

Robert M.

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Choose Your Weapon: International Trade Agreements and Exchange Rate Policy Choice

Mark S. Copelovitch

La Follette School of Public Affairs and the Department of Political Science
at the University of Wisconsin-Madison

copelovitch@wisc.edu

Jon C. Pevehouse

Harris School of Public Policy at the University of Chicago

pevehouse@uchicago.edu



Robert M. La Follette School of Public Affairs
1225 Observatory Drive, Madison, Wisconsin 53706

Phone: 608.262.3581 / Fax: 608.265-3233

info@lafollette.wisc.edu / <http://www.lafollette.wisc.edu>

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**CHOOSE YOUR WEAPON:
INTERNATIONAL TRADE AGREEMENTS AND EXCHANGE RATE POLICY CHOICE**

Mark S. Copelovitch
Assistant Professor
Department of Political Science
and La Follette School of Public Affairs
University of Wisconsin-Madison
306 North Hall, 1050 Bascom Mall
Madison, WI 53706
copelovitch@wisc.edu

Jon C. Pevehouse
Associate Professor
Harris School of Public Policy
University of Chicago
1155 East 60th Street
Chicago, IL 60637
pevehouse@uchicago.edu

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ABSTRACT

Extensive literatures in international political economy (IPE) have explored the politics of trade and exchange rate policies. Yet while these literatures draw on parallel developments in political economy and use similar empirical models, few studies have explored the possible linkages between them. This absence is surprising given that, in practice, an increase in trade protection and a devaluation of the exchange rate have similar impacts on the relative prices of traded goods. This paper examines the question of whether governments engage in “exchange rate protection” - that is, whether they actively manipulate the exchange rate and/or utilize exchange rate fluctuations as a lever to influence the terms of trade. Specifically, we focus on one particular dimension of this question: whether states that have made firm international commitments to free trade are more or less likely to use exchange rate policy to improve the international competitiveness of the domestic tradables sector. Using data on 21 OECD countries from 1975-1999, we find evidence that governments utilize trade and exchange rate policies as both complements and substitutes. Countries that have “tied hands” on trade policy through more extensive international free trade commitments are more likely to adhere to both *de jure* and *de facto* fixed exchange rates, a finding which suggests that stability-oriented exchange rate policy and free trade commitments are complementary. However, this tendency is conditional on the degree of trade openness: more trade dependent OECD economies were no more likely (and in some cases, less likely) to choose fixed exchange rates when they had made firmer international commitments to free trade. In addition, countries with more extensive free trade commitments were also more likely to experience depreciations in their nominal effective exchange rates during this period and this relationship is also conditional on the degree of trade openness. Thus, there is also ample evidence that – in some cases – governments utilize exchange rate policy as a substitute for trade protection. These findings shed light on the complex relationship between different types of macroeconomic policies in the contemporary world economy.

Introduction

Current macroeconomic policy debates have focused heavily on the causes and consequences of the United States' massive and growing current account and trade deficits (Chinn 2005, Mussa 2005, Eichengreen 2006). In 2006, the US current account deficit reached a new high of \$857 billion, or 6.5% of GDP (Bergsten 2006), a level double that of the previous record set during the 1980s. While scholars continue to debate the sustainability of the US "twin" deficits and possible ways of resolving them (Chinn 2005), most experts agree that a key cause of their rapid growth has been the Chinese government's active intervention in foreign exchange markets to prevent any significant appreciation of its currency, the renminbi (RMB). Over the last five years, China has spent \$15-20 billion per month in the foreign exchange (forex) markets, buying US government bonds in an effort to maintain the RMB's relative undervaluation. In the first quarter of 2007, Chinese forex intervention reached a new high of \$45 billion (Bergsten 2006).

The trade-related implications of China's exchange rate policy are clear: China enjoyed a current account surplus in 2006 of approximately \$250 billion, or 9% of its GDP (Bergsten 2006).¹ What is less clear is whether or not China's monetary and exchange rate policies have been driven by the trade implications of maintaining the dollar-RMB peg or by other (non-trade) concerns, such as maintaining low inflation or domestic financial stability.² Nevertheless, many observers in the US, including several prominent members Congress, believe that the Chinese

¹As of July 2007, China's 2007 surplus had reached \$163 billion, and the World Bank was forecasting a full-year surplus of \$378 billion, or 12% of GDP (Reuters, October 31, 2007).

² Ronald I. McKinnon, "Currency Manipulator?" *The Wall Street Journal*, 24 April 2006.

government is manipulating its currency primarily for protectionist purposes and have called for retaliatory tariffs to offset the effects of RMB undervaluation on US-China trade balances.³

This debate about “global imbalances” and Chinese exchange rates is emblematic of a broader issue of longstanding importance to scholars of international political economy (IPE): the connection between exchange rate and trade policies. Yet while the trade implications of exchange rate policies are widely understood, the relationship between governments’ trade policy and currency policy choices is not, despite the fact that the trade and exchange rate literatures in IPE draw on parallel developments in political economy and often use similar empirical models. Moreover, these literatures identify similar sets of variables (e.g., domestic societal interests, political institutions) as key determinants of both trade and exchange rate policy choices.⁴ This gap in the literature is surprising given that, in practice, an increase in trade protection and a currency devaluation have similar impacts on the relative prices of traded goods.

Our main goal in this paper is to explore whether governments engage in “exchange rate protection” – that is, whether they actively manipulate the exchange rate and/or utilize exchange rate fluctuations as a lever to influence the terms of trade (Corden 1981). Specifically, we focus on one particular dimension of this question: are states that have made firm international commitments to free trade more or less likely to use exchange rate policy to improve the international competitiveness of the tradables sector? Using data on 21 OECD countries from 1975-1999, we find evidence that governments utilize trade and exchange rate policies as both complements and substitutes. Countries that have “tied hands” on trade policy through more extensive international free trade commitments are more likely to adhere to both *de jure* and *de*

³ Charles E. Schumer and Lindsey O. Graham, “Will It Take a Tariff to Free the Yuan?” *New York Times*, 8 June 2005.

⁴ These literatures are far too extensive to adequately review here. See Frieden and Martin 2002, Milner 1999, and Frieden and Broz 2006 & 2001 for comprehensive overviews.

facto fixed exchange rates, a finding which suggests that stability-oriented exchange rate policy and free trade commitments are complementary. However, we also find that this tendency is conditional on the degree of trade openness: more trade dependent OECD economies during the 1975-1999 period were no more likely (and in some cases, less likely) to choose fixed exchange rates when they had made firmer international commitments to free trade. In addition, OECD countries with more extensive free trade commitments were also more likely to experience depreciations in their nominal effective exchange rates during this period. Thus, there is also ample evidence that – in some cases – governments utilize exchange rate policy as a substitute for trade protection.

The remainder of the paper proceeds as follows. First, we briefly discuss the existing literature linking trade and exchange rate policies and further develop the theoretical rationale for viewing these two macroeconomic policies as both complements and substitutes. We then develop a set of hypotheses about the relationship between trade and exchange rate policies, which we subject to empirical testing using a time-series/cross-sectional dataset covering 21 OECD countries from 1975-1999. Our results suggest that governments generally employ trade and exchange rate policies as complements, while also suggesting that – under certain conditions – they employ “exchange rate protection” as a way to circumvent the constraints of international free trade commitments. Drawing on these findings, we conclude by offering some thoughts on the ways in which future research might enhance our understanding of the complex relationship between these two types of macroeconomic policies in the contemporary world economy.

