Liberal Mercantilism: Exchange Rate Regimes, Foreign Currency Denominated Debt and Trade Disputes

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Abstract: The use of trade policy as a means of attracting and maintaining hard currency reserves is typically associated with illiberal trade policies, as in 17th and 18th century mercantilism. We argue that the need to protect access to hard currency can also serve liberal ends when it is used as an impetus to open up export markets abroad by initiating trade disputes. We call this behavior "liberal mercantilism". We explore the existence and extent of liberal mercantilism by identifying conditions that increase hard currency needs and corresponding these conditions to the timing and frequency of trade disputes. We find that liberal mercantilism is a substantively important driver of dispute initiations. Our findings have several implications. We provide an explanation for differences in dispute participation rates among developing countries, and we suggest a new link between exchange rate regimes and trade policy. The currency denomination of government debt appears as an important determinant of government behavior in international political economy.

Governments often work to attract and maintain stocks of hard currency. Trade policy has traditionally been used for this purpose and illiberal trade policies – tariffs, import quotas, export subsidies, etc. – have historically been the tool of choice for countries seeking to stem hard currency outflows. This practice reached its apex in the European mercantilism of the 17th and 18th centuries, and it has been noted as a driver of protectionism during the interwar gold standard (Eichengreen and Irwin 2010). The World Trade Organization (WTO) and its predecessor, the General Agreement on Tariffs and Trade (GATT), discourage protectionism as a means of maintaining hard currency reserves among its member countries. This has been especially the case since 1994 when the WTO limited the use of import restrictions justified by balance-of-payment problems.[1] Still, many countries need substantial amounts of foreign currency and trade policy provides a powerful channel to meet these needs. This paper asks: How and to what extent does the GATT/WTO prevent countries from using trade policies as a means of preserving access to foreign reserves?

We argue that the GATT/WTO has not prevented trade policy from being used to attract foreign reserves, but rather that it has changed the means through which countries do so. Rather than relying solely on illiberal trade practices, GATT/WTO members in need of foreign exchange can initiate trade disputes in order to bring down obstacles to foreign exchange generating exports. As such, the GATT/WTO re-channels the same motives that underpinned classical mercantilism into incentives to ensure the liberal trade policies of trading partners. We call this dynamic "liberal mercantilism".

This paper proceeds to show that the existence of liberal mercantilism is theoretically plausible, and, empirically, that the need to attract foreign reserves is a substantively important driver of dispute initiations. Export revenue is a significant contributor to a country's reserve

[1] GATT Articles XII and XVIII:B.

position (see, e.g., Aizenman and Lee 2008); seeking to expand export opportunities by filing trade disputes is therefore a natural response to increased reserve needs. As we describe in more detail below, trade disputes are very plausibly capable of expanding exporting opportunities and, importantly, they operate on a timescale that allows them to serve foreign exchange needs. Declines in reserves often manifest months or years before an acute crisis.[2] Recent works by Allee (2009) and Chaudoin (forthcoming) further indicate that countries typically have a deep bench of plausibly winnable cases, giving them the opportunity to pursue trade disputes if and when financial conditions warrant. Disputes can be filed quickly and a large number of cases are settled within a matter of months. The initiation of trade disputes is therefore a plausible policy option when countries that rely on foreign exchange reserves are losing them.

If liberal mercantilism exists it should be the case that governments with significant foreign exchange needs should react to reserve losses by filing more trade disputes. To assess this proposition empirically, we identify conditions under which sensitivity to reserve losses should be especially high. First, foreign reserves are needed for the exchange market interventions typically required by managed exchange rate regimes (Krugman 1979). The combination of declining foreign reserves and managed exchange rate regimes is a common precursor of currency crises (Broner 2008), and countries experiencing that combination should file more trade disputes as a result. Second, foreign currency debt requires foreign currency reserves to service existing debts and to signal to lenders that debts incurred in the future will be serviced (Wyplosz 2007). Countries should be more likely to initiate trade disputes as a reaction

[2] It is unlikely that trade disputes would be a reasonable strategy for countries facing a full-blown currency crisis. Moreover, countries facing an "acute" balance of payments problem can access safeguard protections available through WTO Articles XII and XVIII:B. Our theory refers to how countries with pronounced foreign currency needs use trade policies to manage their foreign currency reserves in order to avoid such crises.

to reserve losses when they carry large amounts of foreign currency denominated debt. Third, we expect that these factors interact. Failing to maintain a stable currency is particularly damaging under high levels of foreign currency denominated debt because devaluation raises the effective debt burden for entities that borrow in foreign currency but earn in domestic currency – including public borrowers that rely on domestic tax revenue. Reserve losses under managed exchange rate regimes should therefore have their largest impact on dispute initiations when foreign currency debt burdens are high. Finally, we expect the relationship between debt, reserve losses, managed exchange rates, and trade disputes to be more evident after the GATT/WTO criteria for accessing balance-of-payments exemptions were tightened in 1994.

We test our hypotheses in quantitative analyses of trade dispute initiations in a sample of 89 countries between 1974 and 2004.[3] The results bear out most of our expectations. We find that countries using managed exchange rates react to reserve losses by initiating more trade disputes, especially after access to balance-of-payments exemptions was tightened and especially when foreign currency debt levels are high.[4] In contrast, we find no evidence that reserve losses affect the dispute initiation patterns of countries with floating exchange rate regimes. In addition, our estimates indicate that a one standard deviation increase in foreign currency debt load increases the predicted number of initiated disputes by about 50 per cent. All of this

[3] Data availability for our preferred measure of foreign currency debt restricts our main sample to low- and middle-income countries. Using different measures and empirical specifications, our main results also hold in samples including high-income countries (for a total of up to 127 countries) and in samples covering 1972-2011.

[4] We discuss below why we believe these results stem from a shift in how the GATT/WTO treats balance-of-payments exemptions and not from concurrent legal reforms of the dispute settlement body. We also show in the appendix that the results are not driven by changes in GATT/WTO membership.

strongly suggests that countries use the GATT/WTO dispute settlement system in part to manage their access to foreign exchange.

This paper makes several contributions. Our state-centric viewpoint is a natural complement to the literature on the determinants of trade disputes, which typically views the decision to bring a dispute as a function of firms' lobbying efforts, electoral concerns, or the quality of legal claims (Davis 2012). Our findings do no dispute or diminish the importance of these factors in determining *which* disputes are brought, but does identify conditions that impact *when* trade disputes are brought and, by extension, when firm level interests are likely to translate most readily into government actions. Firms' abilities to trigger dispute initiations appear to increase when their interests coincide with a national interest in obtaining foreign currency. Moreover, large foreign exchange generating exporters should be liberal mercantilism's primary beneficiaries. A government's need to secure foreign exchange can be a fortunate happenstance for such firms. We also see this paper as an adjunct to Allee's observation that developing countries "pursue WTO dispute settlement only for the most meaningful cases" (Allee 2009: 4). Our argument implies that "meaningfulness" can be as much a property of the initiating country's macroeconomic condition as of the case itself.

This paper also contributes to the literature on the relationship between trade and financial policies. Copelovitch and Pevehouse (forthcoming) show that reduced flexibility in trade policy stimulates active exchange rate management in order to serve the interests of firms that are affected by fluctuations in international prices. In a similar vein, Broz and Frieden (2001) note that import-competing firms may push governments towards protectionist trade policies when faced with an inability to adjust the exchange rate. Liberal mercantilism suggests an alternative perspective. The goal of maintaining a stable exchange rate can create incentives for governments to address financial imbalances through an active trade policy that plays to

exporting interests while remaining within the confines of agreements that limit the use of illiberal policies. Our argument therefore adds a fourth node to the Mundell-Fleming trilemma: favoring a stable exchange rate and capital mobility forfeits a country's monetary policy autonomy and at the same time increases the sensitivity to changes in its foreign reserves, which in turn may necessitate proactive efforts to preserve access to foreign currency through trade policy.

In the next section, we note the empirical distribution of different exchange rate regimes and foreign currency debt loads and discuss the relationship between these factors and the need to accumulate foreign exchange. We then discuss how the GATT/WTO has shaped the way this need gets channeled into trade disputes and provide quantitative evidence suggesting that liberal mercantilism is an important driver of dispute initiations. The final section concludes.

COUNTRIES NEED MONEY, SOME MORE THAN OTHERS

Since 1990, foreign exchange reserves have increased exponentially (especially in Asia) and now top US$11.1 trillion worldwide, of which US$7.4 trillion are held by emerging markets (IMF 2013).

One motivation for accumulating reserves is to help maintain a stable exchange rate. Exchange rate stability typically requires interventions in the foreign exchange market to offset fluctuations in the supply and demand of the currency. Foreign exchange reserves allow central banks to conduct these operations. Large reserve holdings may also deter speculative attacks by signaling to potential speculators that countervailing interventions are possible and likely (Krugman 1979; Leblang 2003; Broner 2008). Conversely, reserve losses can signal financial fragility and often precipitate depreciations, currency crises, and financial crises, often at

substantial economic and political costs.[5] Countries experiencing reserve losses while operating managed exchange rate regimes are therefore in particular need of access to foreign exchange. Floating exchange rate regimes, by contrast, allow the market to set the exchange rate. They do not require foreign exchange market interventions, and therefore do not present countries with the same need to maintain adequate reserve holdings.

The top panel of Figure 1 shows the distribution of *de facto* exchange rate regimes from 1974 through 2004, using Levy-Yeyati and Sturzenegger's (2005) classification.[6] The vast majority of countries manage their exchange rates and therefore face an ostensible need to maintain adequate foreign reserves, despite the recent move towards *de jure* floating regimes (Calvo and Reinhart 2002).

FIGURE 1 HERE

Large foreign denominated debt stocks are a second reason why governments need access to foreign currency. Many countries, and most non-OECD countries, are unable to borrow externally in their domestic currency. This inability is commonly known as "Original Sin" (Eichengreen, Hausmann, and Panizza 2005). Original Sin occurs for a variety of reasons. Foreign investors might not trust domestic monetary authorities and prefer to put the exchange rate risk on the issuer rather than assume it themselves, particularly where underdeveloped

[5] Depreciating an exchange rate can disrupt investment, increase the price of consumer goods and erode public beliefs about monetary authorities' will or capacity to maintain low inflation.

[6] For all of the figures displayed in the following, we restrict the data to the sample used for our primary empirical model. Because of data availability on our measure of foreign currency debt, this restricts the sample to low- and middle-income GATT/WTO members (non-OECD countries, plus Mexico and Turkey) from 1974 through 2004, for a total of 1631 observations.

capital markets limit hedging opportunities. Even if exchange rate risk is mild, the demand for a stream of payments in a minor currency is typically low (Hausmann and Panizza 2003). As a consequence, many developing markets have little choice but to issue their debt in foreign currencies. Most or all of these countries' external debt is denominated in major currencies such as the US dollar, euro, or yen. Foreign currency debts require foreign currency both for repayment and to signal to potential lenders that future debts will be serviced as well (Wyplosz 2007). Maintaining adequate access to foreign currency is therefore crucial for countries with large foreign currency debt stocks. Failure to do so can increase borrowing costs and possibly trigger sovereign debt crises.

The middle and bottom panels of Figure 1 showcase the distribution of foreign currency debt in our main sample. The middle panel is a histogram of country-years arranged by the portion of externally held public and publicly guaranteed debt (PPG debt) denominated in major or multiple currencies. Higher values reflect greater reliance on foreign currency debt. The majority of low- and middle-income countries owe all or almost all of their external PPG debt in foreign currencies. The bottom panel of Figure 1 is a histogram of country-years arranged by the logged amount of public or publicly guaranteed debt denominated in major or multiple currencies. As it shows, the amount of money they owe in foreign currency is varied and, often, substantial.

Foreign currency debt is itself a reason for countries to accumulate foreign reserves and to be sensitive to foreign reserve losses. Foreign currency debt also amplifies the sensitivity of countries with managed exchange rates to reserve losses. Countries with high levels of foreign currency debt might be unable to borrow the currency needed to maintain stable exchange rates in the event of speculative pressure (Krugman 1979). This inability leaves countries with unenviable options of mounting an interest rate based defense of the exchange rate or devaluing

the currency. Foreign currency debt also magnifies the costs of currency devaluation by increasing the cost of servicing foreign denominated debt from revenue streams denominated in the (then relatively weaker) domestic currency. Public entities that borrow in foreign currencies but tax in local currency must increase taxation, reduce primary fiscal outlays, or draw on reserves in order to meet their debt repayments. Private borrowers risk insolvency when their foreign denominated debts are inflated relative to domestic currency denominated assets. This notably includes financial institutions that borrow cheaply on international markets but earn revenue from local lending. Depreciation driven insolvency is a familiar dynamic to some of the worst financial crises in the last decades. Walter (2008) notes the unwillingness of Asian countries exposed to foreign currency debt to rebalance through the exchange rate during the 1997-1998 financial crisis for fear of rendering local banks with high levels of dollar denominated debt insolvent. Reserve losses are exceptionally problematic to countries operating managed exchange rates under high foreign currency debt stocks.

TRADE POLICIES AND FOREIGN EXCHANGE RESERVES

Trade surpluses (deficits) are a primary means of accumulating (losing) foreign exchange reserves. Trade policy is therefore a natural place for governments to look when trying to manage those reserves, and historically trade policies have assumed an important role in this regard – often with attempts to block further reserve losses through the imposition of protectionist trade policies. While the practice is discouraged by the GATT/WTO (and the Bretton Woods Institutions more generally), the GATT/WTO dispute settlement mechanism provides a “liberal” avenue to use trade policies in order to enhance access to foreign exchange by promoting access to export markets. By challenging and dismantling foreign trade barriers, countries can expand their export opportunities. Most international trade is denominated in the major reserve

currencies. Increased export opportunities should result in larger export receipts and, in turn, more access to hard currency foreign exchange. As Brook (1984: 1055) notes, while expanding developing countries' exports "cannot solve [debt and balance-of-payments problems] singlehandedly, it is the key to the solution". Pursuing trade disputes has the added potential benefit of acquiring a reputation for not being "pushed around" by trading partners, which might prevent future violations of a country's trade rights and thereby also preserve access to foreign exchange. We should therefore expect that under the conditions outlined in the previous section, countries are more likely to initiate more trade disputes.

We also expect that the use of trade disputes as attempt to access foreign exchange became more prevalent after 1994. The GATT initially acknowledged the role of protectionist trade policies in managing foreign reserves explicitly and even tolerated it:[7] GATT Articles XII and XVIII:B make allowances for safeguard protections to shield the balance of payments, thereby preserving a means for trade policies to respond to financial stress while remaining GATT/WTO compliant. These safeguards were the most common form of administrative protection under the GATT, with over 3,400 cases as of 1992 (Finger and Hardy 1995: 294). This led to perceptions of overuse and, in 1994, to significantly tightened criteria by which countries can invoke them.[8] The resulting tightening curtailed the use of "simplified procedures" that limited required consultations and surveillance, required the IMF to confirm the existence of an acute balance-of-payments problem, and mandated a timetable for phasing out any import restrictions (McCusker 2000). While still on the books, Articles XII and XVIII:B have rarely

[7] The International Monetary Fund, similarly, officially acknowledges the relationship between trade policies and a country's reserve position (Independent Evaluation Office of the International Monetary Fund, 2004).

[8] A US trade official, for instance, accused South Korea of "hiding behind a balance of payments rationale and keeping a 300 to 400 percent tariff on beef" (Sunday Mail, April 18, 1993).

been invoked since 1994 (Finger 2010). As such, members of the GATT/WTO lack practical recourse to legal but "illiberal" trade policies to protect foreign exchange reserves in the absence of a crisis. We therefore expect that the relative attractiveness of trade disputes as a means to access foreign exchange should have increased after 1994, such that the propensity of countries to turn to trade disputes in response to reserve losses is larger after 1994.

Our argument assumes that governments believe that trade disputes are plausible means of increasing export revenue. Evidence suggests that this is the case. Bechtel and Sattler (2011) estimate that sectoral exports from complainant countries to the defendant increase by about US$10.5 billion in the three years after a WTO panel ruling. While other studies report smaller effects of disputes on trade flows (e.g., Chaudoin, Kucik, and Pelc 2013),[9] Chaudoin, Kucik, and Pelc note that the positive effects of trade disputes on trade flows have been "taken largely for granted" (2013: 27). We take as a starting point that governments plausibly believe that trade disputes contribute to larger exports by removing trade barriers.

