

Real Exchange Rates and Trade Protectionism in Advanced Industrialized Societies, 1978-2004

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Abstract

Real exchange rate movements are robustly related to the rise and fall of protectionist pressure throughout the advanced industrialized world. I demonstrate this by presenting a theoretical model that incorporates the real exchange rate into a standard factor proportions model of trade policy preferences. The model demonstrates why some firms' trade policy preferences, and thus total demands for protectionism, change in response to real exchange rate movements. I evaluate the model with data on antidumping investigations in OECD countries and South Africa between the late 1970s and 2004. The exercise suggests that the real exchange rate hypothesis offers a more compelling explanation for protectionist waves than the business cycle hypothesis.

As the recent financial crisis pushed the global economy into recession, policymakers began to fear resurgent trade protectionism. World Bank President Robert Zoellick succinctly summarized the concern: "As the recession deepens, leaders will be under pressure to protect home markets..." "A retreat to protectionism would be the type of negative shock that would pull you back into a 1930s scenario" (Barkley 2009). Zoellick's concern appears to have been broadly-shared. G-20 governments pledged themselves to resist protectionist pressures in November of 2008 and April 2009 (G-20 2008, 2009). Pascal Lamy, Director General of the World Trade Organization, dedicated substantial energy to monitoring the spread of protectionism (see, e.g., World Trade Organization 2009). Prominent economists urged governments to resist protectionist demands (see e.g., Baldwin and Evenett 2009). Concern strengthened when the World Bank reported that seventeen of the G-20 governments had implemented forty six trade restrictions by the end of the first quarter of 2009 (Gamberoni and Newfarmer 2009).

These contemporary events reveal just how dark is the shadow history casts upon the present. Eighty years after the Smoot-Hawley Tariff Act first passed in the House of Representatives, policymakers remain haunted by the errors of their predecessors. Should they be? That is, is it reasonable for policymakers to believe that the contemporary global recession will trigger widespread protectionism? There are good reasons to reconsider what lesson we should draw from the 1930s. On the one hand, existing research into the relationship between the business cycle and protectionism does not strongly support the claim that the two are systematically related. Theoretical models developed in this research program struggle to explain why firms that always benefit from protection only seek protection during economic downturns or why firms that gain protection during downturns relinquish these rents during the recovery phase (see, e.g., Cassing et al. 1986; Gallarotti 1985; Grilli 1988; McKeown 1984). Empirical models of the relationship between the business cycle and protection fare little better, as they fail to identify a robust empirical relationship between macroeconomic activity and protectionism (Bohara and Kaempfer 1991; Coughlin et al. 1989; Takacs 1981).

On the other hand, recent work suggests that protectionism in the early 1930s were at least as much a consequence of governments' exchange rate policies as a result of the collapse of aggregate demand (Eichengreen and Irwin 2009). Governments in countries that adhered to the gold standard adopted protectionism; governments in countries that abandoned the gold standard did not. Although Eichengreen and Irwin focus on adherence to the gold standard, the causal force in their analysis is changes in currency values that resulted from these divergent choices. Countries that stayed on gold saw their currencies appreciate relative to countries that abandoned the gold standard. Protectionism was a response to the loss of competitiveness brought about by this change in relative prices. More broadly, economists have long recognized that devaluation and trade barriers (tariffs, quotas, and subsidies) are policy substitutes from the perspective of an individual firm (see e.g., Corden 1997; McKinnon and Fung 1993). Political scientists occasionally recognize the relationship in practice. Jeff Frieden, for example, highlights how in the late 19th century American industry responded to a strong currency by demanding higher tariffs. (Frieden 1997; see also Broz and Frieden 2001). Frieden's observation finds broader support in a small empirical literature that finds that antidumping petitions vary systematically with exchange rate movements (Irwin 2005; Knetter and Prusa 2003; Niels and Francois 2006; Oatley 2009).

Existing literature has not yet specified a theoretical model that links changes in the real exchange rate to changes in the level of protectionism in a framework consistent with standard models of trade policy preferences. This paper embraces this task. I first develop a utility function cast at the sectoral level that incorporates the real exchange rate into a standard factor proportions model of trade policy preferences. The model demonstrates why some firms' trade policy preferences change in response to real exchange rate movements. I then use this utility function to demonstrate how the relative size of protectionist and liberalizing coalitions changes in response to real exchange rate movements.

I evaluate the hypothesis using data on antidumping investigations in six countries between the late 1970s and 2004. The exercise suggests that the real exchange rate hypothesis offers a more compelling explanation for protectionist waves than the business cycle hypothesis. On the other hand, the real exchange rate hypothesis receives robust empirical support; the business cycle hypothesis does not. Consequently, temporal variation in protectionism seems to relate systematically to real exchange rate movements rather than the business cycle. These findings have implications for contemporary policy debates, for our understanding of recent history, and for current research on trade politics that I explore in the conclusion.

