Impact of U.S.-Canada Softwood Lumber Trade Dispute on Forest Products Companies: A Stock Market Perspective

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INTRODUCTION

The softwood lumber trade dispute between the United States and Canada is the longest and largest trade dispute between the two countries. The modern version of the dispute started in 1982 when a group of U.S. lumber producers filed a complaint to the U.S. Department of Commerce, alleging that Canadian lumber producers which obtain most of their timber from Crown (public) lands are subsidized by provincial governments in Canada through low stumpage fees. The two countries have since experienced 5 rounds of trade dispute. The stake is high as U.S.$6 to 7 billion worth of Canadian softwood lumber goes to the U.S. annually. The current tariff revenue alone, imposed by the U.S. in May 2002 at 27.2 percent, is worth billions of dollar each year. Some insiders call the dispute a "softwood lumber war." How much do all of these companies gain or lose due to various trade actions? More importantly, who gains, and who loses? Finally, why do companies assume different positions in the trade dispute?

This study examines the stock price reactions, for both U.S. and Canadian softwood lumber producers, to a series of trade actions related to the dispute. While this study does not cover the economic welfare of consumers in either country, it provides a more direct measure of the economic impacts of trade actions on major lumber producers in both countries. The results explain the motivation of trade actions demanded and supported by U.S. companies and the responses of Canadian companies and may have implications on U.S.-Canada trade policy. This study covers the following major events: a) Canadian withdrawal from the MOU on September 4, 1991, b) Agreement-in-principle reached for the SLA on February 16, 1996, c) Expiration of the SLA on April 1, 2001, and d) Imposition of a 19.67 percent preliminary countervailing duty on Canadian lumber imports by U.S. Department of Commerce on August 10, 2001. The next section describes major events, followed by methodology, data, and results. The final section concludes.

METHODOLOGY

This study uses the event-study methodology to examine the reaction of investors to major news or events associated with the softwood lumber trade dispute. The CAPM specifies a linear relationship between the returns of an individual asset and the returns to a value-weighted portfolio of all assets:

(1) $$R_{it} = \alpha_i + \beta_i R_{mt} + \mu_{it}$$

where R_{it} = the rate of return for stock i on day t;

R_{mt} = the rate of return on the market portfolio on day t;

α_i, β_i = regression parameters;

μ_{it} = a random disturbance term, assumed to be normally distributed as N(0,1), independent of the explanatory variable R_{mt}.

In its multiple regression analysis form, the methodology begins by parameterizing the abnormal return γ_i due to the event in an asset-pricing model using the dummy variable D_t that takes the value of 0 prior to the beginning of the event, and 1 afterwards:

(2) $$R_{it} = \alpha_i + \beta_i R_{mt} + \gamma_i D_t + \mu_{it}$$

where γ_i is a regression parameter for stock i. When the explanatory variables in the return-generating process are the same for each of the N firms, the multiple equations below can be estimated jointly as a seemingly unrelated regression equation (SURE) model (Zellner 1962; Theil 1971):

(3)
$$R_{1t} = \alpha_1 + \beta_1 R_{mt} + \gamma_1 D_t + \mu_{1t}$$
$$R_{2t} = \alpha_2 + \beta_2 R_{mt} + \gamma_2 D_t + \mu_{2t}$$
$$\vdots$$
$$R_{Nt} = \alpha_N + \beta_N R_{mt} + \gamma_N D_t + \mu_{Nt}$$

This approach incorporates the cases where the contemporaneous $E(\mu_{it}, \mu_{jt})$ and non-contemporaneous $E(\mu_{it}, \mu_{j,t-k})$ covariance of the disturbances across equations are non-zero. Note that estimating (3) as a system gains no efficiency in either the coefficients or the residual variances, and produces estimates which are identical to those obtained from OLS estimation of the individual equations (Theil 1971, Chapter 7). The advantage of this approach over residual analysis comes in testing the joint hypotheses since the heteroscedasticity across equations and contemporaneous dependence of the disturbances are explicitly incorporated in the statistical tests (Binder 1985; Collins and Dent 1984). The null hypothesis of no contemporaneous correlation (H_0: $\sigma_{ij}=0$, for $i \neq j$) can be tested by the Breusch and Pagan test statistic (λ), given as:

$$\lambda = T \sum_{i=2}^{N} \sum_{j=1}^{N-1} r_{ij}^2$$

which is asymptotically distributed as chi-squared (χ^2) with N (N-1)/2 degrees of freedom, and r_{ij} is the correlation coefficient of residuals estimated by using the OLS. Given that the stock market data used in this study was time series, serial correlation across observations on each security might exist. We tested the null hypothesis of no autocorrelation, and in some cases, the null hypothesis was rejected. Therefore, we used a formulation of SURE allowing for autocorrelation of order one, $\mu_{it} = \rho_i \mu_{i,t-1} + \varepsilon_{it}$, where ρ_i is the autocorrelation coefficient.

