

The Impact of Government Ideology, Capital Openness, and Exchange Rate Regime on Currency Crisis

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Abstract:

Do leftist governments provoke more speculative attacks and currency crisis compared to rightist governments? We argue that the likelihood of a currency crisis is not driven by government ideology *per se* but rather by a combination of ideology, capital market and monetary policy. We find that leftist governments are more likely to experience a currency crisis when they have a high degree of capital market openness and a fixed exchange rate regime. Our empirical results, based on a pooled time series regression of 56 developing countries over the period of 1975-2005, show that 1) leftist governments tend to have higher interest rate volatility, implying that they are more likely to actively use monetary expansion to stimulate the economy, and 2) Leftist governments are more likely to have currency crises when they have highly liberalized capital markets and pegged exchange rate regimes.

Key words: *currency crisis, government ideology, partisanship, domestic political institutions, exchange rate regime, capital account openness.*

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1. Introduction

In the past decades, many countries in the world, particularly emerging markets, have experienced currency crises that have led to significant output losses and rapid drops in GDP growth. Because speculative attacks often occur when market players question the consistency of a government's domestic macroeconomic policies (e.g. exchange rate commitment (Leblang 2002), leftist governments have often been blamed to cause a currency crisis by adopting expansionary monetary policies and generate a high inflation (Block 2002, Cusack 1999). Do leftist governments provoke more speculative attacks and currency crisis compared to rightist governments?

In this paper we argue that currency crises are not drive by leftist government ideology *per se*. We argue instead that leftist governments are more prone to speculative attacks and currency crises only if their monetary policies violate Mundell's "impossible trinity" theorem – a combination of a high degree of capital openness and fixed exchange rates. While excessive fiscal and monetary spending can generate macroeconomic problems, this expansionary bias by itself does not generate a currency crisis. According to Mundell's macro trilemma, if a country has a combination of very high capital mobility and a fixed exchange rate, it should not use monetary policy to control domestic economies. If the country violates this rule, it would confront increased the risks of a speculative attack (Wyplosz 1998). Therefore, monetary discipline would be relevant in generating currency attacks if a country has a highly open capital market and a pegged exchange regime (i.e. It should not matter if a country has a combination of a closed capital market and a pegged exchange regime).

This paper reviews empirical data on 56 developing countries over the period of 1975-2005 in order to assess how government ideology, capital account openness, and exchange rate regimes interact with each other in generating a currency crisis in. First, we test whether leftist governments are more likely to use monetary expansion to stimulate the economy. We find that leftist governments have a higher interest rate volatility, implying that they are more likely to manipulate monetary policies to stimulate the economy. Second, we test if leftist governments are more likely to experience a currency crisis when they violate Mundell's "impossible trinity" theorem—i.e. when they have a high degree of capital openness and a fixed exchange rate regime. Our empirical results show that leftist governments have experienced more currency

crises when they are combined with highly liberalized capital market and a fixed exchange rate regime.

This paper is organized into five parts. First, we review the theoretical and empirical scholarship on the political and economic causes of currency crises. Second, we discuss how leftist governments are more likely to cause a currency crisis when they violate Mundell's "impossible trinity" theorem. We also discuss how the violation may happen more in emerging markets. In the next two sections, we describe the data and empirical models employed, present the findings, and discuss the robustness of different measurements and empirical models used. We conclude by discussing the implications of our results.

2. Economic Causes of Currency Crisis: Theory and Evidence

2.1. Economic Causes of Currency Crises

Since the first formal explanation by Krugman (1979), academic research into the causes of currency crisis has advanced significantly. The theoretical literature identifies two fundamental ingredients to a currency crisis: 1) inconsistencies between a country's exchange rate policy and its domestic economic policies, which typically leads to an overvalued¹ currency (Willett et al., 2009) and 2) the presence of rational speculators who can spot such inconsistencies and exploit them.

What do we mean by this inconsistency? A good place to start is by looking at theoretical models of currency crises. The first generation of currency crisis models (e.g. Krugman 1979, Flood and Garber 1984) describe the mechanics of a speculative attack under pegged exchange rates. In a situation where the economy is below full-employment and the government chooses to expand domestic output through a fiscal policy expansion, increases in budget deficits would be inevitable unless the country raises taxes. Suppose further that the deficit is financed by printing money (i.e. the deficit is monetized) as observed in many crisis-hit Latin American countries in the early 1980s. The result is high inflation, which would trigger capital outflows and result in a Balance of Payment (BOP) deficit, or widen existing deficits.

The prompt government response would have been to devalue the currency and reset the exchange rate peg at a new (weaker) level, given that BOP deficits typically lead to a weakening of

¹ When a currency is overvalued, its official exchange rate (i.e. the peg) suggests that the currency is being pegged at a level that is stronger than its market rate would suggest.

the domestic currency. However, for a number of reasons governments seem reluctant to conduct such adjustments (Bird and Willett 2008). For one, the act of devaluing itself could invite an unwarranted speculative attack as market participants would question the government's commitment to an exchange rate peg. Eager to avoid such an attack on their currency, governments often prefer to leave the exchange rate level unchanged, which is to say, overvalued. Second, it takes some amount of time before currency devaluation can actually accomplish the intended BOP improvements, and during the intervening period, the country might even see a worsening of the BOP, before it gets better.² This unwillingness to deal with the short-run adverse effects of devaluation is one explanation behind the reluctance to adjust.

In short, without an exchange rate adjustment, the initial fiscal expansion and monetary accommodation results in an over-valued currency; exchange rate and domestic economic policies are therefore inconsistent. Rational speculators and investors can in fact spot such inconsistencies. Expecting that a future depreciation of the currency is in the cards, and knowing that monetary authorities cannot run down their foreign reserves indefinitely to defend the peg (as foreign reserves are finite), speculators and investors will run speculative attacks on the country's domestic currency. Krugman (1979) predicts that speculative attacks will occur at a critically-low level of foreign reserves, when the peg can no longer be supported, yet before the stock of reserves itself is completely exhausted.³ An assumption in his model is that governments are unable to borrow funds for reserves. The crisis ends with a forced devaluation or the move to a floating exchange rate regime (Berg and Patillo 1999).

The key implication from the prediction of the first generation currency crisis models is that countries with good economic fundamentals such as fiscal discipline, sufficient foreign reserves and manageable inflation will not encounter a speculative attack. This group of models has performed quite well in explaining currency crises that occurred in Latin America in the 1980s—however, these models do not provide the best explanation for post-1980s currency crises. Both the European Exchange Rate Mechanism (ERM) crisis of 1992-93 and the Asian

² This is known as the J-curve effect of currency devaluation. In the short-run, elasticities of demand for imports and exports are low, thus the weakening of the currency will first lead to a fall in exports, and an increase in imports. This effect will disappear over time and eventually the current account balance is expected to improve. See Pilbeam (2006) for a full explanation.

³ The timing of the attack is predicted to be *before* reserves are depleted. At critically-low, yet below zero levels, speculators can still earn a profit by attacking the currency.

crises of 1997-98 demonstrated that speculative attacks can and do happen in countries with none of the aforementioned problems.

These shortcomings inspired a second generation of crisis models pioneered among others by Obstfeld (1994). Whereas Krugman (1979) argues that a government faces no choice but to devalue in the face of a speculative attack, second generation theorists instead predict that governments in fact have the option of continuing to defend the currency, and can borrow the money to obtain foreign reserves for this purpose. According to Obstfeld (1994) the government's decision will be based on a cost-benefit calculation of maintaining versus abandoning the peg (i.e. devaluing the currency). Only when economic agents expect the government to abandon the peg will they quickly launch an attack on the currency in question (Leblang and Bernhard 2000). In this regard, Obstfeld (1994) also predicts that a speculative attack can itself trigger a devaluation that would not have occurred in its absence (a “self-fulfilling” crisis). In short, the key implication from the second generation of crisis models is that currency attacks are largely understood to be a function of the policy expectations of currency traders. Governments may react differently to pressures on their currency, but the *traders' expectations of the policy outcome* is what triggers a currency crisis—even if the country has good economic fundamentals, including sufficient foreign reserves.

While these models have contributed to a better understanding of what economic factors lead to currency crises, there are still missing factors that have not been adequately addressed. The first- and second-generation crisis models established that the root cause of a currency crisis is an inconsistency between the value of the exchange rate peg and the conduct of monetary or fiscal policy. However, this tension between the two policies—one external and the other domestic—is further exacerbated under an environment of free capital mobility as predicted by Mundell's (1962) impossible trinity theorem. Therefore, a more complete analysis would test how this policy inconsistency or policy tension plays out under different degrees of capital account openness. Mundell's “impossible trinity” (or macroeconomic trilemma) theorem suggests that the combination of a high degree of capital openness and fixed exchange rates increases the chances of a speculative attack, if the country engages in expansionary monetary policy (Wyplosz 1998).

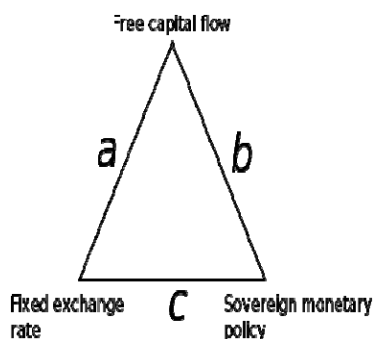
A second shortcoming is that these models do not sufficiently consider how and when political conditions play a role in aiding and abetting currency crises, when in fact there seems to be a clear path for politics to enter the picture. As earlier discussed, second generation authors

emphasize that market expectations of government policies play a key role in determining whether a currency crisis will occur, and these expectations are formed among others by political factors such as the partisan preferences of the government and timing of elections (Leblang and Bernhard 2000). In particular, it has been argued that market participants interpret the likelihood of a government to abandon a currency peg based on their partisan preferences.

