Indebted Interests:
Why Governments Fail to Restrict Foreign-Currency Debt

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Abstract

Foreign-currency borrowing poses a serious threat to financial stability. To mitigate this threat, governments can impose restrictions on foreign-currency debt. This paper explores why some governments do not take more decisive action to preemptively restrict foreign-currency borrowing at the household level. I argue that there are important political disincentives to the regulation of household foreign-currency debt. In addition to restraining consumption, restrictions on foreign-currency debt may signal the government's concern about the stability of the domestic currency, potentially prompting a depreciation that exacerbates the debt burden of households with foreign-currency. This signal will be especially salient in countries with fixed exchange rates and larger exposure to foreign-currency debt. I thus expect these conditions to contribute to a reluctance to regulate foreign-currency debt. I test the predictions of a model that formalizes this argument using original, hand-coded data on foreign-currency borrowing restrictions from 1999-2016. The results show that countries with fixed exchange rates and higher exposure to foreign-currency debt are less likely to increase restrictions on household foreign-currency debt. I also leverage household survey data from the Austrian Central Bank's (OeNB) Euro Survey to test some of the model's microfoundations and find that foreign-currency indebtedness reduces trust in government after a depreciation. In addition to explaining variation in an understudied form of macroprudential regulation, this paper thus also provides new insight into why fixed exchange rate regimes often end in crisis.

*Some of the data used in this paper are derived from the OeNB Euro Survey which have been provided by the OeNB solely for research purposes. These data are obtained under special contractual arrangements from the OeNB and are not currently available from the author.

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1 Introduction

Debt denominated in foreign currency is an important source of financing for many households throughout emerging markets and the developing world (see, among many others, Levy Yeyati (2006), Ranciere et al. (2010), Yeşin (2013), Fidrmuc et al. (2013), and Corrales and Imam (2019)). Such loans pose a serious financial stability risk when the domestic currency depreciates and nominal loan repayments increase. When households hold sufficiently large amounts of foreign-currency debt, a depreciation can raise default rates for both foreign- and local-currency borrowers, suppress consumer spending, reduce house prices, and drive up local unemployment rates (Verner and Gyöngyösi, 2020). Along with sovereign and corporate debt denominated in foreign currency, foreign-currency denominated loans extended to households played an important propagation role in the emerging market crises of the 1990s and prompted considerable concern in many eastern European countries in the wake of the global financial crisis of 2008-2009 (Levy Yeyati, 2006; Bordo et al., 2010; Ranciere et al., 2010; Fidrmuc et al., 2013). In turn, the economic effects of a depreciation on foreign-currency borrowers and the broader economy can translate into threats to the political survival of politicians.[1]

Macroprudential restrictions can prevent the accumulation of risky foreign-currency borrowing or ensure that borrowers are sufficiently hedged against adverse movements in the exchange rate.[2] There are strong efficiency grounds for macroprudential regulation more broadly, which improves social welfare to the extent that individual firms and households do not internalize their contributions to aggregate financial instability (Korinek, 2011b,a; Jeanne, 2013; Korinek and Sandri, 2016; Dávila and Korinek, 2018; Jeanne and Korinek, 2019). That borrowers may be aware of the risks that foreign-currency borrowing poses for their own balance sheets (Beckmann and Stix, 2015), does not make them any more likely to take into account the broader implications of these risks for financial stability, or for post-crisis politics. As I show in this paper, however,

[1] A large literature explores the political effects of financial crises more generally. See especially Mian et al. (2014), Crespo-Tenorio et al. (2014), Funke et al. (2016), and Chwieroth and Walter (2019). See Ahlquist et al. (2020) and Gyöngyösi and Verner (2020) on the political effects of depreciations in the presence of foreign currency debt specifically.

[2] In what follows, I differentiate foreign-currency borrowing restrictions from capital controls. Following Korinek and Sandri (2016), "the defining feature of capital controls is that they apply exclusively to financial transactions between residents and non-residents, i.e. they discriminate based on the *residency* of the parties involved in a financial transaction (Korinek and Sandri, 2016, 27) (italics added)." By contrast, the defining feature of restrictions on foreign currency borrowing is that they discriminate based on the *currency denomination* of the borrowing party's liabilities.

there is considerable variation across countries with respect to the regulation of foreign-currency borrowing. These observations lead to the central puzzle that motivates this paper: why do governments fail to uniformly implement restrictions on such risky forms of credit, particularly at the household level?

I argue that governments face two important political disincentives to regulate risky foreign-currency borrowing. The first disincentive pertains to credit access, and has received attention in the growing literature on the political economy of credit (Rajan, 2010; Ahlquist and Ansell, 2017; Copelovitch and Myren, 2018). Where households have undertaken large amounts of foreign-currency debt, restraining such credit will prove politically unpopular insofar as it constrains households' consumption possibilities.

In this paper, I highlight a second, novel, disincentive to regulate foreign-currency borrowing. I argue that while a build-up of household foreign-currency debt presents both a financial stability and a political threat, restricting this debt signals policymakers' concern about a possible future depreciation. Put differently, restrictions would be unnecessary if the exchange rate were expected to be stable. In turn, this negative signal disincentivizes the imposition of restrictions. I argue that the signaling feature of foreign-currency borrowing restrictions is likely to be particularly salient under two conditions. First, because fixed exchange rate regimes embody an explicit commitment to a particular value of the domestic currency, policymakers in fixed-rate regimes will be more reluctant to undertake regulatory actions that threaten the credibility of that commitment. Policymakers in floating-rate regimes, in contrast, do not confront the signaling disincentive to the same degree because they do not contend with the commitment problem posed by a fixed exchange rate. Second, the disincentive to regulate becomes stronger as exposure to household foreign-currency debt rises because a rise in the debt stock also increases the potential losses from a depreciation induced by restrictions that betray a lack of exchange rate credibility. These losses in turn threaten the political survival of policymakers, especially in fixed-rate regimes.

I develop a game-theoretic model of the regulatory decision of a policymaker in a fixed-rate regime to formalize these disincentives. I then test two central empirical implications of the model. First, I present a novel, hand-coded dataset that measures the intensity of individual-level foreign-currency borrowing restrictions in 74 emerging market and developing economies between 1999

and 2016. The primary source for identifying borrowing restrictions is the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions* (AREAER). I show using this dataset that the cross-national pattern of regulation is consistent with the model's predictions: at higher levels of household foreign-currency debt, an increase in the rigidity of the exchange rate is associated with a lower propensity to regulate.

Using survey data from the Austrian central bank (OeNB) on the individual borrowing decisions of respondents in ten Central and Eastern European countries, I also test a central microfoundation of the model. The reluctance of the government to restrict foreign-currency borrowing is grounded in the anticipation that voters holding foreign-currency debt will penalize policymakers if the domestic currency depreciates. Consistent with this expectation, I show that foreign-currency indebtedness (relative to having no foreign-currency debt) is associated with significantly lower government approval following an exogenous domestic-currency depreciation.

Existing work on the political economy of macroprudential policy, often limited to nascent studies in central banks or international institutions, has largely focused on questions of governance and implementation: how macroprudential frameworks can best be communicated to the public (Domanski and Ng, 2011; Born, Ehrmann, and Fratzscher, 2012), the implications of macroprudential policy for central bank accountability and legitimacy (Goodhart, 2015; Jones and Matthijs, 2019), and ideational obstacles to more aggressive regulation (Stellinga and Mügge, 2017; Baker, 2018). In contrast, a major contribution of this paper is to show that a significant component of cross-national variation in macroprudential policy is attributable to the encroachment of political considerations into what is often cast as a largely technocratic domain.

This paper also draws attention to the informational features of financial regulation. Regulatory changes intended to ensure financial stability may paradoxically precipitate instability to the extent that they signal a negative outlook about the exchange rate or other asset prices. From a policy perspective, this paper thus reinforces the broader importance of the manner in which new macroprudential regulations are communicated to markets and to the public, but also highlights a novel, particular sense in which policymakers' communication strategy matters beyond concerns about democratic legitimacy.

Finally, this paper provides an important addendum to the link between fixed exchange rate regimes and financial crises. Part of the reason that fixed-rate regimes so often end in costly devaluations and widespread financial panic is that the commitments they entail discourage precautionary restrictions on foreign-currency borrowing, which can subsequently build to ever-more dangerous levels before speculative pressure finally brings the house crashing down.

2 Two sources of regulatory disincentives: the access and valuation effects

Two primary disincentives contribute to a reluctance of policymakers to regulate foreign-currency debt. First, in many countries, foreign-currency debt offers a cheap source of financing, as interest rates on such debt are often lower than those on local currency debt.[3] Restricting this source of finance, especially if borrowers cannot obtain other low-cost financing and must reduce their consumption, is therefore likely to prove politically costly. To fix ideas, I label this first political disincentive to impose borrowing restrictions the credit *access effect*.

An important precondition for the access effect is that borrowers vote or form political preferences retrospectively based on their personal economic circumstances—that is, if voting behavior is *egotropic* (see, e.g. Healy, Persson, and Snowberg (2017)). There are good reasons to believe that borrowers will vote egotropically in precisely the cases in which foreign-currency borrowing is most prevalent: developing and emerging-market countries. The marginal utility of consumption of the average consumer is likely to be higher in poorer, developing countries than in richer, industrialized countries.[4] Accordingly, policies that directly threaten personal consumption, such as borrowing restrictions, will likely weigh more heavily on poorer consumers' electoral decision-making than will broader economic conditions, the direct importance of which to a poor consumer's welfare may be unclear to her. A growing body of empirical work supports the idea that voters in developing countries do in fact react to changes in their personal economic circumstances to a greater extent than they do to broader economic developments (Singer and Carlin, 2013; Zucco, 2013; Visconti, 2017).

[3] One reason for this, following Korinek (2011b), is that foreign lenders may attach a risk premium to loans in local currency. Thus, in countries in which domestic credit markets are underdeveloped, there will exist a wedge between interest rates on local- and foreign-currency debt.

[4] Visconti (2017) frames a similar argument in terms of the importance of income changes to poor voters.

Foreign currency borrowing restrictions may prove politically costly for a second, subtler reason as well. By restricting foreign-currency borrowing, policymakers implicitly acknowledge that the exchange rate might move against borrowers. Restrictions signal, in other words, that there is a nonzero probability of a future depreciation. Put differently, if the probability of a depreciation were zero, there would be no need for restrictions and households could borrow in any currency without fear of a depreciation causing their debt payments to rise. In contrast to the access effect, the *valuation effect* operates if, in response to the signal conveyed by borrowing restrictions, market participants update their expectations about the future path of the exchange rate and put downward pressure on the exchange rate. From the perspective of voters, restrictions on foreign-currency borrowing thus raise the probability that existing and future foreign-currency-denominated debt servicing costs will rise sharply.

The valuation effect can be further understood with the aid of a simple example in which a similar logic operates. Suppose a wealthy businessperson travels to a country in which street crime, armed robbery, and kidnappings are a common occurrence in urban areas. The businessperson contemplates hiring an armored car and bodyguards to protect her during the trip. On one hand, the additional protective measures may provide a greater degree of security. On the other hand, to the extent that these measures are visible to would-be criminals, they signal a potentially lucrative and vulnerable mark. As a result, taking these additional measures may paradoxically *increase* the likelihood of an attempted robbery or kidnapping. So operates the valuation effect for policymakers contemplating foreign-currency borrowing restrictions: taking protective measures may paradoxically precipitate the very event from which protection was desired in the first place. The valuation effect should thus discourage policymakers from imposing borrowing restrictions.

