing this latter quality, the number of growth rings per unit of diameter (such as rings per inch) is commonly used to assess wood density.

[2] Such as rot, scarring, twist and other defects. See the British Columbia scaling manual for a description of these and other defects that are considered when logs are scaled and graded.

- *Statistics Canada's log export data* – total volume and total value of exports by province broken down by nine species categories under HS4403. Note that this category is for "wood in the rough, whether or not stripped of bark or sapwood, or roughly squared." This category is broader than just logs and thus the data may well include volume and values for products that would not generally be considered to be logs.

  The United States is Canada's largest log export market, accounting for 47.6% of the volume exported. In 1990, Canada entered into a Memorandum of Understanding (MOU) with the United States with respect to the exchange of import data. Under this MOU, each country uses the other's import data to compile its own export data. Therefore, Canada's exports of softwood logs to the United States are derived from the U.S. Customs import records as compiled by the United States Census Bureau.

- *Statistics Canada's log import data* – total volume and value of imports by province broken down by sixteen species categories. As with the export data, the import data is for wood in the rough.

- *DFAIT log export permit data* – provides volume and value of log exports listed by exporters on export permits issued by the Government of Canada's Department of Foreign Affairs and International Trade.

- *Provincial log export and import data* - most provinces collect little, if any, data on log exports or imports. An exception to this rule is British Columbia, which collects volume of logs exported from lands under provincial jurisdiction by the major species groups found in the province. The data also provides log volume by statutory provincial log grades.

Initial Examination of the Data Sources

DFAIT Data

For all provinces other than British Columbia, the DFAIT export permit does not reflect actual shipments. Instead, the permit authorizes shipments up to the volume indicated on the permit; the shipments can be made at any time over the life of the permit, which can be up to two years. The log values recorded on the permit are the permittee's expected price and may not reflect the actual price received. As such, the permit data for all provinces outside of British Columbia does not reflect the actual value of shipments made during the POR. Instead, it reflects the maximum volume for permits issued during the POR and the permit holders' expectation of the log prices that may be received. This data, as a result, cannot be used as a measure of log export prices, as it neither reflects actual export volumes or the export price actually received.

For British Columbia, the DFAIT data reflects the quantity for which an export permit was issued. Not surprisingly, this data is virtually identical to the British Columbia log export permit data, as the two programs are cooperatively administered. As such, the DFAIT data for British Columbia is not considered further; instead, the B.C. data is reviewed later.

Statistics Canada Data

Countries collect export and import data in order to track trade flows, to prepare their national accounts, and to collect import duties. To facilitate the exchange of trade data most countries have adopted a common classification system known as the Harmonized Tariff Schedule (HS). While this system is capable of great dis-aggregation of trade data, it was not designed to capture, nor is it capable of capturing, the important variations in a highly heterogeneous product such as softwood logs. As such, the calculation of constructed values from trade data in order to value specific species and grades of domestic logs is inappropriate. This concern is further enhanced by the fact that the data is for wood in the rough and not strictly for logs. Given the many methods for determining entered value, use of the term "implicit price," though convenient economic shorthand, is incorrect and imprecise. Average unit values are not a surrogate for actual transaction prices; they are an average of declared tariff values.

Table 1 below lists the estimated volume of timber imported and exported by each province based on Statistics Canada data. Also shown is the provincial harvest volume and import and export volume as a percentage of provincial Crown harvest. The volumes imported into Alberta, Saskatchewan and Manitoba are miniscule in absolute terms and percentage terms. Similarly, the export volumes for Québec and Manitoba are negligible.

TABLE 1
Statistics Canada's Import and Export Log Volume as a Percentage of Provincial Softwood Harvest for the Period of Review

Province	Harvest (m^3)	Imports (m^3)	Percent of Harvest	Exports (m^3)	Percent of Harvest
B.C.	75,467,221	411,447	0.545	4,074,866	5.400
Alberta	24,416,580	767	0.003	35,867	0.147
Sask.	2,194,330	128	0.006	0	0.000
Manitoba	1,372,434	77	0.006	1,352	0.099
Ontario	29,597,707	158,584	0.536	69,004	0.233
Québec	35,210,290	3,255,237	7.833	448	0.001

Potential Errors in Statistics Canada's Log Export Data

Figure 1 below graphs the average constructed export value from each of the included provinces.[3] Constructed value is the average value found when total log export value is divided by total log export volume. These values are aberrationally high, particularly

[3] Saskatchewan had no log exports during the period of review.

Québec's. There are at least four potential causes for this. The first is coding errors by Canadian and U.S. authorities in compiling their respective import and export data. Clear evidence of large scale coding errors is presented below. Such errors nullify the usefulness of the export data and in particular the practice of calculating species-specific constructed values.

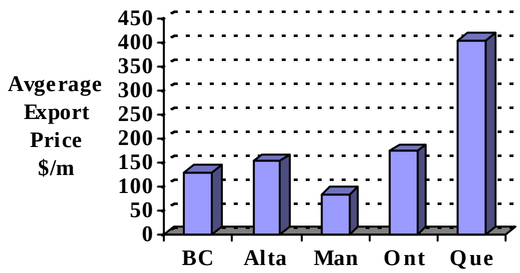

FIGURE 1
Average Constructed Log Export Values by Province
Using Statistics Canada's Log Export Data

The second reason is that in many instances, the logs being exported are high-valued specialty logs meeting some niche market requirements. Such exports would be unrepresentative of either the domestic log harvest or the logs imported into each jurisdiction. For example, Alberta reports that most of its public-land log exports come from fire-killed stands and that these logs command a premium price in the United States by log home builders due to the dry nature of the wood. This quality, while desirable for log home construction, is considered a serious defect when such logs are used for either lumber production or for wood chips.

The third reason is that inappropriate log scale conversion factors were used. An examination of Exhibit GOC-LER-8 of the Canada Nov. 12 Questionnaire Response shows the majority of export permits issued reported the permit volume in board feet log scale or in cords. It thus seems likely that the permit holders reported their shipment volumes to U.S. customs officials in the same units. It is not known if the data edit checks used by the U.S. Census Bureau in compiling the data would recognize the different units, and if it did, what conversion factor would be applied.

The fourth cause may be that the logs were exported through a province but did not originate in that province. An example of this is the cedar exports recorded for Alberta. Alberta has no native cedar and thus did not harvest cedar during the POR.

Evidence of Coding Errors

Evidence of large scale coding errors by Canadian and U.S. agencies in recording their log import data is not hard to find. For example, Table 2 shows Statistics Canada's log export data by HS code for British Columbia. The table also shows the corresponding export volume data from the British Columbia log export permit system. Overall, the total volumes reported are reasonably similar, with the Statistics Canada export data being 7.8% higher than the provincial data. However, the similarity quickly breaks down when a comparison is made of each species under the HS codes. In particular, there are enormous discrepancies between the true fir category (HS 44032062) and the Douglas-fir category (HS 44032080). Clearly, there were large-scale miscoding errors between these two species groups. There are also, however, substantial differences in the other HS categories. In total, only 28% of the Statistics Canada export data has been correctly classified in the HS categories.

TABLE 2
Comparison of British Columbia Coniferous Log Export Data
Statistics Canada's Export Data and BC Export Permit Data

HS Code	**Description**	**Stat Can** (m^3)	**BC** (m^3)	**Difference** (%)
44032031	Pulpwood (balsam, fir and spruce)	18,037	9,140[a]	97.3
44032040	Spruce (saw log or veneer log)	162,606	160,808[b]	1.1
44032050	Pine (saw log or veneer log)	43,158	28,798	49.9
44032061	Hemlock (saw log or veneer log)	742,124	957,749	-22.5
44032062	True Firs (saw log or veneer log)	2,538,020	333,495[b]	661.0
44032070	Cedar (saw log or veneer log)	269,273	227,681	18.3
44032080	Douglas-fir (saw log or veneer log)	266,292	2,060,907	-87.0
44032090	Coniferous (saw log or veneer log)	35,356	1,965	17.0
Total		4,074,866	3,780,543	7.8

a. calculated as the sum of log coastal log grades X, Y and Z plus interior grades 3, 4, 5 and 6.
b. calculated as the provincial species export total less the sum of coastal log grades X, Y and Z plus interior grades 3, 4, 5 and 6.

Statistics Canada data cannot be considered accurate, in light of the above. This is because the majority of British Columbia's log exports are Douglas-fir logs. These logs largely come from coastal private lands that predominately contain Douglas-fir stands. In addition, the B.C. data comes from log scale data recorded by licensed log scalers who are subject to provincial check scales. Both buyers and sellers have an incentive to ensure the accuracy of the scale and, as described in the B.C. Nov. 12 Questionnaire Response at B.C. Vol. 22 ("B.C. LER Response") log buyers physically inspect the log booms prior to making an offer on the logs. The log scale data is submitted to the B.C. Ministry of Forests, which then verifies the data before it is entered into the B.C. log export system. Staff knowledgeable with log scaling rules and species conventions administer this process. The same level of knowledge will not, and cannot be expected to, be found in the data edits conducted by the U.S. Census Bureau when it compiles its import data for this minor import category and submits this data to Statistics Canada to compile its log export data.

Errors in Statistics Canada data affect other provinces also. For example, in its Nov. 12 Questionnaire Response at Québec Vol. 13, Québec reported log exports of 34,796 m^3 during calendar year 2002, as compared to the 488 m^3 reported in Statistics Canada's log export data for fiscal year 2002. Thus, unless 98.67% of Québec's log exports occurred during the first quarter of calendar year 2002, Statistics Canada's log export estimate is highly suspect.

Average Export Log Values. A plot of export log values for logs using Statistics Canada's data (total log shipment value/total shipment volume) as calculated for each species group exported from each province for the period of review is given in Figure 2 below. The number on the horizontal axis indicates the month of the POR in which the shipments took place: month 1 is April 2002 and month 12, March 2003.

The figure shows an enormous variation between and among species and over time. Note that the figure only displays values that were less than $500/$m^3$. Table 3 provides summary statistics on the constructed values by species HS group. The maximum price was for spruce, at the astonishing value of $3,282/ m^3. A value of over $1,000/$m^3$ was also recorded for the "wood in the rough, coniferous, nes" (not elsewhere specified) HS category (HS 4403.20.0090).

In addition to the observations with values greater than $500/$m^3$, note the high number of observations with values greater than $200/$m^3$. These values are aberrational. For example, only 8.5% of the logs traded in the Vancouver Log Market achieve a price greater than or equal to $200/$m^3$. And these prices would only be for extremely high-valued old-growth timber of the highest grade harvested in the coastal forests of British Columbia. The notion that exports from other provinces achieve these rates is simply not credible.

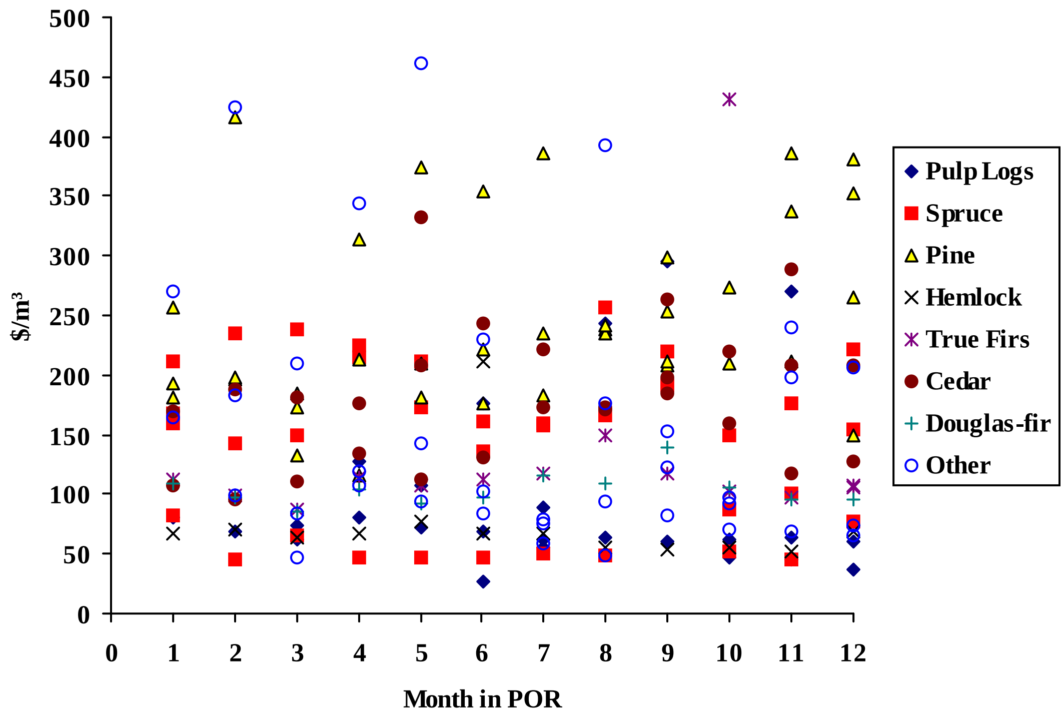

FIGURE 2
Distribution of Monthly Log Values
for Logs Exported to the US by Species Group