Our own estimates suggest that trade disputes do correlate with more export revenue and that at least some of this revenue finds its way into countries' foreign reserves. Columns 1 and 2 of Table 1 show the results of simple, fixed-effects regressions relating foreign reserves to dispute initiation at the GATT/WTO, using the same sample of non-OECD countries from 1974-2004 as we use in our main models.[10] The results indicate that, even when controlling for several likely confounders as well as for unobserved heterogeneity at the country-level, trade disputes in

[9] While Bechtel and Sattler (2011) find that disputes increase bilateral imports at the sector level by the defendant state from the complaining state, Chaudoin, Kucik, and Pelc (2013) report that disputes only marginally increase aggregate imports by the defendant from all of its trading partners at the product level – leaving open the possibility that disputes increase bilateral exports from the complaining state at the expense of third parties.

[10] See the next section for detailed variable descriptions.

one year are associated with US$2.4 billion larger reserve holdings in the following year, roughly four times the average year-to-year change in foreign reserves.[11] Column 3 uses total exports as dependent variable and reports that a dispute in the previous year correlates with an increase in exports of about US$4.7 billion. These effects on reserves and export revenue should not necessarily be attributed to trade disputes alone. As we discuss below, countries in need of foreign exchange often undertake multiple, concurrent policy initiatives to increase access to it. The correlations we observe between disputes and subsequent increases in reserves holdings likely capture the sum total of these efforts (which are too numerous and multifaceted to plausibly control for in our regressions). Whatever the portion of these effects that can be attributed to trade disputes, however, these findings are at a minimum consistent with trade disputes being part of a policy mix that increases access to foreign reserves.

TABLE 1 HERE

Timing also plays an important role in our argument. Trade disputes and government reactions to declining foreign reserve need to occur on similar time-scales for our argument to make sense. Currency crises are often characterized as sudden while trade disputes are perceived as taking a long time to prepare and adjudicate. These conventional wisdoms notwithstanding, the time scales of the two phenomena overlap substantially.

First, while currency crises can occasionally come quickly and without much advance warning, worrisome declines in currency reserves are often a drawn out processes that policymakers can observe over months and years. For example, Argentina has been taking

[11] Two 'placebo tests' provide further support: Trade disputes in a subsequent year and trade disputes five years in the past have no statistically significant effect on reserves.

proactive steps to address its current foreign exchange woes, including trade related measures, since at least 2011, when it began "prohibiting companies and individuals from purchasing dollars for savings purposes" (Levine 2013). Even ostensibly sudden balance of payments crises often come with advance warning. For example, while the 1991 Indian currency crisis is generally associated with the combination of the gulf war oil shock and political uncertainty (Cerra and Saxena 2000), the macroeconomic imbalances that made India vulnerable were long standing. The ratio of Indian reserves to external debt fell consistently and precipitously from 1983 (25.8%) to 1990 (6.6%).[12] India didn't avoid the 1991 crisis, but not because the underlying problems were unknown or unknowable to policymakers. There was plenty of time to use trade disputes as part of a policy mix meant to proactively address declining reserves. Countries are often allowed ample time to prepare and file cases in the face of declining reserves positions.

Second, filing a case at the WTO need not take a long time. Roughly a quarter of all disputes at the WTO are initiated less than a year after the offending measure has been imposed, suggesting that countries can prepare cases swiftly when needed.[13] Additionally, countries often have a bench of available cases to bring forward when necessary (Allee 2009). Chaudoin (forthcoming) notes that lost export markets do not immediately translate into trade disputes. Countries often prepare cases and wait for a politically opportune time to file at the WTO. Our argument is much the same, except that the trigger here is not political opportunity, but rather macroeconomic need. The speed with which cases can be filed can be seen in so called "tit-for-tat filings", wherein the defendant in one case files its own case against the original complainant. This often happens quickly and, as in a 2012 exchange between Argentina and the European

[12] World Development Indicators, accessed 12/15//2013.

[13] Authors' calculation, based on data from Bown (2012).

Union, as quickly as the next day (Chafin 2012). Similar dynamics are on display in the well-known dispute over US tariffs on Chinese tires and the quick retaliatory response by China against US chicken exports in 2009.[14] In these cases it is clear that either the disputes were in some sense "ready to go" whenever the situation called for it or that governments occasionally file cases prior or concurrent to aspects of the underlying investigation.

Finally, while some cases take a long time to be prosecuted and resolved, many cases are resolved relatively quickly. According to data collected by Horn, Johannesson and Mavroidis (2011), the median length of time it takes for a case at the WTO to advance through the consultation and panel stages is roughly one and a half years and somewhat less when the complainant is a developing country; the consultation stage, on average, takes about four months. Under the GATT, the median duration of those cases that reached the panel stage was two years (Reinhardt 1996).

Even these figures overstate the time it takes for a case to resolve because many complaints are settled early. The majority of disputes are settled before a panel is established, and 63 percent of disputes are settled prior to a panel ruling (Busch and Reinhardt 2001). Roughly a fifth of all GATT cases were settled in the same year they were initiated, about 60 per cent of disputes ended a year after the dispute was initiated, and 80 per cent of disputes ended within two years (Reinhardt 1996). Moreover, it is precisely these early settlements that hold the most promise for complainants to gain foreign exchange. Full compliance is significantly more common in cases that are settled early (Busch and Reinhardt 2001) and early settlements, typically crafted behind closed doors, are often discriminatory in that "participants accrue disproportionate benefits […] where trade benefits from settlement are not distributed equitably across WTO members with a stake in the matter" (Kucik and Pelc 2013). Thus, early settlements

[14] We thank Krzysztof Pelc for pointing this out to us.

often provide unusually large potential benefits to the complainant and within a relatively short time period, often within only a few months. Both the frequency and large benefits of early settlements to the complaining party imply that trade disputes have the potential to alleviate even relatively short-term foreign currency needs.[15]

Anecdotal evidence suggests that governments are well aware of the link between increasing export opportunities, the need to garner foreign exchange, and the role of GATT/WTO disputes in doing so. For example, Australian trade minister John Dawkins remarked at a 1986 conference of agricultural exporters in Cairns that agricultural exporters were "suffering reduced export receipts [and] severe balance of payments difficulties" as the result of "the protectionist, subsidizing policies of major industrialized nations."[16] South American delegates noted that "their international debt problems had been exacerbated by […] trade policies of the major industrialized nations."[17] Several participants in the Cairns conference, including Argentina,

[15] It is of course true that many WTO cases require protracted panel rulings and appeals processes and result in decisions in which the benefits are spread evenly across the WTO membership. Such cases may not, in retrospect, be particularly well suited to combatting declines in foreign reserves. However, this outcome may not be known to the complainant *ex ante*. Given the frequency with which settlements *are* reached on a fairly expedited time frame and the large benefits of early settlements to the complainant, it is likely that some of these cases are filed in failed attempts to elicit an outcome that could have affected foreign exchange reserves on a relevant time-scale.

[16] The Xinhua Overseas General Overseas News Service, August 27, 1986.

[17] The Xinhua Overseas General Overseas News Service, August 27, 1986.

Brazil, Mexico, and Chile, initiated disputes against the United States and Europe over agricultural issues in the three years following the conference.[18]

A cursory look at the Latin American experience also suggests that dispute initiation is tied to foreign exchange needs. In the early 2000s, Colombia (2004), Brazil (2005) and Uruguay (2003) issued external, domestic currency denominated debt for the first time (Tovar 2005) and concurrently slowed down their dispute initiation rates.[19] Conversely, as the Argentinean need for foreign exchange increased, so did its rate of dispute initiation. Argentina initiated 5 trade disputes between the GATT's founding in 1948 and the Peso's peg to the Dollar in 1991, but 22 trade disputes during the ensuing period of exchange rate pegs (1991-2001) and large foreign denominated debt burdens.[20] Even this pattern may understate the case: the lone suit that Argentina initiated in 2003 included a staggering 113 claims.

There are, of course, other means of attracting foreign reserves, and there is nothing in our argument to suggest that trade disputes should be the *only* one that countries engage in.[21] Likely, countries take a variety of steps. They could, for example, raise domestic interest rates or

[18] Demekas et al. (1988) report that in the 1980s, the gains from abolishing agricultural subsidies in developed countries would have been sufficient to reduce the public external debt stock of developing countries by 3 to 5 per cent.

[19] Colombia initiated 3 disputes from 1998-2003 and 1 dispute from 2003-2008; Brazil initiated 15 disputes from 2000-2005 and 2 from 2005-2010; Uruguay initiated 1 dispute 1999-2004 and 0 from 2004-2009.

[20] Four of the five disputes that Argentina initiated between the GATT's founding in 1948 and 1991 came at the height of the Latin American debt crisis in 1982, which further suggests a link between dispute initiation and foreign exchange needs.

[21] Once a crisis is imminent countries can access the balance of payment exception or avail themselves of IMF loans. We have neither evidence nor intuition to suggest that a GATT/WTO suit would have any meaningful effect on speculative attacks once they begin, only that they might help bring in the foreign exchange that can allow countries to avoid them.

proactively seek foreign capital in the form of FDI. They can also exploit tariff overhang (actual tariffs that are below bound rates) or file anti-dumping claims to stem the inflow of imports (and the associated outflow of foreign exchange).[22] Filing disputes is not costless – legal fees easily surpass US$500,000, with some estimates as high as US$1.5 million for an average case (Brutger 2013) – but these costs are plausibly offset by expectations of increased export revenue and pale in comparison to the short term economic (and political) costs of raising interest rates during times of economic stress or when short-term domestic debt levels are high. Proactive steps to increase FDI can be unpalatable to local businesses. Protectionism, even when it occurs within the bounds of GATT/WTO rules, may increase the costs of imported goods and lead to cost-push inflation. All of this is to point out that, while initiating trade disputes is neither a free lunch nor a magic bullet, neither are the alternatives.

Returning to the Argentinean example suggests that trade disputes complement alternative strategies. Argentina initiated three trade disputes at the WTO against the European Union and the United States over the course of just a few weeks in the summer of 2012.[23] The Argentinean public sector at the time faced a crippling foreign currency debt burden, the service of which drained US$5.67 billion from the country's reserves in 2012.[24] But bringing the suits at the WTO appears to be just one of several steps that Argentina concurrently made to preserve access to foreign reserves. Others include reducing the time that exporters have to repatriate their foreign currency, placing restrictions on MNCs' ability to convert pesos to dollars, supposedly

[22] In unreported regressions, we find no systematic evidence that countries impose anti-dumping measures or reduce tariff overhang under the conditions we identified.

[23] The disputes concerned US import restrictions on and import delays of lemons as well as meat and animal products, and EU measures restricting the import of biodiesels.

[24] 94 per cent of Argentinean debt in 2012 was denominated in either US dollars or Euros.

considering the use of anti-terror laws to force soybean farmers to export their harvests[25] and, in 2008, encouraging the use of local currency via the Sistema de Pagamentos em Moeda Local (SML) to clear traditionally dollar denominated bilateral trade with Brazil in which Argentina was running an annual deficit of US$2.7 billion at the time of implementation.[26] We argue that Argentina's activities at the WTO should be understood in part as an extension of these other efforts to generate and preserve foreign reserves. Argentina's WTO claims are not necessarily the most important part of their efforts in terms of generating foreign exchange, but they come with profound implications for how we view the GATT/WTO's role in the international economy and for how countries make use of its dispute settlement body.

To summarize, countries with managed exchange rates need foreign exchange to support their monetary policy and countries with large foreign currency debt loads need foreign exchange to service their liabilities to signal to potential investors the ability to service future debt. If countries with managed exchange rates, large foreign currency debt or both let their foreign reserves dwindle too far they run the risk of painful currency crises. As such, these countries should be especially likely to be proactive when faced with declining reserves. Illiberal trade policies – promoting exports, discouraging imports – have historically played a key role in attracting and maintaining foreign reserves, but many countries have lost easy recourse to these policies since the advent of the GATT/WTO, and especially since recourse to balance of payments exemptions at the WTO were made more difficult in 1994. We expect that countries that need reserves but are losing them will react by seeking to shore up export markets by

[25] The Argentinean government denies this. Buenos Aires Herald, March 26, 2013.
[26] A former President of the central bank of Argentina noted of the SML, "Argentina is saving dollars by using this system." The Wall Street Journal, May 17, 2012.

initiating more trade disputes. As such, trade policy continues to play a role in reserve management, but in a way that promotes liberal rather than illiberal ends.

We have provided some anecdotal evidence of countries facing dwindling reserves bringing more suits at the WTO in conjunction with measures that are more obviously meant to shore up their reserves position. We argue that the trade disputes and the other measures should be understood as a suite of policy efforts with a common goal. If our interpretation of these anecdotes is correct and generalizable we expect to see support for the following hypotheses in a larger dataset:

H1: Reserve losses increase the number of trade dispute initiations from countries operating managed exchange rates, especially after access to the balance-of-payments exemptions in GATT Articles XII and XVIII:B was tightened in 1994. Reserve losses should have no such effect on the behavior of countries with floating exchange rate regime.

H2: Reserve losses increase the number of trade dispute initiations from countries with large foreign currency debt stocks, especially after access to the balance-of-payments exemptions in GATT Articles XII and XVIII:B was tightened in 1994.

H3: The effect of reserve losses under managed exchange rates should increase in a country's stock of foreign currency debt.

QUANTITATIVE EVIDENCE

To test our hypotheses we combine information on countries' dispute initiations at the GATT/WTO, reserve positions, exchange rate regimes, and the size and denomination of their public and publically guaranteed debt. Our data is organized by the country-year and restricted to members of the GATT/WTO.

Our primary sample covers 1,631 observations for 89 low- and middle-income countries between 1974 and 2004; about a third of these countries initiated at least one dispute at the GATT/WTO. We focus our main models on low- and middle-income countries because of data

availability of our preferred measure of foreign currency denominated debt (described below in more detail).

Our dependent variable is the yearly number of dispute initiations by a country. We obtain data on dispute initiations from Reinhardt (1996) and Horn and Mavroidis (2011). In our sample, the variable ranges from 0, the mode, to 6, with on average .12 disputes per year.

Independent Variables

Testing our hypotheses requires operationalizing reserve losses, exchange rate regimes, and foreign debt loads. We operationalize reserve losses as the annual percentage change in total foreign currency reserves multiplied by -1, so that positive values indicate reserve losses. The data on foreign reserves come from the IMF and comprise holdings of foreign exchange, special drawing rights, reserves held by the IMF, and gold reserves, valued in current US dollars. This variable is labeled "reserve loss" in the regression tables.[27]

We operationalize exchange rate regimes using Levy-Yeyati and Sturzenegger's (LYS, 2005) index of *de facto* regimes. A de facto exchange rate measure is appropriate for our purposes, given the widely noted gap between *de facto* and *de jure* regimes. Governments need foreign reserves to manage an exchange rate that is declared to float freely, but in fact is managed; there is no need to manage an exchange rate that is declared pegged but in fact floats.

[27] We show in the appendix the results using a measure of reserves minus gold, which is a standard measure used in the literature on speculative attacks on currencies. Our results are not sensitive to the measure of reserves being used. Our rationale for using the gold inclusive measure in our main models and gold exclusive measure in the appendix is that gold holdings can be swapped for hard currency and used as a reserve asset, even if its use as such is marginal: As a practical matter, other than China, India and Russia, the developing countries that make up our core sample don't hold much gold as a reserve currency (Aizenman and Inoue 2013).

The LYS classification is conceptually the most appropriate, since it takes into account not only the volatility of exchange rates, but also the extent of market interventions (Klein and Shambaugh 2008).[28] The index forms three categories: freely floating; intermediate regimes, such as crawling pegs or managed floats; and fixed regimes. We code the variable "floating rate" 1 for floating exchange rates and 0 for the latter two categories, which require interventions.

We operationalize foreign currency debt as the logged value of a country's external, public and publicly guaranteed debt stock (PPG debt) denominated in foreign currencies (available from the World Bank). External PPG debt covers all obligations of government entities and public bodies as well as all obligations of private debtors that are guaranteed by public entities. The World Bank's measure of foreign currency debt comprises debt denominated in French francs and Deutsche Marks (prior to 2000), Euros (after 2000), Swiss francs, Japanese yen, US dollars, British Pounds, and debt denominated in multiple currencies. Most international trade is denominated in these currencies, especially US dollars. We assume that debt issued in these foreign currencies constitutes the vast majority, if not the entirety, of all foreign currency denominated debt. While a simplification, we are unaware of any significant exceptions. This variable is labeled "debt" in the tables and lagged by one year to avoid reverse causality.[29]

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[28] We discuss alternative measures in the appendix. One potential shortcoming of the LYS classification is that it is based on the volatility of reserve holdings; however, we find little correlation between the exchange rate regime variable and our measure of reserve losses (the correlation coefficient is .049), alleviating concerns of collinearity among these variables.