In the following sections, we analyze how violations of the macroeconomic trilemma and the partisan composition of the government can affect the likelihood of a currency crisis. We first describe in more detail the impossible trinity theorem.

2.2 *The Impossible Trinity and Currency Crisis*

One well-known proposition in international monetary economics is the “impossible trinity,” otherwise known as the macroeconomic trilemma, initially developed by Robert Mundell in 1962. Out of three desirable policy goals: 1) monetary policy independence, 2) fixed exchange rates, and 3) free movement of capital, policymakers can only achieve two at any one point in time. Any pair is possible, but violations of the trilemma inevitably results in a speculative attack, followed by a currency crisis (Burda and Wyplosz 2005, Wyplosz 1998).



Source: Pilbeam (2006)

For any country experiencing a sudden fall in domestic output, regardless of their degree of capital openness, monetary or fiscal policy expansion can be quite effective to stimulate aggregate demand and expand the economy. However, these policy interventions can have adverse effects on the BOP equilibrium. As money supply expands, domestic interest rates will fall to maintain money market equilibrium. The fall in interest rates leads to capital outflows,

while the increase in output would *ceteris paribus* result in rising imports, creating a Balance of Payments deficit overall. The domestic currency is then pressured to depreciate. As we have discussed earlier, either the exchange rate has to be allowed to adjust, or the government has to use up its foreign reserves to intervene and maintain the peg.

The degree of a country's capital account openness becomes important when we analyze the impact of the abovementioned fall in interest rates. A high degree of capital mobility implies sensitivity of capital movements to interest rate changes: even the slightest fall in domestic interest rates below world interest rates (or below the interest rate of the base currency to which the exchange rate is pegged) could trigger massive capital outflows (Pilbeam 2006, Obstfeld et al. 2004). The central bank would have no choice but to continuously deplete its foreign reserves in order to prevent the domestic currency from depreciating. In such circumstances of high capital mobility, defending the peg (by selling foreign reserves and buying domestic currency) can be very costly—and, in fact, impossible if capital were perfectly mobile (Obstfeld et al. 2004). Assuming this process continues for a considerable amount of time, eventually the central bank will run out of foreign reserves, leaving the country vulnerable to speculative attacks (Burda and Wyplosz 2005). On the other hand, if the government had instead enforced controls or limitations in outflows, the fall in interest rates would not lead to as strong a capital outflow. Hence if a country chooses to retain the freedom to use monetary policy to achieve internal objectives (such as reducing unemployment), and, at the same time, desires to maintain exchange rate stability, they have no choice but to limit cross-border movements of (foreign) capital.

Mundell's theorem can be seen in practice by observing the policy compositions of different governments. For example, Chinese authorities choose to peg the Renmibi to the US dollar *and* to retain the use of interest rates to achieve domestic goals. This is made possible because China imposes relatively strict capital controls. Meanwhile the US and the UK—both of which are world financial centers and are known to have open capital accounts—have adopted a fully flexible exchange rate regime, as they wish to retain the autonomy to use monetary policy as an instrument to manage short-run fluctuations in the economy.

In sum, the impossible trinity theorem asserts that any country that wishes to let (foreign) capital freely enter and exit the economy must make a consistent choice regarding their external policy (i.e. exchange rate policy) and their domestic policy (specifically their monetary policy):

either they must forego exchange rate stability, or they must sacrifice the ability to use monetary policy to achieve domestic output goals.

2.3. Currency Crisis in Emerging Markets: Violation of the Impossible Trinity

During the Bretton-Woods era (1945-1973), countries largely avoided violations of the trilemma as capital mobility was fairly limited. In fact, the vast majority of emerging markets applied strict controls on international capital movements through a variety of policy measures, including taxes, administrative restrictions and outright prohibitions (Edwards 2001). However, starting in the late 1970s and early 1980s, these emerging and developing countries began to open up their capital accounts by dismantling these restrictions on foreign capital (Edison et al. 2004). This “global” movement towards capital account liberalization was also aided by the spread of neo-liberal ideas and the Washington Consensus (Edwards 2001). By the early 1990s, the majority of developing countries adopted some form of capital account liberalization, albeit with varying degrees of openness (Abiad et al. 2008).

Given this capital mobility, the trilemma requires that countries must either give up monetary policy independence or exchange rate stability—a policy dilemma which many developing countries have failed to deal with, given their policy preferences. On the one hand, because of their immature financial sector, exchange rate stability is particularly valuable to their international transactions (Mo 2008) and hence many of them choose to peg their domestic currencies to the US Dollar, either through hard pegs, adjustable pegs, or using a managed floating exchange rate regime. On the other hand, given lack of capital resources,⁴ developing countries are not completely willing to give up monetary policy autonomy. They often engage in monetary expansion (or loose monetary policy) to finance their budget deficits, which then leads to unsustainable levels of Balance of Payments deficit, as detailed in the first generation of crisis models. Simply put, many developing countries lack the monetary discipline that fixed exchange rates and free capital mobility dictate. As argued by Wyplosz (1998), this is one of the primary reasons for the widespread occurrence of currency crises observed in emerging markets and developing countries in the 1980s and 1990s.

⁴ Although many countries opened up their capital account, they still experienced difficulties in attracting foreign capital, particularly after being hit by a financial crisis (see e.g. Edwards 2001).

3. Government Ideology and Currency Crisis

In the previous section, we analyzed how violations of Mundell's trilemma often lead to currency crises in developing countries. Studies reveal that by and large, the main source of the violation is from the temptation to excessively use monetary policy to stimulate the economy, despite adopting a fixed exchange rate regime and having substantial capital mobility (Wyplosz 1998). However, there has been a notable lack of attention to how government ideology interacts with the impossible trinity to cause currency crisis. In fact, partisan theory has shown that fiscal and monetary policies in advanced countries are strongly associated with party ideology (see Hibbs 1977).

The link between government ideology and the policy trilemma can be illustrated with an economic concept known as the Philips curve. According to the Philips curve, there is an inverse relationship between inflation and unemployment. In other words, price stability and low unemployment are incompatible goals that macroeconomic policy cannot achieve simultaneously (Philips 1958). Any effort to lower unemployment—via fiscal or monetary expansion or a combination of both—comes at the cost of rising inflation. This is due to the fact that while fiscal expansion stimulates aggregate demand and consequently lowers unemployment rates, prices generally rise with stronger aggregate demand, making inflation unavoidable (Mankiw 2012).

How a country tries to manage this trade-off is strongly associated with government ideology (Hibbs 1977). Governments of all stripes, leftist and rightist alike, aim to satisfy their electoral constituencies. Yet the two parties derive support from two distinct and opposing classes: leftist parties are dominated by labor unions and low- to middle-income citizens, while conservative parties attract mainly business groups and higher-income citizens (Boix 2000; Hibbs 1977). In the context of the Philips Curve, the constituents of leftist parties are relatively more concerned with preventing high unemployment (compared to achieving low inflation rates) and the opposite is true for supporters of rightist parties; business owners attach a higher weight to inflation stability as it provides a favorable and predictable business climate (Hibbs 1977).

It thus follows that leftist and rightist governments have conflicting policy preferences: the former suffers greater disutility from high unemployment (compared to high inflation) and the opposite is true for the latter (Block 2002). Under the reasonable assumption that governments influence the rate of unemployment (or inflation) via macroeconomic policies, partisan theory predicts that parties on either end of the ideological spectrum will design and

implement opposite kinds of monetary and fiscal policy (Cusack 1999). To achieve the goal of lower unemployment, leftist governments are more likely to tilt towards both fiscal and monetary expansion. In other words they generally embrace Keynesian-style expansionary policies to stabilize the economy (Boix 2000).⁵ On the contrary, to keep inflation stable, conservative governments prefer to have tight fiscal and monetary policy.

This connection between government ideology and currency crises has been increasingly recognized. Several recent studies have examined the impact of government ideology in generating currency crises, with mixed empirical results: some found that partisanship is strongly associated with financial crisis (Bernhard and Leblang 2000, Leblang 2002, Block 2002, Steinberg 2010, Wibbles and Roberts 2010), while others fail to uncover any significant relationship (e.g. Eichengreen et al. 1995).⁶ Still, these studies have not taken into account the interaction between government ideology and Mundell's macroeconomic trilemma. Although it is well-established that leftist parties tend to have expansionary policies (Cusack 1999), Mundell's trilemma states that such policies are more likely to create a problem under a combination of very high capital mobility and fixed exchange rates, because they can generate imbalances or policy inconsistencies that invite speculative attacks. Put differently, not all expansionary fiscal and monetary policies under leftist governments would lead to a currency crisis, but the likelihood of it to happen would be higher if leftist governments violate Mundell's trilemma.

The following illustrates how the left-right divide in macroeconomic policy preferences affects the likelihood of experiencing a currency crisis. Recall that first generation crisis models identify unsustainable levels of budget and BOP deficit to be the root causes of a speculative attack. Several studies in fact find empirical evidence that leftist parties tend to run higher budget

⁵ Keynes advocates expanding fiscal and monetary policy to fight employment. Fiscal expansion can reduce unemployment via two channels: 1) increasing government spending for infrastructure or other large government projects, which would generate employment, or 2) lowering tax rates, which would trigger more consumption and thus more job growth for the entire economy. Monetary expansion helps to keep interest rates low, which not only helps to boost aggregate demand, but also keeps borrowing costs low.