TABLE 3
Summary Statistics for Monthly Log Values
for Logs Exported to the US by Species Group
($/m³)

	Mean	Max	Min	Std.Dev.
PULP	121.65	294.77	27.62	94.15
SPRUCE	267.47	3,282.00	44.99	574.30
PINE	253.97	508.83	115.24	88.65
HEMLOCK	74.99	212.23	51.33	41.94
TRUE FIR	160.41	546.29	87.18	135.72
CEDAR	167.46	243.50	96.08	41.55
DOUGLAS FIR	103.68	139.08	86.38	13.80
OTHER SW	188.57	1,086.32	47.82	192.04

That the average unit values are not credible is further confirmed by the fact that the maximum value for the price of pulp logs reached a value of \$294.77/m^3 and had an average value of \$121.65/m^3. Table 4 below shows the quarterly price for wood chips in British Columbia during the POR. These prices, in U.S. dollars per oven dried metric tonne (ODMT), were converted to Canadian dollars using the average exchange rate over the POR of 1.549. To convert from ODMT to cubic metres a ratio of the oven-dried weight of wood per m^3 or green timber was used. Nielsen, *et al.* (1985) provides ratios for western species that range from a low of 0.299 tonne/m^3 to a high of 0.485 tonnes/m^3.[4] The ratio for western hemlock, a preferred species for pulping, is 0.423, and this ratio was used to convert the prices in C\$/ODMT to C\$/m^3 in the table.

TABLE 4
Conversion of Wood Chip Prices to Cubic Metre of Solid Wood Equivalents

	BC		
	US\$/ODMT*	**C\$/ODMT**	**C\$/m³**
Q2 2002	52	80.55	34.07
Q3 2002	52	80.55	34.07
Q4 2002	52	80.55	34.07
Q1 2003	53	82.10	34.73
Mean	52.25	80.94	34.24

* Source: Wood Resources International Ltd. North American Wood Fibre Review
ODMT – oven dried metric tonne

The average value over the POR was C\$36.21/m^3 in British Columbia. This value is not even close to the average constructed value for pulp logs of \$121.65/m^3 as derived from the export data. That the constructed value of pulp logs is greater than the value of the wood chips into which pulp logs are converted prior to the pulping process is simply not credible.

The export values for logs not classified as pulp logs can also be shown to be wholly improbable. We do this under the conservative assumption that all of the non-pulp logs were used as sawlogs. This would not strictly be true of all export logs, as many are used for other higher-valued specialty purposes. Nevertheless, these high-valued specialty logs cannot be taken as representative of domestic log prices and, as such, their values would be inappropriate to use in comparison to the price of domestic log sorts.

Under the assumption that the non-pulp logs are all sawlogs, we determined what the minimum average price for the lumber produced from a given log would have to be in order to justify the constructed log value. We then expressed the required minimum average lumber price in US\$/MBF in order to facilitate comparisons to actual lumber

[4] Nielson, R.W., J. Dobie, and D.M. Wright. 1985. Conversion factors for the forest products industry in Western Canada. FORINTEK Canada Corporation, Western Laboratory, Special Publication SP-24R. Vancouver, BC.

prices during the POR. The log price was divided by the average exchange rate over the POR and then divided by a lumber recovery factor (LRF). An LRF gives the ratio of lumber produced, in board feet, per m³ of log input. The higher the LRF, the lower the required average lumber price will be.

Nielsen, *et al.* (1985) reviews several studies that report LRFs in British Columbia. LRFs are shown to vary by log diameter, species, and the type of headrig saw used to break down the logs into lumber. They report LRF values ranging from 0.162 MBF/m³ to 0.272 MBF/m³. A relatively high value of 0.24 MBF/m³ was used in the calculations below.[5]

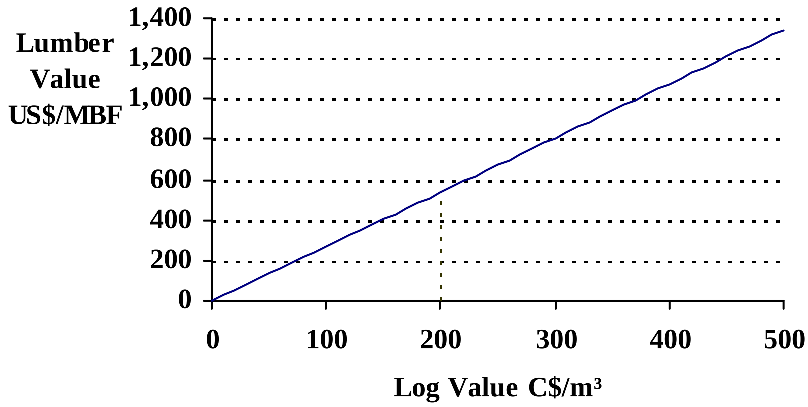

FIGURE 3
Minimum Average Lumber Value Required to Justify a Given Log Value

The results of this calculation are graphed in Figure 3. In this calculation, it was assumed that there are no sawmilling costs or sawmill byproduct revenue from wood chips, sawdust, and shavings. Including the byproduct revenue would lower the required average lumber price, while including sawmilling costs would raise the required average price. As sawmilling costs exceed byproduct revenues, the exclusion of both provides a lower conservative bound on the required average lumber price.

Figure 3 shows, for example, that a log with a constructed value of C$200/m³ would require a minimum average value for all of the lumber produced from the log of US$538/MBF in order to justify the constructed log value. Similarly, a log value of C$500/m³ requires an average lumber price of US$1,345/MBF. Table 5 below shows the required average constructed value needed to justify the mean and maximum implicit export price for each HS species group in the Statistics Canada export data.

[5] Nielson et al. (1985) report the LRFs in BF/m³. Simply divide by 1,000 to yield the same LRF in MBF/m³. Note that a LRF is simply the ratio of actual lumber output per unit of log input. It should not be confused with log scale conversion factors that convert board feet log scale measurements into m³ measurements of log volume.

TABLE 5
Required Minimum Average Log Price for the Mean and Maximum Constructed Monthly Log Values

	Mean Log Value	Required Lumber Price	Max Log Value	Required Lumber Price
	C\$/m³	US\$/MBF	C\$/m³	US\$/MBF
PULP	121.65	327.19	294.77	792.82
SPRUCE	267.47	719.39	3,282.00	8,827.33
PINE	253.97	683.08	508.83	1,368.56
HEMLOCK	74.99	201.69	212.23	570.82
TRUE FIR	160.41	431.44	546.29	1,469.31
CEDAR	167.46	450.40	243.50	654.92
DOUGLAS FIR	103.68	278.86	139.08	374.07
OTHER SW	188.57	507.18	1,086.32	2,921.79

The range of required average lumber prices across and within HS groupings is dramatic. For example, the highest observed monthly constructed log value for spruce has a required average lumber value of US\$8,827/MBF. The average lumber price required to justify the mean pulp log constructed value is US\$327/MBF. By comparison, the Random Lengths North American Framing Lumber Composite Price during the POR was only US\$296/MBF. The required lumber price for the mean constructed log values for spruce and pine are more than double the composite price.[6] In summary, most of the constructed log values generated from the export data are simply not credible.

Errors in Statistics Canada's Log Import Data

The Statistics Canada import data also contains anomalies**.** For example, the import data shows Québec as having imported 91,801 m³ of yellow cedar (cypress) with a constructed value of \$58.05/m³. This is implausible, as yellow cedar is a high-valued species native to the west coast of North America. That this amount was shipped across the continent from the U.S. West Coast at such a low price is improbable, at best. A simple miscoding

[6] The Random Length composite price is an average of lumber prices from various regions across North America. See http://www.randomlengths.com/ for a description of the broad range of species and lumber dimensions included in the composite price. Note that the lumber grades included in the composite price are #2 or better or standard and better. As such, the composite price provides an upward-biased indicator of average North American lumber prices, as it excludes the much lower prices for economy, utility, and other grades. However, the composite price was designed to provide a means of tracking market changes across North America, and not to be an indicator of average lumber prices.

of eastern cedar is the likely cause. A coding error is also likely to be the cause for the Western Hemlock reported as being imported into Québec.

Import Values

Monthly constructed import values were calculated for each HS log import category by province. The values are plotted over time in Figure 4 below; Table 6 provides some summary statistics on the observed values. Note that the figure only displays observations that were less than $250/m^3. There were several observations with values greater than $250/m^3 with the highest value, as indicated in Table 6, being $1,156.88/m^3. Note also that the lowest value was only $0.60/m^3.

As these tables show, there is significant variation in values within and across HS categories. This variation and the outlier values discussed above cast great doubt on the accuracy of the values. Even if the values are in fact based on accurate volumes, they demonstrate enormous variation across shipments in the quality of the timber imports. As such, they cannot be said to be representative of domestic prices.

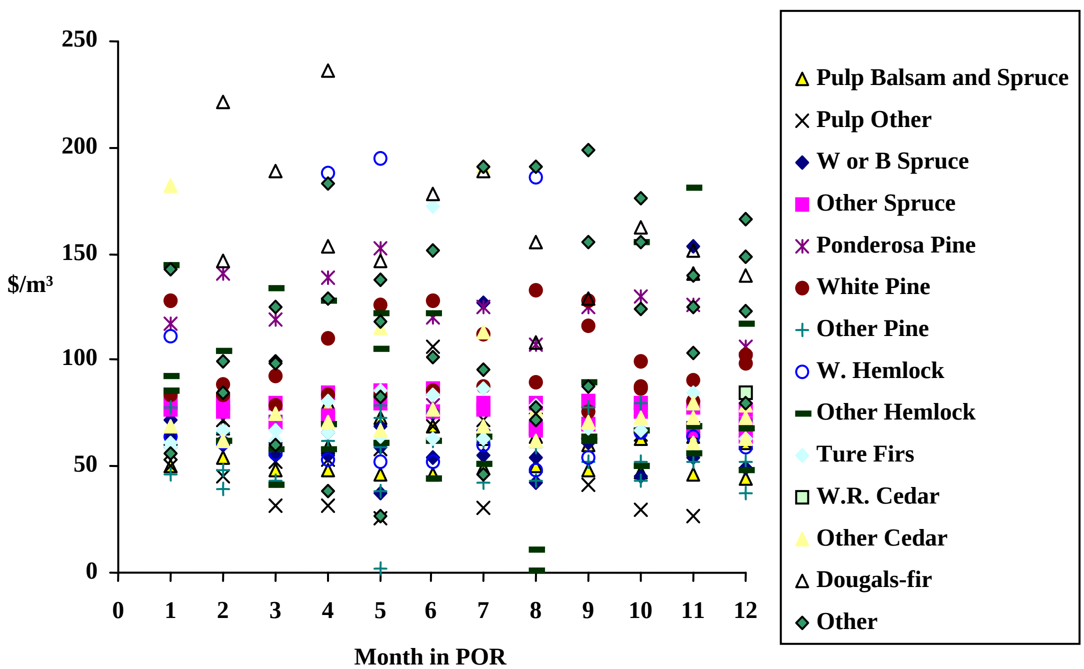

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FIGURE 4
Distribution of Monthly Log Values
for Logs Imported from the US by Species Group

TABLE 6
Summary Statistics for Monthly Log Values
for Logs Imported from the US by Species Group
($/m³)

	Mean	Max	Min.	Std. Dev.
Pulp Balsam & Spruce	58.36	80.11	44.59	10.97
Pulp Other	55.66	106.41	25.78	19.90
W & B Spruce	65.59	153.64	36.98	21.64
Other Spruce	95.79	628.31	64.35	104.52
Ponderosa Pine	121.99	152.52	78.47	18.35
White Pine	98.40	132.48	76.15	18.08
Other Pine	57.24	79.86	2.00	17.44
W. Hemlock	107.48	456.83	48.14	103.92
Other Hemlock	80.26	181.57	0.60	40.48
True Firs	75.84	172.29	58.73	25.20
W.R. Cedar	457.98	1,156.88	84.44	363.66
Other Cedar	85.77	190.54	60.82	36.33
Douglas-fir	163.22	236.00	108.22	34.24
Other SW	115.50	198.78	26.17	44.85
ALL	67.79	190.86	23.39	30.78

Missing Measures of Log Quality

At the start of this note, it was emphasised that logs are a heterogeneous product, with the value of the log being determined not only by its volume, but also by the timber quality and a host of local market conditions. While species is a major determinant of quality, it is by no means the only determinant, nor necessarily the most important determinant, of quality.[7] Factors such as log diameter, straightness, amount of defects, and tree ring density all affect log quality. The implication of this is that comparisons of log prices in which differences in log quality are not controlled can make the price comparisons essentially meaningless.

