Policy Impacts Estimates Are Sensitive to Data Selection in Empirical Analysis: Evidence from the United States-Canada Softwood Lumber Trade Dispute

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Policy Impacts Estimates Are Sensitive to Data Selection in Empirical Analysis: Evidence from the United States-Canada Softwood Lumber Trade Dispute

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Policy Impacts Estimates Are Sensitive to Data Selection in Empirical Analysis: Evidence from the United States-Canada Softwood Lumber Trade Dispute

Abstract

In this paper, we use the U.S. softwood lumber import demand model as a case study to show that the effects of past trade policies are sensitive to the data sample used in empirical analyses. We conclude that, to be consistent with the purpose of analysis of policy and to ensure all else being equal, policy impacts can only be judged by using data up to the time when the policy is terminated.

Keywords: Policy analysis, time-series data, time element, U.S.-Canada, softwood lumber trade dispute

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1. Introduction

Economists and policy analysts attempting to assess the impacts of public policy often use time-series regression methods. Sometimes, the time-series data they use are very long and cover several periods of distinguishable policy regimes. If they use dummy variables to measure the effects of various policy regimes, the data sample period they choose may influence the estimation results and hence the impacts of policy regimes. Further, the dummy variables representing the earlier policy regimes could even have the wrong sign and be significant, contrary to economy theory (Nagubadi and Zhang 2013, Parajuli and Zhang, 2016).

The purpose of this paper is to demonstrate that estimates of policy impacts vary with the data sample used in empirical analyses. We use the U.S.-Canada softwood lumber trade dispute, which has experienced four separate policy regimes, as a case study, and show that the appropriate estimates for the earlier policy regimes are to use data up to the end of the regimes, not data afterwards. This paper is inspired by findings in Nagubadi and Zhang (2013) and Parajuli and Zhang (2016). To estimate an empirical model, we use the same theoretical framework and data employed by Nagubadi and Zhang (2013) and Parajuli and Zhang (2016). The next section presents briefly the trade dispute and the four different policy regimes, followed by empirical models and results. The final section concludes with discussion.

2. The four separate policy regimes in the U.S.-Canada softwood lumber trade

Zhang (2007) presented a detailed historical chronology, political economy, and explanation of the long U.S.-Canadian softwood lumber trade dispute. Canada is the largest exporter of softwood lumber to the United States. Free trade on softwood lumber had prevailed for several decades prior to December 30, 1986, when the two counties signed the Memorandum of Understanding (MOU) that started to limit Canadian exports to the U.S. via a 15% export tax
or stumpage adjustment on the part of Canadian provinces. MOU lasted for nearly 5 years, until
Canada withdrew in October 1991. This was the first policy regime in the largest and long
standing dispute between the two countries. MOU and other trade agreement between the two
countries excluded the maritime provinces of Canada. Thus, as others who conducted empirical
studies on this area (e.g., Wear and Lee 1993, Zhang 2001, 2006), we only include the restricted
Canadian provinces. There were varying details in the number of provinces covered and among
the provinces covered in all of the policy regimes. However, as we are focusing on the aggregate
impacts and these variations are minor, they should not impact our results much.

The two countries then signed the Softwood Lumber Agreement in principle in February
1996 which became a formal trade agreement (SLA 1996) for 5 years. SLA 1996 expired on
March 31, 2001. SLA 1996 was the second policy regime. Between August 2001 and October
2006, the U.S. government imposed countervailing and anti-dumping duties (CVDAD) on
Canadian softwood lumber imports with a combined rate of tariffs ranging from 10.2% to 27.2%.
This policy regime (CVDAD) ended on October 2006 when the two countries signed another
Softwood Lumber Agreement (SLA 2006) that lasted until October 2015. Figure 1 depicts a
graphical overview of Canadian lumber exports to the U.S. under the four trade policy regimes.