[29] PPG debt on average accounts for over 80 per cent of all external debt in low-income countries (World Bank 2006). PPG debt loads are also the most widely available debt data and can be paired with data on the currency composition of PPG debt, making it preferable to alternatives. The appropriate lag structure for this variable is unclear from a theoretical standpoint. As the Indian case illustrates, countries occasionally face years of declining reserves. We use a one year

Raw Data

Figure 2 describes the unconditional relationships between our main independent variables and dispute initiations. The left panel of Figure 2 shows the average number of yearly dispute initiations for countries with managed exchange rate regimes across four different scenarios: for reserve losses and gains in the previous year, and for years before and after 1994. As expected, after 1994, countries with reserve losses initiate about 60% more disputes than countries with reserve gains. There is virtually no difference prior to 1994, when countries were more able to take advantage of the balance-of-payments exemptions in the GATT and install trade restrictions to manage the balance of payments.

The middle and right panels of Figure 2 showcase the unconditional relationship between foreign currency debt and the number of a country's dispute initiations per year. The ticks on the bottom of the graphs represent the distribution of the data. The middle panel shows the relationship between the percentage of PPG debt denominated in foreign currencies and dispute initiations; the right panel shows the relationship between log foreign currency debt and trade disputes. In both figures, countries below the sample median almost never initiate trade disputes while countries at the upper end of the distribution have initiated as many as six disputes within a year. The similarities between the graphs suggest that the relationship is driven by foreign currency denomination, rather than total debt stocks or variables associated with debt stocks.

FIGURE 2 HERE

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lag in our specifications, but report in the appendix that similar (and, in fact, stronger) results obtain if you use two- and three-year averages.

Econometric Tests

The existence of multiple potential confounders suggests the need for additional analyses. Moreover, the interactions implied by our hypotheses are not easily or convincingly documented without a more fully specified model. We estimate several negative binomial count models. The negative binomial model is a generalization of the Poisson model that allows for unobserved heterogeneity, thereby accounting for overdispersion in the data (Cameron and Trivedi 1998). Indeed, we can reject a Poisson model in favor of the negative binomial model based on a likelihood ratio test, with a p-value of .000. We also find no evidence that a zero-inflated negative binomial model would be more appropriate (further discussed below). The model assumes that disputes, conditional on all covariates, follow a Poisson distribution (therefore nesting the Poisson model) with mean parameter $\lambda_{it} = \mu_{it}\upsilon_{it}$, where υ_{it} is a Gamma-distributed random variable and μ_{it} is parameterized as

$$\ln \mu_{it} = f(\textit{reserve loss}_{it-1}, \textit{floating rate}_{it}, \textit{prior 1994}_{it}, \textit{debt}_{it-1}) + \beta\, \textit{controls}_{it-1} + \gamma\, \psi_{it} + \varepsilon_{it},$$

where *prior 1994* is a dummy variable coded 1 in years prior to 1994 and 0 otherwise, i indexes country, t indexes year and ψ represents a year polynomial of degree three (year, year squared, year cubed) to account for common time trends; β and γ are coefficient vectors on the controls and the year polynomial to be estimated. Standard errors are clustered on countries. We report results using several different functional forms for $f(.)$, including models with all four variables interacted with each other and models in which reserve losses, exchange rate regime, and the 1994 dummy are interacted but with foreign debt entering additively.

Control Variables

We include several controls to mitigate the possibility of spurious results; all control variables are lagged by one year and are obtained from the World Development Indicator database. First, reserve losses may be caused by import surges, and we control for annual percentage changes in imports. In a robustness check (Table 3 model 5) we also report a model controlling for changes in exports, as lost export opportunities might result in reserve losses and trigger disputes on behalf of the exporting firm. Second, countries with larger trading volumes should have more opportunities to initiate disputes. At the same time, countries with large trading sectors are more likely to manage their exchange rates and to suffer less from Original Sin (Hausmann and Panizza 2003). To account for these possibilities we control for the log of the total value of a country's trade in a year (exports plus imports). We control for logged foreign reserves because countries with managed exchange rates tend to accumulate larger amounts of foreign reserves (Calvo and Reinhart 2002) and might therefore be able to sustain larger levels of foreign currency debt, which they often accumulate as a by-product of holding currency values below what a market would dictate (Aizenman and Lee 2008). Because this is often done to promote exports, these countries might initiate more trade disputes. We also control for GDP per capita in thousand of US dollars, as many scholars find that wealthier economies are more likely to initiate trade disputes (Busch and Reinhardt 2003; Kim 2008) and wealthier economies may be better able to borrow in domestic currency, to carry larger debt burdens, and to sustain floating exchange rates. The online appendix provides descriptive statistics and more detailed information on the data sources.

TABLE 2 HERE

Results

Table 2 shows the results of our three main models. Model 1 includes the triple interaction between reserve loss, floating rate and prior 1994. Debt enters the equation additively. The model speaks to H1 (in isolation of H2 and H3). Because prior 1994 is coded 0 for observations from 1994 and later, and floating rate is coded 0 for observations for countries with managed exchange rates, the coefficient on reserve loss describes the effect of reserve losses after 1994 and under managed exchange rates. H1 predicts that this coefficient should be positive, and that the interactions between reserve loss and prior 1994 and reserve loss and floating rate should both be negative, such that reserve losses' effect on trade dispute initiation diminishes prior to 1994 and under floating exchange rate regimes. This is precisely what we find: the coefficient on reserve losses (2.18) is positive and statistically significant, indicating that reserve losses correlate with trade disputes after 1994 and when the country suffering the reserve losses operates a managed exchange rate. The negative and statistically significant coefficients on reserve loss x prior 1994 (-1.42) and reserve loss x floating rate (-2.50) suggest that the positive effect of reserve losses on the number of trade disputes is wiped out entirely when exchange rates are floating, and significantly reduced in the period prior to 1994. The coefficient on debt is statistically significant and positive, suggesting that countries with larger foreign debt stocks initiate more disputes.

Figure 3a uses the estimates of model 1 to show the expected percentage increase in the number of dispute initiations resulting from a move from stable reserves to a 25 per cent reserve loss and for a one-standard deviation increase in log foreign currency debt.[30] The figure reports

[30] We report the percentage increase to render estimates comparable across categories. A 25-percentage point change in reserves is not uncommon. Two thirds of the observations experienced such a change within a five-year period, about a quarter within a year.

the average effect, holding all other covariates at observed sample values and averaging over observations (Cameron and Trivedi 1998; Hanmer and Ozan Kalkan 2013), as well as a 95 confidence interval.[31] The figure shows that reserve losses have small, negative, and statistically insignificant effects under floating exchange rates. Prior to 1994, a country with a floating exchange rate and a 25 per cent reserve loss initiates about 14 per cent fewer trade disputes than a country with stable reserves. After 1994, the effect drops to 7 per cent. By contrast, the effects under managed exchange rates are positive and substantively large. Prior to 1994, a country experiencing a 25 per cent reserve loss under a managed exchange rate initiates 22 per cent more trade disputes than a country with stable reserves; after 1994, the effect increases to 74 per cent (the p-values are .043 and .000, respectively).

The right panel of Figure 3a evaluates whether the differences in the marginal effects of reserve losses are different for managed and floating exchange rate regimes and prior to 1994 and after 1994. The first two bars in the right panel show the difference in the marginal effect of reserve losses for years after 1994 and prior to 1994; H1 implies that this difference should be positive under managed exchange rates. This is indeed what we find: under managed exchange rates, reserve losses have larger effects after 1994, when the exemptions for trade restrictions based on a balance-of-payments rationale were tightened; the difference is significant at the 1 per cent level. H1 further implies that the effect of reserve losses should be larger under managed exchange rates than under floating exchange rates, and the final two bars of Figure 3 report this difference. As the figure indicates, the marginal effect of reserve losses is larger under managed exchange rates than under floating exchange rates, both before and after 1994; moreover, the difference in marginal effects is larger after 1994, and in both cases it is statistically significant. Thus, and consistent with H1, we find that reserve losses have larger effects under managed

[31] See the appendix for more a more detailed description.

exchange rates than under floating exchange rates (both before and after 1994), and that reserve losses have larger effects under managed exchange rates after 1994 than under managed exchange rates before 1994. All of these differences are significant at the 5 per cent level. By contrast, the effect of reserve losses under floating exchange rates is not any different after 1994 than before 1994.

FIGURE 3a HERE

Model 2 includes the triple interaction between reserve loss, debt and prior 1994. Floating rate enters the equation additively. This model speaks to H2 (in isolation of H1 and H3). The results of model 2 suggest that countries with high levels of foreign currency debt initiate more trade disputes, but, contrary to H2, that the effect of reserve losses is not in any meaningful way conditional on debt levels and/or the tightening of access to the balance-of-payments exemptions in GATT Articles XII and XVIII:B. The coefficient on debt is not significantly different from the estimates reported in model 1.[32]

FIGURE 3b HERE

32 In unreported robustness checks we estimated a version of model 1 that excludes our debt variable and thereby allows coverage of both OECD and non-OECD countries. We also estimated a version of model 2 that excludes our measure of exchange rate regime and thereby expand temporal coverage to 1972 through 2011. Despite the different samples (and specifications) the results from these models are substantively similar to those from models 1 and 2. These results are available on request.

Figure 3b uses the estimates of model 2 to show the expected percentage increase in the number of dispute initiations resulting from a move from stable reserves to a 25 per cent reserve loss and for a one-standard deviation increase in log foreign currency debt. Consistent with the intuition from the regression tables, there is no evidence from model 2 that reserve losses have an effect on trade dispute initiation or that the effect of reserve losses on trade dispute initiation varies across debt levels or before and after 1994. The left panels of Figures 3a and 3b also report the marginal effect of a one-standard deviation increase in foreign currency debt. Both figures indicate that an increase in foreign currency debt is, by itself, an important driver of dispute initiations: a one-standard deviation increase in foreign currency debt is associated with about 50 per cent more trade dispute initiations.

One interpretation for this result is that foreign currency debt is a liability that lenders hold against a country's foreign currency reserves. An increase in foreign currency debt is conceptually tantamount to a decrease in available foreign reserves. The need for countries with large amounts of foreign currency debt stocks to service current and future debt obligations has been used to explain preemptive accumulations of foreign reserves through export revenue (Wyplosz 2007). Trade disputes are one direct means to expand export revenue and ensure access to foreign reserves and the relationship between foreign currency debt stocks and trade disputes is consistent with this interpretation. By contrast, we do not find that countries with managed exchange rates initiate more trade disputes than countries with floating exchange rates. Indeed, countries with floating exchange rates initiate slightly more trade disputes, although the difference is not statistically significant at conventional levels. This result, and the contrast to the independent effect of foreign currency debt, is consistent with our argument. By itself, a managed exchange rate, while establishing a commitment to maintain a stable level of the exchange rate, does not imply any liabilities that need to be served. This contrasts with foreign

currency debt stocks, which imply a liability that requires foreign currency for repayment. Larger debt stocks imply larger liabilities, and therefore more need to secure access to foreign exchange.

To evaluate H3, model 3 interacts foreign currency debt, reserve losses, floating exchange rates, and the prior 1994 dummy.[33] Figures 4 and 5 illustrate some of the key results from this model. As in Figure 3, the left panel of Figure 4 reports the marginal effect and 95 confidence interval of moving from stable reserves to a 25 per cent reserve loss for various scenarios: under managed and floating exchange rates, and at the sample mean of foreign currency debt ('low debt') and one standard deviation above the sample mean ('high debt'). The graph shows that under managed exchange rates, reserve losses have a positive, significant effect on dispute initiations only at high debt levels; at low debt levels, the effect is positive, but no longer statistically significant. Under floating exchange rates, the effect of reserve losses is virtually zero at low debt levels and small and negative at high debt levels; in both cases, the effect is statistically indistinguishable from zero.

H3 further implies that the effect of reserve losses under managed exchange rates should be larger under high debt loads than under low debt loads. The right panel of Figure 4 reports the relevant quantities to evaluate this claim. The graph shows that under floating exchange rates, the effects of reserve losses are not much different under high and low debt levels; the difference in the effects is small and statistically insignificant. Under managed exchange rates, by contrast, reserve losses have larger effects at high debt levels than at low debt levels. The difference is statistically significant at the 5 per cent level. Figure 4 thus provides support for H3: under managed exchange rates, the effect of reserve losses increases in the level of foreign currency debt. The final two bars in the panel show that at low levels of foreign currency debt, the effect

[33] In the appendix (Figure A1), we show that the main results reported in Figure 3 also hold when calculated from our estimates of model 3.

of reserve losses is not statistically significantly larger under managed exchange rates than under floating exchange rates, although the magnitude of the difference is considerable. At high debt levels, the difference between reserve losses' effects under managed exchange rates and floating exchange rates is positive and statistically significant.

These results underscore that the most dire financial conditions (i.e. the combination of reserve losses, managed exchange rates and large stocks of foreign currency debt) are the most conducive to dispute initiations.

FIGURE 4 HERE

Figure 5 shows that these reported effects apply to a substantial number of observations in the sample. The left panel of Figure 5 reports the marginal effect of moving from stable reserves to a 25 per cent reserve loss under managed exchange rates after 1994, at varying levels of log foreign currency debt. The ticks in the bottom of the graph show the distribution of log foreign currency debt in the sample. Reserve losses have a statistically significant effect above the sample median, and the effect increases rapidly. At the highest levels of foreign currency debt, the expected number of disputes per year increases by more than .5, implying a more than fivefold increase in the expected number of trade disputes compared to the sample average. This accords with intuition: at high levels of foreign currency debt, devaluations are both more costly and harder to prevent through borrowing, heightening the need to access new sources of foreign currency.[34]

[34] At the observed sample values of foreign currency debt, reserve losses have a positive, statistically significant average marginal effect on dispute initiations under managed exchange rates and after 1994, as we show in the appendix. Thus, the result that reserve losses affect

The right panel of Figure 5 reports the marginal effect of a one standard deviation in foreign currency debt under managed exchange rates after 1994, at varying levels of reserve loss. Under large reserve losses, a one-standard deviation increase in foreign currency debt is associated with more than one additional dispute, though the confidence intervals are quite wide at higher reaches of reserve loss. However, even at modest reserve gains the effect of foreign currency debt is statistically significant; the 95 per cent confidence interval only includes zero for the 10% of observations in which reserve gains exceed 70 per cent. For the other 90 per cent of the observations the effect of foreign currency debt is positive and statistically significant. While reserve losses reinforce the problem of foreign currency debt, looming debt by itself appears to be sufficient to drive dispute initiations.

To summarize, the evidence in this section suggests that reserve losses under managed exchange rates are a substantial contributor to the initiation of trade disputes. As expected, this effect increases after the GATT exemptions for balance-of-payments reasons were tightened and for countries that hold large amounts of foreign currency denominated debt. While we find no evidence that reserve losses have a similar effect under large foreign currency debt stocks in the absence of a managed exchange rate, we do find that the presence of large foreign currency debt stocks is associated with the initiation of trade disputes. This latter result is consistent with the interpretation that countries' needs to access foreign currency increase their rates of trade dispute initiation.

FIGURE 5 HERE

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dispute initiation rates does not depend on extrapolation or assuming particularly high debt levels; *on average,* even in model 3, reserve losses under managed exchange rates after 1994 have a positive, significant coefficient.

Robustness checks and additional evidence

We conducted several robustness checks. Table 3 reports the results of six tests that strike us as most central. Additional robustness checks are reported in an online appendix. To ease comparison, we use model 1 as our baseline model.[35] Results across all specifications are similar to those reported for model 1 in the main regression table.