The Statistics Canada export and import log value data only partially controls for species, and, to the extent that pulp logs are correctly classified, only partially for log quality. Within the “saw log and veneer log” category there are no quality parameters, and it is in this grouping that the largest variations in quality are found. This lack of a quality measure largely makes price comparisons from these data sources meaningless other than as a means of indicating that there is, in fact, a quality difference. That there is a higher export price for a given species compared to the import price essentially means that the quality of the logs exported is higher than the quality of the logs imported, and vice versa. Without a means for controlling for timber quality, no other conclusion can be justified.

[7] For example, western hemlock and balsam fir are treated and traded as one species group in the coastal regions of both British Columbia and the U.S. Pacific Northwest.

The only data source that provides measures of log quality is the log export data for the coastal region of British Columbia. The coastal log grading system uses thirteen log grades to cover the significant variation in quality that is found in the logs harvested from the coastal region. Figures 5 to 8 below compare the log grade distributions of exported logs and the domestic logs traded on the Vancouver Log Market for four species over the POR. The figures confirm that there is significant variation in log grade distributions between exported and imported logs. Also, there are significant quality differences within grades between logs that are exported and domestic logs, as noted in the B.C. LER Response. As such, comparisons of overall species prices that do not control for the quality differences are inherently flawed.

Conclusions Regarding Export and Import Value Data

- The DFAIT export permit data represents permits active during the POR. However, for all provinces except British Columbia, this data does not reflect the volume of logs shipped during the POR or the prices received by exporters. Accordingly, this data cannot be used for comparison to domestic prices, to calculate some domestic prices, or for comparison to import data.

- The data collection systems for the log import and export data reported by Statistics Canada were never designed to provide the log quality detail needed to compare constructed export and import values to each other or to domestic prices. Neither data set contains sufficient log quality data to make such comparisons meaningful.

- Large errors were identified in the Statistics Canada export data. The import data also had identifiable coding errors. Such coding errors makes the use of species-specific constructed values highly suspect.

- An examination of the individual constructed import and export values showed both extraordinary variation and implausible value extremes across and within species groups. This casts doubt on the validity of the constructed values as accurate measures of log values.

- If the numerous attributes of log quality are not controlled, comparisons of log prices can produce totally erroneous conclusions.

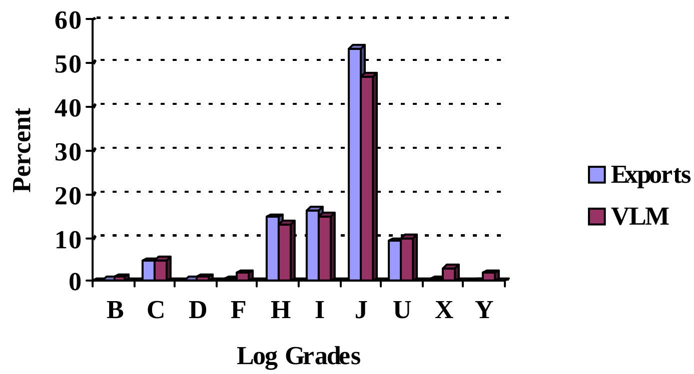

FIGURE 6
Comparison of Log Grade Distributions of Douglas-fir Logs Exported from BC and Douglas-fir Logs Traded on the Vancouver Log Market

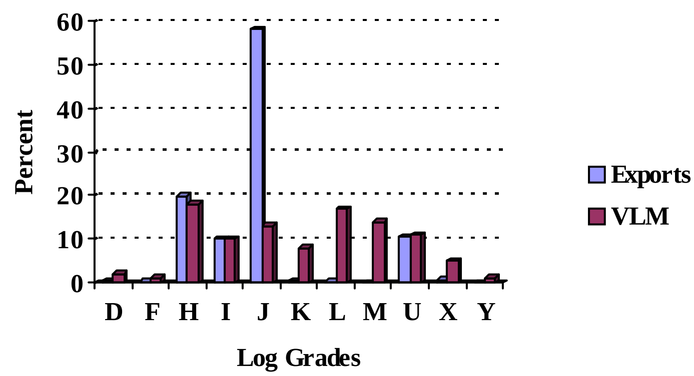

FIGURE 7
Comparison of Log Grade Distributions of Western Red Cedar Logs Exported from BC and Western Red Cedar Logs Traded on the Vancouver Log Market

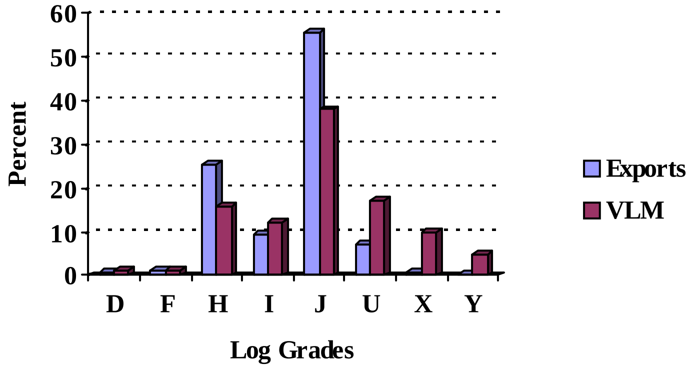

FIGURE 8
Comparison of Log Grade Distributions of HemBal Logs Exported from BC and HemBal Logs Traded on the Vancouver Log Market

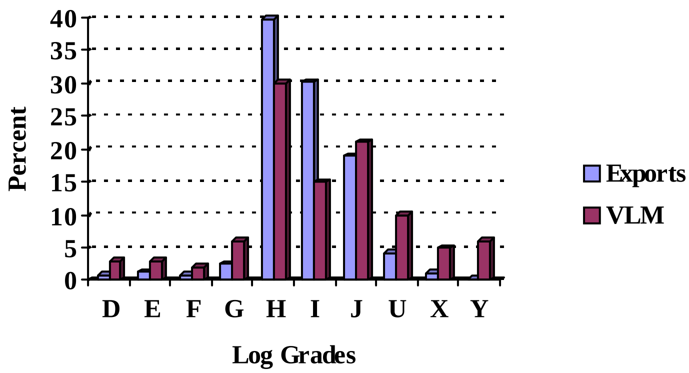

FIGURE 9
Comparison of Log Grade Distributions of Spruce Logs Exported from BC and Spruce Logs Traded on the Vancouver Log Market

Use of Log Prices for Stumpage Price Comparisons

In its remand determination to the NAFTA countervailing duty Panel, the Department of Commerce used a residual value calculation starting from log prices to calculate the alleged stumpage subsidy. The DOC's method for calculating the alleged stumpage subsidy was:

$$\text{Subsidy/m}^3 = \text{Avg. Log Price} - \text{Avg. Harvest Cost} - \text{Avg. Crown Stumpage}$$

For this calculation to be valid, the three right-hand-side variables must be accurately measured. For the average log price, this means that the price must reflect the types and quality of the logs harvested from Crown lands. To use an average price derived from a basket of logs that have different qualities than those harvested from Crown lands would produce erroneous subsidy estimates. The use of prices not directly derived from the sale of a representative sample of logs harvested from Crown lands would necessarily invalidate the calculation.

That market factors other than timber quality can and do affect log prices is amply demonstrated in Figures 9 and 10 below. Figure 9 shows the domestic log price paid for Douglas-fir No. 2 sawlogs in the U.S. Pacific Northwest for three of the log price regions defined by Log Lines Log Price Reporting Service of Mount Vernon, Washington. Region 1 is the Puget Sound area of Washington, Region 3 is the Columbia River area of Oregon, and Region 5 is Oregon's Willamette Valley. Since these regions all employ the same log grading system, the No. 2 sawlog grade is standard across all three regions. There are significant and sustained inter-regional differences in log prices. That these differences occur and persist is neither evidence of log price suppression in one region compared to another, nor evidence of a stumpage subsidy.

Figure 10 provides further evidence that market factors other than timber quality affect log prices. This figure shows large and persistent differences in delivered southern pine sawlog prices across states.

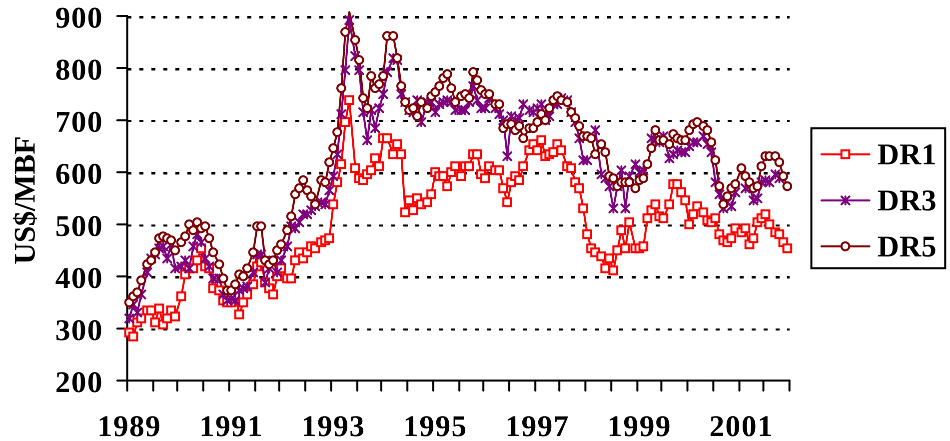

FIGURE 9
Monthly Douglas-fir No. 2 Sawlog Prices in the US Pacific Northwest
(Source: Log Lines Log Price Reporting Service)

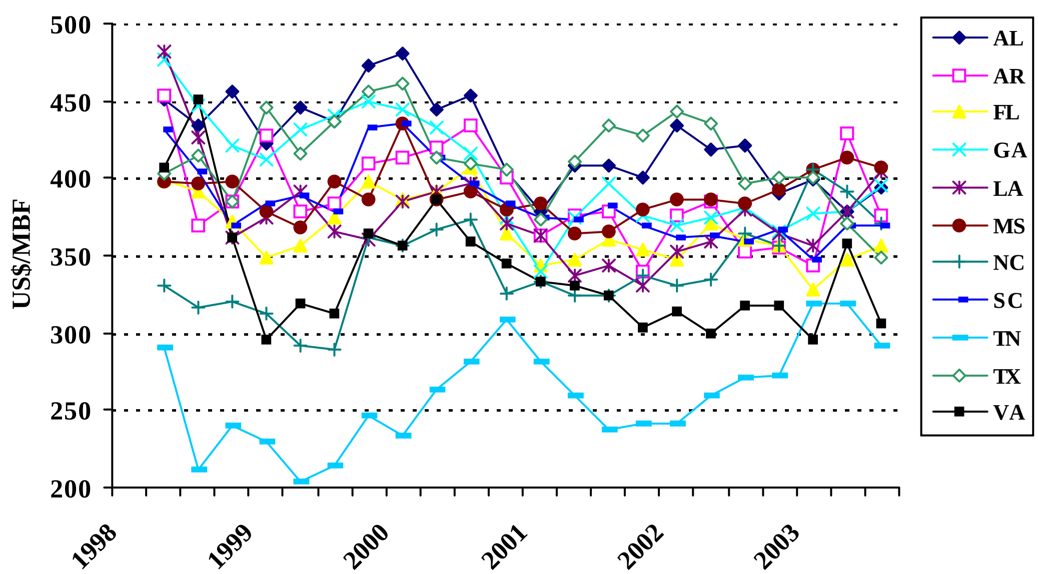

FIGURE 10
Quarterly Southern Pine Delivered Sawlog Prices in the US South
(Source: TimberMart South)

These two figures also show the limited geographical area over which log prices are determined. As Canada has repeatedly stressed to the Department, log transportation costs limit the distance over which logs will be traded. For example, Oregon's Willamette Valley is not a coastal region, which means that logs must be hauled by truck to an ocean port. With these higher transportation costs, it is not surprising that there are limited log exports from this area as compared to the coastal areas of the Pacific Northwest. For its Region 5, Log Lines reports Douglas-fir log export prices for only two months, both in 1990, over the period 1989-2001. This is evidence of the lack of log exports from non-coastal areas.

Price Suppression

The Executive Committee alleges that any difference between export and domestic log prices in Canada is the result of "price suppressions" in the Canadian domestic market by provincial log export restraints. It further alleges that this price difference constitutes a countervailable subsidy.