As the softwood lumber trade dispute is the largest trade dispute between the countries
with some $4 - 7 billions of goods annually being involved, economists have studied the welfare
impacts of various policy regimes or trade restriction measures. Wear and Lee (1993) and
Myneni et al. (1994) found that MOU was effective in reducing Canadian lumber imports to the
U.S. which benefited U.S. producers and harmed U.S. consumers. Likewise, Lindsey et al.
Devadoss (2006), Mogus et al. (2006), and Song et al. (2011) found that CVDAD had significant
negative impacts on Canadian lumber imports. Recently, Nagubadi and Zhang (2013) and Parajuli and Zhang (2016) looked into the effects of SLA 2006 in its 7-9 years of operation on the U.S. lumber imports from Canada, and found it to be effective.

All these studies have used time-series regressions in order to estimate empirical models of Canadian lumber exports to the U.S. In the regression used by Nagubadi and Zhang (2013) and Parajuli and Zhang (2016) where monthly data from 1980 to 2012 (or 2015) were used, the dummy variables used representing MOU and SLA 1996 were no longer significant or even had wrong signs. Baek and Yin (2006) even concluded that SLA 1996 was not effective. We think this conclusion is not warranted for several reasons. First, it is contrary to the empirical evidence that, in each of the 5 years under SLA 1996, Canadian exporters surpassed the duty-free quota by paying $100 per thousand board feet export tax, which was more than 20% of the prevailing lumber prices in these years (Zhang 2007, p. 144-145). Second and as noted earlier, other empirical studies (e.g., Zhang 2001, 2006) show that SLA 1996 was effective. Finally and as we hypothesize in this paper, large data variations and impacts in the later periods might simply overshadow the policy impacts of earlier policy regimes.

3. **Empirical model and data**

For a demonstration purpose, we estimate a monthly econometric model of the U.S. import demand for Canadian lumber using various data sample periods, and examine the effects of various policy regimes on U.S. lumber imports. Nagubadi and Zhang (2013) and Parajuli and Zhang (2016) used an import demand function developed by Buongiorno et al. (1979). Following Nagubadi and Zhang (2013) and Parajuli and Zhang (2016), we specify the U.S. imports for Canadian softwood lumber as:

\[ q_t = f(pus_t, pca_t, h_t, ppi_t, xc_t, MOU, SLA96, CVDAD, SLA06, \sum_{i=1}^{11} M_i) \]
where, $q_{ct}$ denotes the monthly U.S. imports from Canadian provinces restricted under the four policy regimes in the month $t$; $pus_t$ and $pca_t$ represent U.S. domestic price and import price of softwood lumber in the U.S. respectively; $h_t$ represents the monthly housing starts in the U.S.; $xc_t$ is the real exchange rate between Canadian and U.S. dollars; and $ppi_t$ is the overall producer price index for all commodities in the U.S. The policy dummy variables, $MOU, SLA96, CVDAD$ and $SLA06$ represent the past trade policies that were imposed in the Canadian lumber shipments to the U.S. (Zhang 2007; Nagubadi and Zhang 2013; Parajuli and Zhang 2016). The dummy terms, $M_i$ are monthly binary variables which capture the seasonal effects in Canadian lumber exports to the U.S. Parajuli and Zhang (2016) explained the expected signs of every variable in detail.

In order to estimate Equation 1 using the monthly time-series data, we also employ the cointegration framework and vector error correction (VEC) models similar to Nagubadi and Zhang (2013) and Parajuli and Zhang (2016). Since we employ the long time-series data sample from January 1980 to September 2015, the data series might possess potential permanent structural breaks which might substantially influence the estimation results. Accounting for a structural break in both unit root test and cointegration analysis, Parajuli and Chang (2015) and Parajuli and Zhang (2016) estimated VEC models for the stumpage market and U.S. import demand for softwood lumber respectively. In this study, in addition to short-term trend breaks accompanying the trade policy regimes, we consider two permanent structural breaks—January 1987 and January 2006—in the U.S. softwood lumber market, and estimate Equation 1 using the modified cointegration approach of Johansen et al. (2000). The first structural break in January 1987 represents the beginning of trade policy agreements between the U.S. and Canada. Since then, even during the bilateral trade agreement periods (MOU and SLA06), the trade dispute has
been continuously in contention which carried the dispute case to different international arbitration courts several times (Zhang 2007, Random Lengths 2016). Similarly, the second structural break in January 2006 represents the U.S. housing market bubble in 2006 followed by the great financial crisis in 2008. Equation 1 with two structural breaks can be presented in the reduced-form of \( p \)-dimensional unrestricted VEC as follows (Johansen et al. 2000, Joyeux 2007):