Model 5 controls for the percentage change in exports. Lost export opportunities might result from trade barriers abroad, which then get challenged in trade disputes. Interestingly, we do not find support for the idea that a decrease in exports should be met with an increase in trade disputes, though it is likely that such an effect would be better captured in a dyadic dataset. Model 6 groups freely floating and intermediate exchange rate regimes into the category of floating exchange rates. While both intermediate and fixed exchange rates require interventions, the need for intervention is stronger under the latter. The results point to a larger but substantively similar effect. Model 7 estimates a Poisson model with normally distributed random effects at the country-year and at the country level to account for the panel data. We obtain similar results when incorporating a first-order autoregressive error process (not reported). A zero-inflated negative binomial regression, where the inflation equation includes log trade, GDP per capita, and an indicator if a country initiated a trade dispute in the past, yields similar results (not reported). A Vuong test does not reject the negative binomial model in favor of the zero-inflated negative binomial model and a test based on Schwarz' Bayesian Information Criterion favors the negative binomial model over the zero-inflated negative binomial model. We obtain these results both for the specification of the inflation equation described above and for

[35] The appendix notes the results of the robustness checks applied instead to model 3.

the specification of the inflation equation chosen by Davis and Bermeo (2009), which includes only GDP per capita.[36]

Model 8 replaces the variable on foreign currency debt stocks with the percentage of PPG debt denominated in major currencies and multiple currencies. This measure has the advantage of being independent of total debt stocks, which in turn may be associated with institutional or economic factors correlated with dispute initiations. Model 9 replaces foreign currency debt with a variable from Cowan et al. (2006), who collected data on the debt composition and stock for the Americas, New Zealand, Pakistan, and South Africa. These data capture external foreign currency debt net of debt cross-holdings by central banks. Model 10 replaces the dependent variable with the number of legal claims. It is plausible that countries not only initiate more trade disputes, but also submit more legal claims with each dispute. Horn and Mavroidis (2011) provide data on the specific articles that were allegedly violated and scrutinized by a WTO panel.[37] While the variable has the drawback of being available only for WTO disputes that reached the panel stage, it provides an additional test of the logic of our argument. As noted above, the results to all of these robustness checks support our theory and generally produce coefficient estimates that are comparable to each other and to the results noted in Table 2.

We provide a number of additional robustness checks, the results of which are listed in Appendix tables A1 and A2.1. Among the most notable of these are models that 1) consider electoral cycles as an omitted variable (they might drive both dispute initiations and, based on

[36] See Cameron and Trivedi (1998, 2005) as well as Desmarais and Harden (2014) for details on these tests in the context of negative binomial models.

[37] We use the total number of claims per year, not the average per dispute. The latter implies that a country filing two disputes with five claims each would be coded the same as a country with only one dispute with five claims. We obtain similar results when organizing the data set by disputes as the unit of observation.

the Mundell-Fleming model, increases in government debt under managed exchange rates); 2) show that our results are not driven by changes to the GATT/WTO's membership in the 1990s; 3) show that our results are not sensitive to controlling for changes in GDP (which might be associated with changes in a country's reserve and debt position as well as dispute behavior); 4) replace the continuous measure of reserve losses with a binary indicator that equals 1 in years in which a country experiences a reserve loss and 0 when a country has stable reserves or reserve gains (in order to avoid that extreme observations on the variable drive our results); and 5) estimate a logit model, replacing the dependent variable with a dummy for country-years in which at least one dispute is initiated, accounting for temporal dynamics following Beck, Katz, and Tucker (1998). All of our results are consistent with our theory and main findings.

TABLE 3 HERE

Finally, if countries turn to trade disputes in order to gain access to foreign currency, as we suggested, we should expect that the effects of reserve losses and foreign currency debt should be most pronounced for disputes against large export markets whose policies have a more significant impact on a country's foreign exchange revenue. We should expect that reserve losses and foreign currency debt have little, if any, effect for disputes against minor trading partners. By contrast, disputes motivated by domestic political concerns – such as supporting export industries – might be directed even at smaller export markets if politically relevant exporters are involved in those markets. To evaluate whether reserve losses and foreign currency debt have larger effects on disputes against large trading partners, we rearrange our data set in a directed dyadic format. For every year, this data set has two observations for each country-pair: one observation for which country A can potentially initiate a dispute against country B, and one

observation for which country B can potentially initiate a dispute against country A. We then include a variable measuring the log of bilateral exports (Barbieri and Keshk 2012)[38] and interact it with both the variable on reserve losses and the variable on foreign currency debt.[39] Because we use the log, observations with no export flows between two countries in a given year are dropped from the data set, restricting the sample to 'relevant dyads' (we would not expect trade disputes between countries that do not have any trade relationships). Given that the effects of reserve losses should be most pronounced after 1994 and under managed exchange rates, as we showed above, we further limit our data set to those observations, which still leaves 28,355 observations. Finally, in addition to our previous control variables, we include a variable measuring the percentage change in exports between each dyad, in order to assess whether changes in trade flows between two countries are associated with more trade disputes.

The coefficient estimates are shown in Figure A2.2, column 6, in the appendix. Figure 6 reports the main results for scenarios similar to those in Figures 3 and 4. The left panel of Figure 6 displays the average marginal effect of a change from stable reserves to a 25 per cent reserve loss for three cases: for disputes against a country's smallest export market in a given year; for disputes against a country's average export market in a given year; and for disputes against a

[38] I.e., for the first example above, the variable measures the log of bilateral exports from country A to country B; for the second example, it measures the log of bilateral exports from country B to country A.

[39] We treat members of the European Communities (and after its creation, the European Union) as part of a single export market. For instance, Portugal is considered a separate, distinct market until 1986, when it joins the European Communities, and considered part of the European market for years after 1986. Note also that, while the sample is restricted to dispute initiations by non-OECD GATT/WTO members, it includes disputes initiated against OECD members. This is especially important because for many countries, the European Union and the United States are among the top export destinations.

country's largest export market in a given year.[40] As expected, we find that reserve losses have virtually no effect for disputes against a country's smallest export markets; the effect is small (about -2.5 per cent) and not statistically significant; the 95 per cent confidence interval ranges from -6.9 per cent to +2.4 per cent. However, reserve losses have positive and statistically significant effect for disputes against a country's average export market; the number of trade disputes increases by about 28.9 per cent, with a confidence interval excluding zero. Finally, countries facing a 25% reserve loss initiate 81.6 per cent more trade disputes against their largest export market than under stable reserves, and the effect is again statistically significant at the 5 per cent level. Moreover, the differences among these effects are significant at the 5 per cent level, as shown by the second set of bars in the left panel of Figure 6. The first bar represents the difference in the marginal effects for the average export market and the smallest export market; the second represents the difference for the largest and the average export market; and the third for the largest and the smallest export market. All three quantities are positive, and the 95 confidence intervals always exclude zero. Thus, the left panel shows that reserve losses have virtually no effect on trade disputes against a country's smallest trading partners, positive and statistically significant effects on disputes against large trading partners, and that difference between these effects is itself statistically significant.

[40] That is, for each observation, we calculate marginal effects at the smallest value of log bilateral exports for the given country-year, at the average value, and at the maximum value; as before, we hold all other variables at their observed sample values. We then calculate the average marginal effect as the average of these effects. We obtain similar results when using the sample minimum, average, and maximum, but because this would require a larger amount of extrapolation, we prefer calculating and displaying the effects for each country-year's sample minimum, average, and maximum.

The right panel of Figure 6 reports the effects of a change in foreign currency debt; we use the same values as in Figure 4, which display the effect of a one-standard deviation increase from the sample mean. As with reserve losses, we find that an increase in foreign currency debt has almost no effect on disputes against a country's smallest export markets: the effect of -6.3 per cent is small and not statistically significant at conventional levels. The effect is larger for disputes against the country's average export partner – it reaches 44.7 per cent – but it still is not statistically significant at the 5 per cent level. However, a one standard deviation increase in foreign currency debt corresponds with a large increase – 169 per cent – in disputes against a country's largest export partners. Moreover, the differences between the marginal effects are statistically significant, as shown by the second set of bars in the right panel of Figure 6: the effect of foreign currency debt on trade disputes is positive and statistically significant for disputes against a country's largest trading partners, and it is significantly larger than the effect for a country's average and smallest export partner.

In sum, the disputes that countries file when under financial distress are disproportionately aimed at their largest export markets, where changes in the trade balance has the greatest capacity to effect reserve positions.[41] Foreign exchange motivated disputes do not tend to target minor export markets. This finding is consistent with our expectations. We also find no evidence that changes in bilateral exports are associated with more trade disputes, suggesting that at least among non-OECD countries, financial conditions are a more important driver of dispute initiations than sudden declines of export flows.

FIGURE 6 HERE

[41] We obtain similar results using bilateral export ratios and using a dummy to identify a country's ten largest export markets.

The legal reforms to the dispute settlement body

One of the more contentious aspects of our analysis is that we interpret the 1994 dummy as capturing a tighter stance on exemptions for balance-of-payment reasons. This interpretation neglects that the Marrakesh Agreement in 1994 also revised the dispute settlement body. The legal changes provide an alternative explanation for the differences before and after 1994. In fairness to our argument, the relationship between reserve losses, debt, exchange rate management and dispute initiations is not directly impacted by an alternative interpretation of the 1994 dummy. Nonetheless, three findings suggest to us that our interpretation is better supported than the alternative.

First, the effect of the 1994 legal reforms appears limited to its effect on countries' responsiveness to foreign reserve losses. We do not find evidence that countries in our sample brought more disputes after 1994 in the absence of concurrent reserve losses.[42] This finding is consistent with arguments that the high legal and financial costs deter the participation of developing countries even under the reformed rules (e.g., Busch, Reinhardt, and Shaffer 2009). Second, if the 1994 changes in fact allowed low- and middle-income countries to pursue disputes more aggressively, we should see that they also increased the responsiveness to other variables. In regressions with the same control variables as before, we find no significant differences in the effects of changes in exports or changes in total trade flows before and after 1994.

Third, the main procedural changes to the dispute settlement system were made with the Dispute Settlement Procedures Improvement in 1989 and subsequently carried over to the 1994 reforms, as pointed out by Kim (2008). If our results were driven by the legal reforms, using a

[42] In a regression that includes only control variables and the 1994 dummy, the dummy enters with a small, negative, and statistically insignificant coefficient (.012, p = .973). We report all of the following results in the online appendix.

dummy for pre- and post-1989 should produce similar results as a dummy for pre- and post-1994. When replacing the 1994 dummy with a 1989 dummy in our main model, the marginal effect of reserve losses retains statistical significance, but is cut by half in size. When including both the 1989 and 1994 dummies and the relevant interaction terms, reserves losses have a substantively and statistically significant effect under managed exchange rates after 1994, but not between 1989 and 1994, bolstering our confidence that our results reflect the restrictions on balance-of-payments exemptions, not the legal reforms to the dispute settlement body.

CONCLUSION

This paper suggests the existence of a "liberal mercantilism" in which the need to attract foreign exchange drives the use of the GATT/WTO dispute settlement mechanism. The more a country needs foreign exchange, the more aggressive we expect it to be at the GATT/WTO. This is a novel theory, but also a simple and, we think, very plausible one. Empirically, we find evidence that is consistent with our thesis.

We conclude by noting that our findings suggest two non-obvious aspects of the international political economy. The mercantilist policies of the 17th and 18th century were made possible by heavy power imbalances in the global economy, with wealthy and powerful European nations exploiting a weaker periphery. Today, power imbalances manifest in financial prowess: the ability to issue international reserve currencies, which is limited to a few financial centers. For the remaining countries, and low- and middle-income countries especially, this creates a need to access foreign currency. The GATT/WTO's dispute settlement system and its capacity to facilitate access to foreign currency can be viewed as a way to address this imbalance in financial power, and not entirely unlike the World Bank or IMF in that regard. The link between protectionist trade policies of developed countries and financial problems of developing

countries has long been recognized, and it has far-reaching consequences for other international institutions. In an April 1983 meeting, the Development Committee of the International Monetary Fund stressed that "open markets for developing countries' exports are indispensable to the adjustment programs being undertaken with IMF resources" (Brook 1984). Our findings suggest that the GATT/WTO's dispute settlement system provides an opportunity for developing countries to secure open markets for their exports and that the financial imperative to do so is a the primary reason why developing countries make use of the GATT/WTO's dispute settlement system.

Second, liberal mercantilism plays an important role for the smooth functioning of the international trade regime at large. The relative absence of dispute initiations by low- and middle-income countries has been among the GATT's and WTO's most noted shortcomings (Brown and Stern 2005). In this we find something of a silver lining to countries' inability to finance external debt in domestic currencies, which is generally, and reasonably, viewed as a bad thing (hence the term "Original Sin"). While these countries typically find themselves disadvantaged on external debt markets, this disadvantage can catalyze them to secure a better trading environment for their exports by initiating trade disputes. In the process these countries likely build up the legal capacity and experience to secure their trading environment in the future (Davis and Bermeo 2009). We do not make any welfare claims surrounding this tradeoff; it is not clear to us that countries are on balance better off with foreign denominated debt and more secure export markets than with domestic denominated debt and less secure export markets. Nonetheless, liberal mercantilism facilitates a fairer and more participatory global trading regime to the extent that it catalyzes dispute initiations from countries that would not otherwise do so.

Table 1: Disputes, Exports, Foreign Reserves

	Foreign reserves (US$ billion)	Foreign reserves (US$ billion)	Exports (US$ billion)
Disputes	3.36*** (.665)	2.47*** (.615)	4.74*** (1.40)
Log trade		5.25* (3.13)	16.6*** (5.43)
Log exports		1.82 (1.37)	
Log GDP		-3.49* (1.79)	-9.53** (4.49)
GDP per capita		1.78 (1.15)	3.97 (2.64)
Constant	-5.11* (2.68)	-71.4** (34.4)	-137** (62.7)
Country dummies	Yes	Yes	Yes
Year polynomial	Yes	Yes	Yes
Obs.	1630	1630	1629
Countries	89	89	89

*** Significant at 1%, ** significant at 5%, * significant at 10%. OLS coefficient estimates, standard errors in parentheses. Standard errors clustered on countries. Non-OECD GATT/WTO members, Turkey, and Mexico, 1974-2004. All right-hand side variables lagged by one year. Data sources described in the next section. All models include a year polynomial of degree three and country dummies.

Table 2: Negative binomial regression, coefficient estimates and standard errors.

	(1)		(2)		(3)	
Reserve loss	2.18***	(.530)	-1.46	(4.80)	-10.6**	(4.37)
x floating rate	-2.50***	(.599)			13.3	(7.11)
x prior 1994	-1.42***	(.497)	.017	(5.06)	15.0	(11.6)
x floating rate x prior 1994	1.10	(.978)			-19.2	(16.2)
x debt			.080	(.205)	.535***	(.178)
x floaters x debt					-.664**	(.293)
x prior 1994 x debt			-.005	(.213)	-.683	(.474)
x floating rate x prior 1994 x debt					.865	(.693)
Debt	.480**	(.190)	.537**	(.216)	.675***	(.241)
x floating rate					-.420*	(.222)
x prior 1994			-.030	(.843)	-.087	(.187)
x floating rate x prior 1994					-.073	(.299)
Floating rate	.445	(.299)	.460	(.280)	10.4**	(5.32)
Prior 1994	.846**	(.385)	1.16	(3.40)	2.97	(4.53)
x floating rate	-.690	(.440)			.832	(6.97)
Log reserves	.702***	(.195)	.541***	(.169)	.699***	(.207)
Change imports	-.044	(.429)	-.109	(.820)	-.011	(.420)
Log trade	-.374*	(.215)	.246	(.209)	-.363*	(.221)
GDP per capita	.119*	(.066)	.149**	(.064)	.086	(.070)
Constant	-19.4***	(2.32)	-20.4***	(2.77)	-24.4***	(.403)
(Year polynomial	Yes		Yes		Yes	
Number Obs.	1631		1631		1631	
Number Countries	89		89		89	

*** Significant at 1%, ** significant at 5%, * significant at 10%. Coefficient estimates, standard errors in parentheses from negative binomial regression. Standard errors clustered on countries. See Figure 3 for marginal effects based on columns 1 and 3. Non-OECD GATT/WTO members, Mexico, Turkey, 1974-2004. All models include a year polynomial of degree three (year, year squared, year cubed).

Table 3: Additional results, coefficient estimates and standard errors.