The Executive Committee's argument is based on the premise that provincial programs substantially restrict log exports. This is unfounded, as the provinces have demonstrated in the Log Export Restraint Appendix portions of their November 12 Questionnaire Responses. Based on a short-term partial equilibrium framework, the Executive Committee contends that export restrictions increase the supply to the domestic market, which necessarily reduces log prices in Canada.

Record evidence filed by the Canadian parties rebuts this claim. The evidence includes a study by Professor Edward Leamer, who used a longer-term general equilibrium approach to show that any such advantage would necessarily attract new entrants into the domestic market and cause the domestic price to rise until any price advantage is removed. British Columbia's log export permit program, the main target of the Executive Committee's allegations, has been in place for over one hundred years. Thus, as Dr. Leamer demonstrated, any advantage that may have been conferred by the export restraint has long since been competed away and any price difference between export and domestic markets can be attributed to the factors enumerated earlier.

Testing for Differences in Export and Domestic Log Prices in Five Markets

The hypothesis that export and domestic log prices can differ for reasons other than domestic price suppression is tested using data from five markets. The first is Douglas-fir log prices from the U.S. Pacific Northwest. Domestic Douglas-fir No. 2 sawlog prices were used for the domestic price and Douglas-fir export prices are used as the comparable export price (source: Log Lines Log Price Reporting Service). Monthly prices from 1999 to 2002 were used for this comparison. The second is radiata pine log prices from New Zealand. Export prices for pruned logs were compared to domestic pruned prices.[8] The domestic P2 log grade was selected as having the closest grading characteristics to the export grade. Quarterly prices for the period Q2 1994 to Q4 2003 were used for this comparison. Domestic prices are in New Zealand dollars (NZ$) per tonne while export prices are in NZ$ per cubic metre. The New Zealand Ministry of Agriculture and Forestry recommends a volume conversion factor of 0.98m^3/tonne. This

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[8] The log price data and definitions of New Zealand log grades can be found at www.maf.govt.nz/forestry/statistics. The quarterly log prices are given as price ranges. The centre point of the price range was used below.

factor was used to standardize domestic prices into NZ$/m³. The third is softwood log prices from Chile. Average annual export and domestic prices as reported by the USDA Foreign Agriculture Service were used.[9] The fourth is Finland. The Finnish Forest Research Institute publishes annual delivered domestic log prices and volumes of softwood timber exported and imported. Export prices for Finland were based on coniferous wood in the rough trade data published by the U.N. Food and Agriculture Organization. Finally, the coastal B.C. market is reviewed. The average price of all species traded on the Vancouver log market is used as the domestic price and the constructed average export value for all B.C. log exports is used as the export price.[10]

U.S. Pacific Northwest

Figure 11 plots the difference between export and domestic log prices in the Puget Sound area of Washington State. Figure 12 shows the prices in the Columbia River area of Oregon. The averages are given in Table 7. Note the large and persistent difference between export and domestic price in both areas.

If we are to believe the Executive Committee's logic, the U.S. log export restrictions provide Douglas-fir lumber producers in the coastal region of Washington State with a stumpage subsidy of US$101/MBF during 2002. The Douglas-fir harvest in Washington State was 1,744,634 MBF for 2000, the latest year that harvest statistics are available. This produces a total annual subsidy of US$176 million to Douglas-fir harvesters in Washington State. And this is just one species harvested. For Oregon State, the unit subsidy rate is even higher at US$112/MBF.

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[9] See USDA Foreign Agriculture Service. 2003. Chile solid wood products annual 2003.
[10] Both the B.C. export permit value and the Statistics Canada export values are used to derive the implicit export price.

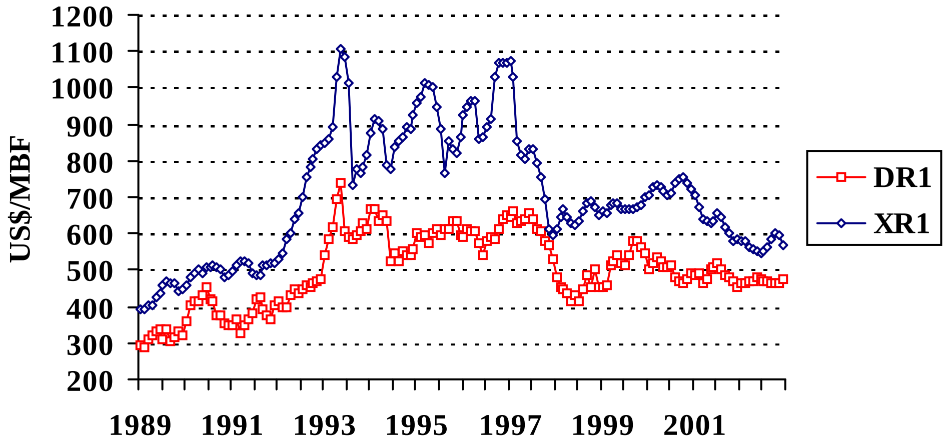

FIGURE 11
Monthly Export and Domestic Douglas-Fir Prices
in the Puget Sound Region (Region 1) 1989-2002
(US$/MBF Scribner)

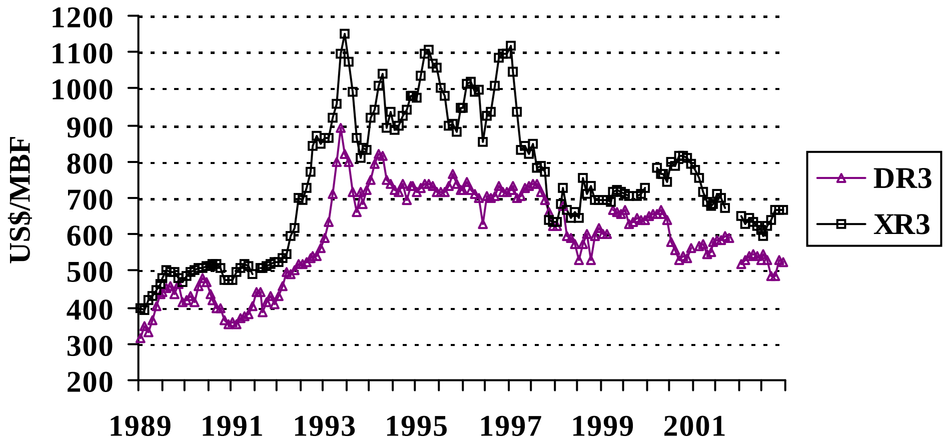

FIGURE 12
Monthly Export and Domestic Douglas-Fir Prices
in the Columbia River Region (Region 3) 1989-2002
(US$/MBF Scribner)

TABLE 7
Average Annual Douglas-Fir Export and Domestic Log Prices
(US/MBF)

Year	Puget Sound Export	Puget Sound Domestic	Puget Sound Difference	Columbia R. Export	Columbia R. Domestic	Columbia R. Difference
1989	317	433	116	405	457	51
1990	398	494	97	420	501	81
1991	376	509	132	398	507	109
1992	440	689	249	510	690	179
1993	616	892	276	729	938	208
1994	586	868	281	750	945	195
1995	605	910	306	731	996	265
1996	599	964	365	709	997	288
1997	617	808	190	709	838	129
1998	452	651	199	592	688	96
1999	526	673	147	640	709	69
2000	499	728	230	603	789	186
2001	486	633	147	574	709	135
2002	469	570	101	526	638	112

Source: Export and Domestic prices from Log Lines Log Price Reporting Service

New Zealand and Chile

The Executive Committee’s theory can also be applied to the New Zealand and Chilean log price data for radiata pine. Figures 16 and 17 show the domestic and export prices for each country. Tables 8 and 9 provide the annual averages for the price differences in each country. If the Executive Committee’s theory is used, a price difference is equivalent to a stumpage subsidy, and New Zealand and Chile would have received a subsidy of US$40.99/m³ and US$19/m³ in 2002. [11] Given that their harvest in 2002 was 20.9 million m³ and 13.2 million m³ respectively, the total subsidy, based on the Executive Committee’s theory, would have been $856.7 million and US$250.8 million respectively. There are no export restrictions in either country that the Executive Committee could point to explain this price distortion. Rather, the price differences between export and domestic prices are due to the many factors that differentiate log export sales from domestic log sales, and nothing else.

[11] New Zealand dollars converted to U.S. dollars using an exchange rate of 0.464289.

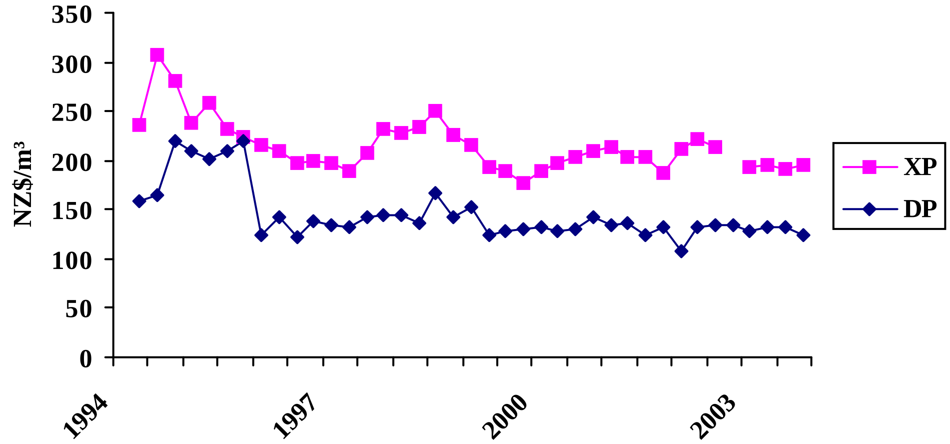

FIGURE 13
Quarterly Export and Domestic Prices Pruned Radiata Pine Logs in New Zealand
(Source: New Zealand Ministry of Agriculture and Forestry)

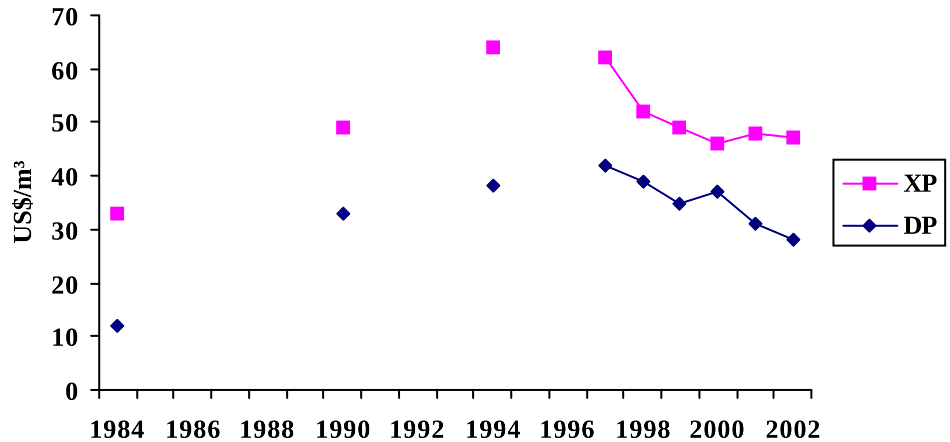

FIGURE 14
Annual Export and Domestic Prices for Softwood Logs in Chile
(Source: US FAS, Chile Solid Wood Annual Reports)

TABLE 9
Difference Between Export and Domestic Log Prices For Pruned Radiata Pine Logs in New Zealand
(NZ$/m³, annual averages)

Year	Export Price	Domestic Price	Difference
1994	274.67	181.12	93.54
1995	237.88	209.82	28.05
1996	205.25	132.40	72.85
1997	206.63	138.39	68.23
1998	234.00	147.96	86.04
1999	193.38	133.80	59.57
2000	191.63	130.61	61.01
2001	202.38	132.14	70.23
2002	215.83	127.55	88.28

TABLE 12
Difference Between Export and Domestic Softwood Log Prices in Chile
(US$/m³)

Year	Export Price	Domestic Price	Difference
1980	54	18	36
1984	33	12	21
1990	49	33	16
1994	64	38	26
1997	62	42	20
1998	52	39	13
1999	49	35	14
2000	46	37	13
2001	48	31	17
2002	47	28	19

Finland

Figure 15 below plots the domestic and export log prices for Finland over the period 1992-2001. Table 10 provides the annual price data. Data for 2002 were not available. As with all of the other regions examined, there is a substantial difference between export and domestic log prices. The Finnish softwood harvest was 44.6 million m³ in 2001, which together with the export-domestic price difference of US$33.53/m³ implies a stumpage subsidy of US$1.5 billion, according to the Executive Committee's theory.