I expect these access and valuation effects to be stronger in countries with fixed exchange rates. A fixed exchange rate regime amounts to a promise by the government to maintain a fixed value of the domestic currency relative to a foreign currency or some basket of currencies. While a fixed exchange rate regime can be attractive to governments in need of inflationary discipline, not all pegs are equally credible in light of differences in the ability or willingness of governments to

maintain the fixed parity.[5] Because these differences are rarely perfectly observable, the credibility of a government's commitment to a fixed exchange rate is uncertain from the perspective of borrowers and other market participants. In this context, a restriction on foreign-currency borrowing risks signaling to market participants that the policymaker cannot fully or credibly commit to the maintenance of a fixed exchange rate and prompting a speculative attack.

In the game-theoretic model presented in Section 3, I capture the inability to commit perfectly credibly to a fixed-rate regime by allowing the policymaker to have private information about the state of politico-economic "fundamentals" that govern the likelihood of a devaluation. The importance of the valuation effect follows the market's uncertainty about these underlying fundamentals—and thus the credibility—of a fixed-rate regime. If market participants could perfectly observe policymakers' ability to commit to a fixed parity, restrictions in fixed-rate regimes would be more likely, as policymakers in non-credible fixed regimes would be forced to regulate in anticipation of a speculative attack. By contrast, uncertainty about policymakers' credibility gives less-credible policymakers an incentive to imitate more-credible policymakers by refraining from regulation, as in the mimicking equilibria of Backus and Driffill (1985) and Bartolini and Drazen (1997). Under this uncertainty, the argument laid out here is also consistent with a "hands-tying" motive that leads less-credible policymakers to attempt to enhance the credibility of their fixed-rate regime by allowing foreign-currency borrowing, thus making a devaluation more costly.[6]

Within fixed-rate regimes, I also expect the access and valuation effects to intensify as exposure to household foreign-currency debt rises. All else equal, higher levels of foreign-currency debt support higher levels of consumption by households, thereby creating a constituency of borrowers for whom foreign-currency-denominated debt is an important and cheap source of financing. Accordingly, borrowing restrictions will have larger effects on consumption, increasing the risk that voters will focus their ire on politicians at the polls. Similarly, where levels of foreign-currency debt are high, the total degree of household exposure to a sudden depreciation (via the valuation effect) is higher. Thus, for higher levels of foreign-currency debt, policymakers in fixed-rate regimes should be increasingly reluctant to restrict this debt.

[5] See, e.g. Drazen (2000) for an overview of models of the credibility and collapse of fixed exchange rates.

[6] I am grateful to Amy Pond for noting this point. Similar hands-tying arguments have been made for full currency dollarization and sovereign debt denominated in foreign currency (see, e.g. Calvo and Végh (1992) and Jeanne (2000)).

Finally, while I do not explicitly model floating-rate regimes in the formal model below, it is useful to contrast the case of a fixed-rate regime with that of a floating-rate regime. In a floating-rate regime, the government makes no commitment to the stability of the domestic currency. As a result, the policymaker in a floating-rate regime does not confront the valuation effect to the same degree as she contemplates borrowing restrictions. Insofar as borrowers in floating-rate regimes are less inclined to borrow in foreign currency in the first place, moreover, the access effect is likely to be ameliorated as well. In short, the same political disincentives against regulation that exist in the fixed-rate case are weaker in the floating-rate case. While these disincentives discourage restrictions in fixed-rate regimes, especially where levels of debt are high, floating-rate regimes should instead be characterized by "technocratic" regulation in which the likelihood of restrictions increases with the level of risky debt, and thus with exposure to adverse movements in the exchange rate.

3 A signaling model of borrowing restrictions

To formalize the argument above, I model the decision of a policymaker in a fixed exchange rate regime to regulate future borrowing in foreign currency. In its structure, the model draws most heavily upon the setup in Morris and Shin's (1998) model of a speculative attack, though I assume away the heterogeneity of speculators that is necessary for their core result. The starting point for the baseline model is a three-period economy, for periods indexed by $t \in \{0, 1, 2\}$, populated by two agents: a government *policymaker* and a unitary *speculator*. The payoffs of the policymaker are determined by the utility of a public that consumes and votes according to this consumption. The economy is an endowment one in which the public can augment its endowment by borrowing, which is assumed to be possible only when denominated in foreign currency. From inception, the policymaker maintains a fixed exchange rate.

Denote the level of the fixed parity (quoted as domestic units per unit of foreign consumption) as e^*, following the notation in Morris and Shin (1998). The shadow price of foreign-denominated consumption—the exchange rate that would obtain in the absence of intervention—is denoted $f(\theta_i)$. θ_i denotes an index of "fundamentals" that characterize the economy. In the

literature on exchange rate pegs and currency crises, a host of macroeconomic indicators, such as the level of reserves available to the central bank, output growth, growth in the money supply, the price level, and the level of interest rates are subsumed under the umbrella of "fundamentals."[7] For the purpose of this simple model, in which I largely ignore the mechanics of the defense of a fixed exchange rate, I assume that θ simply represents the ability of the government to successfully defend the fixed parity against an attack by external speculators. This has the advantage of nesting both concerns about the *technical ability* of government to defend the peg and concerns about the *political will* of the government to do so (see, e.g. Drazen and Masson (1994), Obstfeld (1995), and Obstfeld (1996)).

I assume that $e^* < f(\theta_i)$, so that the domestic currency is overvalued at the fixed parity. This assumption reflects the fact that in developing and emerging-market countries, governments predominantly maintain overvalued exchange rates (Steinberg, 2015). To keep the model as simple as possible, I assume that θ_i takes on one of two values in $\{\theta_L, \theta_H\}$, where θ_H designates a "high" value of the fundamentals, such that the government's ability to defend the peg is high, or alternatively, the government maintains a strong desire to maintain the fixed parity. θ_L has the converse interpretation: fundamentals are weak, the government's ability to defend the peg is low, or equivalently, the government's commitment to the fixed parity is low. Consistent with the interpretation of θ_i as the level of fundamentals, I assume that $f(\theta_L) > f(\theta_H)$. That is, the shadow rate associated with low fundamentals is strictly higher (i.e. more depreciated) than that associated with high fundamentals. I start by assuming that the value of $f(\theta_i)$ is deterministic and common knowledge from the beginning of the game, but relax this assumption later by stipulating that the government is uncertain about the value of the shadow rate when it makes regulatory policy.

Following Morris and Shin (1998), I assume that if the peg breaks, the new, post-devaluation exchange rate reverts to the shadow rate, $f(\theta_i)$. The speculator provides the impetus for such a devaluation. At the end of period 1, the speculator decides whether to attack the currency or to refrain from attacking. Because the emphasis of this model is on the policymaker's initial regulatory decision and not the defense of the peg as in standard currency crisis models, I make

[7] Macroeconomic "fundamentals" are key in so-called "first-generation" crisis models, seminal examples of which are Krugman (1979), Flood and Garber (1984), and Obstfeld (1986).

the simplifying assumption that the peg will break after an attack by the speculator only if the "low" fundamental state, θ_L, is realized. In other words, there is no sense in which the policymaker strategically defends the peg in this model. If the speculator does not attack the currency, the peg remains fixed with certainty. This assumption serves to highlight the incentive a policymaker confronting low fundamentals has to mimick the high-fundamental policymaker.

In addition to overseeing the fixed exchange rate, the policymaker is politically accountable to the public. The public enters into existence with a pre-ordained level of (foreign-currency) borrowing, denoted F_0 (the subscript '0' here indicates that the debt can be thought of as having been contracted in period 0). In period 1, the public can borrow an additional amount, again denominated in foreign currency, denoted by F_1. Under the fixed-rate regime, the additional amount of consumption available to the public from period-1 borrowing is thus $e^* F_1$ in domestic terms. I assume for simplicity that both F_0 and F_1 must be repayed at the beginning of period 2. Furthermore, I assume that the interest rate on all debt is 0.

The government is accountable to the public in the following dual sense. If there is a devaluation, the increase in the domestic-currency price of the debt increases the debt burden of the public, forcing them to reduce consumption in the second period. Because the public enters into period 1 with a preexisting stock of foreign-currency debt, a devaluation is thus unambiguously bad for the public. However, the government can preemptively lessen the blow of a prospective devaluation by restricting foreign-currency borrowing in period 1. For ease of exposition, I assume a discrete policy space, such that the policymaker chooses a "prudential" policy $\psi \in \{0, 1\}$, where $\psi = 0$ denotes a full ban on borrowing and $\psi = 1$ denotes unregulated borrowing. Thus, by choosing $\psi = 0$, a government allows its public to be exposed to a devaluation only through the preexisting stock of foreign-currency debt, F_0. On the other hand, the public gets utility from consumption, so that restricting the borrowing capacity of the public may be politically costly. The policymaker is thus caught between the twin dangers of over-regulating (in the case of no devaluation) and under-regulating (in the case of a devaluation). The public holds the government accountable by means of an election at the end of period 2. I discuss how the government's payoffs vary with the consumption of the public below.

3.1 Information structure and sequence of play

I model the following extensive form game between the policymaker and the speculator.[8] First, Nature reveals to the policymaker the level of fundamentals for $\theta_i \in \{\theta_L, \theta_H\}$. This fact of revelation is common knowledge—that is, the speculator knows that the government knows the realization of θ_i. The public enters into period 1 with its pre-determined stock of foreign-currency-denominated debt, F_0, and endowment income y. At the beginning of period 1 and after learning the value of θ_i, before the public borrows and consumes and before the speculator acts, the policymaker chooses $\psi \in \{0, 1\}$. Contingent upon the regulatory decision of the policymaker, the public either borrows F_1 (if it is permitted to do so) or takes no action—this step in the game is purely mechanical and ignores any possibility of strategic action by the public. The public then consumes out of her available resources.

The next stage highlights the crucial feature of the information structure of the game. After its revelation, θ_i is private information for the policymaker—the speculator does not observe the value of θ_i. Here, it becomes clear why the interpretation of θ_i in terms of political will or commitment to the peg is appropriate, as these characteristics of governments are likely to be imperfectly observable. While it does not observe the realization of θ_i, the speculator does observe the government's choice of ψ, which it interprets as an imperfect signal of θ_i. It does so because it knows that the policymaker knows whether the fundamentals are of high- or low-type, and thus that the policymaker has an incentive to preempt a possible devaluation via regulation. I assume that the speculator has the following prior beliefs about the likelihood of the realization of L-type versus H-type fundamentals: $\Pr(\theta_i = \theta_H) = \alpha$ and $\Pr(\theta_i = \theta_L) = 1 - \alpha$.[9]

After observing the signal from ψ, the speculator thus decides whether to *A*ttack the currency or *R*efrain from attacking. In making this decision, the speculator can calculate the value of the shadow rate $f(\theta_L)$ in order to determine the profitability of attacking relative to refraining. In the baseline incomplete information model, I also assume that the government has full knowledge

[8] Again, I subsume the public into the background of the model to the extent that they do not face a strategic decision in this simple setup.

[9] As I show later, these priors are only relevant for the case where both types of policymaker leave borrowing fully unrestricted. Accordingly, these priors are more correctly written as conditional probabilities, so that $\Pr(\theta_i = \theta_H | \psi = 1) = \alpha$ and $\Pr(\theta_i = \theta_L | \psi = 1) = 1 - \alpha$.

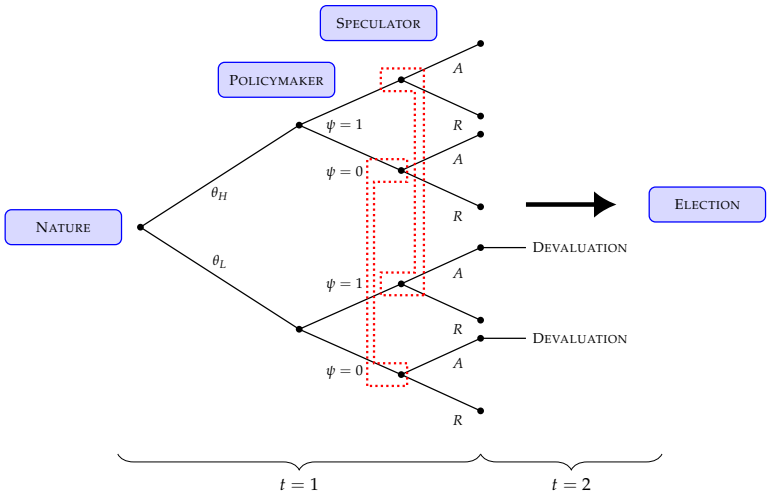


FIGURE 1: Sequence of Play

of the profitability of an attack when it decides to regulate.