⁶ Meanwhile, Leblang and Bernhard (2000) and also Leblang and Satyanath (2006) argue that it is not leftist party *per se* that causes currency crises, but an expectation of a partisan shift to the left as a result of an upcoming election. Empirically, they find that leftist party in power has no significant effect on currency crisis likelihood, but uncertainty about the survival of a right cabinet – suggesting an imminent shift to the left – in fact exerts a positive and significant effect. Partisan cues of the potential government signal to market actors the likely consequences of a change in government identity; therefore, if market participants anticipate an election or a cabinet collapse that will produce an incoming left-party government, the probability of a speculative attack will increase.

deficits compared to conservative governments in advanced OECD economies (see e.g. Hibbs 1977, Boix 2000). Given their expansionary-bias, the economic policies of leftist governments make them more prone to speculative attacks compared to rightist governments (Cusack 1999). Furthermore, left-wing governments favor redistributive policies, and the pursuit of these policies requires additional government spending, further worsening the budget deficit.

The same hypothesis could also be drawn by combining partisan politics and analysis of the second-generation crisis models. Second generation authors argue that currency crises are explained by the market's evaluation of the government's ability and willingness to defend the exchange rate peg. When the market no longer has confidence in the government's commitment to maintain the peg, speculators will launch an attack on the currency (Obstfeld 1994). Private agents form their expectations based on their evaluation of the government's policy preferences regarding the inflation-unemployment trade-off. Devaluation would *ceteris paribus* lead to an improvement in the current account balance, thus expanding output and lowering unemployment (Bird 2007), but it will come at the cost of higher inflation. Therefore, if the market senses that the government in power is more willing to tolerate inflation in order to reduce unemployment (who is more likely to be a characteristic of leftist governments), they will similarly expect that the government will abandon the peg, prompting currency traders to attack the currency (Block 2002).

However, the above explanations do not consider how degrees of capital openness may affect the strength of the relationship between government ideology and the likelihood of a currency crisis. While excessive fiscal expansion may generate BOP imbalances that render the currency vulnerable to an attack, per the macroeconomic trilemma, low degrees of capital openness can dampen this effect. Similarly, private agents' expectations of the government's commitment to a peg will depend on the degree of capital openness. In this paper, we combine the economic and political determinants of currency crisis. First, we argue that violations of the macroeconomic trilemma make a country vulnerable to a currency crisis. Second, we argue that these violations are more likely to occur in nations with leftist governments. Many developing countries have opened up their capital accounts in recent years, while they have kept a fixed exchange rate to maintain exchange rate stability. Even under the liberalized capital market and a fixed exchange rate system, leftist governments are more likely to (excessively) use expansionary monetary policy than their conservative counterparts. This potential violation of

the trilemma can put leftist governments' commitment toward the currency peg into question and causes a currency crisis.

Therefore, our hypothesis can be summarized as following: *Leftist governments are more likely to experience a currency crisis when they have a high degree of capital market openness and a fixed exchange rate regime.*

4. Data and Analysis

To examine the impact of government ideology on a currency crisis, we first test how government ideology is associated with interest rate volatility. Then, we examine how government ideology interacts with financial market liberalization and exchange rate regimes to generate a financial crisis. According to our hypothesis, leftist governments are expected to have higher interest rate volatility, implying that they use more excessive monetary policies to control the market, and they are more likely to generate a currency crisis when combined with a highly liberalized financial market and a pegged exchange rate regime. To test these propositions, we use cross-sectional time series data analysis for 55 developing countries from 1975 to 2005 periods. Developing countries are defined as non-OECD membership countries, while we include a few non-foundational members in the 1960s (e.g., Chile, Estonia, Hungary, Mexico, Republic of Korea, and New Zealand). We also identify a list of 25 emerging markets economies in order to examine whether they behave differently from the other under-developed countries.⁷ See Appendix A for the list of the countries.

4.1. Government Ideology and Interest Rate Volatility

Interest Rate Volatility is measured by the log of a standard deviation of annual discount rates (or money market rates when they have a longer time-span), which is calculated in a three-year term from 1975 to 2005 (i.e., 1975-77, 1978-80, 1981-83, etc.). The interest rate volatility measures the degree of monetary policy fluctuation. It will decrease if a government uses an expansionary policy, and it will increase if a government uses a contractionary policy. If a

⁷ Emerging markets classification are taken from a combination of three different sources 1) Morgan Stanley Capital International (MSCI) Emerging Markets Free (EMF) and Emerging Markets (EM) Index, 2) Countries classified as emerging by Fischer (2001), and 3) Countries classified as "Emerging Asia" from Abiad et al. (2008).

government use a monetary policy excessively, the interest rate is more likely to be volatile and have a larger standard deviation. The data are logged to normalize the values.

Government Ideology is our main independent variable. We use Ha's (2012) government ideology variable, which expands the government party data from *the Database of Political Institutions* (DPI) by the World Bank. This dataset improves on the DPI in three ways. First, it includes *all* of the government parties instead of the three largest parties in the DPI. This is important because government policies are not necessarily affected by major parties. Second, government parties are defined as those holding cabinet portfolios only, which allows excluding indisputably nongovernment parties (e.g., the Taiwan Solidarity Union from 2002 to 2004). Third, these ideological data are weighted by the duration of the government in power in order to account for the possibility that governments with different ideology alternate in the same year. Then, government ideology is measured by treating each government party as a veto player, weighing the duration of the government (See Ha (2012) for detailed explanation). The government ideology ranges from rightist (-1) to leftist (1). We expect to find that leftwing governmental ideology is positively associated with higher interest rate volatility.

We also control for several economic conditions, which may influence interest rates. First, *inflation* is expected to increase interest rate volatility because governments often increase an interest rate to control inflation. Second, *pegged exchange rate regime* (1= pegged, 0 for otherwise)⁸ may increase interest rate volatility because maintaining pegged exchange rate stability does not require specifying any point in the path of money supply in both home and foreign countries (Benigno et al.2007). Third, trade volume (imports and exports as a share of GDP) is likely to be positively associated with the interest rate volatility because domestic markets are more exposed to the fluctuation of global financial market. Forth, *GDP growth* and *Real GDP per capita*, measures of economic development, are expected to have negative relationships with interest rate volatility because they stabilize the monetary market at least in the long run.

⁸ Our reference to the IMF classification of exchange rate regime is based on a de jure measure, which can be defined as what a country claims to do. However, we aware that other scholars such as Reinhart and Rogoff (2009) use a de facto measure, which can be identified as what a country actually does with respect to its exchange rate system despite what it claims. We focus on the de jure exchange rate regimes because the de jure measure is more suitable for capturing a bipolar view of exchange regime policy showing the tendency of a country moving toward either the fixed or floating corners of the spectrum of exchange rate regimes.

Fifth, *Financial market liberalization* is expected to increase interest rate volatility because domestic money market rates becomes less controllable (Honohan 2000). Although *credit growth* may promote financial stability in the long run, its short-term effect can cause excessive volatility in interest rates, especially when financial stability pushes up toward a high level of output stability that can result in inflation (Akram and Eirtheim 2008). A high level of *banking regulation and supervision* is expected to increase interest rate volatility. The control of money flows reduces access to liquid money. This leads to increases in money value. As a chain reaction, interest rates are likely to increase, which thereby leads to a further increase in volatility. The degree of independence from the political influences of government executive is measured by Abiad et al. (2008)'s index of bank regulation and supervision.⁹ Lastly, we control for the current level of *interest rates* in order to capture the likelihood that interest rates become more volatile at higher levels (Gary 1996). All of the explanatory variables are also averaged for the three-year periods. Please see Appendix B for detailed descriptions of the variables and their data sources.

Model Specification

We build pooled time series regression estimates of interest rate volatility for the years 1975 to 2005 for 55 developing countries. A panel data analysis model has an advantage for addressing the effects across countries over time, but due to the panel data structure, the model estimates typically suffer from problems such as serial autocorrelation, contemporaneous spatial correlation, and heteroskedasticity. As a remedy for these issues, we followed Beck and Katz's (1995) adjustment method for panel corrected standard errors. However, this method assumes that there is no serial autocorrelation in the panel. A lagged dependent variable has been popularly used in panel data analysis (e.g., Reuveny and Li 2003, Aisen and Veiga 2006) as one solution. However, other scholars, (e.g., Achen 2000, and Plümper, Troger, and Manow 2005) have criticized the use of a lagged dependent variable in the model. Given that a lagged dependent variable soaks up the effects of independent variables and creates downward biases, they suggest instead adjusting for serial autocorrelation using the AR(1) process. We follow this

⁹ The data for central bank independence are not widely available for developing countries. Cukierman et al. (1992) developed a measure of central bank independence using the turnover rate of central bank governors in 70 developing countries almost over 40 years. However, this measure is criticized because the turnover rates of central bank governors may be endogenously correlated with macroeconomic performance indicators such as economic instability (Dreher et al. (2008).

recommendation along with panel corrected standard error adjusted estimates but check the results with a lagged dependent variable. Country dummies are included in order to control for unmeasured country-specific effects including long term political history and the size of population and territory. Our model is as follows:

$$\begin{aligned} \text{Log}[\text{SD}(\text{Interest rates})]_{i,t} = & \beta_1 * \text{Government Ideology}_{i,t} \\ & + \beta_2 * \text{Log}(\text{Inflation})_{i,t} \\ & + \beta_3 * \text{Pegged Exchange Regime}_{i,t} \\ & + \beta_4 * \text{Log}(\text{Trade})_{i,t} \\ & + \beta_5 * \text{GDP growth}_{i,t} \\ & + \beta_6 * \text{Log}(\text{Real GDP per capita})_{i,t} \\ & + \beta_7 * \text{Financial Liberalization}_{i,t} \\ & + \beta_8 * \text{Credit Growth}_{i,t} \\ & + \beta_9 * \text{Banking Regulation and Supervision}_{i,t} \\ & + \beta_{10} * \text{Log}(\text{Interest Rates})_{i,t} \\ & + \sum \beta_k * \text{Country}_k + \varepsilon_{i,t} \end{aligned}$$

The subscripts i and t indicate, respectively, the country and time period (i.e., 3-year-average or standard deviation) for each set of observations. The variable k denotes country dummies. In identifying the model, the intercept is suppressed. This model analyzes the effect of government ideology on interest rate volatility.