Trade and exchange rate policy: theory

The trade implications of exchange rate policy have long been an important object of study by both economists and political scientists. Indeed, the standard economic views of exchange rate policy emphasize the reduction of currency risk as one of the keys reason why countries choose fixed exchange rates (Mundell 1961, McKinnon 1962, Kenen 1969). Pegging the exchange rate, from this perspective, reduces or eliminates exchange rate risk and facilitates cross-border trade and exchange. In contrast, currency volatility creates uncertainty about cross-border transactions, adding a risk premium to the price of traded goods and international assets (Frieden (forthcoming)). Fixed exchange rates, therefore, enable a government to enhance the credibility of its commitment to international economic integration, thereby encouraging greater trade and investment. In addition to currency stability, the level of the exchange rate has enormous trade-related implications, as it affects the relative price of traded goods in both domestic and foreign markets.

The existing IPE literature highlights numerous historical examples of these connections between trade and exchange rate policies. For example, the question of whether or not to adhere to the gold standard mobilized tradable goods producers and dominated political debates about economic policy in the United States and elsewhere during both the pre-1914 and interwar periods (Simmons 1994, Eichengreen 1992). Similarly, the United States' large current account deficits in the late 1960s and early 1970s, coupled with concerns of American exporters about the loss of competitiveness vis-à-vis Europe and Japan, heavily influenced the Nixon administration's decision to close the "gold window" and end the Bretton Woods era (Odell 1982, Gowa 1983). Finally, the trade-related implications of the dollar's 50% appreciation in the early 1980s, relative to the German Deutsche Mark and Japanese yen, were a major factor leading to the Plaza and Louvre Accords in 1985 and 1987, in which G-7 central banks engaged

in coordinated foreign exchange intervention to stabilize their exchange rates (Destler and Henning 1989, Frankel 1994).

These well-known cases highlight the substantial effects that changes in the level of the exchange rate can have on the relative prices of tradable goods: “In the case of a real appreciation, domestic goods become more expensive relative to foreign goods; exports fall and imports rise as a result of the change in competitiveness. Real depreciation has the opposite effects, improving competitiveness” (Frieden and Broz 2001, 331). Consequently, exchange rate movements have significant domestic distributional consequences. All else equal, exporters and import-competing industries lose from currency appreciation, while the nontradables sector and domestic consumers gain (Frieden 1991). Conversely, currency depreciations have the opposite effect, helping exporters and import-competing firms at the expense of consumers and the nontradables sector (Frieden and Broz 2001).

These effects on the terms of trade make exchange rate policy, in many ways, a close substitute for trade policy. Indeed, a 10% real depreciation is equivalent to a 10% import tax plus a 10% export subsidy (McKinnon and Fung 1993, Frieden and Broz 2001). Thus, just as governments utilize a variety of trade policy instruments to subsidize exporters and/or protect import-competing industries from foreign competition, they can also manipulate the level of the exchange rate to achieve similar effects on the terms of trade. In short, governments may engage in “exchange rate protection” by devaluing the exchange rate, by allowing the exchange rate to depreciate more than it would otherwise, or (as in the case of China currently) by preventing an appreciation that would otherwise occur in the absence of foreign exchange market intervention (Corden 1981).

Utilizing exchange rate policy – rather than trade protection – as a tool for enhancing international competitiveness has three key advantages for governments. First, exchange rate manipulation is generally less transparent than the use of tariffs or non-tariff barriers (NTBs), such as quotas or voluntary export restraints (VERs). Indeed, trade protection is generally more visible and more explicitly protectionist than exchange rate depreciation, which can occur for a variety of reasons (both trade- and non-trade-related). As a result, protectionist trade policies are more likely to mobilize domestic and international opposition than exchange rate protection (Corden 1981). Second, protectionist trade policies often require domestic legislation, whereas the government and/or monetary authority can often freely manipulate the exchange rate without legislative approval. Thus, governments may prefer to utilize exchange rate policy as a way to circumvent domestic political opposition to tariffs and other protectionist trade policies. Finally, exchange rate policy offers national governments a possible way of circumventing their international commitments to free trade. By utilizing currency depreciation as a substitute for tariffs and other protectionist policies, governments can enhance the competitiveness of domestic producers without formally violating the terms of their international trade agreements.

Our central goal in this paper is to shed light on the nature of this relationship between trade and exchange rate policies. Do governments utilize them in tandem to facilitate greater international trade and exchange, or do they substitute exchange rate manipulation for trade protection? More specifically, we focus on one particular dimension of this question: are governments that have made firm international trade commitments (i.e., by signing free or preferential trade agreements) more or less likely to engage in “exchange rate protection”?

International trade agreements and exchange rate protection

The proliferation of preferential trade agreements (PTAs) is one of the defining characteristics of the contemporary world economy.⁵ PTAs are a broad class of international commercial agreements that include common markets, customs unions, and free trade areas. While nearly every country in the world now participates in at least one PTA, there is substantial cross-national variation, with some countries belonging to more than 30 agreements, while others belong to only one or two (Mansfield, Milner, and Pevehouse, 2007). Although they often contain explicit provisions allowing certain types of trade protection, PTAs generally commit member-states to more extensive free trade. Thus, international trade agreements restrict government's ability to use trade policy (tariffs, NTBs, and other measures) to alter the terms of trade.

In line with the two views of trade policy and currency policy as complements or substitutes, this "hand-tying" through international trade agreements could influence government's exchange rate policy choices in two ways. On the one hand, it might be the case that governments which have made more extensive international commitments to free trade are also more likely to choose fixed exchange rates and/or to seek to minimize currency volatility. Fixed exchange rates, in this view, reduce or eliminate currency risk and facilitate international trade and investment. Thus, for countries that have committed to liberalizing their international trade policies, fixed exchanges can be a powerful and complementary policy tool.

On the other hand, governments that have made more extensive free trade commitments might instead prefer to retain monetary and exchange rate policy autonomy for surreptitious protectionist purposes. Indeed, while fixed exchange rates may be desirable for countries

⁵ On the wave of new regional economic integration and PTAs, see Mansfield and Milner 1999, and Milner 1999.

committed to free trade precisely because they eliminate currency risk, they nevertheless entail significant costs. Specifically, adhering to a fixed exchange under conditions of international capital mobility requires a country to sacrifice monetary policy autonomy, as described by the well-known “impossible trinity” theory (Mundell 1962). This inability to adjust interest rates and/or devalue the currency can be particularly problematic if the fixed exchange rate leads to a real appreciation, thereby damaging the competitiveness of domestic exporters in foreign markets. While it may be the case that some countries find these costs relatively modest compared to the benefits of exchange rate stability, other governments may want to retain the option of adjusting interest rates and exchange rates for domestic purposes. Monetary and exchange rate autonomy is likely to be especially attractive to countries (e.g., the United States) with large domestic markets and/or less extensive ties to the world economy.