Three null hypotheses are of interest. The first (H_1) is that the *sum* of the abnormal returns (*aggregate abnormal return*) across the N equations equals zero (i.e., $\sum \gamma_i = 0$). This test measures the impact on Canadian or U.S. forest products companies as a whole. The second (H_2) is that *some* of the abnormal returns equal zero (i.e., $\gamma_i = 0$, for some i), with the impact being systematically related to the characteristics of individual firms. Tests of H_2 are more informative than tests of H_1 if an event affects the sample firms but the effects differ in sign and magnitude. A rejection of H_2 would mean that shareholders of some Canadian and/or U.S. firms suffered or gained from the trade actions. The third hypothesis (H_3) is that the abnormal returns—whether significant or not—are equal across equations ($\gamma_i = \gamma_j$ for $i \neq j$). This hypothesis builds on the previous ones and relates to inter-company differential impacts. Its rejection would mean that abnormal returns are not uniform across firms.

DATA

The Canadian and U.S. forest products companies included in this study are listed in Table 1. These companies were selected because they are large softwood lumber producers in each country and their stocks are publicly traded. Collectively they accounted for 32 to 47 percent of softwood lumber production in each country in 1991, 1996, and 2001. To avoid double counting, forest products companies operating in both countries were assigned to one or the other country group based on the headquarter of the company. We could not, however, maintain the same number of companies in the analysis of all four events because of corporate merge and acquisition in the study period. Data for U.S. firms included in this study are from CSI (http://www.csi.com for stock prices) and EDGAR (http://www.sec.gov/edgar.shtlm, for no. of common stock shares outstanding). Data for Canadian firms are from the Toronto Stock Exchange (for stock prices) and SEDAR (http://www.sedar.com for no. of common stock shares outstanding). The S&P 500 index and TSE 300 index were used as market return index for U.S. and Canada firms, respectively. The estimation period and event window varies by country and event.

Table 1. Share of softwood lumber production/ capacity in each country

	1991*	1996*	2001†
Canadian firms	Share of Canadian softwood lumber production (%)		
Canfor Corporation	6.40	5.20	7.31
West Fraser Timber Co. Ltd.	4.98	5.08	5.66
Weldwood of Canada Ltd.	4.58		
Fletcher Challenge Canada Ltd.	4.00	0.82	
Macmillan Bloedel Ltd.	3.27	3.72	
International Forest Products Ltd.	3.15	2.71	2.36
Domtar Inc.	2.91	2.77	3.54
Slocan Forest Products Ltd.	2.84	4.31	4.01
Doman Industries Ltd.	2.56	2.11	3.07
Donohue Inc.	2.35	4.41	
Avenor Inc. (Can. Pacific For. Prod., Inc.)	1.83	0.96	
Crestbrook Forest Industries Ltd.	1.45	1.44	
Tembec Inc.	1.40	1.56	3.54
Riverside Forest Products Ltd.		1.81	1.77
Ainsworth Lumber Co. Ltd.		0.83	
Primex Forest Products Ltd.		0.75	0.71
Timberwest Forest Ltd.		1.05	
Accumulative share (%)	35.31	36.70	31.97
U.S. Firms	Share of U.S. softwood lumber production (%)		
Weyerhaeuser Co.	8.10	11.46	12.26
Georgia Pacific Corp.	7.32	7.50	6.28
Louisiana-Pacific Corp.	5.49	3.73	2.99
International Paper Co.	2.66	5.58	8.55
Champion International Corp.	2.47	4.22	
Boise Cascade Corp.	2.45	2.19	1.13
Simpson Timber Co.	1.73	2.79	1.75
Pope & Talbot Inc.	1.50	1.70	1.55