[Table 1 is about here]

Findings

Table 1 shows that government ideology is positively and significantly associated with interest rate volatility. The results are also consistent across the different models (Regressions [1] and [2] with AR(1) and regressions [3] and [4] with a lagged dependent variable) and different samples (regressions [1] and [3] with all developing countries and regressions [2] and [4] with only emerging markets. The impacts are also substantively meaningful. According to the regression [1], if a government's ideological orientation shifts from rightwing (-1) to leftwing (1), interest rate volatility increases by a factor of almost 2.40 (almost 1.3 the standard deviation of the measure of interest rate volatility).¹⁰

In short, Table 1 presents robust evidence that leftwing governments are significantly and positively associated with higher levels of interest rate volatility. Given this finding, we test whether the government ideology, capital openness, and pegged exchange rate regime leads to a higher likelihood of currency crisis.

¹⁰ $2 * \exp(0.184)$

4.2. *The Violation of Trilemma and the Risk of Currency Crisis.*

Currency crisis is measured in two ways. First, we use data from Laeven and Valencia (2008), where a currency crisis is coded as a 1 if two criteria are met: 1) a nominal depreciation of the local currency against the USD of at least 30%, and 2) also at least a 10% increase in the rate of depreciation compared to the year before¹¹. For example, if a currency lost 20% of its value against the USD in year t and then lost an additional 40% of its value against the USD in year $t + 1$, then year $t + 1$ would be classified as a currency crisis year. Following the same rule, we are able to identify a total of 99 out of 1,767 reported cases (6% of the sample set).

Second, we also identify the intensity of financial crisis as a continuous measure. We calculate *depreciation rates* based on year-on-year changes in the exchange rate of local currency against the USD. This is not a measure of currency crisis in a strict sense. However, it captures the volatility of exchange rate movements. One reason for testing this variable is that it is a continuous variable, which may provide additional value given that relying on dummy variable implies a loss of information. The average depreciation rate for developing countries including emerging economies is about 0.46. However, the variance of the depreciation rate over 30 years is quite large in a few Latin American countries such as Argentina, Bolivia, and Peru (see a country specific range of depreciation rates for Appendix A).

Our main independent variables are the macroeconomic “trilemma” factors. First, we include a dummy for *pegged exchange rate regime* (PEGGED). For the second component of trilemma, we employ the index of *capital account openness* (KAOPEN) created by Chinn and Ito (2006, 2008). Higher values of this index indicate more openness to cross-border capital transactions. Third, we use the *government ideological orientation* (IDEOLOGY) variable given the tested proposition that left-wing governments tend to exhibit greater monetary policy volatility (see Table 1). As discussed, (leftist) IDEOLOGY escalates the likelihood of a currency crisis and increase depreciation rates when interacted with both KAOPEN and PEGGED.

Several economic performance indicators are taken into consideration to isolate the direct effects of triple interactions on the probability and degree of financial crisis. Development indicators such as *trade volume*, *GDP growth*, and *real GDP per capita* are expected to have a negative relationship with an incidence of currency crisis or a depreciation rate. A warning sign of currency crisis is typically derived from the deterioration of trade and sudden drops in output,

¹¹ These two criteria are initially proposed by Frankel and Rose (1996).

and changes structural. In addition, the experience of *banking crisis* can be a leading indicator of a currency crisis (see e.g. Glick and Hutchinson 1999).¹² With regards to this causal direction running from banking crisis to currency crisis, Obstfeld (1994) argues that speculative attackers develop anticipation against policy makers who seek to control inflation over exchange rate stability in order to avoid bankruptcies and constrain banking sectors. Or as put forth by Velasco (1987) and Calvo (1997), a currency attack may be caused by a bankrun, in particular when the government's bailout of the banking system leads to increase in liquidity but this liquidity is inconsistent with a stable exchange rate. A higher level of policy autonomy pertinent to banking regulation and supervision will lead to decrease in the likelihood (as well as depth) of financial crisis. We also include *credit growth* given that high rates of credit-growth (i.e., a rapid credit-boom) often emerge as a precursor of financial instability (Chiu and Willett 2009; Jorda et al. 2011).

All of the explanatory variables are treated as one-year lagged values in order to capture policy roll over effects, with the exception of variables measuring banking crisis and banking regulation (and supervision) that often occur coincidentally with a currency crisis. More information regarding data sources and sample distribution is available in Appendix B.

Model Specification

Given the nature of dummy values that identify the episode of currency crisis, we run panel probit regression using population-averaged estimators. The population-averaged model is particularly useful in examining the average (rather than an individual country's) probability of a currency crisis given the leftist government's interaction with high capital openness and pegged exchange rate regime, compared with the rightist government's interaction. However, the population-averaged estimators assume an equal correlation model for comparison. This means fixed correlations between observations within a group. To improve the model fit, we use regional dummies that account for group-level variation since regions are entities that control for the contagious effects of financial crisis. Our second model is as follows:

¹² Glick and Hutchison also point out that the reversed casual explanation is also widely accepted. However, in their empirical study of 90 industrial and developing countries over the 1975-1997 periods, they find that while banking and currency crises jointly occur (as a twin pack) in most financially liberalized emerging market economies, the occurrence of banking crisis provides a better leading indicator of currency crisis than vice versa.

$$\begin{aligned}
\Pr(\text{Currency Crisis}_{i,t} = 1) = \Phi (& \beta_0 + \beta_1 * \text{PEGGED}_{i,t-1} \\
& + \beta_2 * \text{KAOPEN}_{i,t-1} \\
& + \beta_3 * \text{IDEOLOGY}_{i,t-1} \\
& + \beta_4 * \text{PEGGED} \times \text{KAOPEN}_{i,t-1} \\
& + \beta_5 * \text{PEGGED} \times \text{IDEOLOGY}_{i,t-1} \\
& + \beta_6 * \text{KAOPEN} \times \text{IDEOLOGY}_{i,t-1} \\
& + \beta_7 * \text{PEGGED} \times \text{KAOPEN} \times \text{IDEOLOGY}_{i,t-1} \\
& + \beta_8 * \text{Log(Trade)}_{i,t-1} + \beta_9 * \text{GDP Growth}_{i,t-1} \\
& + \beta_{10} * \text{Log(Real GDP per capita)}_{i,t-1} \\
& + \beta_{11} * \text{Banking Crisis}_{i,t} \\
& + \beta_{11} * \text{Banking Regulation and Supervision}_{i,t} \\
& + \beta_{13} * \text{Credit Growth}_{i,t-1} \\
& + \sum \beta_k * \text{Region}_k + \varepsilon_{i,t})
\end{aligned}$$

Where $i = 1, \dots, 55$ countries, $t = 1, \dots, 30$ years, and $k = 1, \dots, 5$ regions.¹³ $\Pr(\text{Currency Crisis}_{i,t} = 1)$ is the probability that currency crisis can occur and Φ is the cumulative density (or distribution) function of the standard normal distribution.

To explain variance in depreciation rates, which can serve as a proxy for the intensity of financial crisis, we rely on panel corrected error adjusted model estimators. In particular, in order to capture serial autocorrelation of depreciation rates uniquely distributed within a panel unit over time, we use the panel-specific AR (1) option that allows all cross sectional units to have different AR (1) parameters. Our third model is as follows:¹⁴

$$\begin{aligned}
\text{Depreciation Rates}_{i,t} = & \beta_1 * \text{PEGGED}_{i,t-1} + \beta_2 * \text{KAOPEN}_{i,t-1} + \beta_3 * \text{IDEOLOGY}_{i,t-1} \\
& + \beta_4 * \text{PEGGED} \times \text{KAOPEN}_{i,t-1} \\
& + \beta_5 * \text{PEGGED} \times \text{IDEOLOGY}_{i,t-1} \\
& + \beta_6 * \text{KAOPEN} \times \text{IDEOLOGY}_{i,t-1} \\
& + \beta_7 * \text{PEGGED} \times \text{KAOPEN} \times \text{IDEOLOGY}_{i,t-1} \\
& + \beta_8 * \text{Log(Trade)}_{i,t-1} + \beta_9 * \text{GDP Growth}_{i,t-1} \\
& + \beta_{10} * \text{Log(Real GDP per capita)}_{i,t-1} \\
& + \beta_{11} * \text{Banking Crisis}_{i,t} \\
& + \beta_{11} * \text{Banking Regulation and Supervision}_{i,t} \\
& + \beta_{13} * \text{Credit Growth}_{i,t-1} \\
& + \sum \beta_k * \text{Countries}_k + \varepsilon_{i,t}
\end{aligned}$$

These two models are used to analyze the marginal effect of pegged exchange rate regime with high capital openness policies and the presence of a leftwing government. We expect that this

¹³ Five regions: Europe and Central Asia, Latin American and Caribbean, Middle East and North Africa, South Asia, and Sub-Saharan Africa. East Asia and Pacific is used as the base category (intercept/coefficient β_0).

¹⁴ The constant terms is suppressed in identifying the country fixed effect model.

marginal effect will increase the risk of currency crises, conditional on higher degrees of leftist government ideology.