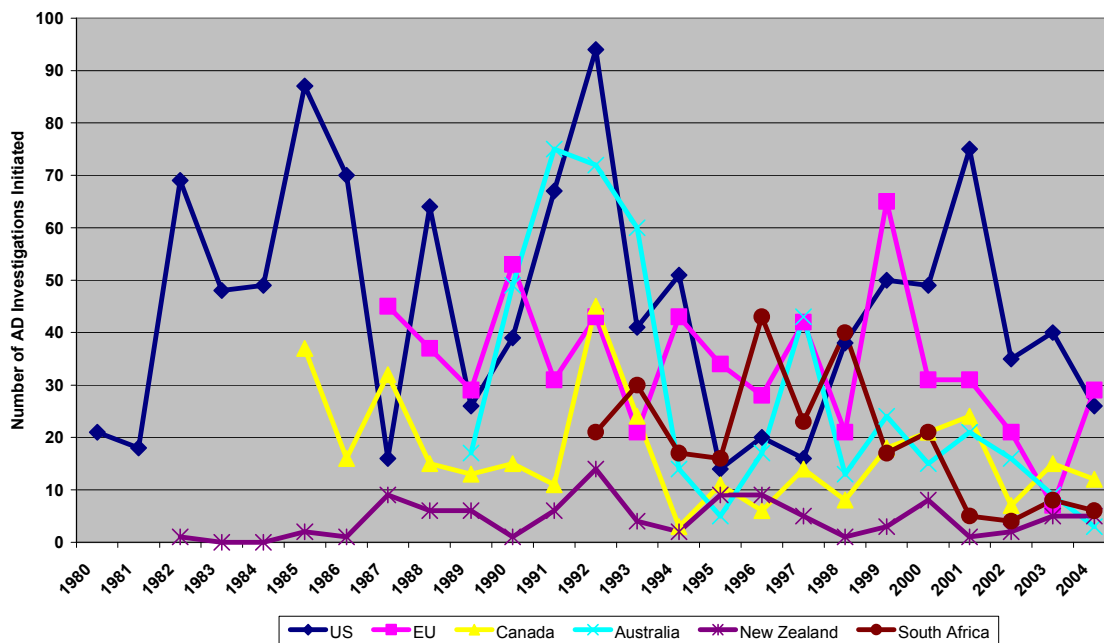
Real Exchange Rates and Demands for Protection

The number of firms that demand government policies to protect them from imports varies over time in all advanced industrialized countries. Figure one illustrates this variation by plotting the number of antidumping petitions filed each year in the major trading nations since the early 1980s. Although the data clearly indicate that antidumping investigations are more frequent in some countries than in others, they also indicate that the number of antidumping investigations varies substantially from year to year in every country. Moreover, these national protectionist waves are not significantly correlated with each other. The absence of significant relationships between these national cycles indicates that protectionist waves are not a product of a common system-level process, such as the growth of global trade or of the global economy, nor a consequence of dyadic trade conflicts. Instead, the data seem to suggest that independent processes in each country generate similar protectionist waves.

Temporal variation should reflect change in the relative power of liberalizing and protectionist forces. Endogenous tariff models assert that tariff rates reflect the balance of power between protectionist and liberalizing coalitions. We should therefore be able to specify the causal mechanism through which change in the economic environment induces more producers to demand protection. The relative power of the protectionist coalition should rise and fall because either the number of firms that prefer high tariffs changes in response to changes in some economic parameter or the number of firms willing to spend money to pursue high tariffs changes in response to changes in some economic parameter.

The model I develop argues that the trade policy preferences of a subset of firms change in response to real exchange rate movements. As the real exchange rate appreciates, some firms that are internationally competitive at the equilibrium exchange

**Figure 1: Antidumping Investigations
1981-2004**



rate are priced out of foreign markets and confront intense competition from imports at home. The trade policy preferences of these firms thus change. Whereas they prefer low tariffs under the equilibrium exchange rate, they prefer a high tariff at the over-valued exchange rate. Consequently, the share of traded goods producers that seek tariff protection increases as the currency appreciates and decreases as the currency depreciates. Changes in the relative influence of the import-competing and export-oriented coalitions are a consequence of real exchange rate movements.

I build the model in two steps. I first develop an expected utility function cast at the sector level. This expected utility function tells us the conditions under which a sector prefers protection. I then use this expected utility function to derive a “benefit from protection schedule” for the entire traded goods sector. This schedule allows me to divide traded goods producers into two coalitions: those who prefer protection and those who prefer open trade. I then use this schedule to demonstrate how coalition membership—and therefore relative coalition size—changes in response to real exchange rate movements.

The Expected Utility Function

The pursuit of policy measures to offset a competitive disadvantage is a costly and uncertain endeavor. As a consequence, producers seek such policy measures only when the benefits they expect are greater than the lobbying costs. We can therefore express the decision to seek such policy measures in an expected utility framework. Sector s 's expected utility from political activity is the difference between the expected benefit the policy measure confers and the cost of political activity needed to acquire the measure:

$$\mathbf{E}(U_s) = (P_i T_{s,i} Q_s - L_i). \quad (1)$$

P_i is the probability that lobbying by sector s yields the policy measure i . $T_{s,i}$ is the benefit of policy measure i per unit of sector s 's output and Q_s is sector s 's total output. L_i is the cost of lobbying for policy measure i .

