

Do exporters of Canadian forest products price to market?

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Outline

- Brief overview of trade literature in forest products
- Pricing to Market – theory and motivation
- Empirical Model and Results
- Summary

Forest products trade

- Heavy use of spatial partial equilibrium methods (e.g., Takayama and Judge).
- Significant focus on trade barriers/policies (e.g., Canada/US softwood Dispute)
- Econometric techniques used for:
 - Estimating elasticities/calibration
 - Testing assumptions (e.g., the law of one price/spatial integration)



The Global Forest Products Model

Joseph Burongiorno

Shunruai Zha

Dali Zhang

James Turner

David Tomberlin



International Trade in Forest Products

Lumber Trade Disputes, Models and Examples

Edited by G. Cornelis van Kooten and Linda Voss

 CABI

Forest products trade – data-driven methods

- Gravity model
- VAR/GVAR
- Differentiated products (e.g., Armington/AIDS model)

Differentiate products

1196



NOTE

Elasticity of demand for Canadian logs and lumber in China and Japan

Kurt Niquidet and Jingwen Tang

Abstract: Over the past decade, Chinese demand for forest products has increased substantially. While domestic production has risen, this increased demand has been met mostly by imports. The boom has been a welcome benefit to large forest products exporting countries such as Canada, especially in light of the weakened demand that occurred in the United States (US) following the financial crisis. While estimates of demand parameters for the US are vast, little is known about Canada's other two leading markets: China and Japan. Furthermore, many existing trade models assume that logs and lumber are homogenous, perfectly substitutable regardless of their origin. In this note, we apply a source-differentiated Almost Ideal Demand System (AIDS) model to Chinese and Japanese log and lumber imports, with an emphasis on imports originating from Canada. Results indicate that the price elasticity of demand for Canadian lumber and logs in China is elastic. In contrast, in Japan, the price elasticity of demand for Canadian lumber is inelastic, but like China, demand for Canadian log imports is elastic. Expenditure elasticities suggest that Canadian wood products are expected to be favoured relative to other countries as demand in China grows; this finding may be attributed to marketing programs.

Pricing to market

- Firms/regions have some market power.
 - Mark-up over marginal cost
 - Mark-up depends on elasticities
- Leads to price discrimination across regions (i.e., law of one price doesn't hold)
- Pricing decision changes with changes in bilateral exchange rates

Pricing to Market when the Exchange Rate Changes

Paul Krugman

WORKING PAPER 1926

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International Comparisons of Pricing-to-Market Behavior

By MICHAEL M. KNETTER*

The paper measures the degree of price discrimination across export destinations that is associated with exchange-rate changes using U.S., U.K., German, and Japanese industry-level data. Given the industries sampled, more price discrimination across destinations is observed in the U.K., German, and Japanese data. For industries that match across source countries, however, behavior is very similar across source countries. Furthermore, destination-specific price adjustment on exports to the United States from Germany and Japan is similar to price adjustment observed on shipments to other destinations. Most variation in the data appears to be related to industry. (JEL D40, E30, F14, L16, L60)

The optimal response of a firm's export pricing in the buyer's currency relative

Empirical Model

The model's theoretical underpinning is based on a producer's profit maximization problem. The first-order conditions of the maximization problem are given by:

$$P_{it} = c_t \frac{\epsilon_{it}}{\epsilon_{it} - 1}, i = 1, \dots, N \text{ and } t = 1, \dots, T, \quad (1)$$

here $i = 1, \dots, N$ represents foreign destinations; P_{it} is the export price to destination i in period t measured in the exporter's currency; c_t is the marginal cost of production in period t , and ϵ_{it} is the elasticity of demand considering the local currency price in destination market i in period t .

For the details of the derivation, please see Knetter (1989).

Empirical Model – Panel of Export Prices

To test if exporters modify prices with fluctuations in the exchange rate, we use the following empirical fixed-effects regression model:

$$\ln p_{it} = \alpha + \theta_t + \tau_i + \beta_i \ln s_{it} + \varepsilon_{it}, \quad (2)$$

where p_{it} is the export unit value measured in the currency of export origin (Canadian dollars per cubic metre of logs and lumber, and Canadian dollars per tonne of pulp), θ_t is a time effect, τ_i is a country effect, s_{it} is the exchange rate (adjusted for inflation) measured in terms of the destination