The state of fundamentals θ_i is then revealed, and the exchange rate either remains fixed at e^* or rises to $f(\theta_L)$. After receiving its period 2 endowment income of y, the public then pays off its remaining debt at (possibly new) prevailing exchange rate and consumes out of any remaining resources. At the end of period 2, the public votes for the *I*ncumbent or a *C*hallenger, assumed to be identical to the incumbent.

Figure 1 depicts this game in extensive form. The dashed lines in the figure demarcate the two information sets of the speculator after the policymaker has chosen its value for ψ, capturing the crucial feature of the game: that the speculator is uncertain about the state of fundamentals after observing ψ and thus about the success of an attack on the currency. Note that an election occurs in period 2 after all other actions have been taken, irrespective of whether a devaluation has occurred.

3.2 Payoffs

The speculator's payoffs are straightforward. I follow Morris and Shin (1998) in specifying these.[10] First, I assume that the speculator pays a fixed cost of t to engage in any speculation. If

[10]Note that the model in Morris and Shin (1998) is populated with a *mass* of speculators that engage in a non-cooperative game among themselves. Here, I assume a representative speculator for simplicity and because my goal is

the speculator attacks the peg and is successful in bringing about a devaluation (in the case where $\theta_i = \theta_L$), her payoff is $f(\theta_L) - e^* - t$. If the attack is unsuccessful (in the case where $\theta_i = \theta_H$), the speculator's payoff is $-t$. Finally, if the speculator refrains from attacking the currency, her payoff is zero.

Next, consider the payoffs of the public. First, for the sake of tractability, I assume that the public's lifetime utility is linear in consumption:

$$U_P = c_1 + \beta c_2 \tag{1}$$

where c_t is consumption in period t and $\beta \in (0, 1)$ is the public's discount factor. From the discussion above, we can write down the public's periodic budget constraints as

$$c_1 = y + \psi e^* F_1 \tag{2}$$

$$c_2 = y - \psi e_2 F_1 - e_2 F_0 \tag{3}$$

where $e_2 \in \{e^*, f(\theta_L)\}$.

It will be useful for what follows to examine the public's consumption under each combination of (1) exchange rate level and (2) regulatory policy. There are four cases to consider. First, suppose the policymaker restricts foreign currency-borrowing in period 1 by setting $\psi = 0$. Then, if there is no devaluation, the public's payoff is

$$U_P(\psi = 0, e^*) = y + \beta(y - e^* F_0). \tag{4}$$

If there is a devaluation, the public must repay its period-0 debt at the new, higher exchange rate $f(\theta_L)$. To simplify the analysis, I assume that $f(\theta_L)F_0 > y$, so that the public defaults on its debt in the case of devaluation. I also assume that after a default, the public suffers a loss of γ_0, capturing a continuation cost to the public's creditworthiness. The public's payoff in the case of a devaluation

not to rule out multiple equilibria, as is the goal in the aforementioned paper.

under restriction foreign currency borrowing is thus

$$U_P(\psi = 0, f(\theta_L)) = y - \beta\gamma_0. \tag{5}$$

Next, suppose that the policymaker does not restrict foreign-currency borrowing, setting $\psi = 1$. In the case of no devaluation, the public's payoff is

$$U_P(\psi = 1, e^*) = y + e^*F_1 + \beta(y - e^*F_1 - e^*F_0). \tag{6}$$

In the case of a devaluation, the public defaults on both its period-0 and its period-1 debt. As in (5), the public pays a continuation cost, denoted γ_1, such that $\gamma_1 \neq \gamma_0$. The public's payoff in this case is

$$U_P(\psi = 1, f(\theta_L)) = y + e^*F_1 - \beta\gamma_1 \tag{7}$$

Finally, following Bueno de Mesquita et al. (2003), the policymaker cares solely about reelection. I conjecture that the probability of reelection, ρ_R, is monotonically increasing in the public's utility: $\rho_R = \rho_R(U_P)$. Under these conditions, the policymaker simply maximizes the consumption of the public.

That the policymaker internalizes the utility of the public has important implications for the decision to restrict foreign-currency borrowing and requires some attention to the ranking of the public's utility outcomes in (4) - (7). In particular, for the question as to whether the policymaker will regulate foreign currency borrowing to be economically and politically interesting, it must be the case that the public's utility in the case of restricted borrowing and a devaluation (equation (5)) must be higher than that in the case of unrestricted borrowing and a devaluation (equation (7)). If this were not the case, then it would always be optimal for the policymaker to set $\psi = 1$. To see this, note that (6) is strictly greater than (4)—conditional on the no-devaluation state, allowing the public to borrow always maximizes the public's utility. I thus impose

Assumption 3.1. $\gamma_0 < \gamma_1 - \frac{e^*F_1}{\beta}$.

which ensures that (5) is strictly greater than (7). Intuitively, the public is better off, in an ex-post

sense, when foreign currency borrowing is restricted before a devaluation than when it is not.

In turn, the assumption that the probability of reelection is increasing in the public's utility implies that the public retrospectively rewards policymakers for delivering better economic performance, conceptualized here in terms of consumption. This is common knowledge to all agents, including the speculator. Thus, in contrast to principal-agent models such as those of Weingast (1984) and Singer (2007), there is no sense in which the interests of the policymaker diverge from those of the public either statically or in a dynamic sense: the policymaker maximizes her utility by maximizing the lifetime consumption of the public, which in turn ensures that the policymaker has the best chance of remaining in office at the end of the second period.

An important consequence of this assumption is that the policymaker achieves her highest possible levels of utility when the exchange rate remains fixed in the second period. This follows from comparing the public's payoffs in (4) - (7):

$$U_P(\psi = 1, e^*) > U_P(\psi = 0, e^*) > U_P(\psi = 0, f(\theta_L)) > U_P(\psi = 1, f(\theta_L)) \tag{8}$$

An alternative way in which to view the ordering in (8) is that this ordering embodies the assumption that the public punishes the policymaker for devaluing the domestic currency.[11] A growing stock of empirical research suggests that devaluations do in fact threaten policymakers' political survival. Cooper (1971) provides suggestive evidence, later updated by Frankel (2005), that both political leaders and finance ministers are more likely to lose their jobs in the year following a devaluation than in normal periods. At least part of this turnover effect, in Frankel's (2005) analysis, appears to result from a "broken-promise" effect whereby explicit, public commitments to defend a peg increase the likelihood that policymakers will lose their jobs when a devaluation does occur. More recently, Steinberg (2019) presents survey evidence from Turkey that suggests that currency depreciation significantly lowers support for the government.

A second virtue of the ordering in (8) is that it makes explicit the sense in which the government's desire to restrict foreign-currency borrowing is contingent upon the level of the exchange rate in period 2. If there is no devaluation ($e_2 = e^*$), the policymaker prefers not to regulate. On

[11] From this perspective, adding an explicit term capturing the utility loss from a devaluation is unnecessary, as it would not change the ordering of the government's payoffs.

the other hand, if there is a devaluation ($e_2 = f(\theta_L)$), the policymaker prefers regulation *ex-post*, as this allows her to salvage some of her reelection prospects. As we will see below, it is crucial that the speculator recognizes these differing incentives.

3.3 Model solution

As is customary in sequential games of incomplete information, I look for perfect Bayesian equilibria (PBE) by proceeding via backward induction, beginning with the public's consumption. I begin by solving a benchmark model of complete information for comparative purposes. I then turn to the model above, in which only the policymaker observes the realization of θ_i.

3.3.1 A benchmark model of complete information

To highlight the role of incomplete information in this simple model, I first consider a benchmark case in which both the policymaker *and* the speculator observe the realization of the stochastic fundamental variable, θ_i. The payoffs of each agent are identical to those specified above. The only change to the game occurs in the sequence of play, such that the speculator can differentiate between her information sets at $\theta_i = \theta_L$ and $\theta_i = \theta_H$.

It is straightforward to show that in this complete-information game, a pure-strategy equilibrium obtains in which governments observing low fundamentals (θ_L) restrict foreign-currency borrowing, while governments observing high fundamentals (θ_H) do not restrict foreign-currency borrowing:

Proposition 3.2. Complete information equilibrium. Under complete information, an equilibrium exists in which θ_L-policymakers restrict borrowing, while θ_H-policymakers do not restrict borrowing. The speculator attacks when she observes $\theta_i = \theta_L$ and refrains from attacking otherwise.

Proof. Proceeding via backward induction, there are four possibilities for pure-strategy equilibria. First, note that the θ_H-policymaker will never set $\psi = 0$—the peg will not break, and so the θ_H-policymaker always does strictly better by setting $\psi = 1$. This eliminates the cases in which (1)

the two types both impose full restrictions ($\psi = 0$) and (2) the θ_H-policymaker sets $\psi = 0$ and the θ_L-policymaker sets $\psi = 1$.

Consider next the pooling candidate in which both types of policymaker pool by setting $\psi = 1$. Because the speculator observes the realization of θ_i, she will attack the currency when $\theta_i = \theta_L$ and refrain from attacking otherwise. Because the policymaker knows this, it will never be optimal for her to set $\psi = 1$ when she observes $\theta_i = \theta_L$. Thus both types cannot set $\psi = 1$.

The remaining case in which the θ_H-policymaker sets $\psi = 1$ and the θ_L-policymaker sets $\psi = 0$ can be shown to be an equilibrium by considering possible deviations. As noted above, the θ_H-policymaker never desires to deviate. Crucially, because the speculator observes θ_i in the case of complete information, the θ_L-policymaker is strictly worse off by choosing $\psi = 1$ over $\psi = 0$. □

3.3.2 Incomplete information: Uncertainty about fundamentals

Now consider the primary case of interest, in which the speculator does not observe the realization of θ_i, receiving information about the state of fundamentals only imperfectly via the policymaker's choice of ψ. Before developing a solution, it will be useful to consider the nature of the problem that the speculator faces in deciding whether to attack the fixed exchange rate.

Recall that the speculator earns $f(\theta_i) - e^* - t$ if an attack is successful, $-t$ if an attack is unsuccessful, and 0 if she decides not to attack altogether. The key obstacle to assessing the expected gains from attacking the currency is that the speculator does not observe θ_i until after the decision to attack or to refrain from attacking. Ex-post, as in the complete information case, the speculator would prefer to have attacked the currency when θ_L is realized and to have refrained from attacking when θ_H is realized.

Based on her understanding of the policymaker's incentives, the speculator uses the observed choice of ψ to inform her assessment of the probable state of fundamentals, θ_i. Suppose that the speculator observes $\psi = 0$. She recognizes that it is only rational for a government in the θ_L state to set $\psi = 0$—as in the incomplete information case, the θ_H-policymaker is strictly better off, under the assumptions in (8), by setting $\psi = 1$. As a result, if the speculator observes $\psi = 0$,

she infers that $\theta_i = \theta_L$ and attacks with certainty, and the peg collapses.