	(5) export changes	(6) fixed rates	(7) panel model	(8) currency share	(9) CLYPS	(10) Claims
Reserve loss	2.17***	3.59***	2.31***	2.47***	1.85***	1.63***
	(.550)	(.930)	(.580)	(.551)	(.537)	(.496)
x floating rate	-2.50***	-3.62***	-2.83***	-3.04***	-2.54***	-1.62
	(.597)	(.906)	(.727)	(.592)	(.530)	(1.76)
x prior 1994	-1.42***	-3.46***	-1.45***	-1.67***	-1.54**	
	(.499)	(.835)	(.548)	(.578)	(.672)	
x floating rate	1.10	3.77***	1.34	1.59	1.90**	
x prior 1994	(.978)	(.872)	(1.13)	(.998)	(.957)	
Debt	.479**	.456***	.553***	8.38***	.416**	.571**
	(.189)	(.176)	(.142)	(2.37)	(.168)	(.269)
Floating rate	.445	1.02***	.453*	.155	-.530	1.42***
	(.299)	(.317)	(.242)	(.308)	(.462)	(.511)
Prior 1994	.842**	.812	1.12***	.872**	2.02***	
	(.406)	(.533)	(.350)	(.392)	(.504)	
x floating rate	-.689	-.462	-.858*	-.584	.441	
	(.443)	(.573)	(.516)	(.401)	(.371)	
Log reserves	.702***	.626***	.720***	.777***	.200	.398
	(.198)	(.174)	(.200)	(.208)	(.179)	(.327)
Change imports	-.035	-.023	-.146	-.231	-.878	-3.44***
	(.497)	(.463)	(.352)	(.492)	(.559)	(1.13)
Change exports	-.026					
	(.612)					
Log trade	-.373*	-.309	-.281	-.177	.212	.585
	(.216)	(.220)	(.260)	(.212)	(.215)	(.557)
GDP per capita	.119*	.176***	.217***	.082	-.110	-.081
	(.066)	(.059)	(.065)	(.083)	(.083)	(.100)
Constant	-19.4***	-19.4***	-23.9***	-22.6***	13.0**	1182***
	(2.31)	(2.46)	(1.97)	(2.45)	(6.53)	(261)
Year polynomial	Yes	Yes	Yes	Yes	Yes	Yes
Number Obs.	1631	1631	1631	1631	292	743
Number Countries	89	89	89	89	21	88

*** Significant at 1%, ** significant at 5%, * significant at 10%. Coefficient estimates, standard errors in parentheses from negative binomial regression. Standard errors clustered on countries. Columns 1-4: Non-OECD GATT/WTO members, Mexico, and Turkey, 1974-2004. Column 5: Foreign currency debt data from Cowan et al. (2006). Column 6: Dependent variable is number of claims submitted, only WTO cases (after 1995). All models include a year polynomial of degree three (year, year squared, year cubed).

Figure 1: Exchange rate regimes and foreign currency debt

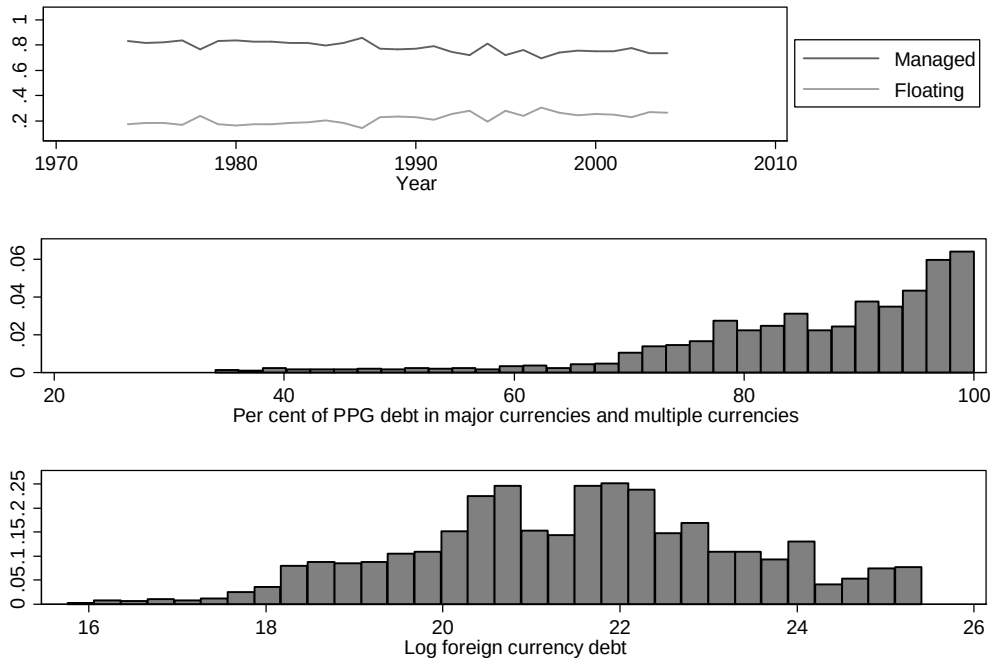

Figure 1, upper panel: Share of countries with managed and floating exchange rates. Managed exchange rates include fixed and intermediate exchange rates. Data from Levy-Yeyati and Sturzenegger (2005). Middle panel: Distribution of the percentage of public and publicly guaranteed debt denominated in major currencies and multiple currencies, excluding debt denominated in IMF Special Drawing Rights. Bottom panel: Distribution of log foreign currency denominated, public and publicly guaranteed debt stocks.
Non-OECD GATT/WTO members, Turkey, and Mexico, 1974-2004.

Figure 2

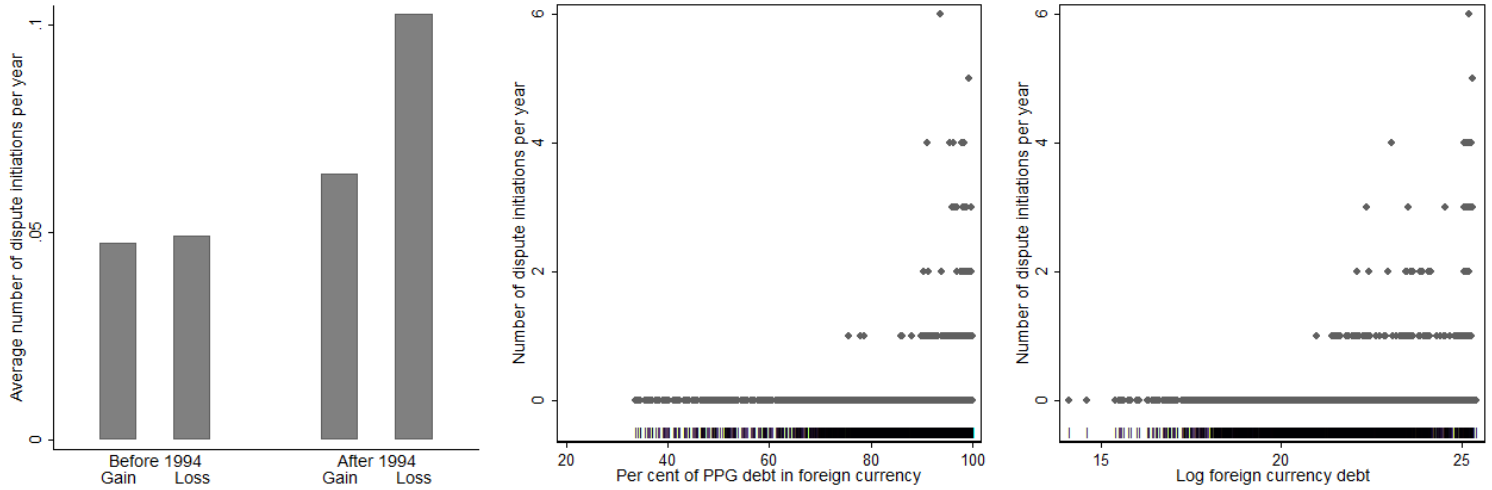

Figure 2, left panel: Average number of dispute initiations for countries with reserve gains and reserve losses in the previous year under managed exchange rates, before and after 1994 (exchange rate regime data from Levy-Yeyati and Sturzenegger 2005). Middle panel: number of dispute initiations and percentage of PPG debt denominated in foreign currency. Right panel: Number of dispute initiations and logged foreign currency PPG debt. Non-OECD GATT/WTO members, Turkey, and Mexico, 1974-2004.

Figure 3a (Table 2, Model 1)

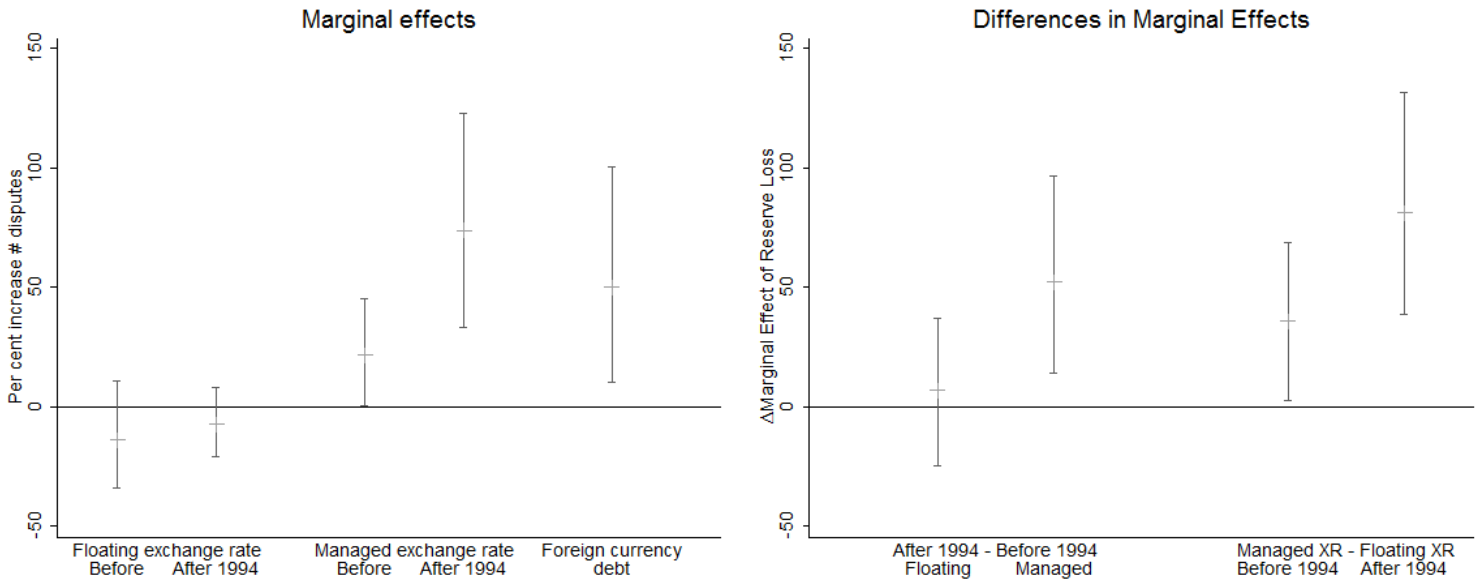

Figure 3a: Average marginal effects and 95 per cent confidence intervals, based on model 1, Table 2. Non-OECD GATT/WTO members, Mexico, Turkey, 1974-2004. Left panel: Per cent increase in number of predicted dispute initiations for a change from stable reserves to 25 per cent reserve loss and for a one standard deviation change in foreign currency debt. Right panel: Differences in marginal effects and 95 per cent confidence intervals. The first two bars indicate the difference in the marginal effect of a reserve loss after 1994 and prior to 1994, for floating exchange rates and managed exchange rates. E.g., the second bar shows that under managed exchange rates, the marginal effect of a reserve loss after 1994 is significantly larger than the marginal effect of a reserve loss before 1994. The right two bars indicate the difference in the marginal effect of a reserve loss under managed exchange rates and under floating exchange rates, for years prior to 1994 and after 1994. E.g., the fourth bar shows that after 1994, the marginal effect of a reserve loss under managed exchange rates is significantly larger than the marginal effect of a reserve loss under a floating exchange rate.

Figure 3b (Table 2, Model 2)

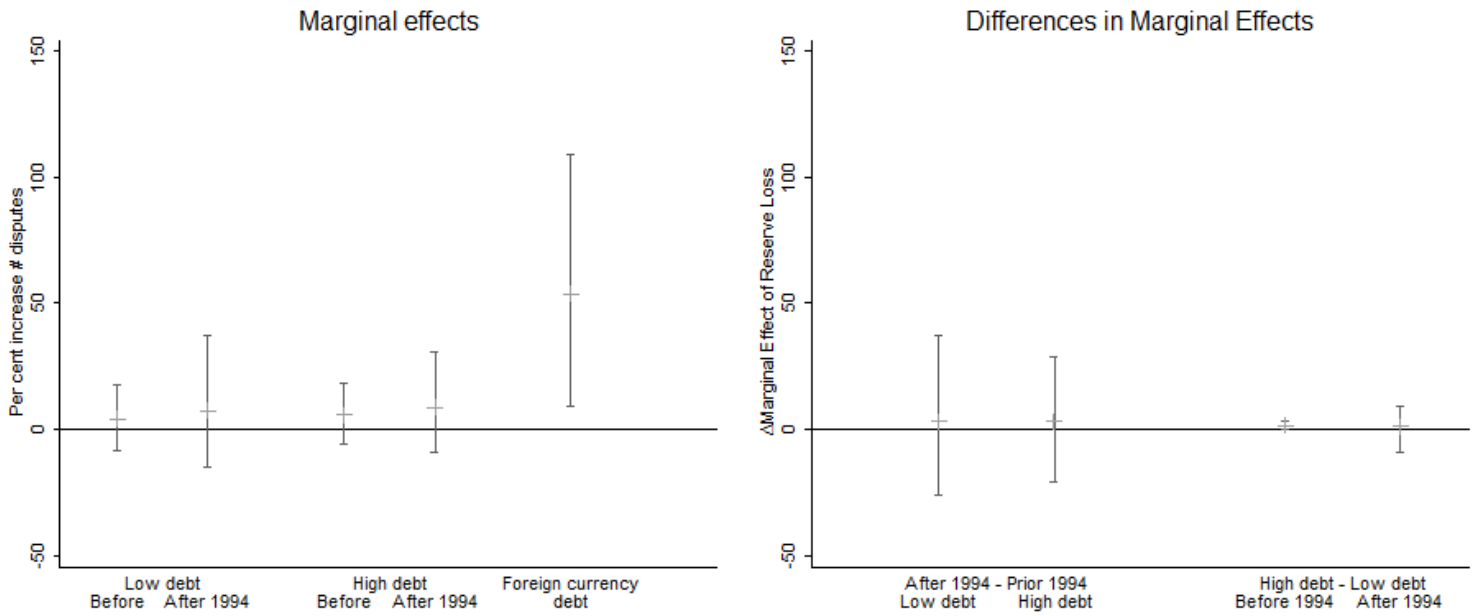

Figure 3b: Average marginal effects and 95 per cent confidence intervals, based on model 2, Table 2. Non-OECD GATT/WTO members, Mexico, Turkey, 1974-2004. Left panel: Per cent increase in number of predicted dispute initiations for a change from stable reserves to 25 per cent reserve loss and for a one standard deviation change in foreign currency debt. 'Low debt' is log foreign currency debt at the sample mean; 'High debt' is log foreign currency debt one standard deviation above the sample mean. Right panel: Differences in marginal effects and 95 per cent confidence intervals. The first two bars indicate the difference in the marginal effect of a reserve loss after 1994 and prior to 1994, at low and high debt levels. The right two bars indicate the difference in the marginal effect of a reserve loss under low debt and under high debt, for years prior to 1994 and after 1994.

Figure 4 (Table 2, Model 3)

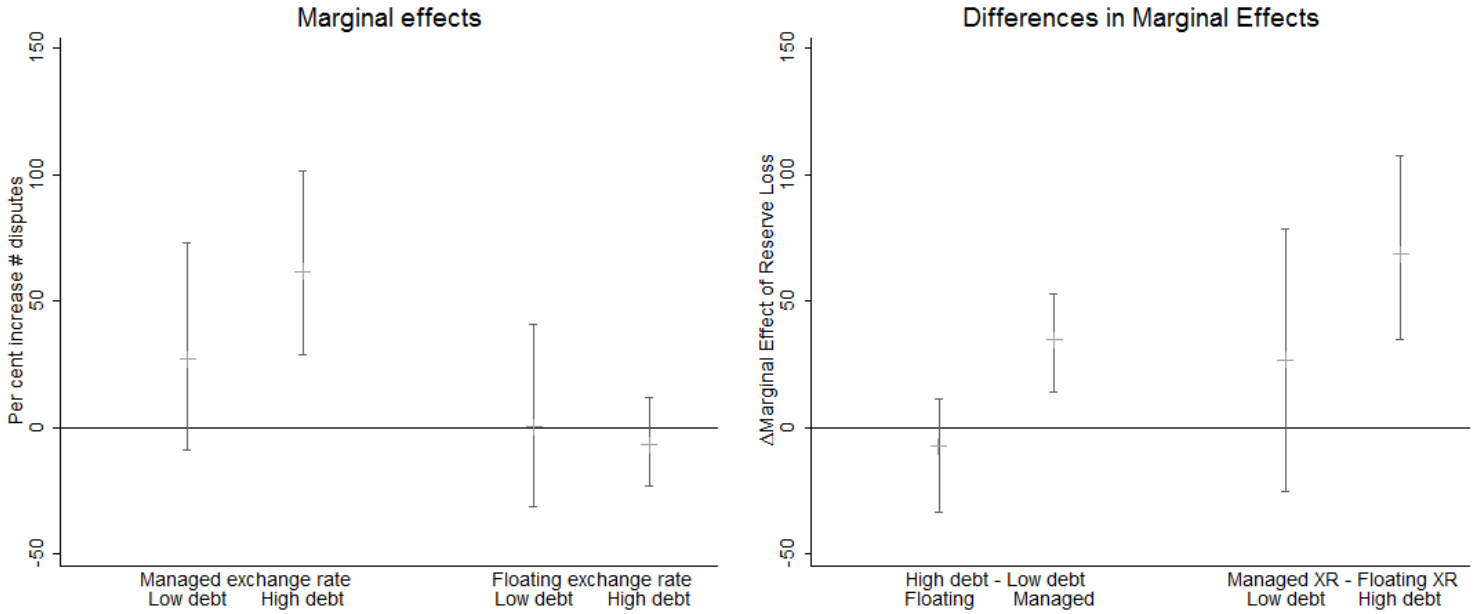

Figure 4: Average marginal effects and 95 per cent confidence intervals, based on column 4, Table 2. Non-OECD GATT/WTO members, Mexico, Turkey, 1974-2004. Left panel: Per cent increase in number of predicted dispute initiations for a change from stable reserves to 25 per cent reserve loss. 'Low debt' is log foreign currency debt at the sample mean; 'High debt' is log foreign currency debt one standard deviation above the sample mean. Right panel: Differences in marginal effects and 95 per cent confidence intervals. The first two bars indicate the difference in the marginal effect of a reserve loss at high and low debt levels, for floating exchange rates and managed exchange rates. E.g., the second bar shows that under managed exchange rates, the marginal effect of a reserve loss under a high debt load is significantly larger than the marginal effect of a reserve loss under a low debt load. The right two bars indicate the difference in the marginal effect of a reserve loss under managed exchange rates and under floating exchange rates, for low and high debt loads. E.g., the fourth bar shows that under a high debt load, the marginal effect of a reserve loss under managed exchange rates is significantly larger than the marginal effect of a reserve loss under a floating exchange rate.