We can further define $T_{s,i}$ as the difference between unit cost in sector s and the world price of the goods sector s produces. Thus,

$$T_{s,i} = (f_s - \Pi_{s,w}) \quad (2)$$

Where f_s is unit cost for sector s and $\Pi_{s,w}$ is the world price for the good produced by sector s . Let f_s be a function of unit factor payments for sector s . Factor payments are a product of the factor mix sector s employs and economy-wide factor prices. I assume that all producers in sector s in all countries employ the same production function. Factor prices reflect home country factor endowments. As a consequence, all producers in a given sector in a given country have identical unit costs (identical production function and identical factor prices). Unit cost in every sector varies across countries as a function of differences in local factor prices. World price ($\Pi_{s,w}$) equals average unit cost for all producers of good s in the world economy.

I incorporate the real exchange rate (R) via its impact on unit cost.¹

$$T_{s,i} = (f_s R - \Pi_{s,w}) \quad (3)$$

I normalize the equilibrium real exchange rate to 1. Real appreciation (increase in R) raises home factor prices relative to the world price; a real depreciation reduces home factor prices relative to the world price. Real appreciation therefore raises f_s for all s proportional to the amount of the appreciation.

Substituting (3) into (1) yields the full expected utility function:

$$\mathbf{E}(U_s) = P_i (f_s R - \Pi_{s,w}) Q_s - L_i. \quad (4)$$

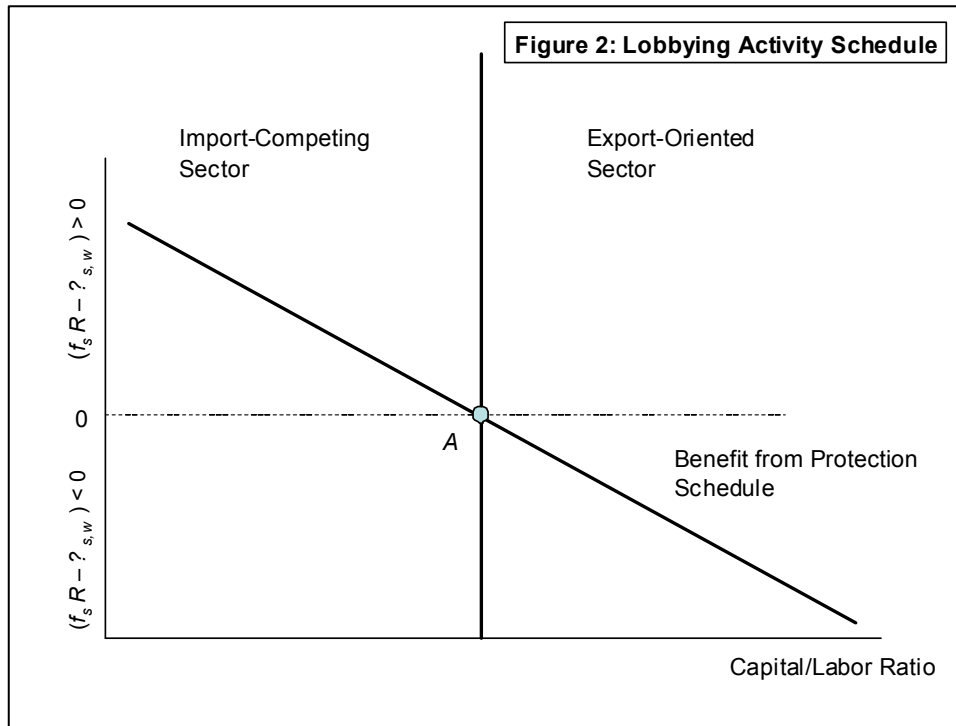
A sector therefore pursues a policy measure to offset a competitive disadvantage if its expected per-unit benefit from the policy is greater than the per-unit cost of lobbying:

$$P_i (f_s R - \Pi_{s,w}) > L_i / Q_s \quad (5)$$

The Benefit from Protection Schedule

Protectionism rises and falls over time because the number of traded goods sectors that satisfy inequality (5) increases as the real exchange rate appreciates and decreases as the real exchange rate depreciates. We can illustrate this dynamic by deriving a "benefit from protection" schedule for all traded goods producers (see figure 2). The horizontal axis is the capital-labor ratio, with the relative importance of capital increasing as we move away from the origin. The vertical axis is $(f_s R - \Pi_{s,w})$. The benefit

¹ See, e.g., Dornbusch (1987). One could incorporate the real exchange rate via its impact on the local currency value of the world price. The important point is that real exchange rate movements alter the gap between unit cost and world price. I chose this depiction to emphasize that producers take the world price as given and consequently, the real exchange rate alters local costs relative to that world price.



from protection schedule, therefore, plots the level of protection a sector requires to offset its competitive disadvantage given the capital-labor ratio it employs, for all possible capital-labor ratios. With labor the scarce factor and capital abundant, $(f_s R - \Pi_{s,w})$ is greater than zero at the origin and becomes progressively smaller as we shift out along the capital-labor ratio.