Here is where incomplete information matters: a θ_L-policymaker knows that setting $\psi = 0$ is perfectly revelatory with respect to θ_i—it amounts, intuitively, to the public admission that the peg is weak or not credible. She will thus never set $\psi = 0$ with certainty unless the speculator attacks with certainty. On the other hand, if the θ_L-policymaker can convince the speculator that $\theta_i = \theta_H$ by setting $\psi = 1$, the former can have her cake and eat it too—the speculator refrains from attacking, the peg holds, and the policymaker receives political benefits from increasing her constituents' borrowing and consumption, corresponding to the highest outcome in (8).

Of course, the speculator observes these incentives as well, and thus attaches positive probability $1 - \alpha$ to the event that $\theta_i = \theta_L$, conditional on observing $\psi = 1$.[12] The speculator knows, in short, that the θ_L-policymaker may try to cheat. In turn, the θ_L-policymaker will prefer—ex-post—to have to set $\psi = 0$ if the speculator risks an attack after all.

Consider formally the case where the speculator observes $\psi = 1$. As described above, the speculator's priors about θ_i are given by $\Pr(\theta_i = \theta_H) = \alpha$ and $\Pr(\theta_i = \theta_L) = 1 - \alpha$, conditional on observing $\psi = 1$. Using these conditional probabilities, the expected value to the speculator of attacking the currency when $\psi = 1$ is thus

$$-\alpha t + (1 - \alpha)(f(\theta_L) - e^* - t) \tag{9}$$

while the expected value of refraining from attacking is 0. The speculator thus attacks if

$$\alpha < 1 - \frac{t}{f(\theta_L) - e^*} \equiv \hat{\alpha} \tag{10}$$

which intuitively implies that an attack is profitable when the prior probability that a government has strong fundamentals is sufficiently small. When intervention is sufficiently costly (high t as a share of gross proceeds from speculation, $f(\theta_L) - e^*$), the threshold for the speculator's priors will be small, so that the speculator must attach a large probability to L-type fundamentals for an attack to be profitable.

[12] See footnote 9 above.

In turn, the level of α governs the type of equilibrium that prevails under incomplete information. I focus on equilibria that survive the Intuitive Criterion (Cho and Kreps, 1987). In contrast to the complete information case in which H-type policymakers do not regulate and L-type policymakers regulate, under incomplete information a pooling equilibrium can obtain in which both types of policymakers do not restrict borrowing:

Proposition 3.3. Pooling equilibrium. For $\alpha > \hat{\alpha}$, there exists a pooling equilibrium in which both H- and L-type policymakers set $\psi = 1$ and the speculator does not attack.

Proof. First note that it is always optimal for the H policymaker to set $\psi = 1$—because a speculative attack never succeeds against a government with high fundamentals, the policymaker never desires to regulate. By (10), it is optimal for the speculator not to attack, given her beliefs about the policymaker's type. Finally, the L-type policymaker has no incentive to deviate from not restricting, because she knows that the speculator will not attack and can maximize the public's consumption by setting $\psi = 1$. □

In addition to this pooling equilibrium, Mathematical Appendix A shows that for $\alpha \leq \hat{\alpha}$, a partial-pooling equilibrium exists:

Proposition 3.4. Partial-pooling equilibrium. For $\alpha \leq \hat{\alpha}$, there exists a perfect Bayesian equilibrium in which the H-type policymaker always chooses $\psi = 1$ (no restriction), the L-type policymaker sets $\psi = 1$ with probability $\delta = \frac{\alpha t}{(1-\alpha)(f(\theta_L)-e^*-t)}$, and the speculator attacks with probability $\lambda = \frac{(1-\beta)e*F_1}{\beta(\gamma_1-\gamma_0-e^*F_1)}$ if she observes $\psi = 1$, and probability one otherwise.

The theoretical importance of these results lies in the role of uncertainty about a government's commitment to maintaining the fixed parity. Few, if any, countries with fixed exchange rates have ironclad commitments to maintaining the parity. As Drazen and Masson (1994) point out, even a "tough" policymaker can confront economic circumstances that make reneging on a policy commitment the optimal policy decision. This section shows that even a small bit of uncertainty about this commitment can create a reluctance on the part of "weak" governments to regulate foreign-currency debt—captured by the tendency of L-type policymakers to pool with H-

type policymakers in refraining from regulation—if such regulation risks signaling that weakness to speculators.

3.3.3 *Extension: Uncertainty about speculative attack*

In the pooling equilibrium of the previous section, both types of policymakers can perfectly anticipate the actions of the speculator. For sufficiently strong beliefs that the policymaker is of type H (above the threshold $\hat{\alpha}$), the speculator refrains from attacking with certainty, allowing the L-type policymaker to mimick the H-type policymaker. Proposition 3.4 suggests that this mimicking behavior can still occur if there is some uncertainty about the speculator's decision to attack; that is, if the speculator randomizes over attacking and refraining from attacking.

In this section, I consider another source of uncertainty about the speculator's decision that more realistically captures the policymaking environment. In particular, suppose that the government is uncertain, at the time of the regulatory decision, about the value of the shadow exchange rate. Formally, suppose that $f(\theta_L)$ is a random variable with known distribution function $L(\cdot)$. That the government is uncertain about the shadow rate is consistent with the idea that, in practice, policymakers may be ex-ante uncertain about the size of a future speculative attack or the ability of speculators to undertake a sustained effort against the peg.[13] I assume that the speculator knows with certainty the shadow rate that will prevail in the event of a successful attack, so that she knows with certainty the value of a successful attack.[14]

For ease of exposition and to highlight the key result, I focus on a pure-strategy equilibrium. Under these conditions and the same priors about policymaker types as in the previous section, the expected value to the speculator of attacking the currency when $\psi = 0$ is again given by (9). Because $f(\theta_L)$ is stochastic, this condition can be rewritten to capture a threshold value $\hat{\mathcal{F}}$ such that values of $f(\theta_L)$ greater than this threshold imply an attack by the speculator:

$$f(\theta_L) > \frac{t + (1-\alpha)e^*}{1-\alpha} \equiv \hat{\mathcal{F}} \tag{11}$$

[13] An equivalent set up could also involve ex-ante policymaker uncertainty about the costs t that the speculator faces in attacking the peg.

[14] As above, this is equivalent to a setup in which the speculator has private information about the costs of an attack.

From the perspective of the policymaker, for whom $f(\theta_L)$ is uncertain, this threshold implies a probability, $\rho^A = 1 - L(\hat{\mathcal{F}})$, that the speculator will attack the peg. Note that an increase in the prior probability α that the policymaker is of type H increases the right-hand side of expression (11), decreasing the likelihood that the speculator will attack.

How will the policymaker behave at the policymaking stage? Recall that a policymaker observing $\theta_i = \theta_H$ always sets $\psi = 1$. We thus focus on the case where $\theta_i = \theta_L$. For a θ_L-type policymaker, the expected value of setting $\psi = 1$ is:

$$(1 - \rho^A)\left[y + e^* F_1 + \beta(y - e^* F_1 - e^* F_0)\right] + \rho^A\left[y + e^* F_1 - \beta\gamma_1\right] \tag{12}$$

while the expected value of setting $\psi = 0$ is:

$$\rho^A\left[y - \beta\gamma_0\right] + (1 - \rho^A)\left[y + \beta(y - e^* F_0)\right] \tag{13}$$

The policymaker thus sets $\psi = 1$ when (12) is greater than (13). After some manipulation, the inequality that results can be shown to reduce to the following:

$$(1 - \beta)e^* F_1 - \rho^A \beta\left[\gamma_1 - e^* F_1 - \gamma_0\right] > 0 \tag{14}$$

where the bracketed part of the second term on the left-hand side is positive by Assumption 3.1. The inequality in (14) reveals a number of insights about the policymaker's decision problem. First, note that (14) will be satisfied for sufficiently small ρ^A. Intuitively, the policymaker will not restrict foreign-currency borrowing if the probability of a speculative attack is sufficiently low.

Second, we can rearrange (14) to show that abstaining from regulation is optimal for the policymaker if

$$F_1 > \frac{-\rho^A \beta\left[\gamma_0 - \gamma_1\right]}{e^*\left[(1 - \beta) + \rho^A \beta\right]} \equiv \Delta^F, \tag{15}$$

where the term $[\gamma_0 - \gamma_1]$ is negative, again by Assumption 3.1. Thus, for $F_1 > \Delta^F$, the θ_L-policymaker will refrain from restricting borrowing (setting $\psi = 1$) and pool with the θ_H-policymaker. I summarize this result in the following proposition:

Proposition 3.5. Pooling equilibrium. Under incomplete information, when $F_1 > \Delta^F$, a pooling equilibrium exists in which both θ_L-policymakers and θ_H-policymakers do not restrict borrowing and the speculator attacks the currency with probability $\rho^A = 1 - L(\hat{\mathcal{F}})$.

This proposition captures a central insight of the model that does not emerge in the simple incomplete-information case of the previous section: for a sufficiently large demand for foreign currency borrowing (recall that both F_0 and F_1 are exogenous in this model), a policymaker in a fixed-rate regime will fail to regulate foreign currency borrowing, even when a costly depreciation could occur in the case of a speculative attack (that is, when $\theta_i = \theta_L$). When the demand for risky borrowing is sufficiently high, the policymaker instead attempts to hide behind the veil of loose regulation, as restrictions imposed on borrowing will precipitate the very outcome the policymaker seeks to avoid. On the other hand, when foreign-currency debt is sufficiently low, a separating equilibrium matching the complete-information case exists. The result in Proposition 3.5 is thus notably similar to the result in Bartolini and Drazen (1997) that, under incomplete information, fiscally-weak governments can mimic fiscally-strong governments by liberalizing their capital accounts. When information is complete, this mimicking is no longer sustainable.

The quantity of foreign-currency debt moderates the decision of the L-type policymaker because a speculative attack is uncertain from her perspective. Risky foreign-currency debt serves as a useful political tool for increasing consumption and reelection prospects in good states, but threatens political survival in bad states. (15) thus captures a threshold beyond which the current political benefits of debt provision outweigh the potential future costs of financial instability. In contrast to what might be expected of a "prudential" regulator who imposes restrictions in line with mounting vulnerabilities, policymakers in fixed-rate regimes will be increasingly averse to restricting borrowing as foreign-currency debt increases. On one hand, this aversion stems from the informational attributes of regulation—regulation signals weaker fundamentals or a weaker commitment to the fixed exchange rate (the valuation effect). However, this aversion is also rooted in the fact that cheap credit is politically useful to policymakers (the access effect), especially where the costs of default are low or can be transferred away from the public. The access effect and the valuation effect combine in this case to discourage restrictions by θ_L-type policymakers.

More broadly, the model highlights an important feedback relation between macroprudential regulation and private sector expectations. Expectations of a future speculative attack inform the decision to limit exposure to risky debt, and this decision can in turn validate the decision of the private sector as to whether or not to attack. It is possible that a similar endogeneity characterizes the relationship between other sources of financial instability and other types of macroprudential regulation. It is conceivable, for example, that loan-to-value (LTV) caps for household mortgages could signal an impending weakness in the housing market, precipitating the very decline in house prices against which such regulation would seem intended to protect.

3.4 Empirical hypotheses

The model yields a number of empirical predictions, of which I focus on two. First, in the case of incomplete information, low-fundamental policymakers in a fixed exchange rate regime refrain from implementing borrowing restrictions so long as the demand for foreign-currency borrowing exceeds a certain threshold (equation (15)). This threshold represents the point at which the benefits of risky debt provision and the risk of precipitating a crisis by inadvertently signaling speculators via restrictions equals the financial stability risks implied by the absence of restrictions. Above this threshold, the demand for foreign-currency debt is sufficiently large that reducing it is politically intractable: doing so both lowers consumption and risks alarming speculators. This threshold is likely to be different across countries, corresponding to different appetites for risky debt as well as different policymaker reaction functions. Accordingly, we should expect that in cross-national data, we should observe a decreasing likelihood of restrictions as the level of household foreign-currency debt increases. The primary hypothesis I test is thus:

> **H1**: As the level of household foreign-currency borrowing increases, borrowing restrictions should be less likely in fixed exchange rate regimes than in floating-regimes.