\[
\Delta X_t = \alpha \left( \beta \right) (X_{t-1}^{T} tD_{t-k}) + \mu D_{t-k} + \sum_{i=1}^{k-1} \Gamma_i \Delta X_{t-i} + \sum_{i=0}^{k-1} \sum_{j=2}^{q} kj_i l_{j,t-t} + \epsilon_t
\]

where, \( D_t = (D_{1,t}, D_{2,t})' \) and \( I_t = (I_{1,t}, I_{2,t})' \)

\[
D_{1,t} = \begin{cases} 
1, & \text{for } 1987M1 + 1 \leq t \leq 2015M09 \\
0, & \text{otherwise}
\end{cases}
\]

\[
D_{2,t} = \begin{cases} 
1, & \text{for } 2006M1 + 1 \leq t \leq 2015M09 \\
0, & \text{otherwise}
\end{cases}
\]

\[
I_{1,t} = \begin{cases} 
1, & \text{for } t = 1987M1 + 1 \\
0, & \text{otherwise}
\end{cases}
\]

\[
I_{2,t} = \begin{cases} 
1, & \text{for } t = 2006M1 + 1 \\
0, & \text{otherwise}
\end{cases}
\]

Also, \( \Delta \) is the first difference notation, \( \Gamma_i = -\sum_{j=i+1}^{k} \Pi_j \) is a coefficient matrix with a dimension of \( p \times q \), \( \mu \) refers to \( p \times 1 \) vector of constant terms, \( D_t \) represents \( p \times q \) deterministic dummy terms, \( k \) is the lag length, and \( \epsilon_t \) denotes a vector of IID errors \((0, \Omega)\). Finally, \( \alpha \) refers to the adjustment parameters which determine the speed of adjustment to disequilibrium, \( \beta \) denotes the matrix of long-run coefficients, and \( \gamma \) is the long-run estimate associated with the trend break term, \( tD_{t-k} \). \( X_t \) is the \((6 \times 1)\) vector of variables specified in Equation 1:

\[
X_t = [qc_t, pus_t, pca_t, h_t, ppi_t, xc_t]' \quad t = 1980M01, 1980M02, \ldots, 2015M09
\]

The empirical estimation of Equation 2 starts with testing for the unit root properties of individual data series. Two unit-root tests, the Dickey-Fuller Generalized Least Square (DF-GLS) test (Elliot et al. 1996), and Zivot-Andrews test (Zivot and Andrews 1992), are applied to...
test the stationarity of the individual data series. Once the order of integration of each variable is identified, the modified cointegration test (Johansen et al. 2000) in the presence of two structural breaks is applied to investigate the number of long-run cointegrating vectors in a system of variables. Parajuli and Chang (2015) and Parajuli and Zhang (2016) used the modified cointegration test in a presence of structural break. If the cointegration test suggests a long-run cointegrating relation among the variables, we can estimate Equation 2 by the VEC method. In order to estimate Equation 2 empirically, we employ the same dataset used by Parajuli and Zhang (2016). The historical monthly data for all variables form January 1980 to September 2015 are collected from various sources, especially Nagubadi and Zhang (2013). Table 1 presents the variables, their descriptions and respective data sources. Similar to Parajuli and Zhang (2016), Canadian lumber exports to the U.S. from only SLA-included provinces are taken into account. All the price series are deflated to real 1982 dollars using the U.S. producer price index for all commodities. All data series except policy dummy variables and monthly seasonal dummies are log-transformed.