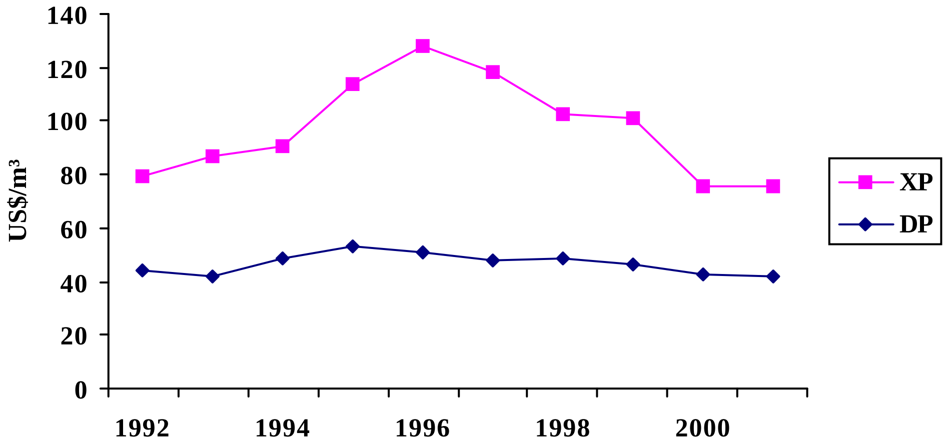

FIGURE 15
Annual Export and Domestic Prices for Softwood Logs in Finland
(Source: UN FAO and Finnish Forest Research Institute)

TABLE 10
Difference Between Export and Domestic Softwood Log Prices in Chile
(US$/m³)

Year	Export Price	Domestic Price	Difference
1992	79.03	44.11	45.31
1993	87.10	42.04	54.96
1994	90.53	48.97	53.09
1995	113.75	52.87	73.33
1996	127.96	50.86	87.91
1997	118.24	47.89	70.36
1998	102.32	48.69	53.63
1999	100.74	46.67	54.07
2000	75.96	42.60	33.36
2001	75.64	42.11	33.53

British Columbia

Export value and domestic price data for British Columbia are now examined. The Statistics Canada constructed log export values are compared to the average price for domestic logs as determined using data from the Vancouver Log Market (VLM). The concerns expressed above regarding the validity of these constructed export values remain. However, as British Columbia is the intended target of the Executive Committee's allegations, the implications of the available data must be analyzed to determine what inferences, if any, can be drawn from the Executive Committee's price distortion theory.

Figure 16 shows the constructed export values for British Columbia for all softwood log exports using Statistics Canada's export data (SCXP). It uses the volume weighted average for the various HS groupings described earlier. The figures also show the average domestic price (DP) for all softwood species traded on the Vancouver Log Market. Finally, the figure includes the constructed log export values based on the export volumes and values reported by the B.C. Ministry of Forests for log exports from provincially controlled lands (BCXP). Figure 17 shows the difference between the constructed export values and the domestic price.

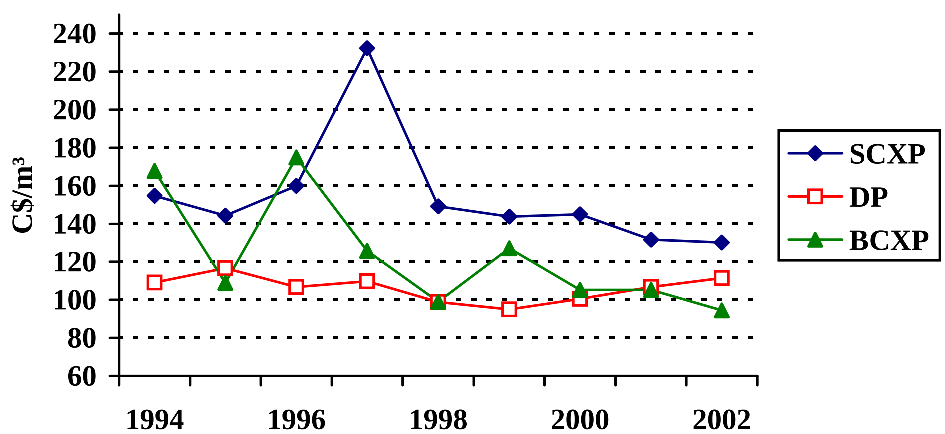

FIGURE 16
Vancouver Log Market Average Annual Domestic Price (VLM) and Average Values of BC Log Exports Based on Statistics Canada (SCXP) And BC Ministry of Forest Data (BCXP)

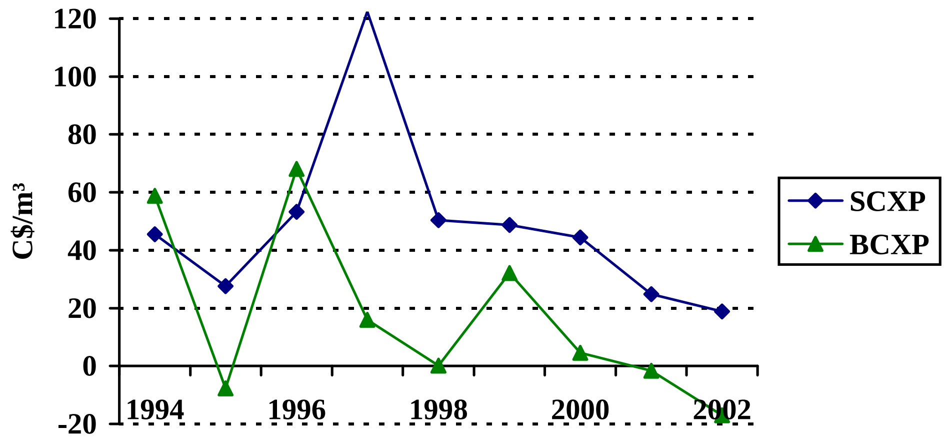

FIGURE 17
Differences Between the Average Annual Value of BC Log Exports Based on Statistics Canada (SCXP) and BC Ministry of Forest Data (BCXP) and the Vancouver Log Market Average Annual Domestic Price

As with the other markets, the difference in export and domestic prices can diverge and converge over different periods in an almost random manner.

Cross Jurisdictional Comparisons

We have demonstrated above that differences between export and import prices for logs can occur in markets with and without log export restrictions, and that these differences persist over time. Now, differences across the jurisdictions reviewed are examined. Prices for calendar year 2002 were used for all areas except British Columbia, which is instead based on data for the POR, and Finland, for which only 2001 data was available. All prices are converted to US$/m^3. To convert the U.S. Pacific Northwest ("PNW") prices from Scribner board foot log scale to m^3 log scale, a conversion factor recommended by Spelter (2002) for the PNW Westside of 6.76 m^3/MBF was used. The results are presented in Figure 18 and Table 11 below.

Of the market comparisons, British Columbia has the lowest price differences – and this comparison was made using the Statistics Canada export values. If British Columbia's export values were based on the B.C. Ministry of Forests data, the B.C. price difference would be negative. If the Executive Committee's theory were accepted, British Columbia's price difference should be greater than New Zealand's, Chile's, and Finland's, but it is not. The Executive Committee's theory must be rejected.

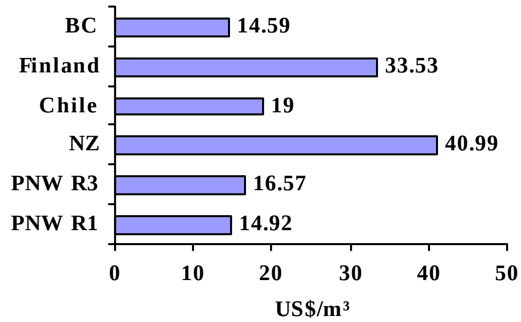

FIGURE 18
Cross Jurisdictional Comparison of the Export-Domestic Price Differences in 2002
(US$/$m^3$)

TABLE 11
Cross Jurisdictional Comparison of the Export-Domestic Price Differences in 2002
(US$/$m^3$)

	Export Price	Domestic Price	Price Difference
US PNW Region 1	84.30	69.38	14.92
US PNW Region 3	94.34	77.77	16.57
New Zealand	100.21	59.22	40.99
Chile	47.00	28.00	19.00
Finland*	75.64	42.11	33.53
BC**	81.85	67.26	14.59

* Finland data for 2001, the latest year available.
**BC data for the Period of Review, export priced based on Statistics Canada data.

Price Convergence

The Executive Committee's price suppression theory is based on the premise that the log export restrictions cause an outward shift in the domestic log supply curve. With a downward-sloping domestic demand curve, this causes the equilibrium price for domestic prices to drop. However, this is a short-term result, as the reduced domestic price should attract new domestic market entrants, causing the price to increase until the remaining price difference between domestic and export prices is due to differences in timber quality and/or differences in the conditions of sale. The Executive Committee's price suppression theory, therefore, requires that the short-term prediction be maintained in the long run. That is, a reduced price will not attract new market participants that would result in rising domestic prices.

If, for arguments sake, the Executive Committee's theory were accepted, the difference in export and domestic prices should be positively related to the degree that export restrictions prevent exports. Conversely, the price differences should be negatively related to the quantity of logs exported. Lower price differences should occur when exports are high and a higher price difference should occur when exports are low. But is this convergence of export and domestic prices as exports increase observed in the marketplace?

Figure 19 shows the export volume as a percentage of total harvest in the market areas examined above. Figure 20 then plots the observed price difference against the export percentage. According to the Executive Committee's theory, we should see a downward relationship between the price difference and the export percentage. But the plot shows no such relationship.

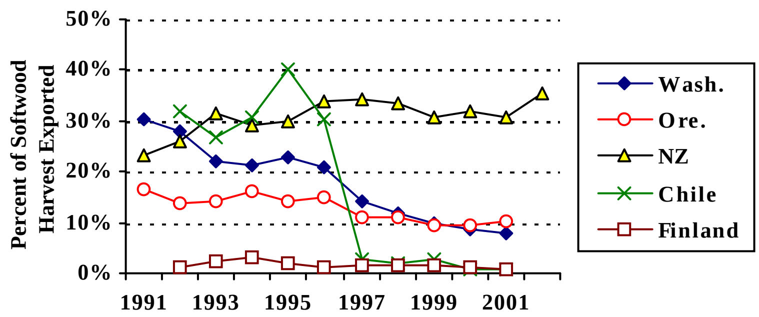

FIGURE 19
Log Exports as a Percentage of Softwood Harvest

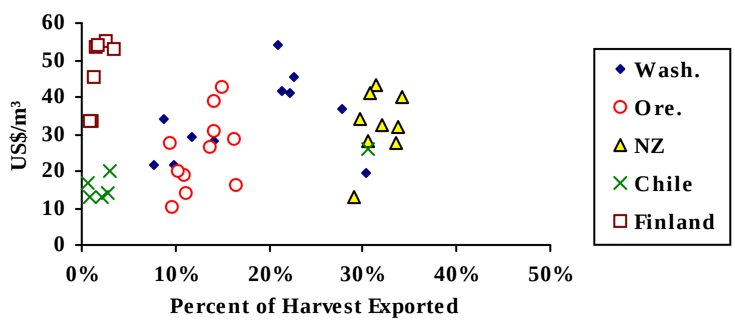

FIGURE 20
Relationship Between Export-Domestic Price Differences
And the Percent of Total Softwood Harvest Exported

Indeed, the relationship shown in Figure 20 suggests that the price difference increases with the percent of harvest exported. This is confirmed by the regression results shown in Table 12 below, in which the percent of harvest exported by each region (PCTEXP) was regressed on the price difference. The coefficients for each region's PCTEXP were positive, not negative. While two coefficients are not statistically significant, the other three are at the 90% confidence level or greater. This does not support the Executive Committee's theory.

TABLE 12
Regression of Export-Domestic Price Differences as a Function of The Percent of Total Softwood Harvest Exports

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	21.66382	4.544665	4.766867	0.0000
ORE_PCTEXP	32.03727	44.97318	0.712364	0.4804
WA_PCTEXP	65.10009	29.08000	2.238655	0.0308
NZ_PCTEXP	34.28127	19.48700	1.759186	0.0862
CHILE_PCTEXP	8.147388	45.05437	0.180835	0.8574
FINLAND_PCTEXP	1900.122	340.6249	5.578342	0.0000

In contrast, Professor Leamer's theory explains the observed data. Under his theory, any price suppression in the domestic market leads to new market entry, which causes the domestic demand curve to shift outward. This results in a higher equilibrium domestic price. The entry continues until the difference in prices between the export and domestic market reflect only quality differences and differences in the conditions of sale. There is no expectation of divergence between export and domestic prices except in the short-run. As British Columbia's log export restrictions are over 100 years old, the short-run no longer applies and no price suppression is observed in any market examined.