We can determine whether a sector prefers protection based on where its production function lies relative to the point at which the benefit from protection schedule equals zero. All sectors that employ a production function to the left of the point at which the benefit from protection schedule equals zero benefit from protection. These producers make up the import-competing coalition. Sectors that employ production functions to the right of this point do not benefit from protection. Together they constitute the export-oriented coalition. Notice that as long as we assume that the real exchange rate and factor prices are at equilibrium, factor proportions alone tell us whether a sector benefits from protection. Sectors that employ the scarce factor intensively benefit from protection. Moreover, if the real exchange rate remains at equilibrium the number of such sectors is invariant.

Real exchange rate movements change coalition membership from one period to the next. A real exchange rate movement is a temporary departure from the long-run equilibrium real exchange rate (R).² Such shocks alter the number of sectors for which $P_i (f_s R - \Pi_{s,w}) > L_i / Q_s$. Real exchange rate appreciation increases the number of sectors for which the expected per-unit benefit exceeds the per-unit cost of lobbying. Real exchange rate depreciation decreases the number of sectors for which the expected benefit exceeds the cost of lobbying.

²I assume that exogenous shocks are normally distributed. Real exchange rate shocks in the 114 country-year sample employed below appear to be normally distributed. The mean annual change was -.0001 percent with a standard deviation of .07.

Figure 3: Lobbying Activity Schedule

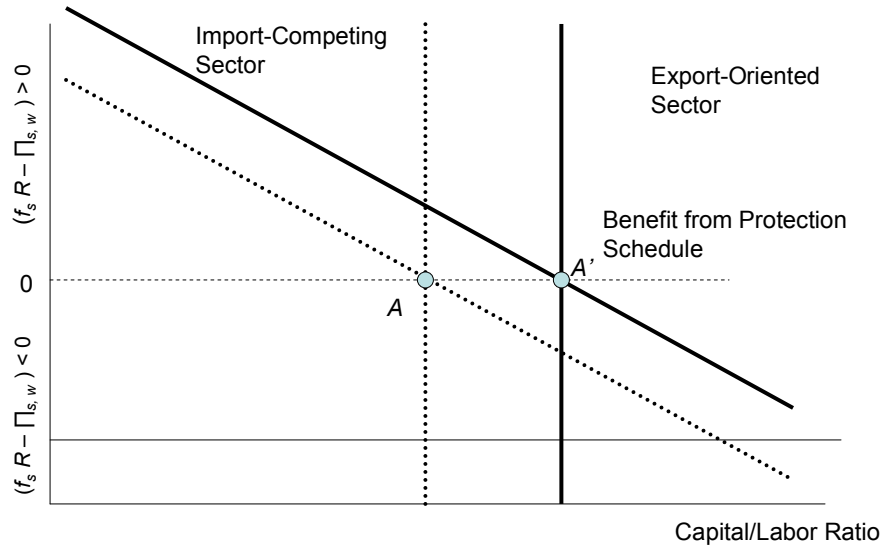


Figure 3 depicts how shocks alter the relative size of import-competing and export-oriented coalitions. A real exchange rate appreciation shifts the benefit from protection schedule up and to the right. The number of sectors whose production functions lie left of the point at which the benefits from policy schedule equals zero increases relative to the number of such sectors at the equilibrium real exchange rate. Consequently, the share of traded goods producers that benefit from protection increases as the currency appreciates, while the share of traded goods producers that benefit from open trade decreases. A real depreciation pushes the benefits schedule down and to the left, thereby increasing the number of sectors whose production functions lie to the right of the point at which the benefits from policy schedule equals zero. Consequently, the share of traded goods producers that benefit from protection decreases as the currency depreciates, while the share of traded goods producers that benefit from open trade increases. The relative size of the import-competing and export-oriented coalitions changes in response to movements of the real exchange rate.

The precise relationship between real exchange rate movements and coalition membership depends upon how sectors are distributed across the capital-labor ratio dimension. The prior discussion assumed (implicitly) that sectors are distributed uniformly across this dimension. Consequently, real exchange rate shocks produce changes in group membership of proportional size. Most exchange rate movements are relatively small and thus change preferences of only a few sectors. Moreover, the sectors whose preferences are affected by these small shocks are those for which the expected benefit from protection is approximately equal to the cost of lobbying at the equilibrium real exchange rate ($P_i (f_s R - \Pi_{s,w}) \approx L_i / Q_s$). Large shocks occur infrequently, but when they do occur they change preferences in a large number of sectors.