Figure 5

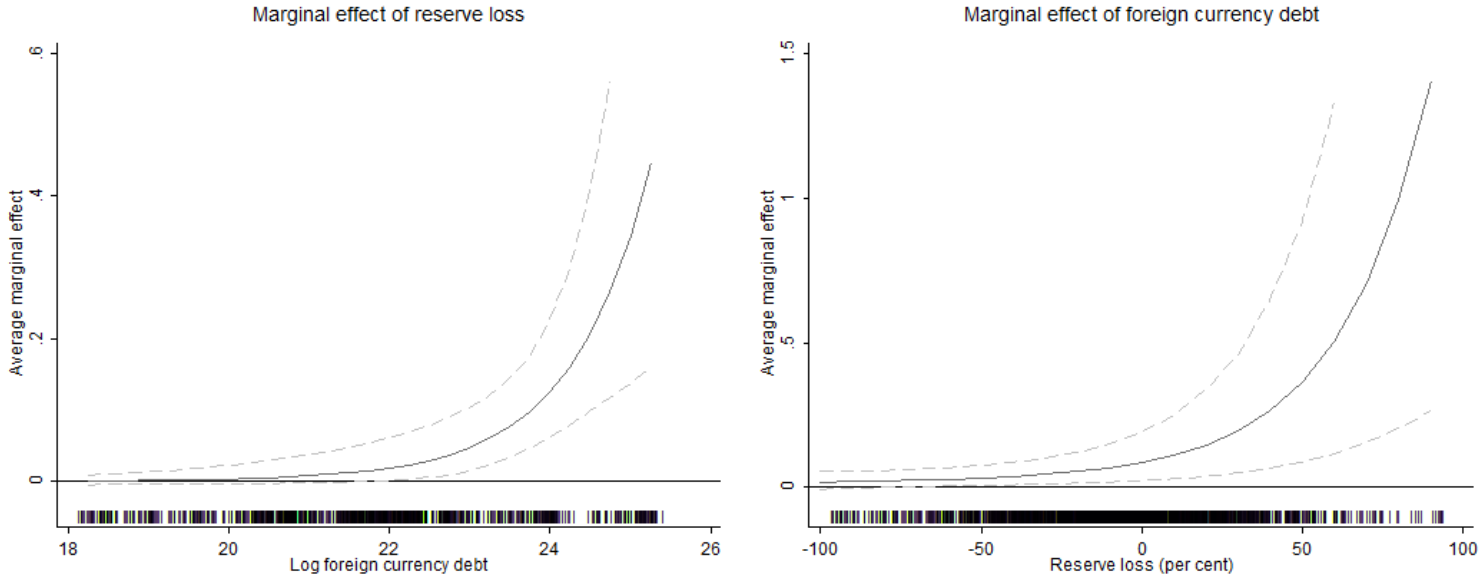

Figure 5: Average marginal effects and 95 per cent confidence intervals, based on column 4, Table 2. Non-OECD GATT/WTO members, Mexico, Turkey, 1974-2004. Left panel: Average marginal effect and 95 per cent confidence interval for a change from stable reserves to 25 per cent reserve loss under managed exchange rates after 1994, at varying levels of foreign currency debt. The ticks in the bottom of the graph indicate the distribution of log foreign currency debt in the sample. Right panel: Average marginal effect and 95 per cent confidence interval for a one-standard deviation increase in log foreign currency debt under managed exchange rates, at varying levels of reserve losses. The ticks in the bottom of the graph indicate the distribution of reserve losses in the sample (restricted to reserve gains of at most 100 per cent).

Figure 6

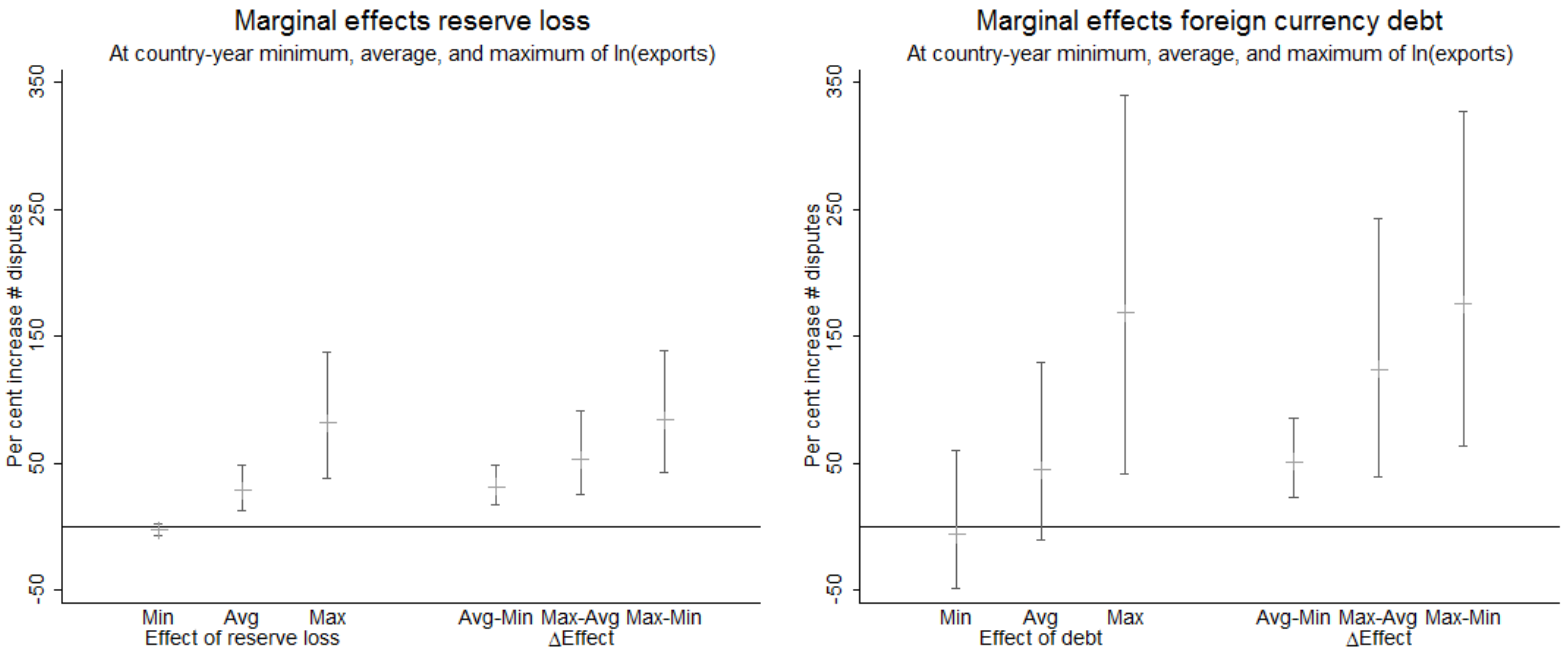

Figure 6: Average marginal effects and 95 per cent confidence intervals, based on results in Table A2.2, column 6, in the appendix, dyadic data set. Left panel: Average marginal effect and 95 per cent confidence interval for a change from stable reserves to 25 per cent reserve loss under managed exchange rates after 1994, calculated for the smallest export market, the average export market, and the largest export market for each country-year. The second set of bars displays the differences in marginal effects and 95 per cent confidence intervals. Right panel: Average marginal effect and 95 per cent confidence intervals for a one-standard deviation increase in log foreign currency debt under managed exchange rates after 1994, calculated for the smallest export market, the average export market, and the largest export market for each country-year. The second set of bars displays the differences in marginal effects and 95 per cent confidence intervals.

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ONLINE APPENDIX

This online appendix contains seven sections, detailing the calculation of average marginal effects and confidence intervals (A), showing that the main results in the top panel of Figure 3 are robust to the full model (B), providing additional evidence (C), discussing alternative exchange rate measures (D), showing that the robustness checks in the main paper hold when including the quadruple interaction term (E), showing the results from changing the 1994 cutpoint discussed in the main paper (F), and displaying descriptive statistics and discussing data sources (G).

A. Average marginal effects and calculation of confidence intervals

To calculate average marginal effects, we set the relevant variables at the specified levels and leave all other covariates at the observed sample values. We then calculate the average marginal effect over all observations in the sample. For instance, to calculate the average marginal effect of a 25 per cent reserve loss under managed exchange rates after 1994, we set the 1994 dummy and the exchange rate dummy to zero, calculate the expected number of trade disputes for a country with stable reserves and for a country with a 25 per cent reserve loss, and average the expected number of trade disputes over the sample.[43] The difference between these two values is the average marginal effect. See Hanmer and Kolkan (2013) for arguments in favor of using average marginal effects, and Cameron and Trivedi (1998) specifically in the context of count models. For the top panel of Figure 3, we present marginal effects as the expected per cent increase in the number of dispute initiations in order to render average marginal effects comparable across the different groups created by the exchange rate regime and the 1994 dummy. The per cent increase is calculated as the average marginal effect, relative to the base scenario (in the example above, this would be the average marginal effect divided by the expected number of trade disputes under stable reserves and managed exchange rates prior to 1994). The scaling does not affect our main conclusions: foreign currency debt increases the expected number of trade disputes, as do reserve losses under managed exchange rates after 1994 significantly increase the expected number of trade disputes; the latter effect is statistically significantly different from the effect prior to 1994.

To obtain confidence intervals for marginal effects and for differences in marginal effects (such as the marginal effects before and after 1994), we use a procedure similar to what is outlined in King, Tomz, and Wittenberg (2003). Specifically, after obtaining coefficient estimates, we create a set of 5,000 coefficients from the estimated coefficients and the estimated variance-covariance matrix. We then create 5,000 average marginal effects, as outlined above, using this distribution of coefficients. The mean of this set of average marginal effects serves as

[43] One complication is that the regressions include a year polynomial of degree three and it is conceptually not possible to set the dummy for years prior to 1994 to zero and yet have year equal to, say, 1980. Thus, we calculate the average marginal effect described in the text only for observations after 1994; analogously, the average marginal effect of reserve losses prior to 1994 is calculated only for observations before 1994.

the average marginal effects; the bounds of the 95 per cent confidence interval are obtained as the 2.5^{th} and the 97.5^{th} percentiles.

B. Marginal effects for the full model

In the main paper we presented marginal effects for H1 and H2; this model omitted the quadruple interaction term to test H3, as well as the associated lower-level terms. We omitted the interaction terms to ease interpretation, to preserve space, and because they are jointly statistically insignificant, based on a likelihood ratio test. Figure A1 displays the marginal effects when calculated from Column 4 in Table 2, the full model with all interaction terms. All marginal effects are calculated at the given covariate values for reserve losses, exchange rates, the 1994 dummy, and foreign currency debt, respectively, holding all other covariates at their observed sample values and averaging over the sample. For the effect of foreign currency debt, we assume stable reserves. As Figure A1 shows, the main results from the main paper also hold in the full model. The only substantive difference is that the effect of reserve losses prior to 1994 under managed exchange rates is no longer statistically significant at conventional levels, which does not contradict our expectations. More important from the perspective of our theory is that the difference between the marginal effects under managed exchange rates before and after 1994 is still statistically significant at the 1 per cent level, as is the marginal effect under managed exchange rates after 1994. The effects of reserve losses under managed exchange rates increase slightly, to 25 per cent prior to 1994 and to 88 per cent after 1994.

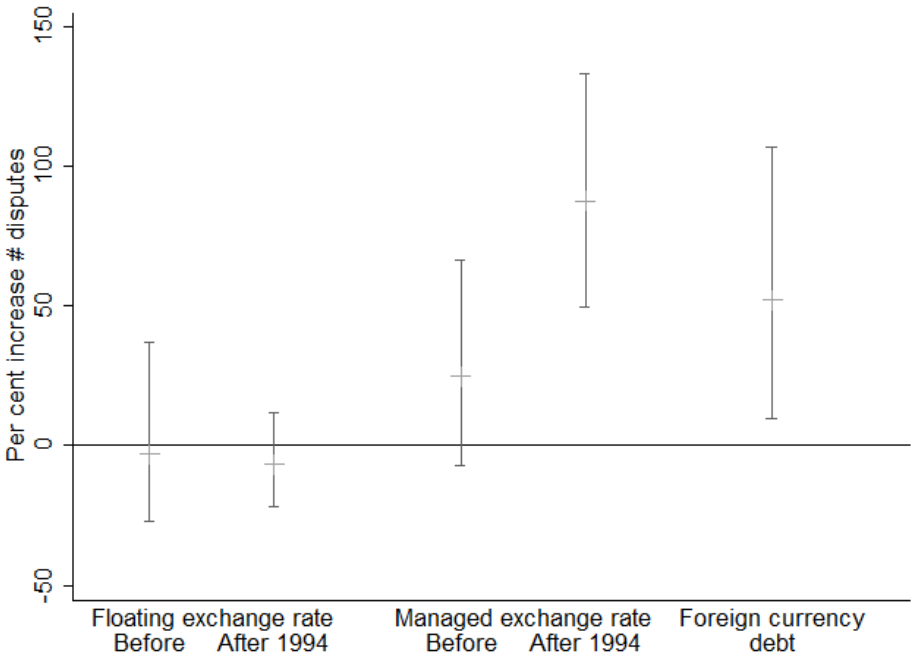

Figure A1: Average marginal effects and 95 per cent confidence intervals at observed sample values. Non-OECD GATT/WTO members, Mexico, and Turkey, 1974-2004. Per cent increase in number of predicted dispute initiations for a change from stable reserves to 25 per cent reserve loss and for a one standard deviation change in foreign currency debt (at stable reserves), based on column 4, Table 2 in the main paper.

Table A1: Additional model specifications.