If one insists on accepting the Executive Committee's theory, then one must also accept that international markets are behaving irrationally, as the data contradicts the theory's predictions. If, on the other hand, Professor Leamer's theory is accepted, then international markets are functioning well. Occam's Razor favours Professor Leamer.

Conclusions

- A difference in export log prices and domestic log prices exists in markets with and without log export restrictions. Thus, a price difference is not evidence in and of itself that prices are suppressed in the domestic market.

- British Columbia was shown to have the lowest export-domestic price difference of the four markets examined. British Columbia's difference was lower than that found in the U.S. PNW, lower than that found in New Zealand, lower than that found in Chile, and lower than that found in Finland. As the latter three countries do not have log export restrictions, the British Columbia difference cannot be attributed to its log export restrictions.

- The results support Professor Leamer's theory that entry into the domestic market will eliminate price differences not due to quality differences or differences in sales conditions between export and domestic sales.

- The results contradict the Executive Committee's allegation of domestic price suppression, which was the basis of their new subsidy claim.

A Review of the Economists, Inc.'s Report on Log Export Restrictions

The Executive Committee has filed a number of studies prepared by the Committee's consultants, Economists, Inc. These include a study that purports to estimate the impact of provincial log export restrictions on domestic log prices.[12] Before considering the faulty logic and procedures used by Economists, Inc., it is instructive to examine the results of their LER stumpage subsidy calculation. This is shown in Table 13 below.

The first row of the table provides the gross revenue of the lumber industry in each province over the period of review, which includes both lumber and residual by-product revenue. The second row is the alleged LER subsidy value calculated by Economists, Inc., and the third row is the required CVD rate needed to offset the alleged subsidy (row two divided by row one). Note the values for Ontario. According to Economists, Inc., the alleged subsidy provided to the Ontario industry is greater than the gross revenue received by the Ontario lumber industry. Under this calculation, the Ontario lumber industry would need to hand over *all* of its gross revenue to government in order to negate the alleged subsidy, and then the industry would still need to pay a further $510 million to the province. These calculations are not realistic. All they demonstrate is the spurious results that can be derived through the use of simplistic inter-jurisdictional or export-import price comparisons.

TABLE 13
Alleged Stumpage Subsidy Due to Log Export Restrictions as Calculated by Economists, Inc.

	BC	Alberta	Ontario	Québec
Ind. Gross Rev.	$7,639,721,000	$1,301,588,000	$1,550,195,000	$3,650,878,000
LER Subsidy	$1,319,568,755	$513,310,515	$2,061,175,967	$306,770,867
CVD	17.27%	39.44%	132.96%	8.40%

Test of the Executive Committee's Ripple Theory – Are Local Stumpage Markets Linked?

Economists, Inc.'s paper puts forward the "Ripple Theory" of price transmission in order to claim that differences in export and domestic log prices affect log prices throughout each province. This theory suggests that an increase in exports in one sub-market creates a supply shortage that causes mills to seek logs in other areas, which drives up prices in these adjoining areas. This ripple continues across all areas, over any and all distances.

[12] Stoner, R.D., H. McFarland and G. Mosteller. Undated. Price impact of Canadian log restraints.

But this is not feasible given the low value-to-weight ratio of harvested logs, which limits the geographic area that encompasses a unified market. Given high transportation costs, the ripples cannot travel far.

The first test of the ripple theory is to look at Figure 10, discussed earlier, which shows quarterly delivered southern pine sawlog prices for the 11 states that make up the United State's southern pine region. The prices are shown to vary considerably and not move in the same direction. Table 14 shows a correlation matrix for log prices across states. If the ripple theory is correct, prices should move together and the correlation between states should be close to +1. Of the 55 correlation pairs, only one is above 0.8, and only seven are above 0.7. On the other hand, 15 state pairs have negative correlations. These negative correlations include bordering states. For example, the correlation between prices in North Carolina and South Carolina is –0.083, while that between Virginia and North Carolina is –0.012. The ripples, therefore, do not travel far in the U.S. South.

Table 15 provides some summary statistics on the states' log prices. It shows that the mean for the prices ranged from a high of US$424/MBF to a low of US$260/MBF, a difference of US$164/MBF. There is also a difference in mean values between bordering states. For North and South Carolina the difference is US$38/MBF, and between North Carolina and Tennessee US$82/MBF.

TABLE 14
Correlation Matrix for Southern Pine Prices for Delivered Sawlogs by State

	AL	AR	FL	GA	LA	MS	NC	SC	TN	TX	VA
AL	1.000										
AR	0.458	1.000									
FL	0.746	0.584	1.000								
GA	0.806	0.565	0.767	1.000							
LA	0.322	0.551	0.553	0.637	1.000						
MS	0.199	0.228	0.211	0.266	0.344	1.000					
NC	-0.203	0.047	-0.060	-0.229	0.014	0.476	1.000				
SC	0.715	0.657	0.790	0.798	0.550	0.226	-0.083	1.000			
TN	-0.510	0.127	-0.233	-0.424	0.112	0.249	0.732	-0.247	1.000		
TX	0.580	0.154	0.297	0.353	-0.229	-0.128	-0.334	0.409	-0.606	1.000	
VA	0.423	0.447	0.696	0.605	0.646	0.245	-0.012	0.673	-0.066	-0.044	1.000

Source: price data from TimberMart South.

TABLE 15
Summary Statistics for Southern Delivered Sawlog Prices
(US$/MBF)

State	Mean	Median	Maximum	Minimum	Std. Dev.
AL	424	422	480	379	29
AR	389	381	453	340	31
FL	366	360	407	328	21
GA	403	396	477	340	36
LA	376	368	482	330	33
MS	390	386	435	364	16
NC	342	334	405	289	30
SC	384	377	435	348	25
TN	260	260	319	204	33
TX	413	413	461	349	28
VA	339	327	451	296	39

The theory can also be tested by running a trend regression for the log prices in each state to determine whether all states have the same price trend despite the considerable variation described above. The regression results are given in Table 16. The constant term (α) and the trend coefficient (β) were significant at the 95% confidence level or better in all regressions except Mississippi and Texas. For the trend coefficient this means that the hypothesis of a common trend can be decisively rejected. However, the wide range and inconsistent signs of the trend coefficients indicate that prices are not even moving in the same direction across states, with prices increasing in some states and falling in others.

TABLE 16
Trend Regressions of Southern Delivered Sawlog Prices by State
(US$/MBF)

State	α	β	R^2
AL	459.51	-3.076	0.47
AR	413.34	-2.152	0.20
FL	388.56	-1.938	0.35
GA	451.52	-4.179	0.58
LA	401.34	-2.195	0.19
MS	388.05	0.185	0.01
NC	308.70	2.864	0.38
SC	413.61	-2.547	0.44
TN	225.99	2.954	0.33
TX	432.21	-1.662	0.14
VA	378.50	1,109	0.32

So why does the ripple theory fail? As noted above, the low value-to-weight ratio of harvested logs limits the geographic area that encompasses a unified market. This issue has been considered in a number of studies conducted by U.S. researchers. For example, Yin, Newman and Siry (2002) tested for stumpage market integration in the 13 pine sawtimber and 11 pulpwood markets in the U.S. South.[13] They found that these markets were not fully integrated. Their reason for this result was:

> *In our opinion, the main reason that a number of price pairs are not co-integrated lies in the fact that timber is a bulky, relatively low valued good. For this type of commodity, localized factors such as the concentration of manufacturing capacity, the availability and quality of resources, and logging conditions all play important role in price formation. Therefore, it is likely for timber prices in various spatial locations to behave differently, causing markets not to be integrated in certain circumstances.*

Further the authors stated:

> *The South is considered to have some of the most active markets in the country and indeed the world. If market integration does not hold for the regions examined here, then it certainly does not hold for all the timber regions in the South. If it does not hold for the South, it cannot hold for the U.S. as a whole.*

There does not appear to be any known reason for it to hold within Canada either.

If markets are not integrated, then there can be no expectation that prices will move together or even remain close over time. In addition, no artificial discounting of the "ripple effect", as done by Economists, Inc., can somehow correct for the fact that markets are not integrated. It does not matter if the price difference is discounted by 5%, as Economists, Inc. did, or by 95%, non-integration of markets simply means that price comparisons are invalid.

Without full market integration, local supply and demand factors will dominate local log and stumpage price movements, and again, inter-region price comparisons will be invalid. For example, the correlation coefficients for log price movements between North Carolina and its four bordering states were Virginia -0.012, South Carolina -0.083, Georgia -0.229 and Tennessee +0.732. Note that the first two states share the longest borders with North Carolina. These results clearly demonstrate the impossibility of any meaningful inference from cross-border price comparisons whenever markets are not fully integrated.

Prestemon and Holmes (2000) have conducted a test of spatial arbitrage between stumpage markets in the U.S. South.[14] On September 22, 1989, Hurricane Hugo, a class

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[13] Yin, R., D.H. Newman and J. Siry. 2002. Testing for market integration among southern pine regions. *Journal of Forest Economics*, 8(2): 151-166 attached at Tab I.A.

[14] Prestemon, J.P. and T.P Holmes. 2000. Timber price dynamics following a natural catastrophe. *American Journal of Agricultural Economics*, 82:145-160 attached at Tab I.B.

IV hurricane, struck the southern coast of South Carolina, which resulted in the destruction of 20 percent of the standing timber in the state's coastal plain. As one would expect, this catastrophic event had a significant impact on local stumpage prices. Prestemon and Holmes then tested to see what impact this event had on surrounding stumpage markets. Their results provide an ideal empirical test of Economists, Inc.'s ripple theory. The authors concluded that:

> *… because the pulse of salvage in the experimental submarket is not detected in control submarkets outside of South Carolina, the experimental price stumpage submarket has very limited spatial integration with other control submarkets.*

In short, the ripple theory failed. The failure of the theory for the confined geographical area of the states bordering South Carolina strongly indicates that that theory cannot be correctly applied over the much larger geographical areas of Canadian provinces.

Washburn and Binkley (1993) also studied the integration of southern pine sawlog stumpage markets and found that they are not fully integrated.[15] Similarly, Nagubadi *et al*. (2000) examined hardwood stumpage markets in six states in the South Central United States and found that these markets were not integrated.[16] Finally Bingham *et al.* (2003) examined the structure of U.S. southern pine roundwood markets.[17] These latter authors concluded that there was limited price transmission through the southern pine region.

Economists, Inc. might respond that the U.S. South is just an aberration, albeit an incredibly large one, and that the ripple theory works well in the U.S. Pacific Northwest, as shown by the correlation in Douglas-fir log prices shown in Figure 9 earlier. However, this would still leave unexplained the large differences in log prices of the same species and log grade that occur between sub-regions. Indeed, the intra-regional differences in log prices are greater than the difference between B.C. log prices and U.S. PNW log prices that Economists, Inc. take as evidence of price suppression in Canada.

The Executive Committee has also submitted quarterly U.S. log prices for Montana and Eastern Washington/Idaho, which were then used by their consultants to do a cross-border log price comparison with the interior of British Columbia and Alberta. Table 17 below gives the average values over the period of review for Eastern and Western Montana. The Eastern Washington and Idaho data do not provide a mean value; instead they give a price range. Table 17 shows the average high prices, the average log price, and the average price mid-point over the period of review.

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[15] Washburn, C.L. and C.S. Binkley. 1993. Informational efficiency of markets for stumpage: reply. *American Journal of Agricultural Economics,* vol. 75, pp. 239-242 attached at Tab I.C.
[16] Nagubadi, V., I.A. Munn and A. Tahai. 2000. Integration of hardwood stumpage markets in the southcentral United States. *Journal of Forest Economics*, vol. 7(1) attached at Tab I.D.
[17] Bingham, M.F., J.P. Prestemon, D.J. MacNair and R.C. Abt. 2003. Market structure in U.S. southern pine roundwood. *Journal of Forest Economics*, vol. 9, pp. 97-117 attached at Tab I.E.

TABLE 17
US Log Price Data for Montana and Eastern Washington/Idaho for the Period of Review
(US$/MBF)

	Western Montana	Eastern Montana	Eastern Washington / Idaho High	Low	Range Mid-Point
Lodgepole Pine	405	373	413	278	345
Douglas-fir	368	391	470	356	413
Western Larch	384	402	470	356	413
Engelmann Spruce	403	376	368	244	306
Subalpine Fir	331	346	391	305	348
Grand Fir	323	308	391	305	348
Red Cedar	487	550	833	500	666
Hemlock	316	325	391	305	348
White Pine	481	350	575	438	506

It is useful to compare the differences in log prices for the same species both within Montana and between the Montana regions and the bordering state of Idaho. There are substantial variations in prices between the three regions across all species. In addition, there is no consistency in relative prices. For example, Idaho has the highest red cedar price at US$666/MBF and Western Montana the lowest at US$487/MBF, a difference of US$179/MBF, while Western Montana has the highest spruce price of US$403/MBF compared to Idaho's US$306/MBF, a difference of US$97/MBF. Thus, the ripple theory does not appear to be working within the inland region of the U.S. Northwest.