Temple-Inland Forest Products Corp.	1.48	1.90	1.65
Plum Creek Manufacturing	1.26	1.28	0.82
Union Camp Corp.	1.25	1.48	
Potlatch Corp.	0.99	1.33	1.55
Willamette Industries Inc.	0.95	1.67	1.96
Bowater Inc.	0.63	0.59	
Accumulative share (%)	38.28	47.42	40.49

*Based on softwood lumber production. Data source: Lumber & Panel North American Fact book 1992-1993, 1998 by Miller Freeman Inc., 600 Harrison Street, San Francisco, CA 94107.
† Based on softwood lumber production capacity. Data source: Paul Jannke, Resource Information Systems, Inc., 4 Alfred Circle, Bedford, MA 01730

EMPIRICAL RESULTS

Tables 2 to 5 presents the results based on joint estimation of parameter estimates of equation (3) using seemingly unrelated regression. For each SURE model corresponding to the 1991, 1996, and two 2001 events, the hypothesis of zero contemporaneous covariance was rejected according to the Breusch-Pagan test statistics, suggesting that SURE framework is appropriate. In addition, using SURE with AR(1) allowing for autocorrelation of order one resulted in improved estimates. Based on Wald test, H_1 was rejected in all 4 events in the case of Canada, suggesting that all these events had statistical significant aggregate impacts on Canadian firms as a whole. In the case of U.S., results were mixed; H_1 was rejected in the two 2001 events but not in other events. However, the hypothesis of no abnormal returns for some companies (H_2) was rejected for all events for both U.S. and Canadian forest products firm groups. Lastly, H_3 was rejected twice in the case of Canada (for the 1996 and August 10, 2001 events) and once in the case of U.S. (August 10, 2001), suggesting that impacts were not uniform in these events. Firm characteristics such as firm size and diversification may explain the difference in company-specific impacts.

Termination of the MOU: September 8, 1991: This is the only event to which the stock prices of both Canadian and U.S. firms reacted negatively (Table 2). The impacts were, however, broader for Canadian firms, and four of which—Canfor, West Fraser Timber, Weldwood, and Slocan—experienced significant negative abnormal returns.

An agreement-in-principle for SLA reached: February 16, 1996: Based on the results presented in Table 3, Canadian companies including Canfor, Donohue, Doman, and Ainsworth experienced a significant decline in stock prices over the event window. In contrast, four of the U.S. companies—Georgia Pacific, Champion International, Union Camp, and Willamette—were better off (Table 3). It seems that Canadians investors did not see the SLA and the 5-year peace brought by it as a positive event even though the SLA was the result of negotiations of all parties—governments of, and various forest products firms in, both countries.

Expiration of the SLA: April 1, 2001: The expiration of the SLA on April 1, 2001 was perceived as a positive event by Canadian investors in six companies—Canfor, West Fraser Timber, Slocan, International Forest Products, Domtar, and Tembec (Table 4). They had positive returns

despite that the Coalition filed cases against Canadian lumber producers, demanding for a huge (as high as 78 percent) duty. Mirroring the opposite response, U.S. firms including Louisiana Pacific, Bowater and Simpson Timber had significant negative returns over the event window (Table 4). This suggests that Canadian investors probably thought that the chance of a preventative duty being eventually imposed was low.

Announcement for a 19.67% preliminary countervailing duty: August 10, 2001: Indeed, the U.S. Department of Commerce announced a countervailing duty of 19.67 percent, much lower than the 40 percent (only for the countervailing duty part) requested by the Coalition. Nonetheless, this event seemed to have surprised them as six Canadian companies—Canfor, Slocan, Doman, Riverside, Tembec, and Ainsworth—had negative abnormal returns over the event window (Table 5). As expected, the impacts were positive and broad based on the U.S. side. Only Pope and Talbot which had operations in Canada had negative abnormal returns.

Industry-wide impacts: After controlling for firm specific risk and movement in market index we estimated the impacts of these events on shareholders' wealth of individual companies and of the whole softwood lumber industry in both countries. The industry-wide impacts were calculated as the total impacts for all firms included in the study divided by their softwood lumber production/capacity share in each country. For the U.S. side, the industry-wide impacts were U.S.$-5.6 and 7.4 billion for the two 2001 events. These results are similar to Zhang (2001) who found that the SLA had brought the U.S. lumber producers $7.7 billions in the first four years. The industry-wide impacts for the U.S. were much smaller for the 1991 and 1996 events. On the other hand, industry-wide impacts were pretty even, ranged from CND$ -720 million to -1.2 billion in the three negative events and 1.2 billion in the first 2001 event (Table 6).