Shocks generate non-linear preference changes if sectors are not uniformly distributed across the capital-labor ratio. Suppose sectors are normally distributed across the capital-labor ratio. Small real exchange rate movements now change preferences for

many sectors, while substantially larger movements produce relatively few additional preference shifts. If sectors are distributed bimodally, or heavily skewed, then moderately large real exchange rate movements may alter no preference, while real exchange rate movements of only slightly larger magnitude will induce many sectors to change their preferences. Such non-linearities might help us account for the behavior of western populists in late 19th century United States, whose demand for currency depreciation, tariffs, or other forms of protection appears correlated with exchange rate shocks (Frieden 1997). The specific functional form that maps real exchange rate movements onto changes in trade policy preferences is thus sensitive to how sectors are distributed across production functions. The more general point, that real exchange rate movements can induce changes in producers' trade policy preferences, is not.

The model thus generates static and dynamic implications. The static implication is identical to our standard Ricardo-Viner model of trade policy preferences. Sectors constitute two groups: import-competing sectors that benefit from protection and export-oriented sectors that do not. Membership in each coalition on average (assuming that real exchange rate movements are normally distributed) and at the equilibrium real exchange rate, is determined by factor proportions. Producers that rely intensively on the scarce factor in production benefit from protection. Producers that rely intensively on the abundant factor benefit from open trade.

What is true on average over the long run (or at the equilibrium real exchange rate) is not true in each period. Real exchange rate movements cause membership in the import-competing and export-oriented coalitions to vary from one period to the next. Real exchange rate appreciation transforms marginally competitive sectors into uncompetitive sectors. Such shocks thereby increase the number of sectors that prefer protection and reduce the number of sectors that do not. Real exchange rate depreciations transform marginally uncompetitive sectors into marginally competitive sectors. Such shocks thus reduce the number of sectors that benefit from protection and increase the number that do not. The magnitude of the change in membership is in turn a function of the magnitude of the shock.

To summarize, temporal variation in protectionism is consequence of how real exchange rate movements, by altering the trade policy preferences of marginally competitive sectors, alter the relative size of import-competing and export-oriented coalitions. The number of producers that benefit from protection increases as the currency strengthens and falls as the currency weakens. As a result demands for protectionism rise in periods of strong currencies and fall in periods of currency weakness.

Data and Analysis

I test the real exchange rate hypothesis using data on antidumping investigations in Australia, Canada, the European Union, New Zealand, South Africa, and the United States. I focus on antidumping petitions because they offer a direct measure of industry demands for protection that is comparable across time and across countries. Antidumping petitions are clear evidence of costly political activity. Each petition filed directly indicates a firm willing to pay real money in an attempt to secure tariff protection. Moreover, we can aggregate antidumping petitions with reasonable assurance that we are adding comparable items. Ten petitions is meaningfully larger than five petitions; and if

in year t twenty-five firms filed antidumping petitions and in year $t+1$ thirty-five firms did so, we know that the number of firms that demanded protection increased by ten. Hence, administered protection offers a direct and consistent measure of the willingness of firms to dedicate resources to the pursuit of tariff protection. In addition, antidumping petitions are reasonably comparable across countries. Antidumping petitions therefore offer a good indication of demands for trade protection.

Alternative measures introduce substantial error by aggregating incomparable items. To create an index of trade legislation by counting the number of trade bills introduced in the legislature each year, for example, requires decisions about the weights to attach to each bill. Should one weigh an omnibus trade bill (that might contain a large number of protectionist measures and a large number of liberalizing measures) the same as an industry-specific tariff bill? How should one weigh legislation that changes rules governing the administered protection process rather than directly changes tariffs or other policy instruments? How does one handle bills that are liberalizing rather than protectionist? Nor are such counts readily comparable across time. How much confidence do we have that twenty-five trade bills introduced in one year are identical to twenty-five different trade bills introduced the next year? One could minimize this problem by looking only at a sub-sample of legislation, restricted by time period or by sector. Although this approach minimizes the aggregation of non-comparable items, it raises other concerns about the extent to which the selected sub-sample is representative of a broader dynamic. Such issues are further compounded when we engage in cross-national research. One could reduce this problem by focusing on the average tariff rate, but this requires us to assume that a change in the average tariff is a consequence of firms' (unobserved) political activity. Antidumping investigations are an observable indicator of this activity.

The selection of countries and time period reflects the availability of data on antidumping investigations and real exchange rate movements. I included all countries for which I could obtain data on antidumping investigations and a consistent real effective exchange rate index. Chad Bown's Global Antidumping Database (Bown 2007) provides the most comprehensive data on antidumping investigations.³ This database presents information on dumping petition filings for 19 countries. My analysis focuses on six of these nineteen: Australia, Canada, the EU, New Zealand, South Africa, and the United States.