Second, I conduct an indirect test of the assumption that foreign-currency debtors are politically-influential constituents. The formal model builds upon the assumption that consumers will penalize policymakers if the domestic currency depreciates.[15] In the model, in which all consumers hold foreign-currency debt, depreciation lowers consumer welfare by raising the value of

[15] See equations (4) - (7).

this debt.[16] In reality, consumers' personal balance sheets are far more heterogeneous, with varying amounts of foreign-currency debt as well as foreign-currency savings, so that valuation effects are more difficult to parse. Nevertheless, I expect consumers with at least some foreign-currency debt to hold less favorable opinions of policy and policymakers if the domestic currency depreciates than those consumers without foreign-currency debt. The following secondary hypothesis captures this expectation:

> **H2**: Foreign-currency indebtedness should reduce support for the government following a depreciation relative to those without foreign-currency debt.

I turn next to the empirical testing of these hypotheses, beginning with the introduction of a novel dataset measuring foreign-currency borrowing restrictions.

4 Explaining cross-national variation in foreign-currency borrowing restrictions

4.1 A novel dataset of foreign-currency borrowing restrictions

Testing **H1** first requires cross-national data on borrowing restrictions. To measure restrictions on foreign-currency borrowing, I follow previous efforts to measure the intensity of capital controls and macroprudential restrictions using the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions* (AREAER).[17] I limit my attention to the electronic version of this database, which tracks changes in restrictions beginning in 1999. The guiding principle I use to arbitrate potential instances of foreign currency borrowing restrictions is whether the following question can be answered in the affirmative based on the narrative information given in the AREAER: "Does a potential restriction discriminate between borrowing (or liabilities) in domestic currency and borrowing (or liabilities) in foreign currency in a way that encourages the former

[16] All consumers hold foreign-currency debt because there is a single, representative consumer or "voting public."

[17] See, among many others, Grilli and Milesi-Ferretti (1995), Quinn (1997), and Chinn and Ito (2008) which attempts to provide a high-level characterization of the overall degree of a country's capital account openness. These summary measures contrast with disaggregated measures that account for the applicability of controls to different asset classes, inflows versus outflows, and residency status (see, e.g. Schindler (2009), Ostry et al. (2012)). Fernández et al. (2016) build on Schindler (2009) and provide perhaps the most detailed disaggregation and widest geographic coverage of capital control measures yet. Disaggregation is also common in studies of macroprudential tools, as in Ostry et al. (2012), Akinci and Olmstead-Rumsey (2018), and Cerutti, Claessens, and Laeven (2017). Foreign-currency-related measures have received cursory treatment in Ostry et al. (2012), Cerutti, Claessens, and Laeven (2017), Cordella et al. (2014), De Crescenzio, Golin, and Ott (2015), and Ahnert et al. (2018), but these do not distinguish between different financial activities or are limited to measures that affect banks and financial intermediaries.

over the latter?" To measure the intensity of restrictions on foreign-currency borrowing, I employ the following coding scheme, with scores ranging from (1) to (5), in the spirit of Quinn's (1997) five-point scale on exchange restrictions:

(1) Foreign-currency borrowing is completely unrestricted

(2) Foreign-currency borrowing is restricted only by source (e.g. foreign-currency borrowing only from an authorized dealer)

(3) Foreign-currency borrowing is restricted according to an explicit quantitative or qualitative benchmark, or requires "soft approval"

(4) Foreign-currency borrowing requires "hard approval" from the government or regulator with no reference to an explicit quantitative benchmark

(5) Foreign-currency borrowing is banned outright

The data appendix discusses the construction of this dataset in more detail.

I apply the coding rule above to the entire set of countries that fall under the IMF's "Emerging Market and Developing Countries" in the online AREAER system. I drop countries where data coverage is sufficiently limited to preclude a judgment about the aggregate level of restrictions and where national sources are unavailable. This results in a panel of 74 countries spanning 1999-2016. The complete list of countries is listed in the data appendix. I display the level of restrictions for a select group of countries in Figure 2 to illustrate the cross-national variation that this paper seeks to explain.

4.2 Empirical strategy and additional data

The key independent variable for the purpose of testing H1 is the interaction between a measure of the exchange rate regime and the prevailing level of household foreign-currency debt. To capture the exchange rate regime, I use the 15-point "fine" classification of exchange rate regimes constructed by Ilzetzki, Reinhart, and Rogoff (2019) (IRR). I define an indicator variable *Fixed* that takes on the value of one if the IRR measure is less than eight and zero otherwise, thus counting as fixed any regime with a de facto arrangement that is more stable than a crawling "band."[18] I establish this cutoff via several considerations. First, this cutoff ensures that roughly 50 percent

[18]For example, countries with crawling pegs or horizontal bands of up to a two percent deviation, as well as currency boards and preannounced pegs, are counted as fixed exchange rate regimes.

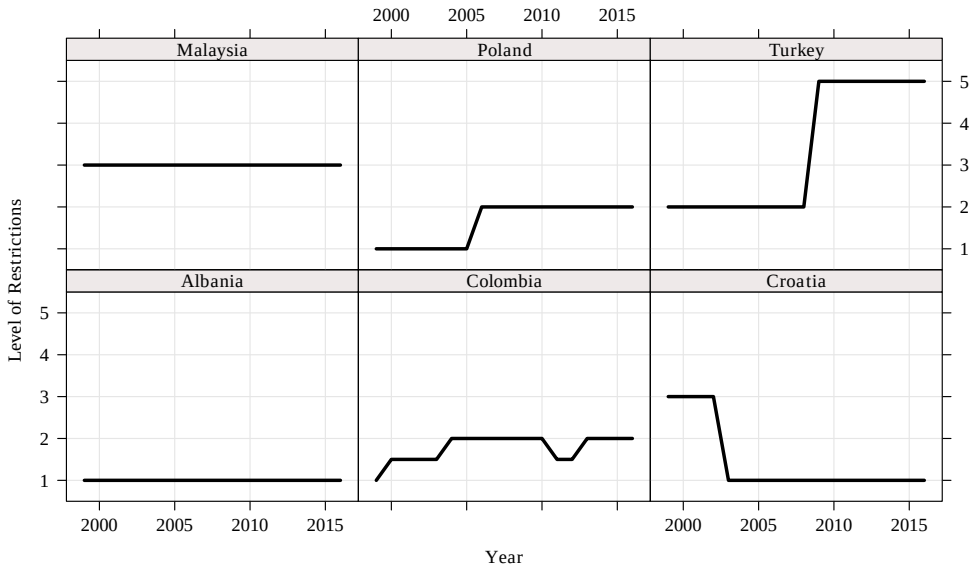


FIGURE 2: Restrictions by Country, 1999-2016

of the sample observations in any given specification is assigned to the treatment (*Fixed*) group, increasing the likelihood that there is sufficient variation in the treatment at important values of the moderator variable—the level of household foreign-currency debt. (see, e.g. Hainmueller et al. (2019)). More importantly, from a theoretical perspective, this cutoff reflects that there likely exists some degree of exchange-rate management that influences exchange-rate expectations, even when such management falls short of an explicit fixed parity. The cutoff is also consistent with Ilzetzki et al.'s (2017) finding that "the world is roughly evenly divided between more flexible exchange arrangements (freely or managed floats) and crawling or hard pegs (Ilzetzki et al., 2017, 38)."[19] Other cutoffs can surely also be justified. Accordingly, I show in the data appendix that the results are qualitatively similar when using both the coarse and fine IRR exchange rate regime indexes as continuous treatment variables.

I interact with this *Fixed* indicator the level of household debt denominated in foreign-currency as a share of total household debt (denominated in both domestic and foreign currency) from the database constructed by Corrales and Imam (2019) (*FCShare*). The household foreign-currency debt variable enters into the model contemporaneously, which may raise some concern

[19]The specific decision to draw the line between fixed regimes at a de facto crawling peg reflects the classification in Ilzetzki et al. (2019) of a de facto crawling peg as one in which adjustments are made in one direction 70 percent of the time. See Ilzetzki et al. (2019), footnote 11.

about reverse causality if restrictions are effective at reducing household foreign-currency debt. As I discuss below, I use the one-year lag of the household foreign-currency debt share variable in the interaction to mitigate this concern. I thus estimate the following linear interaction model via OLS, in which the dependent variable is the yearly change in individual borrowing restrictions, $\Delta Restrictions$, from the cross-country dataset presented in the previous section:[20]

$$\begin{aligned}\Delta Restrictions_{i,t} = \beta_0 + \beta_1 Fixed_{i,t} + \beta_2 FCShare_{i,t-1} + \beta_3 Fixed_{i,t} \times FCShare_{i,t-1} \\ + \beta \mathbf{X}_{t-1} + \nu_i + \epsilon_{i,t}\end{aligned} \tag{16}$$

where $\mathbf{X}_{t-1}$ is a vector of lagged controls and β the vector of coefficients corresponding to those controls.

I include two sets of control variables in the interaction models. In the first set, I consider some alternate macroeconomic and regulatory explanations of changes in borrowing restrictions that are potentially correlated with a country's choice of exchange rate regime or with existing stocks of foreign-currency debt. Foreign-currency borrowing restrictions may be implemented alongside standard capital controls, and such controls may be more likely in countries maintaining fixed exchange rates. I thus include the Chinn and Ito (2008) measure of capital openness as a potential confounder. Foreign-currency debt, and thus restrictions on this debt, may also be linked to a country's level of financial development (Caballero and Krishnamurthy, 2003; Corrales and Imam, 2019). I thus include as a covariate the ratio of M2 to GDP as a proxy for financial depth. In countries that depend more heavily upon international trade, banks and other lenders may be more likely to provide financing in foreign-currency. Because trade dependence might in turn influence policymakers' calculus regarding the desirability of borrowing restrictions, I also control for the sum of the shares of imports and exports in GDP. Finally, I include as standard controls the natural log of real GDP per capita and the level of democracy (Polity IV score).

Fixed exchange rate regimes are prone to collapse, as the model above acknowledges explicitly. One element not explicitly included in the model, but which features prominently in other seminal models of speculative attacks (e.g. Krugman (1979), Obstfeld (1986)) is the level of re-

[20] Below I provide some diagnostic plots that support the assumption of a linear interaction.

serves available to the government for the defense of the fixed parity. Because "high-fundamental" governments may have sufficient reserves to defend against a speculative attack, reserve availability may in turn influence the propensity of the government to impose restrictions on borrowing as well. In addition to the level of reserves, I also include as a covariate a dummy variable indicating whether a country experienced a currency crisis in a given year, following the definition and classifications in Laeven and Valencia (2018).[21] The latter variable accounts for the possibility that governments react retrospectively to crises by imposing borrowing restrictions. Finally, I include in this first group of control variables the yearly inflation and unemployment rates, as existing macroeconomic conditions may influence the choice of exchange rate regime as well as the desirability of borrowing restrictions.[22]

The second set of controls represents an attempt to address the possibility that other political economy drivers influence the likelihood of borrowing restrictions through their influence on the exchange rate regime or on the level of foreign-currency debt. In particular, partisanship likely matters for borrowing restrictions: right-leaning governments may have different macroeconomic objectives as well as different preferences over regulation (Hibbs, 1977; Alesina, 1987; Quinn and Inclan, 1997; Kastner and Rector, 2005; Broz, 2013). To the extent that these different macroeconomic objectives correspond to different choices of an exchange rate regime, the partisan orientation of policymakers may confound the relationship between restrictions and exchange rate regime choice. Accordingly, I control for the partisan orientation of a country's executive using data from the World Bank's *Database of Political Institutions* (DPI).