Table 2. SURE parameter estimates for the Sep 4, 1991 event (t-statistics in parentheses).

	α	β	γ
Canadian firms [Window: -1, +15]			
Canfor Corporation	0.0005 (0.37)	0.9196** (3.73)	-0.0079* (1.77)
West Fraser Timber	0.0007 (0.65)	0.1897 (0.86)	-0.0050† (1.39)
Weldwood of Canada Ltd.	-0.0010 (1.06)	0.3175 (1.46)	-0.0048† (1.38)
Donohue Inc.	0.0002 (0.18)	0.6607** (3.15)	-0.0031 (0.92)
Fletcher Challenge Canada Ltd.	0.0004 (0.32)	0.5910** (2.47)	-0.0027 (0.75)
Macmillan Bloedel	-0.0003 (0.30)	0.9595** (5.35)	-0.0014 (0.47)
Int'l Forest Products	0.0003 (0.20)	0.8264** (2.25)	-0.0040 (0.73)
Domtar Inc.	-0.0001 (0.13)	0.6546** (2.12)	-0.0090* (1.82)
Slocan Forest Products	0.0017 (0.83)	0.3154 (0.73)	-0.0072 (1.09)
Doman Industries Ltd.	0.0001 (0.08)	1.6331** (4.28)	-0.0040 (0.73)
Avenor	0.0005 (0.40)	0.4429* (1.84)	-0.0040 (1.02)
Crestbrook Forest Industries	-0.0008 (0.46)	1.4255** (3.70)	-0.0058 (1.01)
Tembec	-0.0001 (0.18)	0.3231* (1.88)	0.0008 (0.33)
No. of observation	167		
Wald Test (for H_1) (df=1)	7.64**		
Wald Test (for H_3) (df=12)	6.17		
Breusch-Pagan test (λ_{LM}) (df=78)	188.42		

U.S. Firms [Window: 0, +7]			
Weyerhaeuser Co.	-0.0002 (0.16)	1.1997** (8.74)	0.0057 (0.88)
Georgia Pacific	0.0014 (0.72)	1.0037** (6.35)	0.0012 (0.14)
Louisiana Pacific Corporation	0.0022 (1.12)	0.7839** (4.67)	-0.0054 (0.63)
International Paper	0.0004 (0.36)	0.9920** (9.42)	0.0024 (0.47)
Champion Int'l Corporation	-0.001 (0.69)	0.9896** (7.21)	-0.0029 (0.44)
Boise Cascades	-0.0004 (0.28)	0.8238** (6.04)	-0.0006 (0.11)
Pope and Talbot	-0.0005 (0.28)	0.5548** (3.32)	-0.0056 (0.71)
Temple Inland	0.0012 (0.95)	1.0908** (7.25)	-0.0005 (0.09)
Plum Creek Manufacturing	0.0055** (2.46)	0.6645** (2.68)	-0.0045 (0.44)
Union Camp Corporation	0.0002 (0.18)	1.0244** (9.24)	0.0016 (0.33)
Potlatch	0.0013 (0.73)	0.7085** (3.73)	-0.0027 (0.34)
Willamette Industries Inc.	0.0018 (1.17)	0.6669** (4.26)	-0.0116* (1.66)
Bowater	0.0004 (0.21)	0.9247** (5.84)	-0.0106† (1.31)
No. of observation	167		
Wald Test (for H_1) (df=1)	0.70		
Wald Test (for H_3) (df=12)	8.60		
Breusch-Pagan test (λ_{LM}) (df=78)	405.54		

** Significant at 5 percent; * Significant at 10 percent; † Significant at 20 percent. Estimation period: Feb 1, 1991- Sep 30, 1991.

Table 3. SURE parameter estimates for the Feb. 16, 1996 event (t-statistics in parentheses).