Although all data series end in 2004, each starts in a different year. The US offers the longest series, beginning in 1979. South Africa offers the shortest series, beginning in 1992.⁴ Together, these six countries accounted for 1,182—or forty nine percent—of the 2,414 antidumping petitions reported to the WTO by its members between 1995 and 2004. Each observation is a count of the number of antidumping investigations initiated each year. The variable ranges from a low of 0 petitions to a high of 94. The mean number of new investigations each year is 25. Of the thirteen countries that I exclude, India is the only country that relies extensively on antidumping investigations. India

³ http://people.brandeis.edu/~cbown/global_ad/

⁴ The countries included here from 1989 for Australia, 1985 for Canada, 1987 for the EU, 1995 for New Zealand, 1992 for South Africa, and 1979 for the United States. I extended the time series for New Zealand back to 1982 with data provided by the New Zealand Ministry of Commerce (Trade Remedies Group 1998).

reported 400 antidumping investigations in this ten-year period. The remaining twelve countries account for 832 investigations, about one-third of the total number in this period window.

I construct the principal explanatory variable, *Real Exchange Rate*, from an index of each national currency's real trade-weighted value against other major currencies. These indices are not available for the other thirteen countries for which data on antidumping investigations exists. A broad currency index is more appropriate than a bilateral exchange rate, for the broader measure provides a more accurate measure of the price competitiveness of domestic traded goods producers relative to producers in countries with which they trade most heavily. The index I employ is constructed by the International Monetary Fund and is taken from *International Financial Statistics*. I expect a positive coefficient on this variable: the number of antidumping petitions will increase as the currency strengthens in real terms.

Rather than test the real exchange rate hypothesis against the null hypothesis that temporal variation in protectionism is random, I evaluate the hypothesis against the most likely alternative explanation, the business cycle hypothesis. The business cycle hypothesis posits that protectionism increases during recessions and falls during booms (see, e.g., Cassing et al. 1986; Gallarotti 1985; Grilli 1988; McKeown 1984; Takacs 1981; Leidy 1997; Coughlin et al. 1989; Bohara and Kaempfer 1991). Classic "beggarthy-neighbor" dynamics provide the underlying logic. As aggregate demand falls below the number of goods domestic and foreign producers can supply, domestic firms employ tariffs to displace foreign products from the home market. Domestic producers thus push the full brunt of the demand shock onto foreign producers. As demand recovers, domestic producers have less need for protection from foreigners and tariffs therefore fall.

I employ two macroeconomic indicators that previous studies have employed as measures of the economy's position in the business cycle: *GDP Growth* and *Unemployment*. *GDP Growth* is the annual percentage change in real Gross Domestic Product per capita. *Unemployment* is the percent of the civilian labor force actively seeking employment. I expect a negative coefficient on *GDP Growth* while *Unemployment* should return a positive coefficient.

The small sample size limits the number of factors for which I can control. My degrees of freedom are limited by the shortest time series in my sample, which is 12 years for South Africa. Hence, I control for factors emphasized by previous research. I control for *Import Growth*. Common wisdom suggests that the exchange rate and imports move together. A stronger currency reduces the domestic cost of foreign goods, resulting in greater demand for imports. A weaker currency will raise the domestic cost of imports, and we would therefore expect imports to fall. Were I to omit import growth, I would risk attributing changes in the demand for protection to exchange rate movements when in fact they are a function of greater import competition. *Import Growth* is the annual percentage change in imports. I expect a positive coefficient on this variable: demand for protection rises in response to an increase in imports.

Count data are typically non-normally distributed; they are always truncated at zero and they are commonly skewed. Consequently, standard OLS is not appropriate. Employing ordinary least squares to estimate models against count data can therefore produce estimates that are biased, inefficient, and inconsistent. I rely on poisson regression. I estimate the models using Stata's routines for poisson and negative binomial

regression in a cross sectional time series context. Because I am not interested in between country effects and have limited degrees of freedom, I estimated a fixed effects model. Table 1 presents the results.

Table 1: Antidumping Investigations and the Real Exchange Rate				
	Poisson Regression Models		Negative Binomial Regression Models	
	Real Exchange Rate	Log Real Exchange Rate	Real Exchange Rate	Log Real Exchange Rate
Real Exchange Rate	.013***	1.36***	.017***	1.84***
	(.002)	(.17)	(.005)	(.55)
GDP Growth	-3.90***	-4.08***	-3.23	-3.47
	(.99)	(.99)	(2.91)	(2.89)
Import Growth	-.03	-.03	-.04	-.03
	(.03)	(.03)	(.11)	(.10)
EU	.65***	.65***	.65***	.64***
	(.07)	(.07)	(.20)	(.20)
US	1.09***	1.08***	1.18***	1.19***
	(.07)	(.07)	(.20)	(.20)
New Zealand	-1.37***	-1.38***	-1.37***	-1.39***
	(.11)	(.11)	(.21)	(.21)
Australia	.58***	.57***	.53***	.52***
	(.08)	(.07)	(.05)	(.20)
South Africa	.07	.07	.05	.05
	(.09)	(.09)	(.22)	(.22)
Observations	118	118	118	118
Log Likelihood	-745.38	-746.51	-443.72	-443.75
Pseudo R-Squared	.41	.41	.11	.11

As a group, the models highlight a consistent set of relationships. The goodness of fit statistics suggest that the models fit the data relatively well. The models return significant log likelihood ratios in spite of the small sample size while the pseudo R-squared statistics suggest that the models account for almost one-half of the variation in the sample. The country dummy variables indicate substantial cross-national variation in the typical number of antidumping investigations initiated in each country each year. Canada is the omitted country and therefore a positive coefficient on a country dummy indicates a larger number of antidumping investigations than Canada on average. The US, for example, has about 29 more antidumping investigations each year than Canada, controlling for other factors. The EU and Australia also rely more heavily on antidumping investigations than Canada. New Zealand producers file significantly fewer antidumping investigations and producers in South Africa file approximately the same number each year as producers in Canada.