Second, following Copelovitch and Myren (2018), countries constrained with respect to their ability to engage in macroeconomic management directly via monetary policy may turn to the extension of credit to stimulate the economy. The Mundell-Fleming trilemma implies that constraints on monetary policy are likely to bind in particular when the exchange rate is fixed. To account for the possibility that policymakers may loosen borrowing restrictions in response to such constraints, I also include as a control the monetary independence index of Aizenman et al.

[21] Laeven and Valencia (2018) define currency crises as years fulfilling the following two criteria: "1) a year-on-year depreciation of at least 30 percent; and 2) of at least 10 percentage points higher than the rate of depreciation observed in the year before."

[22] The full set of covariates and their sources are listed in the data appendix.

(2013).[23]

Finally, a now-familiar literature in international political economy argues that exchange rate policy, including the stability of the exchange rate, is influenced by the preferences of different economic sectors (see, e.g. Frieden (1991), Frieden and Broz (2006), and Broz, Frieden, and Weymouth (2008)). Following this literature, producers of tradable goods will likely prefer fixed exchange rates while producers of nontradables and services will prefer floating exchange rates. Different sectors may have divergent preferences about foreign-currency borrowing restrictions as well: the tradable goods sector is likely to have stronger preferences for unrestricted borrowing in foreign-currency relative to the nontraded sector. Of course, it is unclear whether firms will have strong preferences about restrictions on *individuals*—the main outcome of interest here. It is possible, however, that firms may see restrictions on individuals as a portent of future restrictions on corporate foreign-currency borrowing. I thus control in various specifications for the sum of the value-added of the agriculture and manufacturing sectors as a share of GDP to proxy for the relative economic importance of the tradables sector and assume that this economic importance translates into political influence.[24]

4.3 Empirical results

The results from estimating progressively richer linear interaction models are shown in Table 1. I include country fixed-effects in each specification and cluster standard errors at the country level to account for serial correlation within country-panels.[25] Model (3) includes the full set of covariates discussed above, and I use the lagged, rather than contemporaneous, value of the foreign-currency share of household debt to account for the possibility that foreign-currency debt is endogenous to the change in borrowing restrictions.[26] Model (6) replicates the specification

[23]This index is a function of the correlation between short-term interest rates in the home country and short-term interest rates in a "base" country to which monetary policy in the home country is most closely linked. The index ranges from 0 to 1, and higher values indicate more monetary independence.

[24]Similar results were obtained using the employment shares of the agriculture and manufacturing sectors, which may more clearly translate into individual preferences for regulation.

[25]Results are qualitatively similar when including year fixed effects. I omit these in the baseline specifications, following Kropko and Kubinec (2018), in light of the complicated interpretation of coefficients they require.

[26]While lagging independent variables that may be simultaneously determined with the dependent variable is common in applied work in IPE, Bellemare, Masaki, and Pepinsky (2017) argue that this practice is generally not sufficient for causal identification.

of model (3), but replaces the dichotomous *Fixed* variable with the "fine" index of Ilzetzki et al. (2019).

The estimates from these models are broadly consistent with H1. In all models except for model (4), the coefficient on the lagged share of household debt in foreign currency ($FC\ Share_{t-1}$) is significant and positive. The positive coefficient on the foreign-currency share of debt indicates that for floating exchange rate regimes (that is, when *Fixed* = 0), higher foreign-currency indebtedness is associated with subsequent increases in borrowing restrictions. I interpret this result as suggestive of a technocratic motive for regulation under a floating exchange rate: restrictions increase with vulnerabilities to movements in the exchange rate. By contrast, the significance and signs of the interaction terms between the foreign-currency debt share and regime type in all of the specifications implies that for higher levels of household foreign-currency debt, a more rigid exchange rate regime is associated with decreases in restrictions relative to more flexible regimes.

Figure 3 plots the marginal effects of a change from a floating to a fixed rate regime for model (3) (left-hand panel) and of a marginal increase in the IRR index (right-hand panel).[27] The marginal effects of *Fixed* show that for lower (less than 40 percent) shares of foreign-currency-denominated borrowing at the household level, fixed exchange rate regimes do not appear to restrict borrowing any more or less stringently than floating-rate regimes. As exposure to foreign currency debt increases, however, fixed rate regimes are increasingly associated with significant relaxations in restrictions, as the confidence intervals for the marginal effect of *Fixed* lie entirely below zero for shares of foreign-currency debt greater than 0.4. Similarly, a marginal increase in de facto exchange rate rigidity in the right-hand panel results in a significant decrease in restrictions above a threshold of foreign-currency debt exposure of about 70 percent.

Valid inference with linear interaction models requires attention to a number of ancillary issues, as Hainmueller, Mummolo, and Xu (2019) point out. In particular, (1) the linearity of interactive effects is itself an assumption that must be tested and (2) marginal effects are valid only where treatment and control groups share a common support. To address these issues, I reestimate models (3) and (4) from Table 1 using Hainmueller et al.'s (2019) binning estimator, which allows for nonlinear marginal effects and ensures that marginal effects are estimated at values of

[27] I reverse the scale of this variable so that an increase represents a greater degree of de facto exchange rate rigidity.

	DV: Δ **Restrictions**			
	(1)	**(2)**	**(3)**	**(4)**
Fixed$_t$	0.067	0.073	0.074*	
	(0.080)	(0.059)	(0.040)	
FC Share$_{t-1}$	0.434***	0.429**	0.414***	-0.193
	(0.161)	(0.172)	(0.088)	(0.144)
Fixed$_t \times$ **FC Share**$_{t-1}$	-0.343*	-0.334**	-0.347***	
	(0.175)	(0.161)	(0.069)	
XR Regime$_t$ (Fine)				0.013
				(0.008)
XR Regime$_t \times$ **FC Share**$_{t-1}$				-0.047***
				(0.016)
Democracy$_{t-1}$		-0.001	0.009	0.011
		(0.010)	(0.009)	(0.009)
RGDP/Capita$_{t-1}$		0.066	-0.102*	-0.103*
		(0.068)	(0.059)	(0.059)
Trade/GDP$_{t-1}$		-0.002	-0.000	-0.000
		(0.001)	(0.001)	(0.001)
Capital Openness$_{t-1}$			0.004	0.006
			(0.041)	(0.041)
M2/GDP$_{t-1}$			-0.002	-0.001
			(0.002)	(0.002)
Currency Crisis$_{t-1}$			0.092	0.087
			(0.304)	(0.298)
Foreign Reserves$_{t-1}$			0.000	0.000
			(0.000)	(0.000)
Inflation$_{t-1}$ (%)			-0.001	-0.000
			(0.001)	(0.001)
Unemployment$_{t-1}$ (%)			0.013***	0.013***
			(0.004)	(0.005)
Monetary Independence$_{t-1}$			0.042	0.039
			(0.062)	(0.064)
Right Government$_{t-1}$			-0.083**	-0.072**
			(0.035)	(0.033)
Tradable Value-added$_{t-1}$			-0.019**	-0.020**
			(0.008)	(0.009)
Constant	-0.063	-0.552	1.213	1.342*
	(0.046)	(0.591)	(0.717)	(0.758)
Observations	630	486	307	307
Within R-squared	0.012	0.017	0.096	0.095
Number of countries	48	40	27	27

*** p<0.01, ** p<0.05, * p<0.1

TABLE 1: Linear Interaction Models. Cluster-robust standard errors in parentheses; all models have country FEs

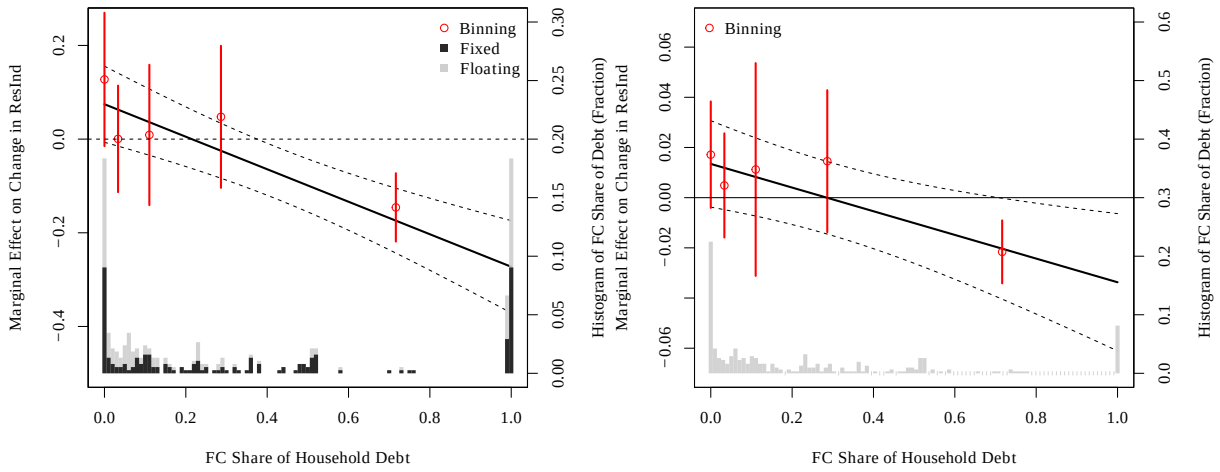


FIGURE 3: Marginal Effects of Exchange Rate Rigidity (Linear and Binning Estimates). Left panel uses dichotomous *Fixed* variable; Wald test statistic for difference between first and fifth bins: 3.84. Right panel uses IRR fine index; Wald test statistic for difference between first and fifth bins: 4.42.

household foreign-currency debt exposure for which there is sufficient data. I display the resulting marginal effects and their confidence intervals as red bars in Figure 3. At bins corresponding to high shares of foreign-currency debt, the marginal effects of changes in regime type are consistent with the linear marginal effects: increasingly rigid exchange rate arrangements are significantly associated with a lower propensity to restrict borrowing. In the data appendix, I show that similar results hold using the semi-parametric kernel estimator proposed in Hainmueller et al. (2019).[28] Finally, panels (A) and (B) of Figure 3 also plot the distribution of the moderator, the share of foreign-currency debt in total household debt. These plots reveal that while there are few countries with household foreign-currency debt exposure shares between 0.6 and 1, the remainder of the distribution appears to satisfy the common support assumption.

There may be some concern about whether these estimates suffer from bias due to reverse causality if, as the model anticipates, an increase in restrictions influences the exchange rate regime—a collapse in a pegged regime, for example. While consistent with the theory, a causal relation of this sort may still lead to the incorrect attribution of an effect leading from exchange rate regime to changes in restrictions. There is some reason to think this may be a nonissue, in

[28]Results for the fine IRR index are weaker when using a cluster bootstrap to construct confidence intervals, however.

light of the specification in (16). A correct mapping of the theory to an empirical specification would hold that changes in restrictions should affect *changes* in the exchange rate regime, rather than the flexibility of the regime itself.[29] Notwithstanding this technical point, the theory suggests a potential shortcut to address any endogeneity from this reverse-causal channel. The crucial observation is that restrictions are only likely to cause a change in the exchange rate regime in in the event of a currency crisis. In extensions to the baseline specification, I thus omit observations for which which a country experiences a contemporaneous currency crisis (as defined by Laeven and Valencia (2018)), while continuing to control for a crisis one year prior. I also try limiting the sample to observations for which the percent change in foreign reserves from the previous year is greater than -20 insofar as currency crises are often accompanied by rapid reductions in reserves. Table 3 in the data appendix reports results that replicate models (3) and (4) from Table 1 but limit the samples according to these criteria.