[Table 2 is about here]

Findings

Table 2 reports the findings from the two equations above. Our models show that government ideology positively affects the likelihood of both a currency crisis and depreciation rates, but this finding is not robustly significant across the different specifications. However, the significance of the estimated coefficient increases when ideology is interacted with PEGGED as well as KAOPEN. This result applies to both the full sample and the sub-sample of emerging market economies. A careful reader will note that our currency crisis model for the samples of emerging economies does not show the statistically significant effect of the triple interaction term. Nevertheless, as pointed out by Brambor et al. (2006), it is perfectly possible to have insignificant interacted coefficients in models with interaction terms. In fact, while point estimates of coefficients are a useful first step, it is difficult to interpret the substantive results of interactive models (especially for non-linear models) from regression tables alone. Following their recommendation, we calculate marginal effects of pegged exchange regimes at different levels of capital openness and the governing strength of the leftist parties.

[Table 3 is about here]

Table 3 summarizes the marginal effects (dy/dx).¹⁵ To facilitate interpretation, we examined 15 different scenarios according to the 3 degrees of capital openness (i.e., limited=0, intermediate=0.5, and highly open=1) and 5 different levels of government ideology (right = -1, center right = -0.5, center=0, center left =0.5, and left = 1). Let us first analyze cases 1-5, where there is limited capital openness. As can be seen, for both leftist and rightist governments, the marginal effect of a pegged exchange rate regime on crisis likelihood is insignificant (compare -0.063 with -.117). This implies that with limited capital mobility, a pegged exchange rate regime does not make the country more prone to speculative attacks, regardless of government ideology. However, as we move from cases 1-5 (limited capital mobility), to cases 11-15 (highly open capital), the marginal effects of pegged currency on crisis likelihood show a different pattern. From these cases we observe that there is a difference between leftist and rightist governments: the more leftist the government in power, the higher the marginal effects of pegged exchange

¹⁵ We use the “margins” command that is made available in Stata Version 12.0.

rate regime on the risk of currency crises. If leftwing governments in emerging market economies choose highly opened capital account policies (case #15), having a fixed exchange rate regime increases the risk of a currency crisis by 18.1%. Similarly, depreciation rates will increase by a factor of 0.695. These effects are statistically significant.

[Figures 1 and 2 are about here]

We also demonstrated these results using graphical presentations. We examine the marginal effects of pegged exchange rate regime (PEGGED = 1) on the risk of currency crisis, conditional on the interaction between high capital openness (KAOPEN = 1) and the level of government ideology (right-left scale). In Figures 1 and 2, we use the full range of government ideological orientation as a conditional value to explain how a pegged exchange regime with highly open capital flows positively affects the risk of currency crises. The marginal effects become positive and significantly different from zero as we simulate an increasingly leftwing government. In other words, compared to rightwing governments, leftwing governments with fixed exchange rates are more crisis-prone.

The control variables show expected signs. We find consistent evidence that a banking crisis predicts both the incidence and intensity of a currency crisis. However, how much of this causality may be derived from endogenously created effects, given the possibility of a twin crisis (the coincidence between a currency crisis and a banking crisis), is not empirically addressed in this paper. Nevertheless, holding other economic development indicators to their expected directions, we find empirical support for our main hypothesis: leftist governments are more likely to experience a currency crisis when there are violations of Mundell's macroeconomic trilemma.

4.3. Robustness Tests

To test the robustness of our propositions, we measure the strength of leftist parties in the government as a share of government seats (LEFT). While government ideological orientation can be determined by the numbers of parties who are potentially veto players, our alternative ideology variable indicates a proportional measure of leftist power in the government. The key finding for the positive correlation between the constitutive terms of trilemma (KAOPEN, PEGGED, and LEFT) and the risk of financial crises remains intact. See the detailed results in Appendices C and D with a marginal effect simulation chart.

Following Laeven and Valencia (2008), we also code at least 30% depreciation rate annually as an incidence of financial crisis. As can be seen in Appendices E and F, the marginal effect of pegged exchange rate regime on crisis is substantively significant when a proportion of the leftist parties in government seats are very high (or the government orientation is left-learning) and that government chooses highly open capital account policies. These robustness tests give added weight to the statistical associations reported above.

5. Conclusion and Discussion

This paper contributes to the literature by identifying the specific conditions where a developing country may confront a currency crisis. We argue that international investors may not necessarily launch speculative attacks in emerging markets because the government is leftist. Instead, they will launch an attack and increase the risks of a currency crisis when a developing country has a very high level of capital mobility and a fixed exchange rate regime, and yet is unwilling to give up control over monetary policy (which happens mostly under leftist governments). In short, currency crises are more likely when there is a violation of the “impossible trinity.” The empirical results support our argument in the following ways. First of all, a stronger leftist government is significantly associated with higher interest rate volatility, implying that it is more likely to employ expansionary monetary policies to stimulate the economy. Second, a leftist government increases the probability of a currency crisis when it is combined with a highly liberalized capital market and fixed exchange rate system. Given a pegged exchange rate regime, the probability of a currency crisis increases as financial market becomes more liberalized; and given a liberalized financial market, the probability of a currency crisis increases when the exchange rate regime is pegged. However, these effects are significantly associated with government ideology as the effects are considerably strengthened as the government ideology changes from rightist to leftist. On the other hand, the effects become statistically insignificant when they are combined with strong rightist governments with discretionary monetary discipline.

The theoretical discussion and empirical results of this paper provide important policy implications for developing countries. In the last few decades many developing countries have removed their financial barriers. With few exceptions, emerging market nations have significantly liberalized their financial markets *without* adjusting their exchange rate regimes. It

is first because a flexible exchange rate regime may cause large fluctuations in the exchange rate level which can harm economic growth (Lahiri and Vegh 2001). Additionally, because most developing countries do not have an independent central bank and often manipulate monetary policies, foreign investors do not necessarily give credits on their flexible exchange rate system (Calvo and Reinhart 2002). Still, given the risk of a financial crisis, it is important for developing countries to make their financial market and exchange rate system compatible. Financial market liberalization is beneficial to the economic growth of developing countries because it attracts foreign investments into nations that lack capital endowments. Given the benefits, developing countries should not close their financial market just to avoid the risk of a currency crisis. Instead, financial market liberalization should be accompanied by adjustments to institutions (i.e. exchange rate regime) and the deployment of more disciplined monetary policies to avoid speculative attacks and the risk of a currency crisis. To make these institutions and monetary policies credible to international investors, developing countries have to establish a central bank, which is dependent from any political pressures and manage a disciplined monetary policy regardless of the ideological preference of government.

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Table 1. Effect of Government Ideology on Interest Rate Volatility

DV: Log [SD(Annual Interest Rate)]	PCSE + AR(1)		PCSE + LDV	
	[1] Full Sample	[2] Emerging Economies	[3] Full Sample	[4] Emerging Economies
Log (Annual Interest Rate)	1.166*** (0.044)	1.173*** (0.059)	1.169*** (0.047)	1.161*** (0.067)
Government Ideology [-1(Right), 1(Left)]	0.184* (0.112)	0.242** (0.130)	0.278*** (0.115)	0.417*** (0.176)
Log (Inflation, CPI)	0.067 (0.053)	0.120 (0.097)	0.117* (0.080)	0.158 (0.132)
Pegged Exchange Rate Regime Dummy	0.036 (0.110)	0.120 (0.133)	-0.017 (0.129)	0.310* (0.176)
Log (Trade Volumes as share of GDP)	0.377** (0.156)	1.242*** (0.294)	0.339* (0.233)	1.106*** (0.467)
GDP Growth	-0.043*** (0.016)	-0.046** (0.023)	-0.051*** (0.021)	-0.045** (0.026)
Log (Real GDP per capita)	0.155 (0.251)	0.003 (0.314)	-0.105 (0.312)	-0.081 (0.251)
Financial Liberalization	-0.031** (0.014)	-0.010 (0.019)	-0.007 (0.021)	-0.003 (0.029)
Credit Growth	0.179 (0.934)	2.827*** (1.076)	0.590 (1.303)	3.126** (1.377)
Banking Regulation and Supervision	0.197** (0.077)	0.010 (0.128)	0.186** (0.103)	-0.010 (0.196)
Log [SD(Annual Interest Rate)] _{t-1}			-0.016 (0.058)	-0.009 (0.057)
Number of Observations	258	133	203	107
Number of Countries	51	24	48	24
Adjusted R ²	0.891	0.876	0.878	0.828
Prob > Chi ²	0.000	0.000	0.000	0.000

Notes: Interest rate volatility is measured in standard deviations of interest rates covering non-overlapping 3-year periods. Sample period: 1975-2005. Standard errors are in parenthesis. We are interested in directional hypothesis testing, one-tailed test results are reported with the significant level at which the null hypothesis is rejected at *** p<0.01, **p<0.05, *p<0.1. The logged values of annual interest rate are controlled in the regression model in order to capture interest rates that become more volatile at higher levels. See Gary's (1996) time series analysis: a regime switching to high volatility of interest rate is more likely when the level of interest rates is high. All estimates are controlled for country fixed effects to capture unobserved characteristics unique to each sampled country group. The constant term is suppressed to avoid country dummy variable traps in the models.