4. Results

The DF-GLS unit-root test reveals that all variables but $q_{ct}$ and $ppi_{ct}$ are in the integration of order I(1). Furthermore, the Zivot-Andrews test with an endogenous structural break shows that all variables in Equation 1 are I(1), suggesting that a structural break in $q_{ct}$ and $ppi_{ct}$ affects the power of the DF-GLS unit root test. Since Parajuli and Zhang (2016) presented unit-root tests, we do not report the results of both unit-root tests here. Table 2 reports the results of the modified cointegration test in the presence of two structural breaks in January 1987 and January 2006. Two-lag vector autoregression specification is selected based on Schwartz information criterion. The null hypothesis of no cointegration is
rejected, indicating that all six variables in Equation 1 are cointegrated with each other. The test identifies one long-run cointegrating vector at the 1% critical value, suggesting that we can estimate a single equation VEC model of U.S. lumber imports from Canada. We incorporate two trend break deterministic terms, \( t_{d87t} \) and \( t_{d06t} \) in the system by following the method of Joyeux (2007), which capture the effects of the structural break in 1987 and 2006.

Table 3 presents the long-run and short-run coefficient estimates obtained from the VEC estimation of the U.S. import demand model for Canadian lumber with different data sample periods. The second column of Table 3 reports the estimates of the import model based on the full data sample period of January 1980 to September 2015. The results based on the full data period with two permanent structural breaks show that both MOU and SLA96 are statistically insignificant, suggesting that both past agreements have no significant effects on the Canadian lumber exports to the U.S. These results are consistent with Parajuli and Zhang (2016). However, when we limit our dataset from January 1980 to October 1991 (the last month of MOU), MOU is found to be negative and statistically significant. The short-term VEC estimate in Column 3 of Table 3 suggests that, in the period between January 1987 and September 1991, MOU reduces the U.S. lumber imports from Canada by approximately 10%, which is consistent with Wear and Lee (1993).

Similarly, when we subset the dataset from January 1980 to the end of SLA96, the effect of SLA96 is found to be negative and statistically significant, implying that the Canadian lumber shipments to the U.S were reduced by about 5%. However, the effect of MOU now turns out to be positive and statistically significant, which is similar to the finding of Nagubadi and Zhang (2013) but contrary to the theory (Column 4 of Table 3). Further, when we extend our data period to September 2006 in order to incorporate the CVD&AD period, SLA96 turns out to
statistically insignificant. MOU is found to be statistically significant and stay positive. CVD&AD is found to be statistically significant with a coefficient estimate of -0.10 (Column 5 of Table 3). It indicates that the period from August 2001 to September 2006 which experienced a widely varying monthly import tariff, caused to drop the U.S. lumber imports from Canada by around 10%.

Thus, it is evident that data sample period selection plays an important role in the empirical analyses of past policy effects. In other words, even if we account for the effects of structural breaks in the long time-series, policy effects in the empirical analysis are time sensitive. As the magnitudes of policy impacts and the market change over time, the larger effects and larger variations in the later period could overshadow the policy impacts in the previous periods.