Turning now to our substantive interest, the positive and statistically significant coefficients on *Real Exchange Rate* in all models provide substantial support for our primary hypothesis. The number of antidumping investigations initiated each year rises and falls in line with changes in the real exchange rate. More investigations are launched when the currency is strong, and fewer are initiated when the currency is weak. The magnitude of the effect of an exchange rate movement is large. With other variables set at

the mean, a one standard deviation exchange rate appreciation (roughly a seven percent real appreciation) generates between 5 and 8 additional antidumping petitions according to the poisson model estimates and between 4 and 14 additional investigations according to the negative binomial models. Given that the average number of investigations each year is 25, this represents an increase of between 20 percent at the low and about 50 percent at the high end of the estimate. Hence, controlling for other factors, industry demands for protection are highly responsive to real exchange movements.

The models provide less robust support for the business cycle hypothesis. *Real GDP Growth* returns a statistically significant coefficient in the two poisson models. Moreover, the negative coefficient aligns with our expectations: the number of antidumping investigations rises as economic growth slows and falls as growth improves. The magnitude of the effect is substantial. Moving from the lowest growth rate in the sample, -4 percent, to the highest growth rate, 6 percent, reduces the number of investigations initiated by 8. Moving from a growth rate one standard deviation below the mean to one standard deviation above the mean reduces the number of investigations initiated by 3. Yet, the negative binomial regression models suggest that the relationship between GDP growth and antidumping investigation initiations is not robust to estimation technique. *Real GDP Growth* fails to return a significant coefficient in either model. An alternative measure of business cycle activity, the unemployment rate, also failed to return a significant coefficient. We must therefore be less confident in the proposition that antidumping investigations respond to business cycle conditions than in the proposition that these investigations respond to real exchange rate movements.

Import Growth fails to return a significant coefficient in any of the models. *Import Growth* comes close to the lower boundary of statistical significance in specifications that exclude *Real GDP Growth*. This may seem surprising, yet it probably reflects the fact that at the macro level, changes in import penetration and changes in GDP growth are strongly correlated with each other, yet the bivariate correlation is only .14. Moreover, we expect a correlation between import growth and real exchange rate movements as well.

The empirical analysis therefore provides robust support for the real exchange rate hypothesis. The number of antidumping petitions rises as currencies strengthen and falls as currencies weaken. This relationship holds even once we control for other likely causes of industry demand for protection such as import growth and changes in macroeconomic conditions.

Conclusion

This paper has combined models of trade and exchange rate policy preferences to create a single model that can explain the protectionist waves. I developed a theoretical model to suggest that the trade policy preferences of a subset of firms change in response to real exchange rate movements. As the real exchange rate appreciates, some firms that are internationally competitive at the equilibrium exchange rate are priced out of foreign markets and confront intense competition from imports at home. The trade policy preferences of these firms thus change. Whereas they prefer low tariffs under the equilibrium exchange rate, they prefer a high tariff at the over-valued exchange rate. I then demonstrated how these changes in relative prices alter the relative size of protectionist and liberalizing coalitions. Consequently, the share of all traded goods

producers that seek tariff protection increases as the currency appreciates and decreases as the currency depreciates. Changes in the relative influence of the import-competing and export-oriented coalitions are a consequence of real exchange rate movements.

I evaluated this hypothesis empirically using antidumping investigation filings in six countries between 1979 and 2004. The empirical analysis provided strong support for the real exchange rate hypothesis. Year-to-year variation in the number of antidumping petitions is highly responsive to real exchange rate movements. The number of sectors that file petitions increases as the currency appreciates and decreases as the currency weakens. Moreover, whereas real exchange rate movements had a systematic impact on demands for protection, standard business cycle indicators were not robustly related to variation in the demand for protection. Thus, real exchange rate movements provide at least as strong an explanation for temporal variation in protectionism than the most popular alternative business cycle hypothesis.

The research carries two broader implications, one for future scholarly work and one of interest to policymakers. The broader scholarly implication is that it might be useful to begin to think more systematically about how the politics of exchange rate and trade policies interact with one another. The standard approach within contemporary social science is to study each policy arena in isolation from one another. This approach has much to recommend it. However, the analysis presented here suggests that studying each in isolation from one another can also cause us to overlook important causal processes in each. On the one hand, we will see more trade policy lobbying than we would expect if we restrict our attention solely to the impact of product market integration. The research reported here indicates that some not insignificant fraction of trade policy lobbying is a response to exchange rate movements rather than product market integration. On the other hand, we will see less exchange rate policy lobbying than we would expect. The research reported here indicates that producers respond to exchange rate movements by lobbying for changes in trade policy. Whether this is in addition to lobbying for changes in trade policy, or instead of such activities seems an important question to answer. In short, when we study each in isolation, we face the possibility of drawing somewhat biased inferences.