Table 2. Effect of Government Ideology on Financial Crisis

	Currency Crisis (1= Crisis, 0 = None)				Depreciation (Continuous Value)			
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
	Panel Probit	Panel Probit	Panel Probit	Panel Probit	PCSE	PCSE	PCSE	PCSE
	Full Sample	Full Sample	Emerging Economies	Emerging Economies	Full Sample	Full Sample	Emerging Economies	Emerging Economies
Pegged Exchange Rate Regime (PGGED) _{t-1}	-0.430** (0.216)	-0.725*** (0.311)	-0.615** (0.324)	-1.072* (0.833)	-0.091** (0.045)	-0.249*** (0.077)	-0.078* (0.061)	-0.351*** (0.112)
Capital Openness (KAOPEN) _{t-1}	0.104 (0.239)	-1.210*** (0.551)	0.606** (0.333)	-1.148 (1.587)	-0.114** (0.062)	-0.422*** (0.119)	-0.289*** (0.091)	-0.951*** (0.200)
Government Ideology (IDEOLOGY) _{t-1}	-0.066 (0.100)	0.100 (0.411)	0.233** (0.122)	0.284 (0.757)	0.022 (0.033)	0.291*** (0.091)	0.070** (0.040)	0.337*** (0.099)
<i>PEGGED</i> × <i>KAOPEN</i> _{t-1}		1.497*** (0.563)		1.864 (1.751)		0.364*** (0.136)		0.761*** (0.224)
<i>PEGGED</i> × <i>IDEOLOGY</i> _{t-1}		-0.221 (0.426)		-0.130 (0.810)		-0.246*** (0.083)		-0.299*** (0.092)
<i>KAOPEN</i> × <i>IDEOLOGY</i> _{t-1}		-1.570*** (0.739)		-1.447 (1.827)		-0.496*** (0.140)		-0.582*** (0.192)
<i>PEGGED</i> × <i>KAOPEN</i> × <i>IDEOLOGY</i> _{t-1}		2.073*** (0.825)		1.974 (1.929)		0.410*** (0.144)		0.587*** (0.197)
Log(Trade as Share of GDP) _{t-1}	-0.178* (0.130)	-0.148 (0.145)	-0.119 (0.210)	-0.062 (0.228)	-0.217*** (0.073)	-0.221*** (0.072)	-0.239*** (0.102)	-0.210*** (0.101)
GDP Growth _{t-1}	-0.012 (0.012)	-0.012 (0.011)	-0.006 (0.016)	-0.003 (0.015)	-0.002 (0.003)	-0.002 (0.003)	0.001 (0.004)	0.001 (0.004)
Log(Real GDP per capita) _{t-1}	0.082 (0.146)	0.0498 (0.149)	0.498*** (0.188)	0.454** (0.213)	0.041 (0.064)	0.065 (0.063)	0.106 (0.073)	0.151** (0.062)
Banking Crisis _t	0.699*** (0.174)	0.652*** (0.176)	1.014*** (0.252)	1.024*** (0.263)	0.297*** (0.058)	0.271*** (0.056)	0.329*** (0.076)	0.341*** (0.072)
Banking Regulation and Supervision _t	-0.349*** (0.123)	-0.0358*** (0.014)	-0.547*** (0.188)	-0.529*** (0.201)	-0.105*** (0.058)	-0.105*** (0.028)	-0.096*** (0.035)	-0.124*** (0.038)
Credit Growth _{t-1}	1.342 (1.367)	1.138 (1.139)	1.953 (1.597)	1.306 (1.654)	-0.143 (0.313)	-0.242 (0.307)	0.276 (0.267)	0.168 (0.244)
# Observations (countries)	1097 (55)	1097 (55)	536 (25)	536 (25)	1064 (54)	1064 (54)	536 (25)	536 (25)
Regional (or Country) Dummies	YES (NO)	YES (NO)	YES (NO)	YES (NO)	NO (YES)	NO (YES)	NO (YES)	NO (YES)
Chi2	99.55***	147.49***	315.42***	777.38***	1268.83***	877.16***	186.32***	214.81***

Notes: Dummy codes for currency crisis are followed by Leven and Valencia (2008). Depreciation is own calculation of year-on-year of growth of exchange rate. Higher values indicate greater depreciation. Panel probit models are estimated by population-average estimators and give robustness errors for controlling heteroskedasticity. Regional dummies are included in currency crisis regression (not shown here) to account for geographical contiguity effect on crisis. PCSE estimators control for panel specific correlation. Pegged exchange regimes account for fixed exchange regime as well as intermediate, but not fully floating exchange regimes. Standard errors are in parenthesis. One-tailed tests significant at *** p<0.01, **p<0.05, and *p<0.1. The constant term for panel probit estimates are not reported here due to a space limit, while it is suppressed for panel corrected standard error adjusted (PCSE) estimates.

Table 3. Marginal Effect of Pegged Exchange Regime on Financial Crisis, Conditional on the Interaction between Capital Openness and Government Ideology

Marginal Effect of Pegged at Cases #	Capital Openness [0,1]	Government Ideology [-1,1]	Currency Crisis Dummy		Depreciation	
			dy/dx Full Sample	dy/dx Emerging Economies	dy/dx Full Sample	dy/dx Emerging Economies
1	Limited (0)	Right (-1)	-0.063	-0.065	-0.003	-0.052
2	Limited (0)	Center Right (-0.5)	-0.077*	-0.081	-0.126*	-0.202**
3	Limited (0)	Center (0)	-0.090**	-0.100	-0.249***	-0.351***
4	Limited (0)	Center Left (0.5)	-0.104*	-0.121	-0.372***	-0.501***
5	Limited (0)	Left (1)	-0.117	-0.145	-0.495***	-0.651***
6	Intermediate (0.5)	Right (-1)	-0.104**	-0.082**	-0.026	0.035
7	Intermediate (0.5)	Center Right (-0.5)	-0.042*	-0.045**	-0.046	0.032
8	Intermediate (0.5)	Center (0)	0.002	-0.011	-0.067*	0.029
9	Intermediate (0.5)	Center Left (0.5)	0.031***	0.022	-0.087*	0.026
10	Intermediate (0.5)	Left (1)	0.050***	0.056**	-0.108*	0.023
11	Highly open (1)	Right (-1)	-0.152*	-0.101	-0.048	0.121
12	Highly open (1)	Center Right (-0.5)	-0.014	-0.010	0.033	0.265***
13	Highly open (1)	Center (0)	0.049**	0.054	0.115*	0.409***
14	Highly open (1)	Center Left (0.5)	0.084***	0.113***	0.215*	0.552***
15	Highly open (1)	Left (1)	0.117***	0.181***	0.279**	0.695***

Notes: One-tail tests significant at ***p<0.01, **p<0.05, *p<0.1.

Figure 1. Marginal Effect of Pegged Exchange Rate Regime on Currency Crisis as Government Ideology Changes from Right to Left in High Capital Openness.

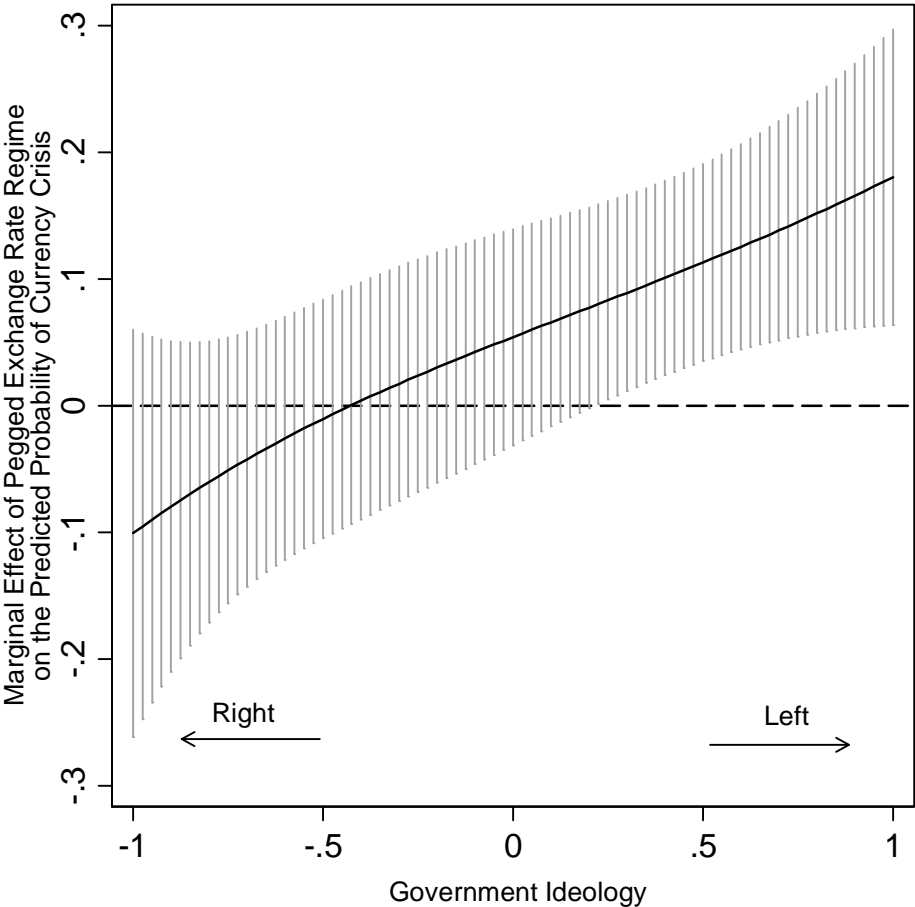
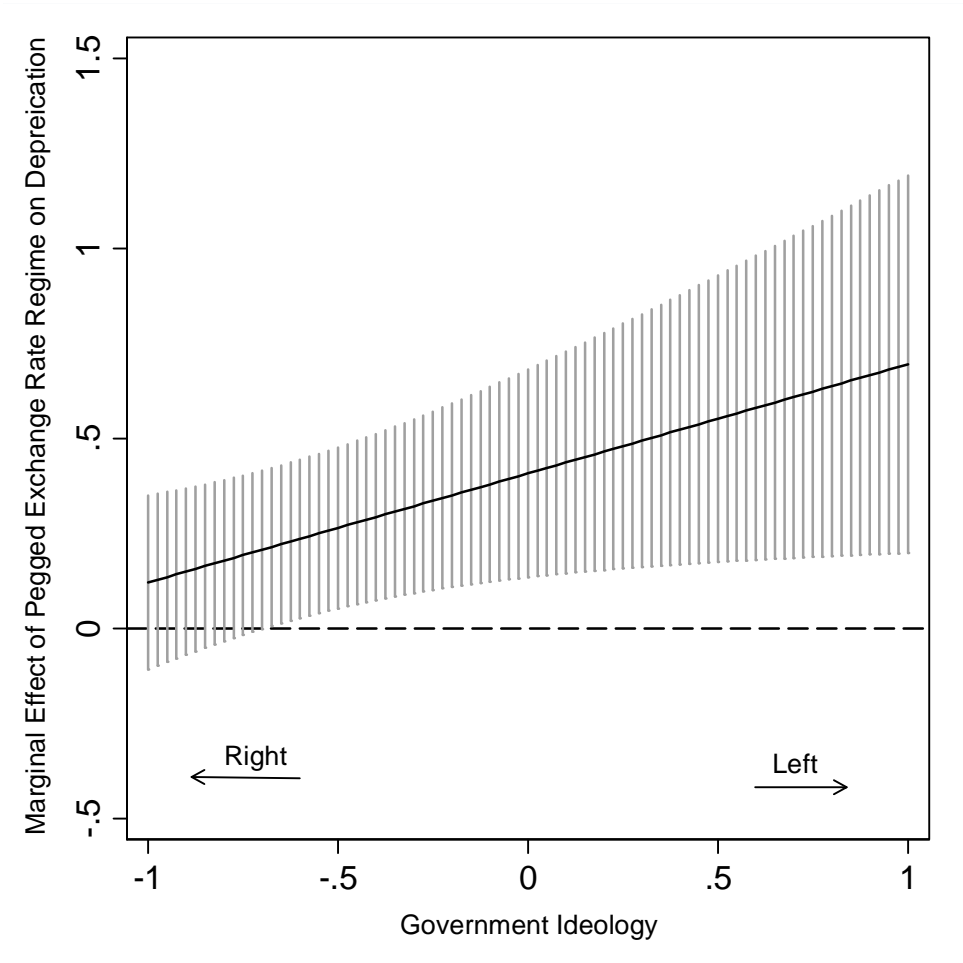