5. Conclusions and Discussion

We find that the effects of past trade policies in the U.S. lumber imports model are time sensitive to the ending observation chosen. In the entire data sample period from 1980 to 2015, past trade agreements—MOU and SLA96—are found to be statistically insignificant. However, when we subset the data period to the end of each policy regime, effects of both policy regimes are found to be statistically significant with expected signs. We believe that the results using data until the end of each policy regime are consistent with economic theory, empirical results, the purpose of policy analysis, and political economy reality. The latter is demonstrated by the intense fights for the termination of MOU and SLA96. In addition, Figure 1 clearly shows that MOU stopped the momentum and reversed the trend of increasing Canadian exports of softwood lumber to the U.S. in the late 1980s. Similarly, SLA96 stopped the momentum and possibly reversed the trend of increasing Canadian exports to the U.S. in the middle and late 1990s.
This paper and the studies we cited are about analysis of policy, not analysis for policy. Analysis of policy often looks at the effect of the current, or a new policy regime versus a previous policy regime or status quo by comparing current observations with past observations, *ceteris paribus*. These observations do not need to include future observations because the assumption of all things being equal could be more easily violated with the addition of future observations. As for being consistent with the purpose of policy analysis, we shall use a true story as an example to demonstrate the relationship between the very purpose of policy analysis and the appropriate choice of observations.

A dean of a forestry school evaluates his faculty based on a 5-point scale; 1 being “not meet expectation”, 2 being “marginally meet expectation”, 3 being “meet expectation”, 4 being “nearly exceed expectation”, and 5 being “exceed expectation.” All faculty in his school have 2- or 3-way appointments (teaching, research, extension, and service), and for each appointment, he assigns a score of 1 to 5 as well. The final score for a faculty is the average weighted by her individual appointment percentage. If the final score has decimal point, it is rounded up to an integer. So, when the weighted averages for two faculty are 3.5 or 4.45 respectively, their final score would be all equal to 4.

One year, a faculty who got a score of 4.45 showed the Dean that, despite they could be rounded to 4, a score of 4.45 and of 3.5 are statistically different at the 5% level, because, assuming a normal distribution, the t-ratio for these two numbers is 13.28, which is greater than the critical value of 12.70 at the 5% level. Therefore, it is not fair that a faculty with a score of 4.45 be ranked the same as the faculty with a score of 3.5. As the purpose of this analysis of policy exercise was to show that the annual evaluation policy and procedure have flaws and need refinements, two observations were enough.
The Dean, on the other hand, provided her with all the average scores of 7 other faculty members whose average score was at 4. Statistical analysis shows that 4.45 is not statistically different from the scores of all these faculty at the 5% level. What the Dean did was basically adding more observations and thus masking the impacts of a fundamental flaw in the annual evaluation system. In doing so, the Dean was trying to answer another question: whether the faculty who scored 4.45 performed better than all other faculty whose average score was 4. This is a different question and irrelevant for the original purpose of the discussion (purpose of policy analysis)—which was whether there were flaws in the School’s annual evaluation policy and procedure.

Coming back to our current study—although it is unclear what exactly causes this kind of masking or dilution effects in long time series study as we presented in this paper, this is likely related to the facts that impacts in the lumber imports caused by the past policies in the early periods are overshadowed by the larger influences in the later periods (Nagubadi and Zhang 2013), that market changes over time, and that the structure and severity of the trade agreements varies.

Evidently, in Figure 1, we see less fluctuation in Canadian lumber imports during the periods of MOU and SLA96 compared with the periods of CVDAD and SLA06. Also, the collapse of U.S. housing markets in the recent recession is far longer and more severe than in the early 1980s and in other recessions, while the housing markets in the early 2000s were the strongest in the whole study period. As for the structure and severity of the trade agreements, MOU is a 15% export taxes or stumpage adjustment, SLA96 is a two-tier export-tax rated quota system, CVDAD is a strictly tariff measure although the tariff rate was very high, and SLA06 is a price-specific export tax-rated quota system with the possibility of free trade if prevailing
monthly U.S. lumber price reaches $355 per thousand board feet. We are not sure which one of
these three factors contributes more to this kind of masking or dilution, nor can we answer how
much variation in later periods would be required to observe this kind of masking results or if the
same sort of dilution happens for estimates in short periods of long data series regardless of the
extent of variations in the later periods. Nonetheless, the larger the dataset that contains
observations long after the termination of a policy regime, the harder for one to maintain the
assumption of all else being equal and still stick to the very purpose of policy analysis. Thus, we
suggest that, in empirical works, policy impacts can be best judged by only using data up to the
time when the policy is terminated, but not afterwards.