Ultimately, while there are well-grounded theoretical reasons why trade and exchange rate policies might be complementary, there are equally compelling reasons why governments may utilize exchange rate policies as a substitute for trade protection. Thus, the literature suggests two clear but opposing hypotheses about the link between international trade agreements and national exchange rate policies:

- *H1 (complements): Countries are less likely to engage in exchange rate protection when international trade agreements restrict their ability to use trade protection*
- *H2 (substitutes): Countries are more likely to engage in exchange rate protection when international trade agreements restrict their ability to use trade protection*

In terms of observable implications, each of these hypotheses suggests a possible link between the number of PTAs to which a country belongs and the probability that it will adopt fixed exchange rates. All else equal, H1 suggests that countries with more extensive PTA

commitments will be more likely to adopt fixed rates (i.e., less likely to manipulate the exchange rate for protectionist purposes), while H2 suggests exactly the opposite. An alternative observable implication of H2 is that international trade commitments will be negatively correlated with the rate of a currency's nominal depreciation and/or changes in the real effective exchange rate (REER). Indeed, it might be the case that governments are hesitant to deviate from their formal exchange rate commitments but nevertheless seek (or passively accept) real and/or nominal exchange rate movements because of their beneficial effects on international competitiveness. We test both observable implications in the empirical analysis below.

Empirical analysis

In order to evaluate our hypotheses, we analyze a time-series/cross-sectional dataset containing data on exchange rate movements and exchange rate regime choices for 21 OECD countries for the 1975-1999 period. We focus on OECD countries for reasons of data quality and availability. We begin by modeling a country's stated choice of exchange rate policy as well as movements in each country's nominal exchange rate.

We initially estimate the following model:

$$\begin{aligned} \text{ERPOLICY}_{i,t} = & \beta_0 + \beta_1 \text{Trade Open}_{i,t-1} + \beta_2 \text{nPTA}_{i,t-1} + \beta_3 \text{Capital Open}_{i,t-1} + \beta_4 \text{GDP}_{i,t-1} + \\ & \beta_5 \text{pcGDP}_{i,t-1} + \beta_6 \text{Growth} + \beta_7 \text{Inflation}_{i,t-1} + \beta_8 \text{Curr Account}_{i,t-1} + \beta_9 \text{Checks}_{i,t-1} + \\ & \beta_{10} \text{CBI}_{i,t-1} + \beta_{11} \text{Mfg Exports}_{i,t-1} + \varepsilon \end{aligned}$$

There are numerous ways to measure a country's choice of exchange rate regime. Our initial choice of dependent variable is to examine countries' formal (*de jure*) exchange rate regime choices. Our data are drawn from the IMF's *Annual Report on Exchange Rate*

Arrangements.⁶ While there are many different types of fixed and managed floating regimes, we focus here on the binary distinction between fixed exchange rates and all other types. Thus, *ERPOLICY* takes a value of 1 for all types of “hard” pegs (currency boards, currency unions, pegs to one or more individual currencies) and a value of 0 for all other regimes (managed floats, pure floats, crawling pegs/bands, etc.).

As a robustness check on our initial estimates, we also focus on the movements of nominal effective exchange rates (NEER) for each OECD country.⁷ We label this second dependent variable Δ NEER. While this is not a perfect measure of state intervention in currency markets, the depreciation rate of a currency against those of its trading partners captures (at least partially) the degree to which a country’s monetary policymaking authorities seek to actively manipulate the exchange rate (cf. Frieden 2002; Broz 2002). The data are taken from the Bank of International Settlements (BIS 2006). We take the first difference of the data to isolate changes in the nominal exchange rate. We use changes in nominal effective exchange rates as an initial, if imperfect, measure of state behavior as a check on the *de jure* classifications of regime choice.

Independent variables

In order to evaluate our hypotheses, we introduce several independent variables. First, to gauge the importance of trade flows to a country’s economy, we introduce *Trade Open*, which is the share of state *t*’s GDP that originates from trade in year *t-1*. While standard economic literature suggests that trade dependent economies are likely to prefer fixed, stable exchange

⁶ We thank Nancy Brune for generously sharing her data, which recodes the IMF data and draws on earlier data from David Leblang.

⁷ The NEER is the geometric weighted average of a basket of bilateral exchange rates. The weights are derived from manufacturing trade flows and capture both direct bilateral trade and third-market competition. See BIS 2006 for further details.

rates, it is possible that more trade-dependent economies will be less likely to fix in order to keep open the possibility of protecting the tradables sector through exchange rate manipulation. Thus, exchange rate manipulation substitutes for overt trade protection. Moreover, it is likely that trade-dependent economies will join PTAs to lock-in trading relationships with key partners. Thus, it is crucial to include this measure to hedge against omitted variable bias. The data are taken from the World Bank's World Development Indicators (2007).

Next, $nPTA$ is the number of PTAs of which state i is a member in year $t-1$. We include all PTA agreements, whether free trade areas, customs unions, common markets, as well as non-reciprocal ("hub and spoke") agreements. We alternatively substitute a second measure for trade policy commitments into our empirical model. We substitute $nPartners$, which measures the number of trade partners covered by a preferential trade agreement, for $nPTA$. After all, it could be that a state (e.g., the US) is member to a number of bilateral PTAs, covering a limited number of trading partners, whereas a European state (e.g., France) is a member of some PTAs, but at least one with numerous partners.⁸

Concerning both $nPTA$ and $nPartners$, if H1 is correct, we would expect a positive relationship to the probability of fixing exchange rates, given the desire to provide currency stability to enhance trading relationships. If H2 is correct, we could see a lower probability of fixing in order to not have ones hands tied too tightly. In terms of the nominal effective exchange rate dependent variable, if H1 is correct, we should expect little correlation between trade policy choice and NEER movements; indeed, under fixed rates, one should see relatively little movement in the exchange rate overall. Yet, if H2 is correct, one observable implication is that countries whose hands are tied tightly in the trade policy realm experience depreciations –

⁸ Data for both PTA variables are taken from Mansfield, Milner, and Pevehouse (2007).

whether through active intervention in foreign exchange markets or “tacit” acceptance through non-intervention – to enhance their tradable sector’s competitiveness.

The next group of independent variables control for other macroeconomic correlates of exchange rate regime choice. First, a country's policies regarding the movement of international capital will also likely influence its exchange rate policy. To account for this possibility, we introduce *Capital Open*, which measures state i 's restrictions on capital using the Chinn and Ito (2006) index. The index measures four facets of capital account openness: the existence of multiple exchange rates; restrictions on current account transactions; restrictions on capital account transactions; and requirement of the surrender of export proceeds. Traditionally, one would expect countries that are more open to international capital flows to be more likely to fix their exchange rates. That said, many of the largest, most open OECD economies (e.g., the US, UK, and Japan) have pursued floating exchange rates throughout the post-Bretton Woods era. Consequently, we do not have strong expectations in either direction about the coefficient on *Capital Open*.