	(1) Fixed effects	(2) Random effects	(3) Reserve dummy	(4) Currency share	(5) Original sin	(6) Interaction
Reserve losses	2.53*	2.11*	.707*	2.12*	3.20*	2.14*
	(.000)	(.000)	(.009)	(.000)	(.000)	(.000)
x floating rate	-3.00*	-2.49*	-.516	-2.50*	-3.52*	-2.60*
	(.000)	(.000)	(.170)	(.000)	(.000)	(.000)
x prior 1994	-1.76*	-1.56*	-.176	-1.45*	-2.35*	-1.39*
	(.000)	(.001)	(.639)	(.004)	(.000)	(.003)
x floating rate	1.56	1.32	-.155	1.26	2.20*	1.05
x prior 1994	(.241)	(.283)	(.848)	(.199)	(.005)	(.268)
Floating rate	.221	.154	.832*	.358	.203	.284
	(.528)	(.560)	(.011)	(.223)	(.531)	(.312)
Prior 1994	.752	.213	.760	.809*	.900*	.829*
	(.054)	(.401)	(.087)	(.035)	(.016)	(.038)
x floating rate	-.893	-.802	-.533	-.640	-.758	-.717
	(.139)	(.131)	(.236)	(.106)	(.061)	(.078)
Foreign currency share						.820*
						(.006)
Log debt						3.49*
						(.004)
x foreign currency						-.031*
						(.012)
Debt	.332*	.455*	.489*	.443*	4.68	
	(.011)	(.001)	(.013)	(.012)	(.065)	
Log reserves	.846*	.567*	.618*	.703*	.833*	.664*
	(.005)	(.001)	(.001)	(.000)	(.001)	(.001)
Change imports	-.266	-.136	-.009	-.020	-.271	-.039
	(.474)	(.389)	(.983)	(.965)	(.583)	(.927)
Log trade	.371	-.393	-.296	-.410	-.256	-.517*
	(.361)	(.173)	(.173)	(.064)	(.361)	(.029)
GDP per capita	-.101	-.061	.138*	.084	-.061	.083
	(.607)	(.233)	(.028)	(.231)	(.182)	(.190)
Agriculture/GDP	-.045	-.062*				
	(.440)	(.000)				
Count previous disputes	-.043	-.003				
	(.104)	(.826)				
Log GDP	.031	.230				
	(.975)	(.260)				
Constant	-49.1*	-21.0*	-20.1*	-17.0*	-19.1*	-92.7*
	(.001)	(.000)	(.000)	(.000)	(.000)	(.001)
Year polynomial	No	No	Yes	Yes	Yes	Yes
Country effects	Fixed	Random	No	No	No	No
Number Obs.	1502	1502	1631	1629	719	1631
Number Countries	88	88	89	89	38	89

* Significant at 5%. Coefficient estimates, p-values in parentheses. Negative binomial regression (except for model 2, which is a Poisson model with normally distributed country-year and country effects). Standard errors clustered on countries. Models 3-6 include a year polynomial of degree three (year, year squared, year cubed).

C. Additional models

Tables A1 and A2 present additional results. Table A1: Column 1 shows that our results are robust to including several control variables: the share of agriculture in GDP (countries with larger agricultural sectors may have lower levels of economic and institutional development, which should be associated with fewer dispute initiations; at the same time, their trade balance and hence their reserve positions might be more volatile); log GDP (larger countries might be less subject to retaliatory action and hence initiate more trade disputes; at the same time, they are often able to sustain larger debt burdens); country dummies, to capture country-specific effects; and we replace the year polynomial with the count of previous disputes (Davis and Bermeo, 2009, argue that the experience gained in previous disputes contributes to more active participation in trade disputes in the future; the variable may also capture unobserved heterogeneity across countries, and in addition serves as a more theoretical driven way to control for time trends in patterns of dispute initiations). Column 2 presents estimation results from the same model, but moves from a negative binomial model to a Poisson model with normally distributed random effects at the level of the country-year (which were assumed to be gamma-distributed in the negative binomial model) and of the country (rather than the country-dummies in the previous model); this is equivalent to column 2, Table 3 in the main paper, but with additional controls. The results are robust to these modifications. The only exception is when including log GDP, but not country dummies or country-random effects, in which case the standard error on foreign currency debt increases, such that the coefficient estimate of foreign currency debt is no longer statistically significant. However, even then, we obtain that the marginal effect of foreign currency debt is statistically significant under the coincidence of managed exchange rates and reserve losses, and that the effect of reserve losses increases (statistically significantly) in foreign currency debt (and vice versa). The large standard error on the coefficient for foreign currency debt seems to be driven by the high collinearity between total debt stocks and GDP, but not by foreign currency debt denomination. When using instead the percentage of PPG debt that is denominated in foreign currencies (which is less correlated with GDP), we obtain a statistically significant coefficient in all specifications (as shown in the main paper; see also the discussion of column 6 below). The coefficient on foreign currency debt is also statistically significant when including log GDP, but dropping the exchange rate variable from the model (which expands the sample size), or when controlling for time trends through the count of previous disputes, rather than the year polynomial.

Columns 3 through 5 estimate the model from Column 1, Table 2 in the main paper, but replace key variables. Column 3 replaces the measure of reserve losses with a dummy that is coded 1 for years in which a country experienced reserve losses and 0 for reserve gains. The variable avoids that outliers on reserve losses drive our results. We obtain similar results when using instead changes in the reserve-debt ratio (Wyplosz 2007). Column 4 replaces the measure of foreign currency debt with logged debt payments on external public and publicly guaranteed debt made in foreign currency, goods, or services; the variable is an alternative measure of foreign currency debt and captures the actual debt burden. Column 5 replaces foreign currency debt with the original sin measure of Hausmann and Panizza (2003), which measures the share of a country's securities issued in foreign currency. This variable also provides a cleaner measure of foreign currency debt, but it has a number of limitations. Most notably, the data are available

only as average for two time periods and only for a small set of countries, and we have strong reason to believe that they are not missing at random.[44] Our main results are robust in all models.

Column 6, finally, shows the results when replacing the debt variable with an interaction between log PPG debt and the variable on the share of PPG debt that is denominated in foreign currencies, and including the constitutive terms. Figure A2 plots the predicted number of trade disputes as a function of the share of PPG debt denominated in foreign currencies. The graph supports our interpretation of previous results that, indeed, the currency denomination of PPG debt is an important explanatory variable for trade dispute initiation. Moreover, when including log GDP in the model, the figure is virtually unchanged, supporting our earlier remark that the effect of foreign currency denomination is robust to controlling for GDP.

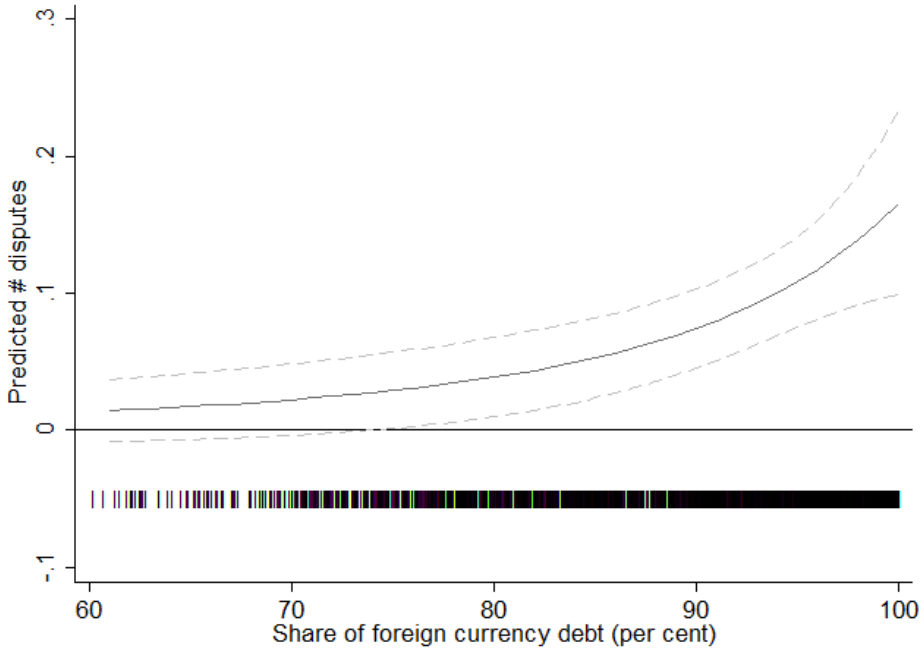

Figure A2: Predicted number of trade disputes as a function of the share of PPG debt that is denominated in foreign currencies (major and multiple currencies), 95 per cent confidence interval. Based on column 6, Table A1.

[44] For example, in Levy-Yeyati and Sturzenegger's exchange rate classification, among countries for which the original sin data are available, 45% are classified as free floaters and about 30% are classified as hard peggers. This pattern is almost reversed in the full sample of Levy-Yeyati and Sturzenegger.

Tables A2.1 and A2.2 present several additional robustness checks. In Table A2.1, Columns 1 through 3 control for executive and legislative elections, respectively, in the current year in order to control for 'political dispute cycles.' Plausibly, election years are associated with more trade dispute initiations, in an attempt by the executive to show support for domestic industries. At the same time, and under managed exchange rates especially, election years may be associated with increased fiscal spending and thereby larger debt burdens and, plausibly, negative trade balances (and hence reserve losses) due to increased domestic consumption. As pointed out by Clark and Hallerberg (2000), the incentive to engage in fiscal expansions would be reinforced under managed exchange rates. Consequently, electoral cycles in dispute initiations are an important alternative interpretation for our findings. As shown in columns 1 through 3, there is little evidence that election years (as identified in the Database of Political Institutions, Keefer et al. 2010) are associated with more trade disputes. While not reported, a variable indicating whether there is an executive election in the following year enters with a positive and statistically significant coefficient; however, none of our main results are affected.

It is plausible that our 1994 variable does not pick up the legal changes to the dispute settlement body, but instead a shift in the GATT/WTO's membership: several countries joined in the 1990s, especially former members of the Soviet Union which arguably pursued a distinct set of economic policies. To rule out that our results are driven by these new members, Column 4 estimates our main model but restricts the sample to countries that were GATT/WTO members before 1990. Our results are barely affected and the coefficient on foreign currency debt increases by almost 20 per cent.

Column 5 includes a lagged dependent variable. Column 6 reports results from a logit model (we restrict the dependent variable to a dummy coded 1 in years in which a dispute was initiated) that also includes a variable counting the years since the last dispute initiation. At the same time, because the dependent variable is binary, it guards against our results being driven by few years of excessive dispute initiations. Again, our results are robust to this modification. We obtain almost identical results when using dummies for each spell length (not reported), which, according to Beck, Katz, and Tucker (1998), is a preferred way to account for temporal dependence in binary data and renders the model equivalent to a duration model.

Table A2.2 contains further model specifications. The first column replaces the variables on reserve losses and log reserves with variables based on a measure of reserves minus gold, a measure of reserves commonly used in the literature on speculative attacks. Our results are robust to using this alternative measure. The second column drops the variable on logged reserves from the model. The LYS measure of exchange rate regimes is based on reserve volatility and in the data set is moderately correlated with actual reserve holdings (but not with reserve changes). To avoid that high collinearity among included variables is driving some of our results, we drop the variable log reserves from the model. The coefficient estimates on reserve losses and exchange rate regime remain stable, suggesting that collinearity is not a concern for including the variable on reserve losses. The third column includes the lagged percentage change in GDP as a control variable. Recessions may be associated for balance of payment problems, increasing debt burdens, and attempts to help domestic exporters by initiating trade disputes. Our results remain robust to controlling for changes in GDP.

The fourth column replaces the percentage change in reserves with the average percentage of the last two years; the fifth column uses the three-year average. Because the average is 'smoother' than the year-to-year change, this measure (together with the results from

the binary indicator reported above) should further alleviate concerns that extreme observations for reserve changes drive our results. The measure may also address concerns that some disputes take a long time to prepare, and furthermore takes into account that persistent reserve losses should create even more pressing financing needs and hence have stronger effects on dispute initiations than a one-time reserve loss. The results support this interpretation; the effect of reserve losses is largest when using the three-year average.

The sixth column, finally, rearranges the data set in dyadic format and includes a variable for log bilateral exports. We expect that the effects of reserve losses and foreign currency debt increase in the size of the export market; that is, countries attempting to gain access to foreign currency should target large trading partners. The results support this interpretation; see Figure 6 in the main text for marginal effects calculated from the model.

Table A2.1: Additional robustness checks.

	(1) Executive election	(2) Legislative election	(3) Either election	(4) 'old' members	(5) Lagged DV	(6) logit model
Reserve loss	2.17*	2.21*	2.21*	2.37*	2.23*	1.92*
	(.000)	(.000)	(.000)	(.001)	(.000)	(.012)
x floating rate	-2.50*	-2.56*	-2.57*	-2.58*	-2.55*	-2.53*
	(.000)	(.000)	(.000)	(.004)	(.000)	(.004)
x prior 1994	-1.43*	-1.45*	-1.45*	-1.55*	-1.34*	-1.44*
	(.004)	(.004)	(.004)	(.011)	(.005)	(.050)
x floating rate	1.13	1.19	1.19	1.71	1.02	1.26
x prior 1994	(.240)	(.218)	(.218)	(.265)	(.280)	(.299)
Log foreign debt	.485*	.480*	.483*	.575*	.419*	.425*
	(.012)	(.013)	(.013)	(.005)	(.015)	(.019)
Floating rate	.447	.429	.424	.337	.491	.603
	(.133)	(.146)	(.157)	(.302)	(.051)	(.070)
Prior 1994	.929*	.936*	.932*	.860	.877*	.696
	(.019)	(.016)	(.017)	(.086)	(.021)	(.185)
x floating rate	-.709	-.700	-.691	-.838	-.716	-.694
	(.097)	(.101)	(.103)	(.092)	(.082)	(.164)
Log reserves	.704*	.706*	.707*	1.015*	.691*	.510*
	(.000)	(.000)	(.000)	(.000)	(.000)	(.011)
Change imports	-.047	-.063	-.075	-.211	.016	-.051
	(.912)	(.880)	(.855)	(.633)	(.971)	(.919)
Log trade	-.382	-.380	-.385	-.600*	-.363	-.168
	(.080)	(.079)	(.077)	(.007)	(.074)	(.486)
GDP per capita	.118	.115	.115	.103	.111	.106
	(.072)	(.085)	(.082)	(.157)	(.051)	(.104)
Legislative election		.115	.157			
		(.440)	(.372)			
Executive election	.010		-.102			
	(.969)		(.740)			
Time count						-.043*
						(.001)
Lagged disputes					.252*	
					(.001)	
Constant	-18.5*	-18.4*	-18.3*	-22.9*	-18.3*	-18.0*
	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)
Number Obs.	1584	1584	1584	1137	1631	1631
Number Countries	88	88	88	47	89	89

* Significant at 5%. Coefficient estimates, p-values in parentheses. Standard errors clustered on countries. Columns 1-3, 5: Non-OECD GATT/WTO members, Mexico, and Turkey, 1974-2004. Column 4: Only GATT/WTO members that joined before 1990. All models include a year polynomial of degree three (year, year squared, year cubed). Column 6: Dependent variable is dummy coded 1 if dispute initiated.

Table A2.2: Additional robustness checks.

	(1) Reserves minus gold	(2) Drop reserves	(3) GDP growth	(4) 2-year average	(5) 3-year average	(6) Dyadic Exports
Reserve loss	2.12*	1.12*	2.13*	3.21*	4.19*	.603*
	(.468)	(.315)	(.531)	(.749)	(1.07)	(.211)
x floating rate	-2.30*	-1.32*	-2.43*	-2.99*	-3.14*	
	(.523)	(.438)	(.568)	(.867)	(1.14)	
x prior 1994	-1.56*	-.667	-1.42*	-1.30	-3.47*	
	(.414)	(.393)	(.489)	(.910)	(1.11)	
x floating rate	1.52*	.103	1.046	.038	.059	
x prior 1994	(.700)	(.902)	(.962)	(1.50)	(1.84)	
x bilateral exports						.178*
						(.035)
Log foreign debt	.509*	.593*	.468*	.499*	.521*	.323
	(.184)	(.216)	(.189)	(.188)	(.185)	(.339)
x bilateral exports						.116*
						(.033)
Bilateral exports						-2.09*
						(.767)
Change exports						-.237
						(.239)
Floating rate	.461	.547	.476	.435	.448	
	(.295)	(.337)	(.280)	(.320)	(.324)	
Prior 1994	.774	.602	.834*	.887*	.271	
	(.399)	(.403)	(.371)	(.381)	(.408)	
x floating rate	-.562	-.438	-.730	-.959*	-1.12*	
	(.382)	(.443)	(.427)	(.454)	(.441)	
Log reserves	.719*		.715*	.720*	.645*	.030
	(.176)		(.201)	(.192)	(.180)	(.178)
Change imports	-.052	.077	.452	.287	.213	-1.10
	(.422)	(.458)	(.441)	(.478)	(.369)	(.806)
Log trade	-.428*	.271	-.379	-.408	-.353	-.576
	(.212)	(.195)	(.214)	(.217)	(.210)	(.333)
GDP per capita	.117	.168*	.119	.120	.124	.068
	(.068)	(.081)	(.065)	(.064)	(.067)	(.078)
GDP growth			-.949			
			(.648)			
Constant	-19.3*	-21.9*	-19.3*	-19.1*	-20.2*	-38.0
	(2.27)	(2.61)	(2.31)	(2.30)	(2.38)	(114)
Number Obs.	1631	1631	1631	1624	1614	28355
Number Countries	89	89	89	89	89	82

* Significant at 5%. Coefficient estimates, p-values in parentheses. Standard errors clustered on countries. Columns 1-3, 5: Non-OECD GATT/WTO members, Mexico, and Turkey, 1974-2004. All models include a year polynomial of degree three (year, year squared, year cubed).