Obviously, in any statistical analysis, one would need adequate sample size for the
asymptotic properties of the estimators. Some even advocate a sample size as large as possible.
However, choosing an appropriate data sample period is quite critical in policy impact analysis
studies and needs considering the purpose of policy analysis. And adding observations after a
policy regime is completed does not help assess the impact of the policy regime and often dilutes
the impact estimates because doing so makes it harder to maintain the focus of policy analysis
and the assumption of all else being equal. Thus, when a series of policy regimes are
implemented, a rule for selection of an appropriate time series sample in policy analysis is to
include only a specific collection of observations until the end of each policy regime. As for the
specific empirical study used in this paper, one could try alternatives to VEC model such as non-
linear modeling.
References


### Table 1. Variables, their descriptions and sources

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Unit</th>
<th>Source</th>
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<tbody>
<tr>
<td>(q_{ct})</td>
<td>Canadian lumber exports to the U.S. from SLA-included provinces</td>
<td>million board feet (mmbf)</td>
<td>Statistics Canada</td>
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<tr>
<td>(p_{ut})</td>
<td>PPI for lumber and wood products (WPU0811)</td>
<td>Index (1982=100)</td>
<td>US Bureau of Labor Statistics</td>
</tr>
<tr>
<td>(pca_{t})</td>
<td>Canadian softwood lumber price in U.S. dollars</td>
<td>$1982/mbf</td>
<td>Total value/quantity of imported lumber</td>
</tr>
<tr>
<td>(h_{t})</td>
<td>Housing starts in the U.S.-seasonally adjusted annual rate</td>
<td>1000s</td>
<td>U.S. Census Bureau</td>
</tr>
<tr>
<td>(x_{ct})</td>
<td>Canada/U.S. foreign exchange rate C$/US$</td>
<td></td>
<td>U.S. Federal reserve system</td>
</tr>
<tr>
<td>(ppi_{t})</td>
<td>U.S. producer price index for all commodities</td>
<td>Index (1982=100)</td>
<td>U.S. Bureau of Labor</td>
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<td>MOU</td>
<td>Memorandum of Understanding</td>
<td>0 or 1</td>
<td>1 for 1987:01-1991:09</td>
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<td>SLA96</td>
<td>Softwood Lumber Agreement 1996</td>
<td>0 or 1</td>
<td>1 for 1996:01-2000:09</td>
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<tr>
<td>CVDAD</td>
<td>Countervailing duties and anti-dumping tariffs</td>
<td>0 or 1</td>
<td>1 for 2001:08-2006:09</td>
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<tr>
<td>SLA06*</td>
<td>Softwood Lumber Agreement 2006</td>
<td>0 or 1</td>
<td>1 for 2006:10-2015:06</td>
</tr>
<tr>
<td>recs08</td>
<td>Great financial crisis of 2008-09</td>
<td>0 or 1</td>
<td>1 for 2007:12 – 2009:06</td>
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* 0 for months in which prevailing monthly price was above $355/mbf or when free trade prevailed during SLA 2006.
Table 2. The Johansen cointegration rank test with two structural breaks (optimum lags=2)

<table>
<thead>
<tr>
<th>H0</th>
<th>H1</th>
<th>LR Statistics</th>
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<th>1% critical value</th>
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<td>n=0</td>
<td>n&gt;0</td>
<td>219.14</td>
<td>129.82</td>
<td>138.86</td>
</tr>
<tr>
<td>n=1</td>
<td>n&gt;1</td>
<td>99.80</td>
<td>99.27</td>
<td>107.30</td>
</tr>
<tr>
<td>n=2</td>
<td>n&gt;2</td>
<td>63.55</td>
<td>72.57</td>
<td>79.61</td>
</tr>
<tr>
<td>n=3</td>
<td>n&gt;3</td>
<td>36.89</td>
<td>49.83</td>
<td>55.89</td>
</tr>
<tr>
<td>n=4</td>
<td>n&gt;4</td>
<td>17.96</td>
<td>30.94</td>
<td>36.04</td>
</tr>
<tr>
<td>n=5</td>
<td>n&gt;5</td>
<td>6.22</td>
<td>15.98</td>
<td>20.33</td>
</tr>
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Table 3. Long-run and short-run coefficient estimates of Vector Error Correction Models: U.S. lumber imports from Canada (1980:01-2015:09) [optimum lags=2]