Figure 2. Marginal Effect of Pegged Exchange Rate Regime on Depreciation as Government Ideology Changes from Right to Left in High Capital Openness.



APPENDIX A. Samples from 55 Developing Countries (1975-2005)

Countries	Log[SD(Interest Rates)]			Currency Crisis (Total #)	Depreciation			Emerging Economy
	Avg	Max	Max		Avg	Min	Max	
Albania	1.02	-0.22	1.93	1	0.01	-0.20	0.45	Yes
Argentina	5.11	-1.12	15.54	6	7.01	-0.12	119.87	No
Bangladesh	-0.72	-1.24	-0.46	1	0.08	-0.04	0.83	Yes
Bolivia	1.41	0.14	4.13	1	8.80	0.00	183.36	No
Brazil	3.97	-0.08	9.04	6	2.52	-1.00	26.19	No
Bulgaria	1.68	-0.94	4.47	1	0.97	-0.18	6.71	No
Burkina Faso	-0.27	-1.24	0.17	1	0.04	-0.21	0.81	No
Cameroon	-0.53	-1.24	0.68	1	0.04	-0.21	0.81	Yes
Chile	0.79	0.22	1.23	1	0.27	-0.16	3.25	Yes
China	-0.71	-1.57	1.05	0	0.06	-0.09	0.46	Yes
Colombia	1.15	-0.46	2.08	1	0.16	-0.13	0.51	No
Costa Rica	0.76	-0.55	1.92	2	0.19	0.00	3.21	No
Cote d'Ivoire	-0.27	-1.24	0.17	1	0.04	-0.21	0.81	No
Ecuador	1.43	-0.08	2.56	2	--	--	--	Yes
Egypt, Arab Rep.	0.09	-0.75	1.13	2	0.11	-0.06	0.82	No
El Salvador	-0.19	-0.42	0.25	1	0.05	-0.05	1.00	No
Estonia	-0.17	-1.25	1.24	1	0.01	-0.17	0.16	No
Ethiopia	1.03	0.41	1.65	1	0.06	0.00	1.41	No
Georgia	1.80	1.52	2.06	2	0.04	-0.12	0.38	No
Ghana	1.31	0.37	2.15	4	0.33	0.01	0.99	No
Guatemala	0.59	0.35	0.73	1	0.09	-0.04	1.50	Yes
Hungary	0.74	-0.55	1.32	0	0.06	-0.19	0.26	Yes
India	0.02	-0.55	0.55	0	0.06	-0.08	0.43	Yes
Indonesia	1.03	0.18	3.06	2	0.13	-0.14	0.95	No
Israel	1.49	-0.43	5.73	7	0.49	-0.08	4.92	No
Jamaica	0.40	-0.80	1.61	3	0.18	-0.12	1.68	Yes
Jordan	-0.37	-1.24	0.72	1	0.04	-0.14	0.74	No
Kenya	0.76	-0.87	2.57	1	0.09	-0.34	0.88	Yes
Korea, Rep. of	-0.32	-1.24	1.71	1	0.04	-0.29	1.01	No
Lithuania	0.87	-1.52	3.41	1	-0.02	-0.17	0.15	No
Madagascar	0.56	-1.14	1.27	3	0.15	-0.12	0.97	Yes
Malaysia	-7.17	-2.74	0.43	1	0.02	-0.07	0.54	Yes
Mexico	1.98	0.41	3.23	3	0.32	-0.05	2.61	Yes
Morocco	-0.39	-0.61	-0.06	1	0.03	-0.14	0.29	No
Mozambique	2.25	2.13	2.36	1	0.48	-0.21	9.29	No
Nepal	-0.11	-1.24	0.55	2	0.07	-0.05	0.41	No
New Zealand	0.70	-0.55	1.82	0	0.03	-0.21	0.37	No
Nigeria	0.65	-0.27	1.97	3	0.29	-0.13	3.47	Yes
Pakistan	0.53	-0.60	1.28	5	0.06	-0.04	0.30	No
Paraguay	1.58	0.92	2.05	2	0.16	-0.14	1.22	Yes
Peru	2.28	-0.96	6.11	0	6.15	-0.05	95.96	Yes
Philippines	0.36	-1.71	1.90	2	0.08	-0.12	0.53	Yes
Philippines	0.36	-1.71	1.90	2	0.08	-0.12	0.53	Yes

APPENDIX B. Data used for Tables 1 and 2.

Variable	Description	Mean	SD	Sources
Dependent Variables				
Interest Rate Volatility †	Annual discount rate (or money market rate where it has a longer time span). Volatility calculated as standard deviation of 3 year non-overlapping periods from 1975 to 2005.	0.92	1.85	International Financial Statistics, IMF
Currency Crisis Dummy	Current crisis =1 per definition of Laeven and Valencia.	0.06	0.23	Laeven and Valencia (2008, 2010) and own calculation based on IFS data
Depreciation	Year-on-year rate of growth of exchange rate, higher values indicate greater depreciation.	0.46	6.14	Own calculation based on IFS data
Independent Variables				
Government Ideology	Ideological position of the parties in government. -1 (right) to 1 (left)	0.06	0.85	Ha's (2012) generated value from Database of Political Institution, Word Bank.
Capital Account Openness	Composite index (0-1) of capital account openness. Higher values signify more open to cross-border capital transaction.	0.36	0.32	Chinn and Itho (2006, 2008), IMF
Pegged Exchange Regime	Dummy for pegged exchange regime (1 = pegged or intermediate, 0 = floating)	0.77	0.42	IMF
Control Variables				
Inflation (CPI) †	Consumer price index as percentage change from prior year	2.45	1.36	World Development Indicators; Penn World Tables
Trade Openness †	Sum of Import and Exports as share of nominal GDP.	3.96	0.58	
Growth	Real GDP growth rate (annual)	3.64	5.16	Abiad, Detragiache, and Tressel (2008)
Real GDP per capita†	Real GDP per capita, 2005 constant international \$, PPP.	8.35	0.95	
Financial Liberalization	An aggregated index of six dimensions of financial liberalization (eliminations of interest rate controls, credit controls and excessively high reserve requirements, bank entry barriers, capital account restrictions, liberalization of security market policy and privatization). The sale is 0-18 (higher scores indicate more liberalized financial sector).	8.91	5.27	
Banking Crisis Dummy	Banking crisis = 1 per definition of Laeven and Valenica	0.10	0.30	Laeven and Valencia (2008,2010)
Banking Regulation and Supervision	Proxy for central bank Independence. Scaled index going from 0 to 3, where 3 is the highest score. The larger index score denotes the higher levels of institutional independent from executive influences.	0.68	0.81	Abaid et al. (2008)
Credit Growth	Annual change in credit /GDP ratio, where credit is defined as private credit by deposit money banks and other financial institutions.	0.006	0.04	Database on Finanical Development and Structure, World Bank; Beck, Demirguc-kunt and Levine (2000)

Note: † indicates the use of logged values to control for skewness. For table 1, the pegged exchange regime identifier is strictly pegged regime only