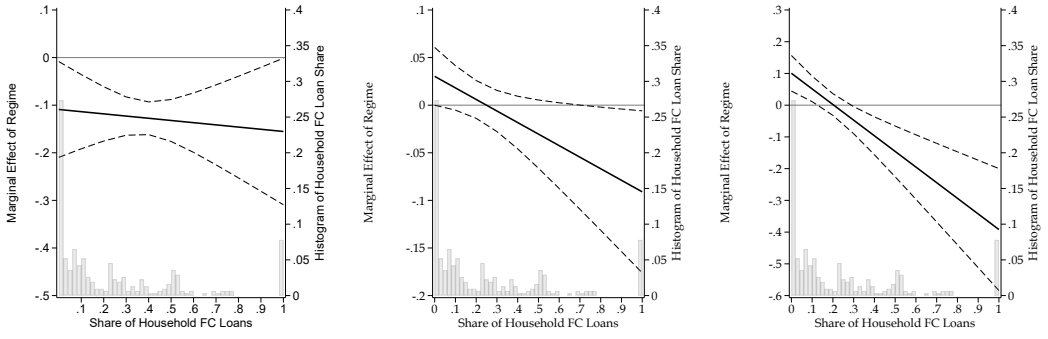
Another concern with the results above may be that regulatory outcomes are driven by unobserved differences in policymakers' risk appetites rather than by concerns about political popularity or electoral survival. Recent research suggests that policymakers in more democratic countries may be more responsive to citizens' demands for credit and consumption, potentially contributing to greater financial instability in democracies (Steinberg et al., 2015; Lipscy, 2018). To explore this possibility, I split the effective sample into two groups—"more democratic" and "less democratic"—corresponding to whether a given country-year has a Polity score greater than or equal to 7. Table 4 in the data appendix reports estimates for these subsamples and shows that while the interaction between the exchange rate regime type variable and household foreign-currency debt exposure remains significant and appropriately signed for democracies, this effect disappears for the less-democratic subsample. Overall, these results support the contention that regulatory outcomes are driven, at least in part, by a political survival mechanism like the one in the model above.

As a final robustness check, I estimate single-equation error-correction model (ECM) to allow the relationship between exchange rate regime, foreign-currency debt, and borrowing restric-

[29] A more rigorous approach to dealing with the potential for reverse causality in this case would be to find an instrumental variable associated with the exchange rate regime but uncorrelated with changes in restrictions, which is a nontrivial endeavor because of the close linkage between foreign-currency debt and the exchange rate.

tions to unfold flexibly over time following the interactive specification in Warner (2019). In contrast to the previous section, an ECM implicitly models the level, as opposed to the change, in borrowing restrictions, thus preserving important information present in cross-national differences in levels of regulation. Standard unit-root and cointegration diagnostic tests presented in the data appendix indicate that the key variables behave like bounded unit roots and are cointegrated. The presence of a cointegrating relationship between borrowing restrictions and foreign-currency debt is theoretically and intuitively appealing. It suggests that while, in the long run, increases in financial vulnerability via foreign-currency debt may be linked to more stringent regulatory actions, other forces may produce short-run deviations from this long-run relationship. I have suggested that one moderator of these deviations is the choice of exchange rate regime.

Figure 4 reports the marginal effects from the ECM estimates for the binary *Fixed* variable and for the fine and coarse IRR indexes. While the marginal effects of the binary *Fixed* variable in panel (A) do not display a pattern of regulation that varies significantly with foreign-currency share of household debt, the results for the fine and coarse IRR regime indexes indicate clearly that increases in exchange rate rigidity are associated with lower levels of regulation beyond a certain share of total debt denominated in foreign currency. These results, along with those presented above, thus represent strong evidence for the claim that fixed exchange rates discourage foreign-currency borrowing restrictions above a particular threshold of foreign-currency indebtedness. The specific location of this threshold appears to be sensitive to model specification choices.



(A) *Fixed* (B) IRR Fine (C) IRR Coarse

FIGURE 4: Marginal Effects from ECMs. Models contain full set of lagged covariates, with standard errors clustered at the country level. Specification allows for four interaction variables of the differenced and lagged values of exchange rate regime and foreign-currency debt share.

5 Depreciation and government approval

Underpinning the claim that policymakers in fixed exchange rate regimes will be reluctant to impose restrictions on foreign-currency borrowing relative to their floating-rate-regime counterparts is an assumption about the extent to which this reluctance is driven by the fear of reprisal from voters who suffer from an exchange rate depreciation. In this section, I present survey evidence consistent with this assumption. While the results do not permit inference about the intention of individual respondents to vote or engage in other forms of civic participation in response to a depreciation, they do suggest that individuals adjust their subjective assessments of the government in the wake of depreciation in ways that reflect their personal financial exposure to depreciation.

5.1 Data and empirical strategy

To examine whether individual voters are likely to punish policymakers who deliver exchange rate depreciation, I use survey data from the Austrian central bank's (*Oesterreichische Nationalbank* (OeNB)) Euro Survey (Oesterreichische Nationalbank, 2019). Beginning in 2007, the OeNB conducted biannual[30] representative surveys of individuals in ten central, eastern, and southeastern European countries. In addition to measuring individual respondents' holdings of foreign-currency-denominated savings and loans, the Euro Survey collects responses to a variety of attitudinal questions regarding the personal economic fortunes of respondents, their evaluation of national economic circumstances, and their expectations regarding the future path of economic variables like inflation and the exchange rate. Roughly 1,000 respondents were surveyed per country in each survey wave.[31]

For the purpose of evaluating **H2**, an ideal empirical setting would involve the direct observation of respondents' attitudes about and approval of incumbent policymakers. In the absence of responses that directly measure approval, I focus instead on a question in the Euro Survey that asks respondents to assess on a five-point scale the degree of "trust" they have in the government

[30] The survey frequency was revised to once per year in 2015.

[31] Additional information about the Euro Survey, including the sampling procedure, can be found at https://www.oenb.at/en/Monetary-Policy/Surveys/OeNB-Euro-Survey/Technical-Details.html.

or cabinet of ministers (with 1 corresponding to "I trust completely" and 5 corresponding to "I do not trust at all").[32] A deep literature on the sources and implications of changes in political trust emphasizes that political trust may be directed toward some combination of both political institutions and specific elected officials (see, e.g. Easton (1965), Miller (1974), Citrin (1974), Keele (2005)), [33] so that the question assessing trust in government may capture broader ideological positions and attitudes about institutions rather than the notion of incumbent approval I seek to capture here. In spite of this ambiguity, however, empirical evidence suggests that lower trust in government does drive voter support for political challengers over incumbents (Hetherington, 1999; Bélanger and Nadeau, 2005; Hooghe, Marien, and Pauwels, 2011). I therefore take responses to the Euro Survey's question about government trust as a useful, albeit noisy, proxy for government approval.

There are two primary independent variables in the analysis. First, to measure a respondent's personal financial exposure to a depreciation, I use responses to a question about the currency-denomination of a respondent's loans. If the respondent indicates having any of their existing loans denominated in foreign currency, I code a binary variable (*Current FC Loan*) equal to one, and zero otherwise (including those without any debt). To measure depreciation, I use the historical percentage change in the euro/local-currency exchange rate over the twelve months prior to each individual respondent's interview date, which can plausibly be taken to be exogenous to contemporaneously-measured government trust. I use the euro exchange rate with the local currency in light of the empirical setting: households in Central and Eastern Europe are more likely to take out loans denominated in euro than in another foreign-currency, at least partly by virtue of their close economic and political ties to the eurozone.[34] In the data appendix, I use the one-year depreciation rates of the local currency against the Swiss franc and the dollar as robustness checks.

My baseline empirical strategy is to estimate linear models in which the dependent variable is the ordered degree of trust in the national government and the independent variables are *Cur-*

[32] Belabed and Hake (2018) also use responses to this question as a dependent variable, but they are interested in the influence of sub-national income inequality on government trust.

[33] For an overview of this literature, see Citrin and Stoker (2018).

[34] This assumption is consistent with, for example, Yeşin's (2013) contention that much of the unhedged foreign-currency liabilities in emerging European countries are denominated in euro, as opposed to dollars or Swiss franc, though the latter was also a popular financing currency before the removal of the franc's peg to the euro in 2015. See also, e.g. European Central Bank (2015).

rent FC Loan, the one-year depreciation of the local currency against the euro, and their interaction:

$$\begin{aligned} GovTrust_i =& \theta_0 + \theta_1 CurrentFCLoan_i + \theta_2 \%\Delta XR_i \\ &+ \theta_3 CurrentFCLoan_i \times \%\Delta XR_i + \beta \mathbf{X}_{i,j} + \alpha_j + \nu_t + \varepsilon_i \end{aligned} \tag{17}$$

for individual i, country or region j, and year of survey t, where β is the vector of coefficients corresponding to the vector of country- and individual-level controls $\mathbf{X}_{i,j}$ and α_j and ν_t correspond to $j-1$ country or region effects and $t-1$ year effects. I expect the coefficient θ_3 on the interaction term to be negative, so that those respondents with some exposure to the exchange rate via foreign-currency debt will hold less favorable evaluations of the government after a depreciation. In most contexts, the ordered dependent variable would suggest a nonlinear model, such as a probit or logit model, estimated via maximum likelihood. However, because the inclusion of group-level (regional and country) fixed effects would run up against the "incidental parameters" problem in the maximum likelihood case (see, e.g. Greene (2004)), and because unobserved heterogeneity likely exists at the group level, I opt for a linear approach that permits the inclusion of such fixed effects. I cluster standard errors at the regional level to account for the possibility that government trust and political approval may be correlated among individuals in the same geographic units.[35] As a robustness check, I use multilevel models to model intra-group variation directly, rather than simply adjusting standard errors.

I include several sets of control variables in the analysis. The first set of controls consists of demographic variables drawn from other questions included in the Euro Survey and capture a respondent's age, education level, profession, income level, and employment status. To account for the possibility that a respondent's borrowing behavior and reaction to a depreciation might depend upon her net exposure to the exchange rate, I include in the baseline specification an indicator variable that equals one if a respondent reports having a foreign-currency-denominated savings account, and zero otherwise.

Second, I include a set of variables that proxy for a respondent's access to credit and knowl-

[35]Survey respondents are nested within NUTS II (*Nomenclature of Territorial Units for Statistics II*) regions, which are in turn nested within countries. Regional clustering of standard errors is consistent with other work using the Euro Survey, including Brown and Stix (2015) and Begović, Adnett, and Pugh (2016).

edge of or experience with exchange-rate risk. To capture access to credit, I include two binary variables indicating whether a respondent's town or village has a bank or an ATM as well as the respondent's evaluation of the time it takes to reach to the nearest bank branch. As a proxy for a respondent's knowledge of exchange rate risk, I use the response to a question that asks the respondent to agree or disagree with the statement, "I know someone who has gotten burned on a foreign currency loan because repayments became much higher than expected." Both a respondent's access to credit and knowledge of exchange rate risk may influence the likelihood of having a current loan in foreign currency. At the same time, if a respondent faces difficulty accessing credit or has second-hand knowledge of the personal financial implications of a depreciation on foreign-currency debt, she may be more likely to negatively evaluate the government. Omitting these variables thus may lead to biased inferences. Because the credit access variables are predetermined with respect to current loans, post-treatment bias due to these variables is unlikely. Similarly, it seems more likely that knowledge of the dangers of foreign-currency debt is a determinant of foreign-currency borrower status rather than a result. Nevertheless, in the data appendix, I show that the results presented below are robust to excluding the credit and exchange rate risk proxies.

A third set of country-level controls attempt to capture macro-level influences on respondents' trust in government and propensity to hold foreign-currency debt, as well as These include the share of income earned by the top 10 percent of the income distribution as a proxy for inequality, real per-capita GDP, the inflation rate, and the unemployment rate. I also include an index of democracy (Polity IV), as less democratic governments could plausibly contribute to lower government trustworthiness and a general pessimism about the future value of the local currency. Data sources and full descriptions of all variables appear in the appendix.