Second, we add controls for the size and development of the economy of each state. *GDP* is the natural log of gross domestic product of state i in year $t-1$. Traditionally, larger economies are more likely to choose monetary policy autonomy since their own domestic markets are so important. Indeed, with the exception of the European Monetary Union, most larger economies in the post-Bretton Woods era have chosen floating exchange rates. In addition to overall economic size, we control for level of development by measuring each state's per capita GDP (*pcGDP*) in year $t-1$. In general, wealthier countries are less likely to choose fixed exchange rates for credibility purposes, since inflation tends to be lower than in the poorer countries. In addition, wealthier countries throughout the post-Bretton Woods era have, on the

whole, been more likely to adopt floating exchange rates than poorer countries in the developing world. As with GDP, *pcGDP* also enters the model as a natural log. Both sets of data are taken from the World Bank's latest *World Development Indicators* database (2007).⁹

We also include a variable to control for the rate of economic growth, since the purpose of exchange rate intervention could be to prime the economy (Frieden 2002). A government facing solid economic growth and a healthy economy is less likely to lower interest rates to stimulate economic activity; thus by extension they have incentives to fix their exchange rate as well. In contrast, recessions may increase a government's propensity to use depreciation to stimulate the economy. To control for this possibility, we introduce *Growth* into our model, which is the annual percentage change in GDP between time $t-1$ and time t . Data are taken from the World Bank *World Development Indicators* (2007).

Next, we measure inflation levels in state i , since higher inflation in an economy may pressure a government to peg its currency as a nominal anchor for monetary policy (Frieden and Broz 2001). In addition, we include a measure of the size of the current account relative to GDP, labeled *Current Account*, in order to control for those governments running larger balance of payments deficits. These states are, in general, more likely to manipulate the exchange rate for adjustment purposes. Both variables are lagged one period to mitigate endogeneity concerns, and both are taken from World Bank's *World Development Indicators* (2007), with missing data filled in using the IMF's *International Financial Statistics* (2007).

We also include variables to control for the influence of domestic societal interests and political institutions on exchange rate policy choices. Many scholars have noted the relationship between democracy and various types of democratic institutions with exchange rate regime choices (e.g., Bernhard and Leblang 1999; Hallerberg 2000). While many have noted

⁹ GDP and pcGDP are in constant 2000 dollars

differences among various types of democratic institutions (e.g., parliamentary versus presidential systems), we focus on so-called veto players or checks on executive power, since the presence of these actors has been linked to influences on both exchange rate policies (Hallerberg 2000, Keefer and Stasavage 2002) as well as membership in preferential trading arrangements (Mansfield, Milner, Pevehouse 2007).¹⁰

Another important domestic institution to consider when modeling exchange rate regime choice is central bank independence (CBI) (Simmons 1996). Existing literature has found mixed evidence of the link between the independence of the central bank and exchange rate fixity, with some scholars arguing that these institutions are complementary, while others view them as substitutes – that is, as alternative ways to achieve the same economic policy objectives (low inflation, credibility of monetary commitments) (Bernhard, Broz, and Clark 2002). Despite these mixed findings, most scholars agree that one cannot analyze exchange rate regime choice without also considering the structure of the central bank. As such, we introduce *CBI* into our model. Data on CBI are based on Cukierman’s (1992) methodology for calculating legal independence, and are compiled from the *Comparative Political Dataset* for the period 1975-1996 (Armingeon, et. al. 2005), and Polillo and Guillen (2005) for the remaining years.¹¹

Finally, since we are interested in the behavior of states who may be more reliant on the tradables sector, it is important to control not just for overall levels of economic openness, but also the degree to which the state relies on export-intensive sectors such as manufacturing. To this end, we control for the lagged percentage of all exports that originate in the manufacturing sector, defining this variable as *Mfg Exports*. Given the importance of currency stability to this

¹⁰ We do not control for a country’s regime type because our sample is made up of all democracies for most of the sample period.

¹¹ Alternative CBI measures are available for only a subset of our sample; we therefore rely on Cukierman’s index.

sector, we expect a positive relationship. It is also likely that countries with strong manufacturing exports are likely to have preferences for free trade, thus it is important to introduce this variable as a control. Data are taken the World Bank's *World Development Indicators* (2007).

Our data is time-series/cross-sectional data with country-year as the unit of analysis. Our time series runs from 1975-1999. We stop our sample in 1999 because of the onset of European Monetary Union (EMU), since this agreement effectively fixes a currency for a significant portion of our sample.¹² In our model of *de jure* ER choice, we utilize logistic regression where we also introduce a counter for the number of years since an episode of fixing to account for any temporal dependence in the data.¹³ When Δ NEER is our dependent variable, we use OLS estimation with panel corrected standard errors.¹⁴

Results

We begin by estimating the determinants of the *de jure* exchange rate. The results are presented in columns 1 and 2 of Table 1. Consistent with our first hypothesis, it appears that more trade-dependent economies are more likely to fix their exchange rate: the estimate of *Trade Open* is positive and statistically significant. Moreover, our next variable of interest, *nPTA* is also positive and statistically significant, suggesting states that have committed themselves to free trade are more likely to fix exchange rates. Again, this is consistent with H1 and follows

¹² Extending the observation sample to 2003 attenuates our results below only slightly. This is likely due to the fact that the non-EMU years still far outnumber the EMU years. We leave the theoretical and empirical extension of our hypothesis under EMU to later work.

¹³ Normally, this variable serves as the basis for a spline function (Beck, Katz, and Tucker 1998). In our case, none of the knots of the spline achieved statistical significance, yet the base of the function (the year counter) consistently did. We do not report the estimate of the base in tables to conserve space.

¹⁴ We also include a lagged endogenous variable in the models of Δ NEER. This variable never achieves statistical significance, but our key results do not vary based on its inclusion or exclusion.

from standard economic reasoning that free trading states are concerned with currency stability. As shown in Table 2, the influence of increases in PTA membership is quite striking – moving from the mean number of PTAs to one standard deviation above the mean yields and increase of over ten percent in the probability of *de jure* fixing. The estimate of *nPartners* is positive, but does not achieve statistical significance. Yet, overall, there appears to be strong support for the complements view of trade and exchange rate commitments.

Few of the remaining variables in the first model achieve statistical significance. *Capital Open* is negative and statistically significant – a likely result of the fact that several of the most open OECD states (e.g., the U.S. and Japan) float their currencies. Finally, our measure of manufactured exports is positive and significant as expected. Table 2 shows changes in predicted probabilities based on the estimates of these two variables, the magnitude of which are comparable to a change in *nPTA*.

Table 2. First Differences, De Jure Exchange Rate Regime (1=FIX)

Predicted probability of fixing, all variables at means: 25.5%

Variable	Predicted change (FIX)	Interpretation
Number of PTAs	10.38%	13 to 24 PTAs
Capital account openness	-12.27%	1.29 (Austria 1991) to 2.60 (USA 1995)
Manufacturing share of exports (%)	13.25%	67.7% (USA 1985) to 88.3% (Germany 1993)

Interestingly, a different view of the complements, substitutes question emerges when examining Δ NEER as the dependent variable, as shown in columns 3 and 4 of Table 1. *Trade Open* remains positive, but is no longer statistically significant. Both *nPTA* and *nPartners* are negative and statistically significant, suggesting that more tightly constrained trade policy leads to exchange rate depreciation. Table 3 presents the first differences of these estimates and the influence of changes in *nPTA* is substantial, moving from the mean to one standard deviation

above the mean, in percentage terms. Together, these estimates are puzzling, especially in light of the findings of the previous model. We return to this momentarily.