	α	β	γ
Canadian firms [Window: -1, +11			
Canfor Corporation	-0.0008 (0.78)	0.8454** (4.21)	-0.0146** (2.92)
West Fraser Timber	-0.0012 (0.54)	0.5098 (0.97)	-0.0054 (0.51)
Donohue Inc.	-0.0003 (0.28)	1.2065 (5.77)	-0.0070† (1.40)
Slocan Forest Products	-0.0001 (0.09)	0.0891 (0.73)	-0.0008 (0.28)
Macmillan Bloedel	-0.0010† (1.38)	1.5584** (12.01)	0.0023 (0.70)
Int'l Forest Products	-0.0001 (0.13)	0.8298** (4.58)	-0.0019 (0.41)
Domtar Inc.	-0.0016 (1.28)	2.0137** (8.50)	0.0006 (0.10)
Doman Industries Ltd.	-0.0009 (0.88)	1.0013** (4.46)	-0.0094** (1.91)
Riverside Forest Products	-0.0014 (1.31)	0.6000** (2.98)	0.0011 (0.22)
Tembec	-0.0022** (2.23)	1.1000** (5.70)	-0.0025 (0.54)
Crestbrook Forest Industries	-0.0026** (2.38)	1.1210* (5.18)	0.0012 (0.24)
Ainsworth Forest Products	-0.0010 (0.65)	0.5733* (1.72)	-0.0120* (1.65)
Primex Forest Products	-0.0006 (0.38)	0.1909 (0.62)	-0.0025 (0.36)
No. of observation	294		
Wald Test (for H_1) (df=1)	2.36†		
Wald Test (for H_3) (df=12)	18.03†		
Breusch-Pagan test (λ_{LM}) (df=78)	207.35		
U.S. Firms [Window: -1, +15]			
Weyerhaeuser Co.	-0.0006 (0.78)	1.1657** (8.17)	0.0032 (0.94)

Georgia Pacific	-0.0012 (1.22)	0.9983** (6.89)	0.0053† (1.29)
Louisiana Pacific Corporation	-0.0022* (1.78)	1.6465** (8.00)	0.0042 (0.81)
International Paper	-0.0006 (0.74)	0.8549** (6.44)	0.0027 (0.82)
Champion Int'l Corporation	-0.0008 (0.71)	0.8818** (4.87)	0.0063† (1.33)
Boise Cascades	-0.0001 (01.12)	1.2734** (6.50)	0.0052 (1.01)
Pope and Talbot	-0.0007 (0.71)	0.4744** (4.87)	0.0004 (0.11)
Temple Inland	-0.0010 (1.16)	0.9055** (7.23)	0.0036 (1.05)
Plum Creek Manufacturing	0.0006 (0.88)	0.6755** (5.39)	-0.0014 (0.49)
Union Camp Corporation	-0.0013* (1.65)	0.9270** (7.77)	0.0053* (1.70)
Potlatch	-0.0003 (0.57)	0.7596** (8.09)	0.0019 (0.88)
Willamette Industries Inc.	-0.0010 (0.87)	1.1808** (6.68)	0.0063† (1.30)
Bowater	-0.0001 (0.04)	0.9815** (4.75)	0.0034 (0.52)
No. of observation	294		
Wald Test (for H_1) (df=1)	1.56		
Wald Test (for H_3) (df=12)	5.16		
Breusch-Pagan test (λ_{LM}) (df=78)	327.88		

** Significant at 5 percent; * Significant at 10 percent; † Significant at 20 percent. Estimation period: Feb 1, 1995-Mar 29, 1996.

Table 4. SURE parameter estimates for the April 2, 2001 event (t-statistics in parentheses).

	α	β	γ
Canadian firms [Window: -2, +2]			
Canfor Corporation	0.0007 (0.40)	0.9821** (91.69)	0.0179* (1.67)
West Fraser Timber	0.0016 (0.80)	0.9741 (76.37)	0.0160**(2.04)
Slocan Forest Products	0.0031† (1.57)	0.9770** (80.68)	0.0230* (1.90)
Int'l Forest Products	0.0025† (1.38)	0.9793**(90.42)	0.0207* (1.91)
Domtar Inc.	0.0019 (1.18)	0.9853**(102.14)	0.0147† (1.52)
Doman Industries Ltd.	-0.0019 (0.38)	1.0155** (33.22)	-0.0155 (0.51)
Riverside Forest Products	-0.0012* (0.47)	0.9842 (65.84)	0.0158 (1.06)
Tembec	0.0005 (0.29)	0.9762** (88.16)	0.0238** (2.15)
Ainsworth Forest Products	-0.0010 (0.37)	0.9957** (59.40)	0.0043 (0.25)
Timberwest Forest Ltd.	0.0028** (2.52)	0.9975** (144.35)	0.0025 (0.36)
No. of observation	182		
Wald Test (for H_1) (df=1)	5.44**		
Wald Test (for H_3) (df=9)	7.46		
Breusch-Pagan test (λ_{LM}) (df=45)	132.34		
U.S. Firms [Window: -2, +2]			
Weyerhaeuser Co.	0.0013 (0.79)	0.6088**(4.82)	-0.0057 (0.56)
Georgia Pacific	0.0012 (0.43)	-0.1569 (1.03)	-0.0125 (0.93)
Louisiana Pacific Corporation	-0.0008 (0.30)	-0.3243* (1.66)	-0.0217† (1.31)
International Paper	-0.0002 (0.08)	-0.1823 (1.19)	-0.0042 (0.34)
Boise Cascades	0.0009 (0.48)	-0.1458 (1.06)	-0.0110 (0.93)
Pope and Talbot	-0.0016 (0.84)	0.8705** (6.41)	-0.0055 (0.49)
Temple Inland	0.0012 (0.83)	0.6582** (6.06)	-0.0034 (0.40)