Data

- BC export data from Statistics Canada (1994 to 2015)
- Panel: logs, lumber, pulp by species and destination
- Real Exchange Rates – OECD and IMF Statistics

Table 2: The impact of real exchange rate and country effects on BC lumber export prices

Product	Destination	Country effects(τ)	Exchange rates (β)
Cedar	Taiwan	2.35 (0.16)***	-0.19 (0.01)***
	France	1.91 (0.44)***	-0.23 (0.07)***
	Germany	2.10 (0.44)***	-0.19 (0.07)***
	Japan	2.83 (0.17)***	-0.11 (0.03)***
	China	2.65 (0.25)***	0.02 (0.04)
	Netherlands	2.46 (0.43)***	-0.14 (0.07)**
	South Korea	4.23 (0.23)***	-0.67 (0.06)***
	UK	1.26 (0.08)***	-0.34 (0.02)***
	US		-0.55 (0.04)***
Number of observation = 1683; R ² =0.79			
Hem-fir	Taiwan	0.20 (0.06)***	0.04 (0.03)
	Italy	2.28 (0.86)***	0.30 (0.15)**
	Japan	0.45 (0.11)***	-0.18 (0.07)**
	China	-0.22 (0.32)	-0.15 (0.09)*
	South Korea	0.51 (0.14)***	-0.05 (0.08)
	UK	-0.57 (0.18)***	-0.25 (0.06)***
	US		-0.05 (0.02)**
Number of observation = 1561; R ² =0.90			

Hemlock	Taiwan	0.51 (0.24)***	-0.07 (0.01)***
	UK	1.48 (0.38)***	-0.18 (0.04)***
	South Korea	3.50 (0.72)***	-0.75 (0.22)***
	China	1.71 (0.31)***	0.00 (0.10)
	Japan	1.99 (0.31)***	-0.28 (0.04)***
	Germany	3.10 (0.62)***	0.13 (0.13)
	Italy	4.35 (0.66)***	0.40 (0.11)***
	US		-0.38 (0.06)***

Number of observation = 1400; R²=0.86

S-P-F	Taiwan	1.99 (0.38)***	-0.06 (0.02)**
	Japan	2.31 (0.44)***	-0.08 (0.05)
	China	1.51 (0.38)***	-0.22 (0.07)***
	Philippines	0.30 (0.43)	-0.42 (0.09)***
	South Korea	2.69 (0.51)***	-0.20 (0.07)***
	UK	0.92 (0.31)***	-0.24 (0.04)***
	US		-0.45 (0.09)***

Number of observation = 1561; R²=0.54

Note: Numbers in the brackets are the robust standard errors (Huber/White/sandwich). ***Indicates statistical significance at the 1% level or better; **Indicates significance at 5% level or better; *Indicates significance at 10% level or better.

Table 3: The impact of real exchange rate and country effects on BC pulp export prices

Product	Destination	Country effects(τ)	Exchange rates (β)
BCTMP	China	0.82 (0.26)***	0.10 (0.02)***
	Japan	0.56 (0.20)***	-0.08 (0.03)***
	Taiwan	0.56 (0.22)**	-0.02 (0.01)
	Indonesia	0.68 (0.20)***	-0.03 (0.02)*
	Korea	0.78 (0.20)***	-0.08 (0.02)***
	India	0.51 (0.21)**	-0.01 (0.02)
	US		-0.12 (0.04)***
Number of observation = 1450; R ² =0.57			
Bleached Pulp	China	-0.01 (0.01)	0.02 (0.01)***
	Japan	-0.08 (0.03)***	-0.06(0.01)***
	Korea	0.16 (0.04)***	-0.10 (0.01)***
	Taiwan	-0.13 (0.03)***	-0.05 (0.01)***
	Indonesia	0.10 (0.33)***	-0.04(0.00)***
	Thailand	-0.15 (0.03)***	-0.07 (0.01)***
	France	-0.14 (0.03)***	-0.02 (0.01) *
	Germany	-0.37(0.02)***	-0.06 (0.01)***
	Italy	-0.14 (0.03)***	-0.02 (0.01)*
	Spain	-0.14 (0.03)***	-0.02 (0.01)*
	US		0.01 (0.01) **
	Number of observation = 2958; R ² =0.85		

Conclusion

- Widespread evidence of pricing-to-market behaviour
- Leads to price stabilization for most products and destinations
- Forest Economists need to catch up with “New Trade Theory”
- Also “New-New Trade Theory” (e.g., Firm-level analysis)