Table 3. First Differences, Change in Nominal Effective Exchange Rate (%)

Predicted change in NEER, all variables at means: -1.32%

Variable	Predicted change in NEER	Interpretation
Number of PTAs	-0.64%	13 to 24 PTAs
Current account/GDP (%)	0.77%	-0.9% to 2.6%
Inflation (%)	-0.98%	7.1% to 13.0%
Capital account openness	0.90%	Mean (1.29) to Max (2.60)

Most of the remainder of the variables are of the expected sign, although again, few achieve statistical significance. *Curr Account* is associated with an appreciating exchange rate, while *Inflation* appears associated with a depreciating rate – both as expected. Interestingly, *Capital Open* is now positive and statistically significant, which is consistent with our theoretical expectations but counter to the results from the first model. In each of these cases, as shown in Table 3, the first differences for these controls are also quite sizable.

Further investigation

An interesting puzzle emerges from the first set of empirical results. When predicting a country’s stated regime policy, trade openness and trade regime commitments correlate with outcomes consistent with conventional wisdom (the complements hypothesis, H1). Yet, when measured against a measure of behavior, the substitutes hypothesis emerges with some support. Clearly, there appears a possibility that a country’s words (i.e., their *de facto* exchange rate policies) can differ from their “deeds” (i.e., their *de jure* commitments) in international monetary relations. Indeed, this observation is not at all new and for the last five years, scholars have begun to refine measures of exchange rate behavior (Reinhart and Rogoff 2004, Levy-Yeyati and

Sturzenegger 2004; Shambaugh 2004). Essentially, one cannot always infer a government's exchange rate regime choices simply by measuring its formal, stated policy commitments.

To further investigate whether trade and exchange rate commitments are complements or substitutes, we move to measures of ER policy based less on the words of the state than on deeds. We use three different behavioral measures of *de facto* ER regime choice. We iteratively substitute these three measures in our initial model to re-test our hypotheses.¹⁵

Our first measure is based on the Reinhart-Rogoff classification of a country's *de facto* exchange rate regime. It takes a value of 1 for all forms of *de facto* fixed exchange rates, and a value of 0 for all forms of crawling peg, managed floating, or free floating regimes.¹⁶ Our second measure comes from Levy-Yeyati and Sturzenegger (here in LYS; 2004), who code a three-category variable of fixed, floating, or intermediate exchange rates. Our third and final measure comes from Shambaugh (2004), who creates an indicator variable for whether a state has pegged their exchange rate in practice, or allowed it to float (or has affirmatively devalued it). While we defer the reader to other sources for a comparison of the three data sets (for an excellent review, see Appendix A of Bearce and Hallerberg 2006), we do note that each of the measures is based on some combination of movements in exchange rates and changes in reserves. Thus, these measures are based on actual behavior (unlike the *de jure* measure), but allow some movement of exchange rates. This should decrease the noise from a direct measure of nominal exchange rate movement.

¹⁵ From this point forward, we will show results based only on *nPTA*, but re-estimating the remainder of the models with *nPartners* yields identical results.

¹⁶ <http://www.publicpolicy.umd.edu/faculty/reinhart/readme.txt>. "1" corresponds to the RR "coarse" classification "1", "0" corresponds to the RR classifications "2", "3", "4", and "5". Cases coded as "6" (dual exchange rates/missing values) are dropped from the sample.

The estimates of the model on these three measures of *de facto* ER policy can be found in Table 4.¹⁷ Initially, we note that in no case is *Trade Open* statistically significant, suggesting little relationship between a state’s trade dependence and their *de facto* exchange rate. Next, *nPTA* is positive and statistically significant in every case, lending support to H1. Indeed, turning to the marginal effects based on estimates from column 1, which are presented in Table 5, increasing the number of PTAs from the mean by one standard deviation results in a seven percent increase in the probability of fixing the exchange rate. While this is a modest effect, when increasing all variables one standard deviation from their means, it is the single largest influence on the probability of *de facto* fixing an exchange rate. Parenthetically, we also note the difference between the base predicted probability of *de jure* fixing (25%) versus the base predicted probability of *de facto* fixing (5%). This clearly suggests a large gap between words and deeds in the exchange rate realm.

Table 5. First Differences, De Facto Exchange Rate Regime (Reinhart-Rogoff) (1=FIX)
Predicted probability of fixing, all variables at means: 4.8%

Variable	Predicted change (FIX)	Interpretation
Number of PTAs	7.34%	13 to 24 PTAs
GDP growth (%)	-1.80%	2.5% to 4.8%
GDP per capita	-3.56%	France (1985) to USA (1985)
Inflation (%)	-2.68%	7.1% to 13.0%
Veto players (CHECKS, log)	2.86%	4 to 6 veto players
Current account/GDP (%)	2.82%	-0.9% to 2.6%
Central bank independence	5.89%	0.40 (Ireland/Portugal) to 0.58 (Austria)
Manufacturing share of exports	5.26%	67.7% (USA 1985) to 88.3% (Germany 1993)

Turning to the control variables, we initially highlight those that are of consistent sign and statistical significance across the three models. First, *Growth* and *Inflation* are consistently

¹⁷ For the Reinhart/Rogoff and the Shambaugh data, we use logistic regression, again utilizing a counter of the years between episodes of fixing as a control for temporal dependence. We retain the LYS three-category system and use ordered probit to estimate these models. As a control for temporal dependence, we create three counters: one for the time elapsed between values of “1”, “2”, and “3” respectively.

negative and significant, both in concert with theoretical expectations. In two of three cases, *Curr Account* is positive and statistically significant, suggesting that current account surpluses are associated with fixity.

Turning to the domestic institutional variables in our model, higher numbers of veto players as measured by *Checks*, is associated with a higher probability of fixing. This is likely due to the need of a government to make a firmer commitment to their exchange rate in the face of potential pressure from government opposition. Again, in two of three cases, *CBI* is positive and statistically significant, consistent with existing empirical findings.

A Final Cut

Based on the estimates of Table 4, it appears that the complements hypothesis would carry the day: increasing trade constraints appear to be correlated with increasing exchange rate constraints. Yet, this does not completely explain our empirical puzzle from Table 1: how and why are higher trade constraints correlated with currency depreciation? Moreover, we find it strange that *Trade Open* is never statistically significant and is signed inconsistently – if more open, free trade-oriented economies desire currency stability, why shouldn't both of these measures be associated with fixity.

Perhaps, as we suggested earlier, there are conditions under which states may attempt to deviate from their exchange rate commitments. In particular, we examine the conditioning influence of trade openness. It is possible that highly trade dependent states, who have already chosen to tie their hands vis-à-vis free trade may attempt to peg their exchange rates, but give way to temptation to deviate from fixity. To investigate this possibility, we re-estimate each of the three models from Table 4, adding an additional interaction term: $nPTA \times Trade\ Open$.