Plum Creek Manufacturing	-0.0008 (0.54)	-0.1335 (1.25)	-0.0023 (0.37)
Potlatch	-0.0007 (0.60)	-0.1194† (1.31)	-0.0016 (0.19)
Bowater	-0.0001 (0.10)	-0.0871 (0.74)	-0.0152† (1.62)
Simpson Timber Co.	0.0002 (0.23)	-0.0388 (0.53)	-0.0081† (1.30)
No. of observation	177		
Wald Test (for H_1) (df=1)	2.23†		
Wald Test (for H_3) (df=10)	7.41		
Breusch-Pagan test (λ_{LM}) (df=55)	787.11		

** Significant at 5 percent; * Significant at 10 percent; † Significant at 20 percent. Estimation period: August 1, 2000-April 4, 2

Table 5. SURE parameter estimates for the August 10, 2001 event (t-statistics in parentheses).

	α	β	γ
Canadian firms [Window: -2, +1]			
Canfor Corporation	0.0018 (0.77)	0.1567 (0.50)	-0.0432** (3.72)
West Fraser Timber	0.0008 (0.40)	0.0437 (0.17)	-0.0050 (0.52)
Slocan Forest Products	-0.0006 (0.21)	0.6614* (1.86)	-0.0226† (1.58)
Int'l Forest Products	-0.0010 (0.34)	0.2487 (0.81)	-0.0129 (0.99)
Domtar Inc.	-0.0003 (0.15)	0.5896** (2.46)	0.0066 (0.68)
Doman Industries Ltd.	-0.0036 (0.63)	1.7766** (2.34)	0.0406† (1.45)
Riverside Forest Products	0.0005 (0.20)	0.273 (0.92)	-0.0233** (2.15)
Tembec	-0.0007 (0.26)	0.6089** (2.21)	-0.0165† (1.36)
Ainsworth Forest Products	0.0045 (1.15)	0.2119 (0.42)	-0.0341* (1.79)
No. of observation	91		
Wald Test (for H_1) (df=1)	4.17**		
Wald Test (for H_3) (df=8)	24.97**		
Breusch-Pagan test (λ_{LM}) (df=36)	55.25		
U.S. Firms [Window: -2, +2]			
Weyerhaeuser Co.	0.0014 (1.01)	0.8555** (6.70)	0.0021 (0.38)
Georgia Pacific	0.0022** (2.18)	0.7171** (6.04)	0.0070† (1.61)
Louisiana Pacific Corporation	-0.0022 (1.30)	0.7250** (3.96)	0.0200** (2.80)
International Paper	0.0016 (1.11)	0.8963** (6.31)	0.0037 (0.62)
Boise Cascades	0.0012 (1.04)	0.6070** (5.20)	0.0065† (1.41)
Pope and Talbot	0.0006 (0.28)	0.2474 (1.21)	-0.0136† (1.59)
Temple Inland	0.0024** (2.16)	0.8151** (6.85)	0.0041 (0.88)
Plum Creek Manufacturing	0.0018* (1.72)	0.4095** (3.56)	0.0115** (2.59)
Potlatch	0.0001 (0.06)	0.6515** (5.01)	0.0044 (0.90)
Bowater	0.0002 (0.14)	0.6791** (5.70)	0.0070† (1.38)
Simpson Timber Co.	0.0003 (0.14)	0.0241 (0.17)	0.0180** (2.16)
No. of observation	86		
Wald Test (for H_1) (df=1)	3.84**		
Wald Test (for H_3) (df=10)	14.60†		
Breusch-Pagan test (λ_{LM}) (df=55)	817.99		