Appendix C: Alternative Measure of Government Ideology

Variables	DV1: Currency Crisis Dummy		DV2: Depreciation	
	Full Sample	Emerging Economies	Full Sample	Emerging Economies
	[1]	[2]	[3]	[4]
	Panel Probit	Panel Probit	PCSE	PCSE
Pegged Exchange Regime (PEGGED) _{t-1}	-0.532*	-0.859**	-0.108	-0.250**
	(0.367)	(0.639)	(0.089)	(0.127)
Capital Openness (KAOPEN) _{t-1}	0.220	0.299	-0.151*	-0.718***
	(0.368)	(0.692)	(0.113)	(0.188)
Left (% of Government Seats) _{t-1}	0.006	0.012	0.003**	0.4001
	(0.006)	(0.012)	(0.001)	(0.209)
<i>PEGGED</i> × <i>KAOPEN</i> _{t-1}	-0.119	0.299	0.102	0.047**
	(0.513)	(1.122)	(0.129)	(0.210)
<i>PEGGED</i> × <i>LEFT</i> _{t-1}	-0.007	-0.005	-0.003*	-0.001
	(0.007)	(0.014)	(0.001)	(0.002)
<i>KAOPEN</i> × <i>LEFT</i> _{t-1}	-0.047***	-0.0049*	-0.007***	-0.001
	(0.013)	(0.034)	(0.003)	(0.003)
<i>PEGGED</i> × <i>KAOPEN</i> × <i>LEFT</i> _{t-1}	0.050***	0.050*	0.007***	0.002
	(0.014)	(0.037)	(0.003)	(0.004)
Log(Trade as Share of GDP) _{t-1}	-0.149	0.024	-0.223***	-0.193**
	(0.151)	(0.255)	(0.073)	(0.102)
GDP Growth _{t-1}	-0.011	0.005	-0.002	0.002
	(0.011)	(0.016)	(0.003)	(0.004)
Log(Real GDP per capita) _{t-1}	0.083	0.432***	0.108	0.121**
	(0.145)	(0.174)	(0.059)	(0.062)
Banking Crisis _t	0.660***	1.184***	0.304***	0.348***
	(0.174)	(0.297)	(0.056)	(0.074)
Banking Regulation and Supervision	-0.330***	-0.471***	-0.131***	-0.126***
	(0.134)	(0.196)	(0.034)	(0.040)
Credit Growth _{t-1}	1.329	1.814	-0.236	0.167
	(1.392)	(1.591)	(0.304)	(0.247)
# Observations	1097	536	1064	536
# Countries	55	25	54	25
Region Dummies	YES	YES	NO	NO
Countries Dummies	NO	NO	YES	YES
Chi2	140.68***	1559.95***	1903.13***	215.88***

Notes: One-tailed tests significant at *** p<0.01, **p<0.05, and *p<0.1. Government participation by the leftist parties is used as an alternative measure for government ideology. The data series are obtained from Ha(2012).

Appendix D. Marginal Effect of Pegged Exchange Regime on Financial Crisis, Conditional on the Interaction between Capital Openness and Government Participation by the Left

Marginal Effect of Pegged at Cases #	KAOPEN	Left (%)	Currency Crisis Dummy		Depreciation	
			dy/dx Full Sample	dy/dx Emerging Economies	dy/dx Full Sample	dy/dx Emerging Economies
1	Limited(0)	Left (0%)	-0.060	-0.080*	-0.108	-0.250**
2	Limited(0)	Left (20%)	-0.081**	-0.088*	-0.174**	-0.263***
3	Limited(0)	Left (40%)	-0.106**	-0.097	-0.241***	-0.276***
4	Limited(0)	Left (60%)	-0.133**	-0.105	-0.307***	-0.288***
5	Limited(0)	Left (80%)	-0.163*	-0.112	-0.374***	-0.301**
6	Limited(0)	Left (100%)	-0.197*	-0.118	-0.440***	-0.314**
7	Intermediate(0.5)	Left (0%)	-0.074**	-0.038**	-0.057	-0.015
8	Intermediate(0.5)	Left (20%)	-0.023	-0.008	-0.054	-0.006
9	Intermediate(0.5)	Left (40%)	0.011	0.018	-0.052	0.004
10	Intermediate(0.5)	Left (60%)	0.031***	0.042***	-0.050	0.013
11	Intermediate(0.5)	Left (80%)	0.043***	0.065***	-0.047	0.030
12	Intermediate(0.5)	Left (100%)	0.050***	0.089***	0.045	0.032
13	Highly Open(1)	Left (0%)	-0.091	0.006	0.006	0.220**
14	Highly Open(1)	Left (20%)	0.017	0.047*	0.065	0.252**
15	Highly Open(1)	Left (40%)	0.052***	0.074***	0.137*	0.293**
16	Highly Open(1)	Left (60%)	0.063**	0.095***	0.208**	0.315**
17	Highly Open(1)	Left (80%)	0.069**	0.116***	0.279**	0.347**
18	Highly Open(1)	Left (100%)	0.076*	0.140**	0.351**	0.378*

Notes: One-tailed tests significant at *** p<0.01, **p<0.05, and *p<0.1.

APPENDIX E. Alternative Measure of Crisis

Dependent Variable: Depreciation 30% More(1 = 30% more, 0 for otherwise)	Full Sample	Emerging Economies	Full Sample	Emerging Economies
	[1]	[2]	[3]	[4]
	Panel Probit	Panel Probit	Panel Probit	Panel Probit
Pegged Exchange Regime (PEGGED) _{t-1}	-0.476* (0.307)	-0.667** (0.395)	-0.331 (0.314)	-0.021 (0.314)
Capital Openness (KAOPEN) _{t-1}	-0.504 (0.618)	-1.472** (0.833)	0.263 (0.591)	-0.142 (0.687)
Government Ideology (IDEOLOGY) _{t-1}	0.216 (0.317)	0.811** (0.293)		
Left (% of Government Seat) _{t-1}			0.004 (0.005)	0.009** (0.004)
<i>PEGGED</i> × <i>KAOPEN</i> _{t-1}	0.338 (0.602)	1.488* (0.962)	-0.397 (0.489)	-0.178 (0.498)
<i>PEGGED</i> × <i>IDEOLOGY</i> _{t-1}	-0.168 (0.371)	-0.704*** (0.275)		
<i>KAOPEN</i> × <i>IDEOLOGY</i> _{t-1}	-0.876** (0.418)	-1.803** (0.855)		
<i>PEGGED</i> × <i>KAOPEN</i> × <i>IDEOLOGY</i> _{t-1}	0.766* (0.521)	1.884*** (0.772)		
<i>PEGGED</i> × <i>LEFT</i> _{t-1}			-0.004 (0.006)	-0.009** (0.004)
<i>KAOPEN</i> × <i>LEFT</i> _{t-1}			-0.027** (0.012)	-0.019* (0.013)
<i>PEGGED</i> × <i>KAOPEN</i> × <i>LEFT</i> _{t-1}			0.025** (0.012)	0.021** (0.011)
Log(Trade as Share of GDP) _{t-1}	-0.497*** (0.194)	-0.426*** (0.203)	-0.512*** (0.198)	-0.455** (0.195)
GDP Growth _{t-1}	-0.025** (0.012)	-0.043*** (0.016)	-0.023** (0.011)	-0.041** (0.018)
Log(Real GDP per capita) _{t-1}	0.018 (0.147)	-0.040 (0.243)	-0.022 (0.153)	0.266* (0.121)
Banking Crisis _t	0.531*** (0.162)	0.754*** (0.221)	0.561*** (0.159)	0.805*** (0.210)
Banking Regulation and Supervision _t	-0.516*** (0.124)	-0.411*** (0.138)	-0.486*** (0.120)	-0.372** (0.166)
Credit Growth _{t-1}	-0.207 (1.586)	1.709 (1.887)	-0.181 (1.571)	1.831 (1.710)
Number of Observations	1071	536	1071	536
Countries	54	25	54	25
Chi2	105.67***	193.42***	81.25***	111.90***

Notes: One-tailed tests significant at *** p<0.01, **p<0.05, and *p<0.1.

APPENDIX F. Marginal Effect of Pegged Exchange Regime on Deprecation 30 % More, Conditional on the Interaction between Capital Openness and Government Participation by the Left

Marginal Effect of Pegged at Cases #	Capital Openness	Government Ideology	dy/dx (Full Sample)	dy/dx (Emerging Economies)	Left (%)	dy/dx (Full Sample)	dy/dx (Emerging Economies)
1	Limited	Right	-0.054	0.005	Left (0%)	-0.063	-0.004
2	Limited	Center Right	-0.074	-0.052	Left (20%)	-0.082	-0.037
3	Limited	Center	-0.095*	-0.133*	Left (40%)	-0.102*	-0.076
4	Limited	Center Left	-0.118	-0.237**	Left (60%)	-0.124*	-0.120*
5	Limited	Left	-0.142	-0.357***	Left (80%)	-0.148	-0.168*
6	Limited				Left (100%)	-0.172	-0.221**
7	Intermediate	Right	-0.099*	-0.022	Left (0%)	-0.104**	-0.017
8	Intermediate	Center Right	-0.075*	-0.006	Left (20%)	-0.103*	-0.012
9	Intermediate	Center	-0.052	0.011	Left (40%)	-0.032	-0.006
10	Intermediate	Center Left	-0.032	0.028	Left (60%)	-0.004	-0.001
11	Intermediate	Left	-0.014	0.046	Left (80%)	0.017	0.004
12	Intermediate				Left (100%)	0.034	0.009
13	Highly Open	Right	-0.150*	-0.535	Left (0%)	-0.146*	-0.028
14	Highly Open	Center Right	-0.076	0.028	Left (20%)	-0.049	0.005
15	Highly Open	Center	-0.020	0.080**	Left (40%)	0.014	0.032
16	Highly Open	Center Left	0.019	0.113***	Left (60%)	0.049*	0.052
17	Highly Open	Left	0.042	0.138***	Left (80%)	0.064*	0.068
18	Highly Open				Left (100%)	0.068*	0.080

Notes: One-tailed tests significant at *** p<0.01, **p<0.05, and *p<0.1.