<table>
<thead>
<tr>
<th>Variable</th>
<th>Full data period</th>
<th>MOU only</th>
<th>MOU &amp; SLA96</th>
<th>MOU, SLA96 &amp; CVDAD</th>
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<tr>
<td>qc&lt;sub&gt;t&lt;/sub&gt;</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>pus&lt;sub&gt;t&lt;/sub&gt;</td>
<td>-0.91** (0.16)</td>
<td>0.46 (0.42)</td>
<td>-0.68** (0.22)</td>
<td>-0.90** (0.16)</td>
</tr>
<tr>
<td>pca&lt;sub&gt;t&lt;/sub&gt;</td>
<td>0.90** (0.12)</td>
<td>0.62** (0.26)</td>
<td>0.61** (0.18)</td>
<td>0.60** (0.13)</td>
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<tr>
<td>h&lt;sub&gt;t&lt;/sub&gt;</td>
<td>-0.67** (0.05)</td>
<td>-0.83** (0.07)</td>
<td>-0.64** (0.06)</td>
<td>-0.57** (0.06)</td>
</tr>
<tr>
<td>xc&lt;sub&gt;t&lt;/sub&gt;</td>
<td>0.17 (0.14)</td>
<td>-0.74** (0.36)</td>
<td>-0.39** (0.18)</td>
<td>-0.34** (0.14)</td>
</tr>
<tr>
<td>ppi&lt;sub&gt;t&lt;/sub&gt;</td>
<td>0.66** (0.26)</td>
<td>-0.20 (0.55)</td>
<td>-0.72** (0.40)</td>
<td>-0.20 (0.30)</td>
</tr>
<tr>
<td>td87&lt;sub&gt;t-2&lt;/sub&gt;</td>
<td>-0.001* (0.0005)</td>
<td>-0.004** (0.001)</td>
<td>0.00004 (0.005)</td>
<td>0.0003 (0.0005)</td>
</tr>
<tr>
<td>td06&lt;sub&gt;t-2&lt;/sub&gt;</td>
<td>0.0003 (0.0002)</td>
<td>-0.0002 (0.0003)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-5.27</td>
<td>-5.28</td>
<td>1.28</td>
<td>-0.72</td>
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Short-run Coefficients

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<tr>
<th></th>
<th>ECM</th>
<th>MOU</th>
<th>SLA96</th>
<th>CVDAD</th>
<th>SLA06</th>
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<td>-0.74** (0.09)</td>
<td>-0.60** (0.07)</td>
<td>-0.57** (0.06)</td>
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<tr>
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<td>-0.02 (0.01)</td>
<td>-0.10** (0.02)</td>
<td>0.04** (0.02)</td>
<td>0.06** (0.02)</td>
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<tr>
<td></td>
<td>0.02 (0.01)</td>
<td>-0.05** (0.01)</td>
<td>-0.01 (0.01)</td>
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<tr>
<td></td>
<td>-0.11** (0.02)</td>
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<td>-0.05** (0.01)</td>
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<td>245</td>
<td>317</td>
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<td>0.53</td>
<td>0.46</td>
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*p<0.1, ** p<0.05

Values in parenthesis are corresponding standard errors. ECM is an error-correction term in the system which represents the speed of adjustment in the long-run equilibrium state of the system.
Figure 1. Canadian lumber exports to the U.S. under various trade policy regimes