** Significant at 5 percent; * Significant at 10 percent; † Significant at 20 percent. Estimation period: April 20, 2001-August 15,

Table 6. Impacts† of U.S.-Canada softwood lumber trade controversy (in US$1,000)

Canadian Firms	Sep. 4, 1991	Feb.16, 1996	Apr. 2, 2001	Aug. 10, 2001
Avenor	NSND	na	na	na
Ainsworth	na	-19,937	-584,763	-2,929
Crestbrook Forest Industries	-69,979	-15,146	Na	na
Canfor Corporation	-24,867	-147,319	74,970	-107,623
Doman	-2,019	-51,697	-3,256	703,200
Domtar, Inc	-105,127	14,472	27,329	-117,435
Donahue	-18,679	-65,125	na	na
Fletcher Challenge Canada	NSND	na	na	na
Int'l Forest Products	-17,944	-916	23,805	-9,716
Primex Forest Products	na	-908,160	na	na
Riverside Forest Products	na	-902	443,233	-20,490
Slocan Forest Products	-4,353	-21,431	38,824	-39,339
Tembec	3,930	-16,290	89,882	20,588
TimberWest	na	na	-2,813	NSPD
Weldwood of Canada	-52,919	na	na	na
West Fraser Timber	-123	27,649	129,031	51,936
Macmillan Bloedel	-137,532	-6,705	na	na
TOTAL	-429,615	-304,254	377,630	-224,304
Industry-wide impact	-1,216,696	-829,030	1,208,031	-717,544
U.S. Firms				
Weyerhaeuser	41,137	71,706	-1,538	602,281
Georgia Pacific	-3,895	363	-150,461	526,090
Louisiana Pacific	-44,111	7,023	-99,469	156,682
International Paper	-20,249	-253,376	-1,719,885	918,475
Champion International	-101	195,478	na	na
Boise Cascades	15,437	41,134	-12,780	113,236
Pope and Talbot	-2,584	-9,964	-6,831	-12,027
Temple Inland	6,551	58,680	-3,303	213,944
Plum Creek Manufacturing	-252	13,694	-36,716	360,566
Union Camp	43,155	89,456	na	na
Potlatch	-23,141	25,061	-56,354	44,035
Willamette	-55,520	199,043	na	na
Bowater	-6,435	46,981	-162,764	103,355
Simpson Timber Co.	na	na	-30,548	-14,016
TOTAL	-50,009	485,277	-2,280,650	3,012,621
Industry-wide impact	-130,640	1,023,359	-5,632,625	7,440,408

NSND: No number of common share data; na: Not applicable; NSPD: No share price data.

†Calculated as $n_i(P_i^1 - \hat{P}_i)$ where n_i is the number of common stock shares for firm i, $\hat{P}_i = P_i^0 \exp(\alpha_i + \beta_i \ln(INDEX^1/INDEX^0))$, where P_i^0 is a 10-day average share price, 10 days prior to the test window, P_i^1 and $INDEX^1$ are respectively ith stock price and market index (S&P 500 or TSE 300) on the last day of the test window (post event).

CONCLUSIONS

The findings of this study suggest that event specific impacts associated with the U.S-Canada softwood lumber trade dispute have been large enough to be noticeable in stock prices of forest products firms. In three events (1991, 1996, and August 2001), Canadian forest products firms as a whole were hit hard, but they had substantial gains when free trade returned. This may explain why some Canadian forest products firms—represented by the Free Trade Lumber Council—favor the litigation (to fight the U.S. case in WTO and NAFTA) route rather than negotiation.

Firm specific impacts vary among firms in both countries. Given the relatively higher reliance of Canadian forest products companies on the U.S. market, both medium and large Canadian firms were adversely impacted by restrictive trade actions. In the case of U.S., adverse impacts were confined only to the medium forest products companies while the positive impacts included large companies such as Georgia Pacific Corporation and International Paper (whose market capitalizations were more than U.S.$10 billion). This suggests that company size and possibly diversification might have helped large U.S. firms, but did not insulate large Canadian companies from specific events.

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