The results can be found in Table 6. Now, a conditional story of complements and substitutes begins to emerge quite clearly. In each set of estimates, as in previous estimates, *nPTA* is positive and statistically significant, indicating more commitment to free trade is correlated to more commitment to exchange rate pegs. Now, however, *Trade Open* is positive and statistically significant in two of the three models, consistent with a complements story. Yet, the interaction between these two variables, in two of three cases, is negative and statistically significant. Moreover, in all three cases, a Wald test can reject the possibility of joint insignificance of the three terms. This is strong empirical evidence that states with extensive trade commitments and extensive trade dependence are *less* likely to fix their exchange rates. As previously suggested, the logic here is simple: when facing competitiveness problems (i.e., currency appreciation) and the inability to manipulate trade policy because of free trade commitments, states may attempt to diverge from their stated policy of exchange rate fixity.

Interpreting these interaction effects can be difficult, so we create several figures to guide their interpretation. First, Figure 1 shows various values of the *nPTA* coefficient based on increasing values of *Trade Open* for the estimates of column 1 in Table 6. Note that the estimate of the coefficient of *nPTA* slopes downwards, indicating a less positive relationship between trade and exchange rate commitments as trade dependence rises. Indeed, for most values of trade dependence greater than the median, the coefficient of *nPTA* is not distinguishable from zero. Thus, what we can say with certainty based on the estimates from column 1 is that as trade dependence increases, the likelihood of a complements-type policy goes to zero.

Figure 2 reproduces the same graphs for the estimates of column 2 in Table 6, using the LYS coding of *de facto* exchange rates. Here, the results are even more striking. When trade dependence is relatively low, more PTAs are associated with an increase probability of fixing.

Yet, note that when the value of trade dependence is higher than the median, the coefficient on *nPTA* turns negative and in some regions of the distribution statistically significant. In addition, Figure 3 also shows the value of the *nPTA* coefficient over values of trade dependence for the Shambaugh estimates of column 3. Again, at higher values of trade dependence, *nPTA* is negatively associated with fixing. Thus, across the later two behavior measures of *de facto* exchange rate policy, there appears to be a strong conditioning influence of *Trade Open* on *nPTA*.

As a final check, we re-estimate our NEER model from Table 1, column 2, now including the interaction of *nPTA* and *Trade Open*. Now, unlike in Table 1, the coefficient of *nPTA* is positive, although not statistically significant. Consistent with the sets of estimates in Table 6, *Trade Open* is positive and (like two sets of estimates) statistically significant. The interaction term is negative, and a WALD test rejects the hypothesis that these three terms are jointly insignificant. Figure 4 graphs the *nPTA* coefficient by levels of trade dependence, and a nearly identical picture to the three measures of *de facto* policy emerges. At low values of trade dependence, *nPTA* is positive and statistically significant, while at high values, the coefficient is negative and statistically significant.

These findings strongly suggest that on the whole H1 receives significant support, but that the complements story is conditional. When a state is faced with tied hands in the trade realm, an economy dependent on international trade, and an appreciating currency, state leaders appear to desire wiggle room in their exchange rate commitments.

Conclusions

In this paper, we empirically examine the question of whether governments engage in “exchange rate protection” - that is, whether they actively manipulate the exchange rate or utilize exchange rate fluctuations as a lever to influence the terms of trade (Corden 1981). Specifically, we focus on one particular dimension of this question: whether states that have made firm international commitments to free trade are more or less likely to use exchange rate policy to manipulate the terms of trade. Our empirical results for OECD states from 1975-1999 suggest that the answer to this question is conditional. In general, trade and exchange rates commitments are complements – a finding consistent with traditional theoretical expectations. That is, we find a positive correlation between hand-tying in the trade sector and exchange rate policy: countries belonging to a larger number of PTAs are more likely to choose fixed *de facto* exchange rates as a complement in order to maintain international stability and reduce currency risk.¹⁸

However, this effect is conditional on the degree of trade openness: countries that are more trade dependent are no more likely to fix the exchange rate (and in some cases less likely) when they have signed more PTAs. Moreover, more extensive international trade commitments are negatively correlated with depreciations of the nominal effective exchange rate. Thus, it appears that – in some cases – governments utilize exchange rate policy as a substitute for trade protection.

Avenues for further research

Ultimately, the empirical results of our analysis suggest that existing political economy theories have not fully elaborated the complex relationship between countries’ trade and

¹⁸ We also adopted various measurement strategies regarding trade policy commitments. Specifically, we coded a variable measuring the proposed level of integration in a country’s trade agreements (i.e., free trade area, common market, customs union, economic union). The results based on that variable were identical to those presented here.

exchange rate policy choices. Clearly there are conditions that lead some states to “double-commit” to both exchange rate stability and free trade, while other conditions lead some governments to keep at least one option open in order to respond to domestic pressures. Future research should therefore focus more clearly on delineating the conditions under which states choose one strategy over the other, and it should explore further the reasons why this varies over time and across cases.

To this end, we conclude with some brief thoughts on additional variables that might be incorporated into future analyses of the trade/exchange rate policy relationship. First, such studies would benefit significantly by incorporating additional measures of variation in domestic political institutions. Much of the existing exchange rate literature examines the effects of domestic institutions on state choices about both the level and fixity of the exchange rate (electoral cycles, wage bargaining institutions, partisanship, government stability, etc.) (Frieden and Broz 2001). Including these variables, as well as interactions between them, in future empirical work would clarify the effect of domestic politics on governments’ choices about their international macroeconomic commitments.

Second, incorporating more nuanced measures of domestic interest group pressure into the analysis could further elucidate the domestic politics of trade and exchange rate policy choices. Thus, future research might test the importance of key interest groups, including exporters, import-competers, and the domestic financial sector. Since these groups have widely divergent preferences over both trade and exchange rate policies (Frieden 1991), their relative strength in the domestic political economy is likely to be a key determinant of whether governments utilize trade and exchange rate policies as complements or substitutes. Third, it is possible there are interaction effects between domestic interest-group pressure and international

trade/exchange rate commitments. That is, it could be that exchange rate protection is greatest where societal interests (import-competers, exporters) strongly favor trade protection but the government has nevertheless signed PTAs.¹⁹

Finally, more fine-grained data on two aspects of the project could allow more focused tests of our propositions. In particular, a measure to differentiate PTAs by goods coverage would more accurately gauge the extent of countries' international commitments to free trade. Indeed, not all PTAs are made alike: those PTAs that cover more goods or promise deeper integration may impinge on states' policy choices differently than those offering more extensive "opt-outs" or escape clauses. In sum, while this paper offers initial evidence that states appear, in some cases, to keep some trade and/or monetary autonomy to provide wiggle room for foreign economic policy, more research remains to be done to clarify the nature and extent of these complex relationships.

¹⁹ The case of the United States and NAFTA quickly comes to mind, though there are surely numerous other such examples.