The research reported here also has clear policy implications. Governments' best strategy for avoiding a resurgence of protectionism is cooperation to stabilize exchange rates. If protectionism is a response to the relative price changes brought about by real exchange rate movements, then the required degree of coordination is much less demanding. Governments need only try to keep key currencies—the euro, the dollar, the yen—close to their current values. If currencies must be realigned, this should be achieved via the G-20 process and implemented slowly.

References

- Baldwin, Richard, and Simon J. Evenett, eds. 2009. *What World Leaders Should Do to Halt the Spread of Protectionism*. London: Center for Economic Policy Research.
- Barkley, Tom. 2009. "G-20 Warned on Restricting Trade." *Wall Street Journal*, April 23.
- Bohara, Alok K., and William H. Kaempfer. 1991. "A Test of Tariff Endogeneity in the United States." *The American Economic Review* 81 (4):952-60.
- Bown, Chad P. 2007. *Global Antidumping Database, (Version 3.0)* 2007 [cited July 16 2007]. Available from http://people.brandeis.edu/~cbown/global_ad/.
- Broz, Lawrence, and Jeffrey Frieden. 2001. "The Political Economy of International Monetary Relations." *Annual Review Of Political Science* 4:317-43.
- Cassing, James, Timothy J. McKeown, and Jack Ochs. 1986. "The Political Economy of the Tariff Cycle." *The American Political Science Review* 80 (September):843-62.
- Corden, Warner Max. 1997. *Trade policy and economic welfare*. 2nd ed. Oxford: Clarendon Press.
- Coughlin, Cletus C., Joseph V. Terza, and Noor Aini Khalifah. 1989. "The Determinants of Escape Clause Petitions." *The Review of Economics and Statistics* 71 (2):341-7.
- Dornbusch, Rudiger. 1987. "Exchange Rates and Prices." *The American Economic Review* 77 (March):93-106.
- Eichengreen, Barry J., and Douglas A Irwin. 2009. "The Slide to Protectionism in the Great Depression: Who Succumbed and Why?" In *NBER Working Paper No. w15142*.
- Frieden, Jeffrey. 1997. "Monetary Populism in Nineteenth Century America: An Open Economy Interpretation." *Journal of Economic History* 57 (June):367-95.
- G-20. 2008. "Declaration Summit on Financial Markets and the World Economy." http://www.g20.org/Documents/g20_summit_declaration.pdf.
- . 2009. "The Global Plan for Recovery and Reform." <http://www.g20.org/Documents/final-communique.pdf>.
- Gallarotti, Giulio M. 1985. "Toward a Business-Cycle Model of Tariffs." *International Organization* 39 (Winter):155-87.
- Gamberoni, Elisa, and Richard Newfarmer. 2009. "Trade Protection: Incipient but Worrisome Trends." *Trade Notes* (37):1-6.
- Grilli, Enzo. 1988. "Macro-economic Determinants of Trade Protection." *The World Economy* 11 (3):313-26.
- Irwin, Douglas A. 2005. "The Rise of US Anti-dumping Activity in Historical Perspective." *The World Economy* 28 (5):651-68.
- Knetter, Michael, and Thomas Prusa. 2003. "Macroeconomic Factors and Antidumping Filings: Evidence from Four Countries." *Journal of International Economics* 61 (1):1-17.
- Leidy, Michael P. 1997. "Macroeconomic Conditions and Pressures for Protection under Antidumping and Countervailing Duty Laws: Empirical Evidence from the United States." *IMF Staff Papers* 44 (1):132-44.
- McKeown, Timothy J. 1984. "Firms and Tariff Regime Change: Explaining the Demand for Protection." *World Politics* 36 (January):215-33.

- McKinnon, Ronald I., and K.C. Fung. 1993. "Floating Exchange Rates and the New Interbloc Protectionism." In *Protectionism and World Welfare*, ed. D. Salvatore. Cambridge: Cambridge University Press.
- Niels, Gunnar, and Joseph Francois. 2006. "Business Cycles, the Exchange Rate, and Demand for Antidumping Protection in Mexico." *Review of Development Economics* 10 (3):388–99.
- Oatley, Thomas. 2009. "Exchange Rate Movements and the Demand for Protection."
- Takacs, Wendy. 1981. "Pressures for Protectionism: An Empirical Analysis." *Economic Inquiry* 19 (4):687-93.
- Trade Remedies Group. 1998. "Trade Remedies in New Zealand." Wellington: Department of Commerce.
- World Trade Organization. 2009. "Report to the TPRB from the Director-General on the Financial and Economic Crisis and Trade-Related Developments." Geneva: WTO.