In summary, all tests of Economists, Inc.'s ripple theory have failed and failed decisively. Differences in log prices between regions reflect differences in timber quality, differences in conditions of sale, and differences in local supply and demand conditions. The ripple theory fails for log markets within the United States where adjustments for national border effects are not required. This makes inter-jurisdictional comparisons of log prices meaningless unless all of these factors are controlled for.

Errors in Constructing An Export Benchmark

So far we have shown that the subsidy values generated by the Executive Committee's consultants are so inflated that they exceed the gross value of the lumber produced from the allegedly subsidized logs. We have also shown that the theoretical basis for comparisons of export and domestic log prices is without merit. Further, we have seen that the ripple theory of log price transmission simply fails all tests. However, even if for argument's sake, we put aside the conclusion that Economists, Inc.'s methods and theories are wrong, there still remain numerous logical and factual errors in their subsidy calculations.

Their errors include:

- The use of cross-border log price comparisons for coastal British Columbia, the B.C. Interior, Alberta and Québec. No adjustments are made for thick border effects, differences in sales conditions, or differences in harvesting costs or utilization standards, nor were adjustments made for B.C. Interior, Alberta, and Québec differences in timber quality.

- For Ontario, Economists, Inc. employ a comparison of export and domestic prices using the Statistics Canada export data discussed at length above. No adjustments are made for timber quality or differences in sales conditions.

- The export market benchmark created by Economists, Inc. arbitrarily selects between domestic prices and export values. That is, if the domestic price for a given species is greater than that in the cross-border area, they use the domestic price as their benchmark. Cross-border benchmarks are illegal. Nevertheless, were one to insist on doing a cross-border price comparison, then the comparison should, at the very least, be done consistently. If a domestic price lower than the cross-border price is taken as evidence of a subsidy, then a domestic price greater than the cross-border price is evidence of no subsidy and should not be discarded. This cherry picking of prices by Economists, Inc. allows them to further inflate the alleged subsidy value.

- Where Economists, Inc. conducts cross-border log price comparisons it is necessary to convert U.S. log prices in US$/MBF Scribner log scale to C$/m^3. This raises the issue of the correct log volume conversion factor to be used. The conversion factor selected is one that grossly inflates the price comparison.

We now examine the effect on the cross-border price comparison if we eliminate the price cherry picking and the use of an inappropriate conversion factor. Setting aside the fact that cross-border comparisons are invalid, it is shown that the alleged subsidy finding from cross-border comparisons largely vanishes just from the correction of these two errors in methodology. Before proceeding, a brief digression on conversion factors is needed.

Log Scale Conversion Factors

In the initial investigation, Commerce undertook cross-border stumpage price comparisons. As such, the Department needed a log scale conversion factor to convert U.S. stumpage prices measured in $/MBF to $/m^3. Unfortunately, there is no such thing as a standard conversion factor, as it varies by the dimensions of the logs being measured. This is due to the archaic log scaling rules used in the United States that measure only a portion of the solid wood content of a log. This portion varies with log diameter, length, and taper, which makes the conversion factor vary between any two bundles of logs.

Canadian provinces undertook extensive dual scaling exercises of Canadian logs in order to provide an accurate conversion factor. Commerce, however, rejected the conversion factors developed by Canadian provinces based on dual scaling studies of Canadian trees. In doing so, Commerce stated at page 145 of its Decision Memo:

> *Moreover, some of these scaling studies submitted by respondents are based solely on the trees in Canada, not the U.S. trees that underlie the reported stumpage prices. The point of the exercise is to convert thousand board feet as used in the United States to cubic metres, which is the measure used in Canada, not the other way around.*

Commerce then chose to use conversion factors of 5.66 m^3/MBF for coastal British Columbia and 4.81m^3/MBF for the remainder of Canada. The source of these factors was an appendix to a 1982 study by the U.S. International Trade Commission.[18] That appendix did not actually undertake a study of log scale conversion factors in the United States. Instead, it relied on a 1973 B.C. study that undertook a dual scaling exercise for 63 hemlock and balsam logs in coastal British Columbia.[19] There is no basis to conclude that the conversion factor developed from this small sample of B.C. logs in 1973 is representative of the current conditions in coastal British Columbia, let alone conditions in the coastal region of the Pacific Northwest. And this factor would certainly not be representative of the remainder of the United States.

The United States now has up to date conversion factors developed by the USDA Forest Service.[20] It should be noted that the author of the report, Henry N. Spelter, was selected in 2003 to receive the U.S. Department of Agriculture Honor Award. The award announcements stated:

> *As part of this effort, Spelter developed a new, more accurate method for calculating the conversion factors required to compare U.S. and international timber prices. In the United States, timber is measured in terms of "board feet" of usable lumber. In other countries, timber is measured in cubic meters based on the entire log. The problem arises because the number of board feet of lumber that can be produced from a cubic meter of timber varies depending on the diameter of the log.*
>
> *Spelter demonstrated that the older conversion factors in use when average log diameters were large are no longer appropriate because the size of timber harvested in the Western United States has decreased. Small diameter logs*

[18] United States International Trade Commission. April 1982. Conditions relating to the importation of softwood lumber into the United States. Report to the Senate Committee on Finance on Investigation No. 332-134 under Section 332 of the Tariff Act of 1930.
[19] Price Waterhouse & Co. March 1973. A regional comparison of stumpage, taxation and other factors in the forest industries of British Columbia and the U.S. Pacific Northwest.
[20] Spelter, H. 2002. Conversion of board foot scaled logs to cubic meters in Washington State, 1970-1998. USDA Forest Service, Forest Products Laboratory, FPL-GTR-131 ("Spelter 2002"); Spelter, H. 2003. Challenges in converting among log scaling methods, USDA Forest Service, Forest Products Laboratory, FPL-RP611 ("Spelter 2003") attached at Tab I.F.

contain a higher proportion of wood that would be considered waste in the U.S. measurement system and ignored, thereby skewing conversions. Spelter's research on conversion factors has aided in the ongoing efforts to resolve the trade dispute regarding U.S. imports of Canadian lumber. [21]

Spelter's recommended conversion factors are 6.76 m³/MBF for the coastal area of Washington State and 5.93 m³/MBF for areas in Eastern Washington. It should be noted that Spelter's recommended conversion factors were based on 1998 data and that he had shown that the conversion factors had been increasing over time. This trend had been due to the steadily declining average log diameter as the region transitioned from the harvest of old-growth timber to second-growth timber. The trend indicated that the average annual increase in the conversion factor was over 1.5% per annum.[22]

Caveat on Conversion Factors

Conversion factors that are representative of the logs harvested in a given area have but one use. It is to convert the volume of logs in that area from one scale to another. Applying their factors to the log prices in a given area is appropriate to assist in comparison of log prices within an area. But when used to compare prices in different areas, it must be recognized that conversion factors do not provide any adjustment for log quality. Thus, simply converting a U.S. log price from US$/MBF to C$/m³ does *not* provide a control for smaller log diameters or lower wood quality of the logs produced in different Canadian provinces.

And indeed, differences in conversion factors between regions is positive evidence of a quality difference. For example, based on large scale dual scaling studies, British Columbia, Alberta and Saskatchewan provided Commerce with the following conversion factors:

- B.C. Coast 6.99 m³/MBF
- B.C. Interior 6.66 m³/MBF
- Alberta 8.51m³/MBF
- Saskatchewan 8.62 m³/MBF

In addition, Québec presented evidence that a representative conversion factor for its Crown timber would be in the range of 9.02-9.32 m³/MBF.

The only conclusion that can be drawn from a comparison of the Canadian conversion factors to the Washington State conversion factors is that logs harvested from Crown lands in Canada are of a smaller size, and thus of a lower quality, than are the logs harvested in the coastal and interior regions of Washington State. Note that applying the Canadian conversion factors to the U.S. log prices would not correct this problem. Volume conversion factors adjust for volume differences; they do not adjust for *value*

[21] The news release for the award ("Spelter 2003") is available at www.fpl.fs.fed.us/notices/spelter_award.htm.
[22] For further evidence supporting Spelter 2002, see Spelter 2003.

differences. This means that converting the volume basis of log prices is not enough to make cross-border log price comparisons valid. Quality adjustments, as well as the host of differences caused by national borders, must be accounted for before it is possible to make a valid comparison. Economists, Inc. made no such adjustments in its cross border comparisons

Recalculating the Executive Committee's Cross-Border Price Benchmarks

<u>B.C. Coast and Québec</u>

To show the biases introduced by Economists, Inc. in its cross-border comparison we replicate its calculations for the B.C. Coast and Québec, but this time using the Spelter conversion factors for Washington. In addition, we do a consistent comparison and do not substitute the Canadian log price for the U.S. log price whenever the Canadian price is higher. Again, none of the other required adjustments for quality and border effects, etc. are made.

Table 18 below replicates the price benchmark calculations of Economists, Inc. for the B.C. Coast. The first column shows the species and the log grades deemed to be comparable by the consultants. Thus DF/Special Mill OG is interpreted as meaning that B.C. coastal log grades D and F are compared to the Special Mill Old Growth log grade in the U.S. PNW. The second column provides the Vancouver Log Market (VLM) price by species and grade. The third column provides the U.S. log prices in US$/MBF for areas chosen by the consultants. The U.S. price in the fourth column is converted to C$/m³ using an exchange rate of 1.517 and the old conversion factor of 5.66 m³/MBF. The column headed "Executive Committee's Benchmark" shows the inconsistent practices of Economists, Inc. in which domestic prices are substituted for the U.S. log price whenever the domestic price is higher. The values shown in boxes in that column are the B.C. domestic prices that have been substituted for the cross-border price. Note that six of the twenty-three species/grade price comparisons have a higher B.C. value, and this occurs before correcting the benchmark for the use of the wrong conversion factor.

The final column gives the U.S. log price in C$/m³ using the new conversion factor of 6.76 m³/MBF for the B.C. Coast, as recommended by Spelter, and the same exchange rate as used earlier. Comparing the VLM price to the corrected cross-border prices shows that thirteen of the twenty-three species/grade prices now have a higher value in British Columbia than in the United States. The "price gap" found by Economists, Inc. is unfounded.

At the bottom of the table are the volume-weighted averages of the various prices. Using this method, Economists, Inc. calculated its cross-border benchmark as C$143/m³ and compared that to the average VLM price of C$106.87/m³ to find a "price gap" of C$36.13/m³. The first thing to notice is the effect of their selection of domestic prices for their benchmark when the domestic price exceeded the cross-border price. That is, compare the average U.S. price of C$138.42/m³ to the "benchmark" price of C$143/m³.

The practice adds a further C$4.58/m³ to the alleged price gap. As noted earlier, the Spelter conversion factors were developed using data up to 1998, and the conversion factor for the Coast has been increasing at a rate of over 1.5% per annum. If we increase the conversion factor by this rate up to 2002, then the alleged price gap vanishes in its entirety.

The second and more important thing to notice is the huge impact the conversion factor has on cross-border comparisons. That is, compare the adjusted benchmark value to both the U.S. price calculated under the old conversion factor and to Economists, Inc.'s original benchmark. The adjusted benchmark of $US115.90/m³ is C$27.10/m³ lower than the original, and the price gap shrinks from $36.13/m³ to US$9.03/m³. Seventy-five percent of the Executive Committee's subsidy allegation has vanished simply by correcting only two mistakes.

These adjustments do not make the cross-border comparisons valid. The price differences between the B.C. Coast and Washington State are now less than occurs in log prices between sub-regions of Washington and Oregon. In addition, there has not yet been any control for the other factors identified earlier that affect log prices.

Table 19 repeats the same exercise for Québec. Again, the Washington State conversion factors are used, and not the Québec conversion factors. For the Québec comparison, the alleged price gap vanishes almost completely. If the Québec conversion factors had been used instead, the cross-border comparison would have shown logs in Maine as being "subsidized." Of course, such a conclusion for Maine, based on cross-border price comparisons, is no more correct than are the findings of Economists, Inc. for the Canadian provinces.