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Table 1. Modeling Exchange Rate Commitments and Outcomes

	de jure	de jure	Δ Nominal ER	Δ Nominal ER
Trade Open _{i, t-1}	0.050*** (0.010)	0.055*** (0.010)	0.017 (0.014)	0.018 (0.013)
nPTA _{i, t-1}	0.051*** (0.020)	--.--	-0.057* (0.034)	--.--
nPartners _{i, t-1}	--.--	0.022 (0.014)	--.--	-0.058** (0.023)
KA Open _{i, t-1}	-0.787*** (0.269)	-0.799*** (0.259)	0.698* (0.399)	0.704* (0.392)
GDP _{i, t-1}	-0.177 (0.239)	0.032 (0.217)	0.169 (0.330)	0.001 (0.315)
pcGDP _{i, t-1}	1.015 (0.699)	0.592 (0.625)	0.437 (1.097)	0.401 (1.064)
Growth _{i, t-1}	-0.025 (0.091)	-0.043 (0.089)	0.118 (0.158)	0.128 (0.156)
Inflation _{i, t-1}	-0.081 (0.061)	-0.095 (0.059)	-0.169* (0.100)	-0.182* (0.100)
Curr Account _{i, t-1}	-0.090 (0.072)	-0.081 (0.076)	0.220** (0.112)	0.247** (0.112)
Checks _{t-1}	-0.229 (0.556)	-0.043 (0.515)	1.103 (1.072)	1.185 (1.036)
CBI _{i, t-1}	1.294 (1.117)	1.262 (1.079)	-3.118 (2.361)	-2.421 (2.355)
Mfg Exports _{i, t-1}	0.035*** (0.010)	0.032*** (0.010)	0.022 (0.022)	0.030 (0.022)
Constant	-8.317 (8.941)	-9.730 (8.699)	-11.942 (13.388)	-7.436 (12.963)
N	471	471	471	471
χ^2	92.85***	96.79***	87.22***	90.64***

NOTE: Logistic regression with robust standard errors are show in columns 1 and 2; OLS with panel-corrected standard errors are shown in columns 3 and 4. The base of a spline function is present in columns 1 and 2; while a lagged dependent variable is present in columns 3 and 4. *** = p<.01; ** = p<.05; * = p<.10.

Table 4. Modeling de facto Exchange Rate Behavior

	Reinhart/Rogoff	LYS	Shambaugh
Trade Open _{i, t-1}	0.008 (0.012)	-0.001 (0.004)	0.010 (0.010)
nPTA _{i, t-1}	0.096*** (0.025)	0.027** (0.011)	0.052*** (0.020)
KA Open _{i, t-1}	0.402 (0.307)	-0.339*** (0.103)	-0.443* (0.228)
GDP _{i, t-1}	-0.202 (0.370)	-0.742*** (0.129)	-0.299 (0.251)
pcGDP _{i, t-1}	-3.855*** (1.151)	0.148 (0.324)	-1.635** (0.753)
Growth _{i, t-1}	-0.228** (0.092)	-0.074* (0.043)	-0.157** (0.077)
Inflation _{i, t-1}	-0.159*** (0.062)	-0.082*** (0.024)	-0.278*** (0.061)
Curr Account _{i, t-1}	0.162* (0.084)	0.057** (0.025)	0.019 (0.059)
Checks _{i, t-1}	1.544** (0.644)	0.414* (0.251)	0.558 (0.573)
CBI _{i, t-1}	5.122** (2.389)	0.373 (0.567)	3.179** (1.357)
Mfg. Exports _{i, t-1}	0.042** (0.016)	0.004 (0.005)	0.011 (0.010)
Constant/Cut 1	35.226*** (11.734)	-18.372*** (3.813)	22.636** (10.830)
Cut 2	--	-17.370*** (3.796)	--
N	471	401	471
χ^2	84.76***	216.96***	112.22***

NOTE: Logistic regression with robust standard errors are shown in columns 1 and 3; ordered probit with robust standard errors is shown in column 2. The base of a spline function is present in columns 1 and 3; while three bases are present in column 2. *** = p<.01; ** = p<.05; * = p <.10

Table 6. Modeling de facto Exchange Rate Behavior with interactions

	Reinhart/Rogoff	LYS	Shambaugh	Δ Nominal ER
Trade Open _{i, t-1}	0.038 (0.027)	0.045*** (0.010)	0.056*** (0.022)	0.074** (0.033)
nPTA _{i, t-1}	0.180** (0.075)	0.150*** (0.029)	0.188*** (0.069)	0.078 (0.081)
nPTA x Trade Open	-0.001 (0.001)	-0.002*** (0.000)	-0.002** (0.001)	-0.003* (0.001)
KA Open _{i, t-1}	0.469 (0.341)	-0.304*** (0.109)	-0.327 (0.230)	0.871** (0.406)
GDP _{i, t-1}	-0.202 (0.377)	-0.642*** (0.134)	-0.312 (0.268)	0.505 (0.352)
pcGDP _{i, t-1}	-3.948*** (1.185)	-0.297 (0.335)	-1.997*** (0.757)	-0.112 (1.136)
Growth _{i, t-1}	-0.216** (0.092)	-0.065* (0.043)	-0.141* (0.078)	0.165 (0.159)
Inflation _{i, t-1}	-0.150** (0.061)	-0.078*** (0.024)	-0.267*** (0.061)	-0.149 (0.098)
Curr Account _{i, t-1}	0.167** (0.082)	0.078*** (0.026)	0.031 (0.056)	0.235** (0.109)
Checks _{i, t-1}	1.620** (0.684)	0.554** (0.278)	0.786 (0.565)	1.398 (1.071)
CBI _{i, t-1}	4.613* (2.493)	0.226 (0.569)	3.008** (1.331)	-3.596 (2.394)
Mfg. Exports _{i, t-1}	0.039** (0.017)	-0.001 (0.005)	0.009 (0.011)	0.018 (0.022)
Constant/Cut 1	34.341*** (11.608)	-17.554*** (4.074)	23.168** (11.075)	-18.661 (12.825)
Cut 2	--	-16.492*** (4.052)	--	--

Table 3, continued

	Reinhart/Rogoff	LYS	Shambaugh	Δ Nominal ER
WALD	21.06***	32.13***	16.66***	7.64*
p of χ^2	0.00	0.00	0.00	0.054
N	471	401	471	471
χ^2	80.24***	208.68***	116.31***	104.54***

NOTE: Logistic regression with robust standard errors are shown in columns 1 and 3; ordered probit with robust standard errors is shown in column 2; OLS with panel-corrected standard errors in column 4. The base of a spline function is present in columns 1 and 3; while three bases are present in column 2. A lagged dependent variable is present in column 4. *** = $p < .01$; ** = $p < .05$; * = $p < .10$

Figure 1. Coefficient values of $nPTA$ as *Trade Open* rises, based on Reinhart/Rogoff definition of fixing.