D. Alternative exchange rate measures

The exchange rate measure provided by Levy-Yeyati and Sturzenegger (LYS, 2005) is conceptually the most appropriate to test our theory: It is based on movements in exchange rates and interventions to maintain the exchange rate; thus, the measure captures exchange rates that are actively managed by government authorities. As the authors of an alternative exchange rate measure note, LYS allows "somewhat volatile but heavily managed exchange rates to be considered pegs. […] Those exploring […] intervention behavior may refer to LYS" (Klein and Shambaugh 2006). Moreover, it is a de facto measure, which is based on actual exchange rate movements, not (merely) on announced behavior.

Two prominent alternative de facto exchange rate measures are provided by Reinhart and Rogoff (RR, 2002) and Klein and Shambaugh (KS, 2006). RR is based on dual market (or 'black market') rates and exploits that official exchange rates often deviate from market-based exchange rates. This measure is problematic for our purposes for several reasons. First, RR uses the volatility of the exchange rate through a five year rolling average, which implies substantial amounts of smoothing. Second, RR already incorporates difficulties with maintaining the current exchange rate level: as RR note, when the market rate drops beyond the official rate, market participants expect the monetary authorities to be unable to maintain the exchange rate at its current, official level.[45] However, this operationalization provides an opportunity for an additional test: We should see that countries initiate more trade disputes when the RR measure indicates a move from a managed exchange rate towards a more flexible rate, since this should represent doubts about the ability of monetary authorities to maintain a stable exchange rate level. Column 1 in Table A3 shows that this is indeed the case.

KS provide a measure of exchange rate stability based on bilateral exchange rates. The variable does not take into account interventions to manage the exchange rate, but it cleanly captures stable exchange rates. While the measure is for our purposes conceptually inferior to LYS, which focuses on managed exchanged rates, we obtain similar results, as shown in column 2 of Table A3.

[45] When replacing the exchange rate variable from LYS with RR, we find that reserve losses have substantively and statistically significantly larger effects under managed exchange rates than under floating exchange rates, but the effect of reserve losses is not statistically significant under managed exchange rates.

Table A3: Alternative exchange rate measures.

	(1) RR	(2) KS
Regime switch	1.24*	
	(.000)	
Reserve losses		6.24*
		(.000)
x floating rate		-5.98*
		(.000)
x prior 1994		-6.53*
		(.000)
x floating rate x 1994		6.67*
		(.000)
Debt	.496*	.467*
	(.019)	(.016)
Floating rate		.699
		(.172)
Prior 1994		1.36
		(.232)
x floating rate		-.958
		(.351)
Log reserves	.515*	.598*
	(.002)	(.001)
Change imports	0.383	-.136
	(.317)	(.774)
Log trade	-0.214	-.251
	(.316)	(.245)
GDP per capita	.127*	.172*
	(.048)	(.012)
Constant	-19.5*	-20.5*
	(.000)	(.000)
Year polynomial	Yes	Yes
Number Obs.	1493	1631
Number Countries	86	89

* Significant at 5%. Coefficient estimates, p-values in parentheses. Negative binomial regression. Standard errors clustered on countries. All models include a year polynomial of degree three (year, year squared, year cubed).

E. Robustness checks with full model

Table A4 shows the results from the robustness checks in the main paper, now including the quadruple interaction term and all constitutive terms. We rescale the debt variable, such that it is zero at its sample maximum and negative for lower values. Thus, the coefficient on reserve losses reflects the coefficient under managed exchange rates after 1994 at the sample maximum of foreign currency debt. As the table shows, our main results are supported in these models as well: Both foreign currency debt and reserve losses (under managed exchange rates, after 1994, and at large foreign currency debt) significantly increase dispute initiations in all five models. Under floating rates, the effect of reserve losses is almost entirely wiped out, as indicated by the coefficient on reserve loss x floating rate, and significantly reduced in years prior to 1994, as indicated by the coefficient on reserve loss x prior 1994.

The effect of reserve losses, moreover, increases in foreign debt burdens, as suggested by our third hypotheses. While the coefficient on reserve loss x debt is not statistically significant at the 10 per cent level in two of the models, the substantive effects are notable even then. For columns 2 and 4 (those models where the interaction between reserve loss and foreign currency debt lacks statistical significance), Figure A3 plots the marginal effect of a 25 per cent reserve loss under managed exchange rates prior to 1994 at various levels of foreign currency debt; this is the equivalent to the middle panel of Figure 3 in the main text. As can be seen, the substantive effects are notable and substantively meaningful, even though the interaction term lacks statistical significance. Moreover, similar to the results in the main paper, reserve losses have statistically significant effects (at the 5 per cent level) above the sample median of foreign currency debt. Finally, when controlling for the count of previous dispute initiations, all five interaction terms are statistically significant.

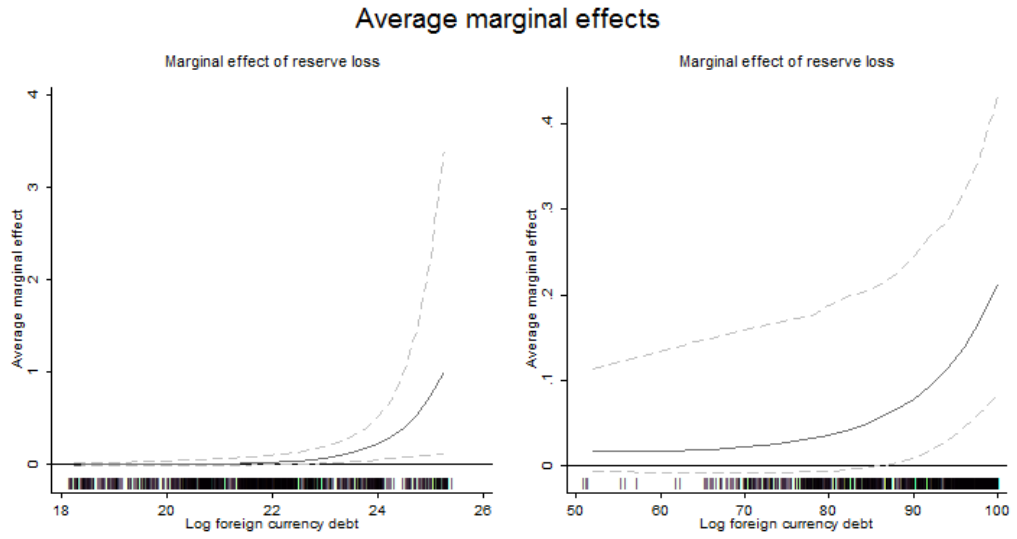

Figure A3: Average marginal effect and 95 per cent confidence interval for moving from stable reserves to 25 per cent reserve loss under managed exchange rates after 1994, for varying levels of foreign currency debt. Left panel: Calculated from column 2, Table A4, which codes exchange rates as floating for both intermediate and freely floating exchange rates. Right panel: Calculated from column 4, Table A4, which codes foreign currency debt as the percentage of PPG debt denominated in foreign currencies.

Table A4: Additional results, full model.

	(1) exports	(2) fixed rates	(3) panel model	(4) share	(5) CLYPS	(6) Claims
Reserve loss	3.04*	5.659*	2.811*	2.642*	2.504*	3.934*
	(.000)	(.001)	(.000)	(.000)	(.000)	(.003)
x floating rate	-3.63*	-5.585*	-3.251*	-3.162*	-3.173*	-3.827
	(.000)	(.002)	(.000)	(.000)	(.000)	(.121)
x prior 1994	-2.46*	-5.518*	-2.287*	-1.812*	-1.711*	
	(.000)	(.000)	(.000)	(.006)	(.022)	
x floating rate	2.84	5.839*	2.717	.442	3.764	
x prior 1994	(.128)	(.000)	(.218)	(.711)	(.273)	
x debt	.539*	.772	.525*	4.064	.582*	.770
	(.003)	(.151)	(.007)	(.581)	(.032)	(.057)
x floating rate x debt	-.668*	-.717	-.591*	-2.952	-.535	-.657
	(.024)	(.212)	(.015)	(.721)	(.103)	(.331)
x prior 1994 x debt	-.687	-.759	-.769*	-4.563	-.054	
	(.131)	(.113)	(.091)	(.635)	(.865)	
x floating rate	.867	.763	.907	-18.60	.446	
x prior 1994 x debt	(.203)	(.164)	(.207)	(.420)	(.572)	
Debt	.675*	.844*	.887*	8.735*	.558*	.648*
	(.005)	(.013)	(.000)	(.006)	(.009)	(.019)
x floating rate	-.421	-.436	-.381	-1.594	-.260	-.706*
	(.059)	(.154)	(.057)	(.685)	(.350)	(.007)
x prior 1994	-.089	-.431	-.271	2.790	-.121	
	(.641)	(.168)	(.141)	(.551)	(.544)	
x floating rate	-.072	.483	.001	-7.937	.241	
x prior 1994	(.812)	(.194)	(.997)	(.221)	(.397)	
Floating rate	-.265	.327	-.331	.104	-1.004	-.489
	(.547)	(.347)	(.378)	(.771)	(.120)	(.579)
Prior 1994	.737	.085	.598	1.081*	1.801*	
	(.164)	(.902)	(.154)	(.035)	(.000)	
x floating rate	-1.03	.341	-1.111	-1.073*	.976	
	(.222)	(.621)	(.299)	(.010)	(.120)	
Log reserves	.698*	.587*	.697*	.794*	.169	.341
	(.001)	(.001)	(.001)	(.000)	(.396)	(.307)
Change imports	.021	.075	-.088	-.246	-.911	-4.813*
	(.966)	(.861)	(.819)	(.624)	(.129)	(.001)
Change exports	-.085					
	(.899)					
Log trade	-.360	-.274	-.261	-.205	.263	.950
	(.107)	(.229)	(.134)	(.336)	(.221)	(.143)
GDP per capita	.085	.160*	-.031	.082	-.130	-.188
	(.225)	(.009)	(.357)	(.310)	(.079)	(.100)
Constant	-7.24	-7.441	-8.566*	-13.681*	15.64*	1088*
	(.119)	(.098)	(.002)	(.000)	(.016)	(.000)
Year polynomial	Yes	Yes	Yes	Yes	Yes	Yes
Number Obs.	1631	1631	1631	1631	292	744
Number Countries	89	89	89	89	21	88

* Significant at 5%. Coefficient estimates, p-values in parentheses from negative binomial regression. Standard errors clustered on countries. Columns 1-3: Non-OECD GATT/WTO members, Mexico, and Turkey, 1974-2004. Column 4: Foreign currency debt data from Cowan et al. (2006). Column 5: Dependent variable is number of claims submitted, only WTO cases (after 1995).

F. The 1994 changes to the DSB

Table A5 displays the regression results for the models mentioned in the section "The legal reforms to the dispute settlement body." The first column just includes the 1994 dummy and the control variables from the main model; the coefficient on the 1994 dummy is small and statistically not significant, showing that the legal reforms in themselves had no effect on dispute participation rates in the sample of non-OECD countries. Column 2 interacts the 1994 dummy with changes in exports, and column 3 interacts the 1994 dummy with changes in trade. As the results show, the effect of these variables is not conditional on the 1994 dummy (whereas reserve losses, as shown in the paper, are). This lends further confidence to the idea that we did not capture the legal reforms to the dispute settlement body, which may have facilitated the ease with which disputes can be initiated, but the restrictions to balance-of-payment exemptions.

The fourth and fifth column exploit that the legal changes to the dispute settlement body had indeed largely been implemented by 1989. Hence, if our results are due to changes to the dispute settlement body, we should observe no difference for the results with the 1989 dummy compared to the results with the 1994 dummy. However, as the table shows, the coefficient on reserve losses is much smaller than using the 1989 dummy; indeed, the average marginal effect of reserve losses is almost cut in half compared to the model using the 1994 dummy. In the fifth column, we include both the 1994 and the 1989 dummy, and all relevant interactions. In this model, we find that the marginal effect of reserve losses under managed exchange rate is positive, but not statistically significant prior to 1989 (the p-value is .294); between 1989 and 1994, the effect of reserve losses is close to zero and again statistically not significant (the p-value is .805). By contrast, after 1994, the effect is large, positive, and statistically significant (the p-value is .006). These results lend further support to our interpretation of the 1994 dummy.

Table A5: Evaluating the 1994 dummy

	(1)	(2)	(3)	(4)	(5)
	1994	changes exports	changes trade	1989	1989 and 1994
Prior 1994	.012	.565	.412		.258
	(.370)	(.486)	(.518)		(.523)
Prior 1989				-.479	-.129
				(.341)	(.410)
Change exports		-.179			
		(.596)			
x prior 1994		1.02			
		(1.13)			
Change trade			.848		
			(.937)		
x prior 1994			-.043		
			(1.325)		
Change reserves				1.10*	2.97*
				(.358)	(.654)
x floating rate				-1.67*	-3.37*
				(.408)	(.699)
x prior 1994					-3.01*
					(.720)
x prior 1989				.633	1.89
				(1.05)	(1.27)
x prior 1994 x floating rate					2.07*
					(.887)
x prior 1989 x floating rate				-.071	-.534
				(1.32)	(1.43)
Floating rate				.130	.228
				(.345)	(.338)
x prior 1989				-.383	-.091
				(.446)	(.599)
x prior 1994					-.414
					(.453)
Changes imports	-.883*	-.227	.248	-.118	-.074
	(.440)	(.578)	(.850)	(.491)	(.460)
GDP per capita	-.115*	.128	.125	-.119*	-.116*
	(.027)	(.071)	(.070)	(.033)	(.032)
Log reserves	.530*	.747*	.747*	.836*	.916*
	(.239)	(.114)	(.114)	(.213)	(.225)
Log trade	.309			-.016	-.097
	(.271)			(.237)	(.230)
Constant	-22.0*	-19.14*	-19.4*	-20.3*	-19.9*
	(2.68)	(2.34)	(2.36)	(3.01)	(2.72)
Number Obs.	3414	1631	1631	1957	1957
Number Countries	125	89	89	111	111

* Significant at 5%. Coefficient estimates, p-values in parentheses. Negative binomial regressioneffects. Standard errors clustered on countries. All models include a year polynomial of degree three.

G. Descriptive statistics and data sources

We obtained our main variables from the following sources:

Disputes: Data on the number of trade disputes are from Horn and Mavroidis (2011, updated version from 2012) and Reinhardt (1996).

Floating rate: We use the classification by Levy-Yeyati and Sturzenegger (2005) and create a dummy equal to 0 for freely floating exchange rates and equal to 1 for others.

Reserve loss: Relative change in reserves (Δ reserves/lagged reserves), calculated from total reserves (monetary gold, IMF special drawing rights, holdings of foreign exchange). We multiply the variable by -1, such that the variable captures relative reserve losses. The data is obtained from the World Bank World Development Indicators, FI.RES.TOTL.CD, which in turn draw on the International Monetary Fund.

Log reserves: Log of total reserves (monetary gold, IMF special drawing rights, holdings of foreign exchange). From the World Bank World Development Indicators, FI.RES.TOTL.CD, which in turn draw on the International Monetary Fund.

Log foreign currency debt: The variable measures the amount of external, long-term, public and publicly guaranteed government debt denominated in major foreign or multiple currencies. We identify the share of debt in foreign or multiple currencies using data from the World Bank World Development Indicators, which draw on the International Debt Statistics, where we also obtain data on public and publicly guaranteed debt (DT.DOD.DPPG.CD).

Change imports: The relative change in a country's imports (Δ imports/lagged imports), calculated from total imports, obtained from the World Bank (NE.IMP.GNFS.CD).

Log trade: Log of total trade, calculated from total exports plus total imports, both obtained from the World Bank World Development Indicators (NE.EXP.GNFS.CD and NE.IMP.GNFS.CD).

GDP per capita: GDP per capita in 1,000 US dollars, obtained from the World Bank World Development Indicators (NY.GDP.PCAP.CD).

Table A6 provides descriptive statistics for our main variables in the sample.

Table A6: Descriptive Statistics

	Obs.	Mean	Std. Dev.	Min.	Max.
Disputes	1631	.107	.464	.000	6.000
Floating rate	1631	.237	.426	.000	1.000
Reserve loss	1631	-.263	1.24	-3.24	.936
Log foreign currency debt	1631	21.4	1.89	15.4	25.4
Log reserves	1631	19.9	2.20	14.2	26.8
Change imports	1631	.095	.214	-.614	1.89
Log trade	1631	22.0	1.738	17.9	27.6
GDP per capita	1631	1.29	1.422	.071	8.27
Year	1631	1991	8.95	1974	2004

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