TABLE 18
Economists, Inc.'s Calculation of the Price Gap for Coastal BC

Species and Log Grade	VLM Price	US Price	US Price	Exec. Comm. Benchmark	Adjusted Benchmark
	C$/m	US$/MBF	C$/m	C$/m	C$/m
Douglas-fir					
DF/Special Mill OG	417.8	703.63	188.59	417.80	157.90
HI/2S	118.59	495.18	132.72	132.72	111.12
J/3S	88.78	431.96	115.77	115.77	96.94
UX/4S	45.44	414.88	111.20	111.20	93.10
Hemlock					
DF/2S	183.18	336.75	90.26	183.18	75.57
HI/2S	82.15	336.75	90.26	90.26	75.57
J/3S	58.29	305.47	81.87	81.87	68.55
UX/4S	39.93	266.17	71.34	71.34	59.73
True Firs					
DF/2S	183.18	336.75	90.26	183.18	75.57
HI/2S	82.15	336.75	90.26	90.26	75.57
J/3S	58.29	305.47	81.87	81.87	68.55
UX/4S	39.93	266.17	71.34	71.34	59.73
Lodgepole					
DF/2S	99.43	336.75	90.26	99.43	75.57
HI/2S	58.33	336.75	90.26	90.26	75.57
J/3S	69.18	305.47	81.87	81.87	68.55
UX/4S	25.81	266.17	71.34	71.34	59.73
Spruce					
DF/2S	414.18	336.75	90.26	414.18	75.57
HI/2S	110.81	336.75	90.26	110.81	75.57
J/3S	67.77	305.47	81.87	81.87	68.55
UX/4S	38.54	266.17	71.34	71.34	59.73
Red Cedar					
DFHI/3S	214.31	981.92	263.18	263.18	220.35
J/3S	154.64	981.92	263.18	263.18	220.35
UX/4S	81.45	832.2	223.05	223.05	186.75
Weighted Average	106.87	516.46	138.42	143.00	115.90

TABLE 19
Calculation of Benchmark Prices and Price Gap for Québec

Species	Domestic Price $C/m3	US Price $US/MBF	Benchmark Original $C/m3	Benchmark Adjusted $C/m3
SPFL	60.24	261.67	82.53	66.94
E. White Pine	60.24	253.53	79.96	64.86
Red Pine	60.24	131.25	60.24	33.56
E. Hemlock	60.24	179.44	60.24	45.91
E. White Cedar	60.24	150.00	60.24	38.37
Weighted Average	**60.24**	**261.02**	**82.38**	**66.77**

Quality Warnings in the Studies Data Sources

The data sources cited by Economists, Inc. explicitly recognized the importance of quality differences in the formation of log prices. For example, each issue of the *Montana Sawlog and Veneer Log Price Report* contains a disclaimer stating that:

> *These prices are not necessarily a reflection of current market prices. Fair market prices may vary a great deal based on log size, length, quality, contract size and terms, and a number of other factors.*

Economists, Inc. simply ignored this warning and assumed, without justification, that all other factors are equal. They are not, as demonstrated by the earlier conversion factor comparisons.

Another quality issue is that the domestic price series include not only sawlogs used to produce lumber, but also what would be defined as pulp logs in the United States, which are much less valuable on a per-unit basis. This fact alone could lead to the spurious appearance of a price gap owing to the magnitude of the differences in value between sawlogs and pulp logs. For example, the average price for Douglas-fir pulp logs in Puget Sound in 2002 was only US $95/MBF, while prices for sawlogs in the region ranged from $401/MBF to $588/MBF (Log Lines 2003 Statistical Yearbook).

The presence of pulpwood is only one of many quality issues that invalidate comparisons between domestic log prices and U.S. benchmark prices.[23] Log size is one such issue. Data from Québec illustrate where such a factor could lead to a spurious indication of subsidy. During the POI, the average size of trees harvested in Québec Crown lands was

[23] A host of factors invalidate cross-border comparisons including differences in timber characteristics and operating conditions, differences in governmental policies and economic conditions such as wages, capital costs, taxes and fluctuations in exchange rates. *See* Canada's Sept. 17, 2003 letter to the Dept. of Commerce at 7-12.

only 6.18 inches measured at the butt and 4.9 inches measured at the small end.[24] However, the log price data from Maine sawmills reported that for spruce and fir, which dominate Québec's harvest, 92% of logs had small-end (top) diameters of 6 inches or greater. Given that the corrections above virtually eliminated the entire price gap, one could reasonably conclude that log prices are actually higher in Québec than in neighbouring U.S. states, after adjusting for quality differences. This interpretation is more consistent with the observation that Québec actually imports a large quantity of sawlogs from the United States and exports very few.[25]

With respect to the Alberta-Montana log price comparisons, it should be noted that Commerce itself rejected such a comparison in Commerce's final determination. Commerce concluded that the types and quality of trees in Montana were not comparable to those in Alberta and, as such, cross-border stumpage prices comparisons were not valid. Economists, Inc. therefore are making a cross-border log price comparison that Commerce earlier rejected.

The Ontario Comparison

Table 20 below gives the Statistics Canada log export data as recorded at Tab 8 of the Executive Committee's submission on log export restraints. This is the data used by Economists, Inc. to construct their export benchmark.

TABLE 20
Export Data for Ontario from the Executive Committee's Submission

	Volume (m^3)	Value ($)	Constructed Value ($\$/m^3$)
Cedar	29,901	3,908,366	130.71
Coniferous nes	6,481	724,304	111.76
Hemlock	486	15,826	32.56
Pine	20,286	6,778,421	334.14
Spruce	7,155	407,214	56.91
True Fir	44	6,947	157.89
All Species	64,353	11,841,078	184.00
Derived SPF Value	33,966	7,916,886	233.08

In using these data, the authors chose not to use the all species constructed value or the individual species constructed value. Instead, they chose to construct a weighted average price for what they define as the SPF group. The weights used were the export volume weights, a choice that causes additional distortions, as described below. They then defined the SPF group as composed of coniferous nes, spruce, pine, and the true fir categories.

[24] Québec Dec. 17, 2001 Supp. Questionnaire Response, GOQ-5-8 attached at Tab I.G.
[25] In 2003, Québec's imports of coniferous saw logs from the US totalled C$150 million while its exports to the US were less than C$200,000.

The table shows significant variation in constructed values. In particular, contrast the exceptionally high value of C$334.14/m^3 for pine compared to C$56.91/m^3 for spruce. Such a high constructed value for pine logs does not appear to be a credible representative value for the pine logs harvested from Crown lands. It is certainly hard to reconcile such an extreme pine value with the more modest value for spruce logs. If both are being used to produce lumber, then their values should be more comparable, unless the pine logs are being used for some specialty application.

Earlier we examined the wide range of constructed values that could be generated from the export data and calculated what the minimum average value for the lumber produced from a given log would have to be in order to justify the constructed log value. Repeating that process for the pine log value produces a minimum average price of US$917.77/MBF for the lumber produced from these pine logs. This value is based on a conservative calculation.[26] Contrast this with the Random Lengths framing lumber composite price of US$296/MBF for the period of review. The composite price is less than 1/3 of the average lumber price needed to justify the pine log price. The constructed export value for pine logs is therefore not credible.

A second way of looking at this is to reverse the conversion of log prices conducted by Economists, Inc. for cross-border log price comparisons. That is, instead of converting from US$/MBF log scale to C$/m^3, we reverse the process and convert from C$/m^3 to US$/MBF log scale. To do this, we now divide the pine value by the average exchange rate of 1.517 and then multiply by the log scale conversion factor. This produces a value of US$1,409.69/MBF. The highest cross-border log price used by Economists, Inc. for the other provinces was US$261.67/MBF for Québec, US$375.67/MBF for Alberta, US$576.63 for the B.C. Interior and US$981.92/MBF for coastal British Columbia. The last two prices were for high-valued western red cedar logs. Thus, even the highest single cross-border price used by Economists, Inc. was still over US$400/MBF less than the equivalent U.S. price for the Ontario pine logs. This result also leads to the conclusion that the pine log export value is not credible.

These results can lead to only one of two conclusions. First, the extreme constructed log value for pine is the result of data miscoding by the collecting agency and the values are false. Note that a number of serious coding errors were discovered in the earlier review of the export data. Second, if we accept that the data is correct, this extraordinarily high constructed value is for logs that are not representative of pine logs harvested in Ontario. In either event, the use of such an extreme pine log value is not valid.

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[26] This calculation was based on the use of a relatively high lumber recovery factor (LRF) of 0.24 MBF/m^3. As noted earlier, a lower LRF produces a higher required minimum average price for the lumber produced from a log. The LRF for Ontario was 0.196 MBF/m^3. Using this LRF produces a minimum average lumber price of US$1,124/MBF. See Exhibit ON-S-6 of Ontario's November 12, 2003 Questionnaire Response where a cubic metre per log to lumber conversion rate of 5.09 m^3/MBF is reported. A LRF of 0.196 MBF/m3 is simply the reciprocal of the 5.09 m^3/MBF factor.

Furthermore, the construction of a SPF group value is also invalid, as demonstrated in Table 21 below. Because pine had the greatest export volume, it is given the greatest weight in constructing the SPF group. This produces the remarkably high value for SPF logs of C$233/m^3. The minimum average price required for the lumber produced from such SPF logs would be US$640/MBF. That is over twice the Random Lengths composite lumber price for the period of review. The constructed log value when converted to an equivalent U.S. log price is US$983/MBF, which is still higher than all of the U.S. log prices used by Economists, Inc. in the cross-border log price comparisons for the other provinces.

TABLE 21

	Unit	Pine	SPF Group
Constructed Value	C$/m^3	334.14	233.08
Required Lumber Value	US$/MBF	917.77	640.19
Equivalent US Log Price	US$/MBF Scribner	1409.69	983.44

It was noted above that the calculation of a weighted-average SPF value using the export volumes caused additional distortions. The authors could have chosen to simply use the individual species values, as was done for all of the other provinces. The weighted-average benchmark price would then have been calculated based on the provincial harvest species breakdown. The Ontario table given in the appendix to the Economists, Inc. report actually provided this harvest breakdown. But in using the harvest species distribution, far less weight would have been given to the extreme pine value and far more (56.43%) to the constructed log value for spruce. Instead, by first using the export weights to construct an SPF group price, the analysis further inflates the alleged domestic-export price gap. Note that using the harvest volumes as the weights does not correct for the use of such an extreme and necessarily unrepresentative pine value. Rather, it just shows how the authors' errors have been compounded by the creation of an SPF group average.

The review of the Ontario price comparison leads to three conclusions. First, the procedures used by the authors in the Ontario comparison contradict the conclusions of their own report. Second, the price comparison is driven by an extremely high constructed value for pine logs that cannot be credibly used as representative of the value of logs harvested from Ontario forests. Finally, the weighted-average export benchmark is further inflated by constructing an SPF value rather than using the individual species values.

Other Criticisms of the Report

<u>Efficiency of Canadian Sawmills</u>

Economists, Inc. also makes the claim that Canadian sawmills are inefficient in comparison to their U.S. counterparts.[27] This is simply not true. Figure 24 below shows the total sawmilling costs net of wood costs for five North American regions. The data is from a recent global lumber industry cost benchmarking study (PriceWaterhouseCoopers and International Wood Markets Research Inc., 2002).[28] By netting out wood costs, the strict costs of sawing the log into lumber can be seen. It also avoids accusations that Canadian costs are lower due to lower wood costs. The figure shows that the Canadian regions have lower costs than their U.S. competitors. This is most dramatic for the B.C. Interior, Canada's most important lumber producing region, which enjoyed costs that were 35% lower than those of their competitors in the U.S. West.

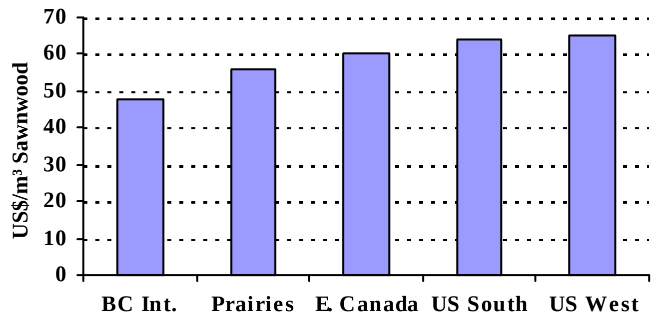

FIGURE 21
Comparison of Non-Wood Sawmilling Costs

Conclusions

The Economists, Inc. report makes numerous methodological errors and erroneous assumptions that serve to create an alleged subsidy where none exists.

[27] Stoner et al. at p. 12.
[28] PriceWaterhouseCoopers & International Wood Markets Research Inc. 2002. Global lumber/sawn wood cost benchmarking report.