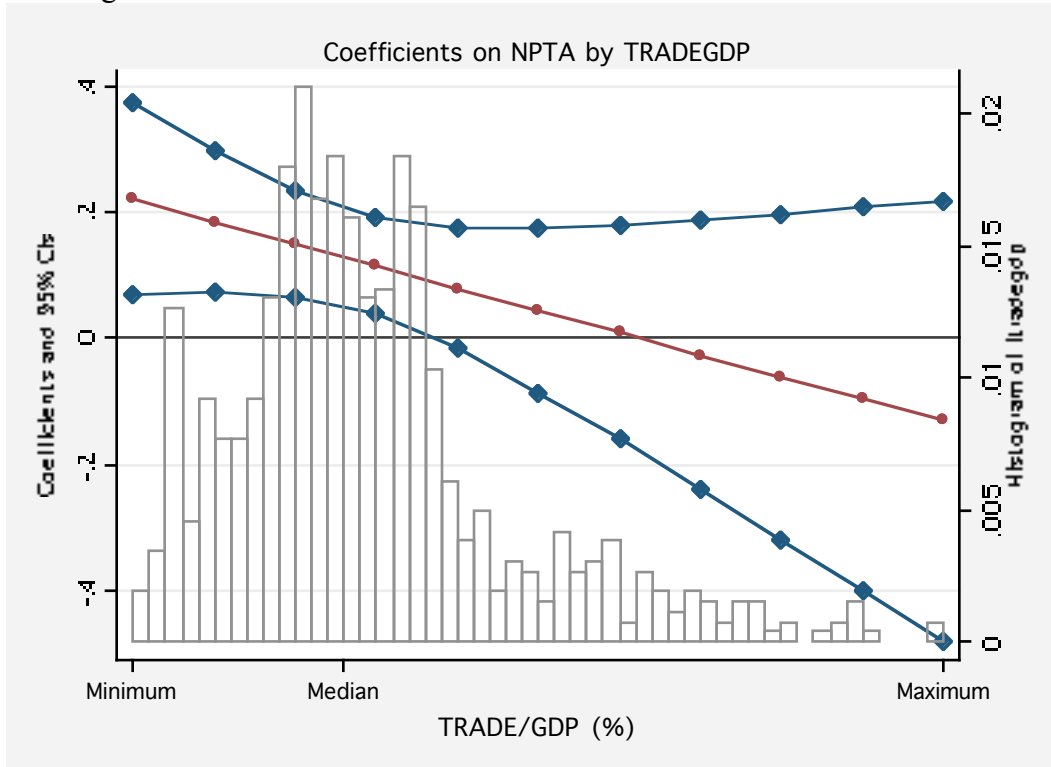


Figure 2. Coefficient values of $nPTA$ as *Trade Open* rises, based on LYS definition of fixing.

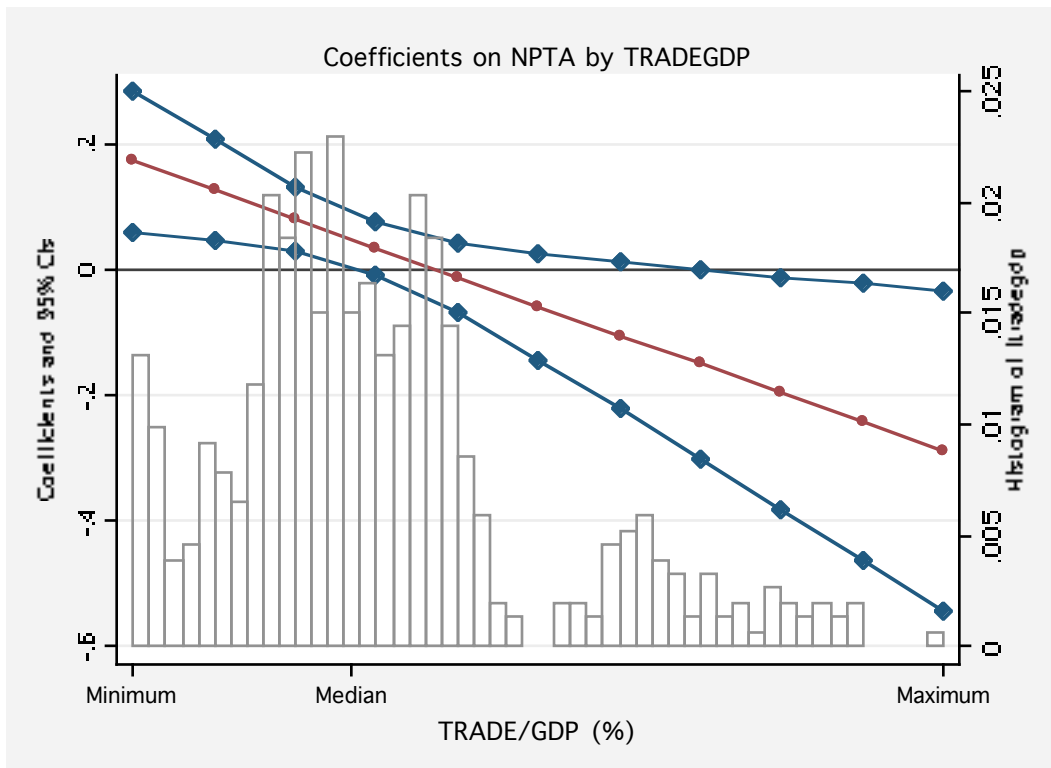


Figure 3. Coefficient values of $nPTA$ as $Trade\ Open$ rises, based on Shambaugh definition of fixing.

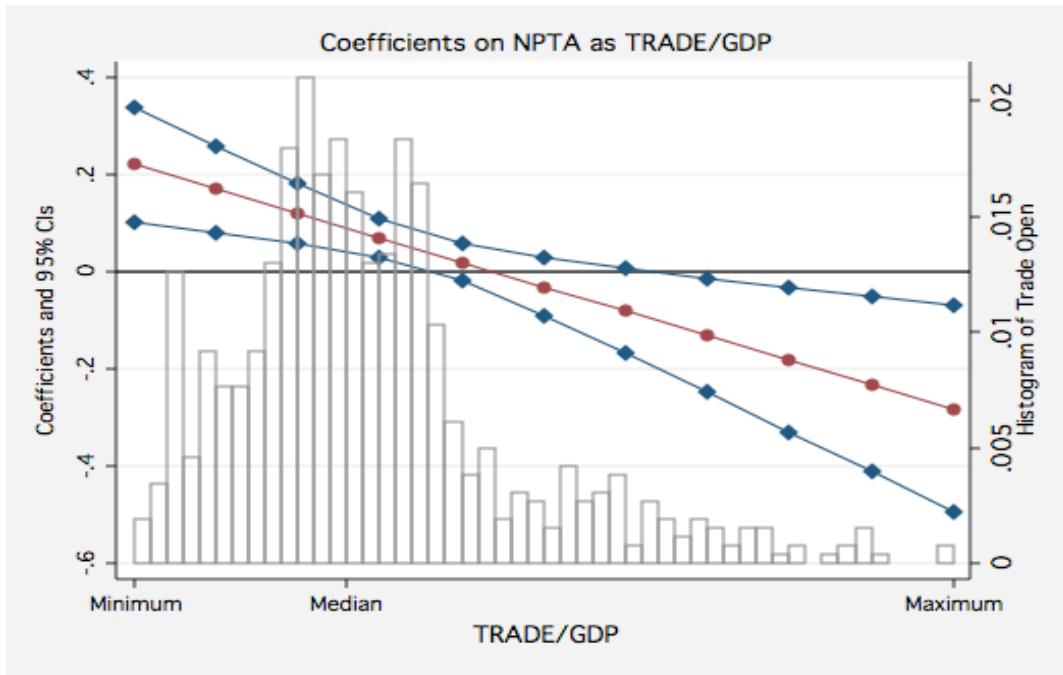


Figure 4. Coefficient values of $nPTA$ as $Trade\ Open$ rises, based on changes in NEER.