Finally, I include as a control variable the response to a question that taps respondents' trust in the European Union.[36] Greater trust in EU institutions may encourage borrowing in euro and Swiss franc as well as contribute to increased trust in government. More broadly, controlling for trust in the EU serves to support the interpretation of trust in government variable as trust in *domestic* government. In other words, I partial out trust in the EU in order to get closer to

[36]The question is analogous to the one about general government trust, and follows the same response scale.

something like true incumbent approval.

5.2 Results

Table 2 reports the results from estimating linear models for the change in the euro-local currency exchange rate following (17). Models (1) and (2) successively add the sets of covariates discussed above. I include regional- (NUTS II) and year-specific intercepts in each model and standard errors are clustered at the regional level. Model (3) reports the results from a multilevel, or hierarchical, model in which country and region effects enter as random variables (i.e. a "random intercept" model).[37] Diagnostic tests displayed in the table indicate that intra-regional correlation is substantial and that the hierarchical model is favored over a linear approach that does not account for the nested structure of the data.

In all models, the coefficient on *Current FC Loans* is positive and significant, indicating that foreign-currency indebtedness when the exchange rate is stationary is associated with higher distrust of the government. This finding is consistent with early theoretical accounts that see foreign-currency borrowing as the result of a lack of policy credibility.[38] Moreover, in all models except (1), the interaction term is negative and highly significant, implying that a depreciation decreases government trust for respondents with debt denominated in foreign currency. A number of controls are significant and have expected signs. For example, younger and unemployed respondents tend to trust the government less, while having a white-collar job contributes to significantly higher government trust. As anticipated, trust in the EU is positively and significantly associated with government trust. Results of analogous models estimated for the one-year changes in the CHF/LC and USD/LC exchange rates are reported in the data appendix. The results for the latter two exchange rates are qualitatively similar to, if slightly weaker than, those for the EUR/LC.

Figure 5 plots the marginal effect of *Current FC Loans* for a range of one-year changes in the EUR/LC exchange rate, along with the distribution of exchange rate changes corresponding to the estimation sample.[39] This figure demonstrates clear and statistically significant marginal effects of

[37] See, e.g. Gelman and Hill (2007).
[38] See, e.g. Jeanne (2005).
[39] These marginal effects correspond to specification (2) in Table 2.

Gov. Trust	**(1)**	**(2)**	**(3)**
%Δ **EUR/LC**	0.026***	-0.050*	0.091***
	(0.007)	(0.028)	(0.008)
Current FC Loans	0.083**	0.067*	0.073**
	(0.033)	(0.036)	(0.035)
%Δ **EUR/LC** × **Current FC Loans**	-0.013**	-0.013**	-0.014**
	(0.006)	(0.006)	(0.006)
FC Savings	0.010	-0.023	-0.000
	(0.046)	(0.040)	(0.041)
Education	-0.007	0.001	-0.003
	(0.013)	(0.014)	(0.012)
Age	-0.004***	-0.005***	-0.005***
	(0.001)	(0.001)	(0.001)
Female	0.022	0.026	0.023
	(0.024)	(0.024)	(0.021)
Low income	0.015	0.001	0.007
	(0.038)	(0.040)	(0.026)
Unemployed	0.106***	0.098**	0.094***
	(0.039)	(0.041)	(0.030)
White-collar job	-0.096***	-0.107***	-0.106***
	(0.032)	(0.033)	(0.027)
EU Trust	0.352***	0.352***	0.352***
	(0.018)	(0.020)	(0.009)
Bank Far Away	0.019	0.023*	0.024***
	(0.012)	(0.013)	(0.007)
Bank in Village/Town	0.055	0.116	0.083
	(0.084)	(0.082)	(0.058)
ATM in Village/Town	0.041	-0.033	0.009
	(0.090)	(0.085)	(0.058)
Burned FC Loan	-0.024**	-0.021*	-0.024***
	(0.012)	(0.012)	(0.007)
Democracy		0.347**	-0.384
		(0.159)	(0.242)
Inflation (%)		0.862***	-0.338***
		(0.220)	(0.039)
Unemployment (%)		-1.075***	0.001
		(0.221)	(0.016)
Inequality		-111.257***	-15.430***
		(20.565)	(3.114)
Log. GDP Per Capita		-29.102***	-1.535
		(5.441)	(0.640)
Constant	2.339***	325.216***	26.506***
	(0.110)	(59.768)	(5.921)
Intra-class Correlation			
Country			0.050
			(0.037)
Region			0.115
			(0.037)
LR Test (vs. linear model) $\chi^2(2)$			494.78
p-value			0.000
Observations	13,300	11,854	11,854
Est. Method	OLS	OLS	ML
Number of countries			9
Number of regions	102	102	102
Years in sample	2012-2013	2012-2013	2012-2013
R-squared	0.259	0.268	

*** p<0.01, ** p<0.05, * p<0.1

TABLE 2: Results for Linear Models Using One-year Change in EUR/LC. Standard errors clustered at NUTS II level in parentheses; (1)-(3) contain year and region FE. (4) reports multilevel model results with random intercepts at the country and region levels.

foreign-currency indebtedness on government trust when the local currency depreciated over the previous year. In short, holding foreign currency loans and experiencing a one-year local currency depreciation is associated with a significant decrease in government trust (recall that an increase in *Gov Trust* represents lower trust), and this effect strengthens with the size of the depreciation. In contrast, while foreign-currency indebtedness is associated with increased government trust for large appreciations of the local currency, as might be expected, the marginal effects are not statistically significant at this end of the support of exchange rate changes. Marginal effects from the multilevel models are very similar to those in Figure 5, and are displayed in the data appendix.

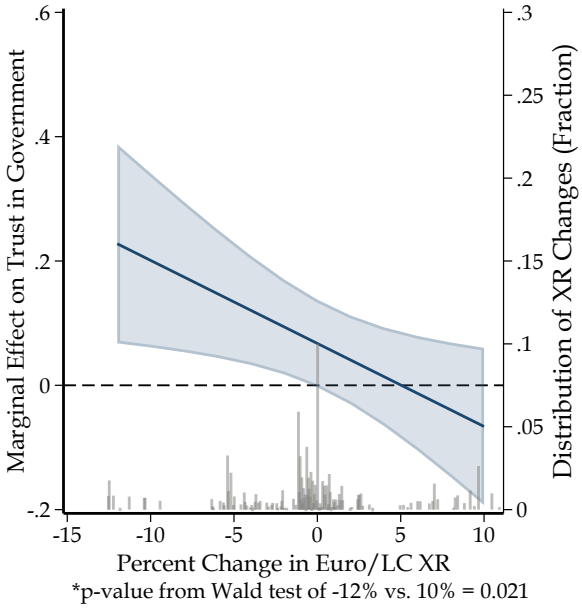


FIGURE 5: Marginal effects of foreign-currency indebtedness for changes in EUR/LC.

As with the cross-national evidence on borrowing restrictions, I check both the linearity and the common support assumptions of the linear interaction models using the diagnostic tools of (Hainmueller et al., 2019). I show in the data appendix that foreign-currency indebtedness continues to reduce government trust in the presence of high levels of depreciation using both binning and semi-parametric kernel estimators, though the marginal effects for the USD/LC exchange rate are only marginally significant for the kernel estimator.[40] The kernel estimator in particular

[40]I establish bin cutoffs to ensure that the evaluation points for the binning estimator correspond to exchange rate changes sufficiently large to prompt a change in government trust.

supports the linearity assumption. These figures also display the distribution of exchange rate changes while distinguishing between respondents with and without foreign-currency loans. Visual inspection of these distributions suggest that there is sufficient variation in foreign-currency indebtedness to satisfy the common support assumption.

In summary, I find clear evidence, consistent with **H2**, that holding foreign-currency debt is associated with a decline in government approval after a depreciation has occurred. While the specific currency composition of respondents' debt is not observable, I confirm that this relationship holds for the euro—the foreign currency in which Central and Eastern European households are most likely to borrow. These results also do not speak to whether foreign-currency borrowers will actually vote on the basis of their balance sheets, though lower government approval in response to a depreciation is at least a precondition for political action. Moreover, the fear that voters will in fact respond at the ballot box may itself be sufficient to produce looser regulatory outcomes.

6 Conclusion

As has been increasingly recognized in the IPE literature, debt provision plays an important political role by virtue of its ability to satisfy popular demands for consumption and increased living standards. The political utility of debt, however, comes at the cost of possible future financial instability. This is especially true of foreign-currency debt, which has been implicated in a number of emerging market financial crises and continues to raise concerns among policymakers.

This paper has argued that the unique characteristics of foreign-currency debt impart an important twist to the standard tradeoff between the political utility of credit extension and the risk of a financial crisis. To explain why policymakers might be reluctant to restrict foreign currency debt in spite of the associated financial stability risks, I have advanced the following narrative: (1) in countries employing an exchange rate peg, policymakers are reluctant to regulate borrowing denominated in foreign currency, because (2) the very act of regulation may signal to market participants that the peg is less-than-fully-credible, and (3) the resulting downward pressure on the exchange rate and mounting foreign-currency debt burdens will spell the political ruin for

these policymakers. In contrast, policymakers in floating-rate regimes have more room to move—they are not hamstrung by preexisting commitments or by the expectations of voters and market participants.

I have presented two sets of empirical evidence for steps (1) and (3) in this narrative. Policymakers in fixed-rate environments are less likely to restrict foreign-currency borrowing, particularly as the exposure of households to a devaluation increases. Survey evidence from central and eastern European countries—no strangers to debt dollarization—suggests that this apparent reluctance on the part of policymakers may be justified. Foreign-currency indebtedness is strongly associated with lower levels of trust in the government after a medium-term depreciation of the local currency. Those without foreign-currency debt display no such pattern in their approval of the government. This evidence is consistent with the political contention and unrest in several CES countries, such as Poland (Ahlquist et al., 2020) and Croatia (Rodik, 2015), that followed the Swiss National Bank's abandonment in 2015 of the Swiss franc's peg to the euro.

I have not interrogated step (2) in the narrative here. Does the imposition of restrictions actually prompt pressure on the exchange rate in countries with exchange rate pegs? While there is some indication that the imposition of capital controls may affect the likelihood of a crisis (Glick and Hutchison, 2000; Glick et al., 2006; Rodriguez and Wu, 2013), the lack of direct evidence on the influence of regulatory changes on market expectations suggests a clear need for further research.

Nevertheless, the evidence presented here is strongly symptomatic of an important constraint on macroprudential policy in emerging and developing economies. This constraint implies an important corollary to Calvo and Reinhart's (2002) famous "fear of floating" thesis. Fixing the exchange rate may lead to financial instability by another, more insidious means: a buildup of cheap foreign-currency debt that is initially politically convenient but eventually becomes a millstone around the necks of policymakers caught between the need to curtail that debt and the prospect of catalyzing the crisis they seek to avoid.

References

Ahlquist, J., Copelovitch, M., and Walter, S. The Political Consequences of External Economic Shocks: Evidence from Poland. *American Journal of Political Science*, 64(4):904–920, feb 2020.

Ahlquist, J. S. and Ansell, B. W. Taking Credit: Redistribution and Borrowing in an Age of Economic Polarization. *World Politics*, 69(4):640–675, 2017.

Ahnert, T., Forbes, K., Friedrich, C., and Reinhardt, D. Macroprudential FX Regulations: Shifting the Snowbanks of FX Vulnerability? Bank of Canada, 2018. Working Paper.

Aizenman, J., Chinn, M. D., and Ito, H. The "Impossible Trinity" Hypothesis in an Era of Global Imbalances. *Review of International Economics*, 21(3):447–458, 2013.

Akinci, O. and Olmstead-Rumsey, J. How Effective Are Macroprudential Policies? An Empirical Investigation. *Journal of Financial Intermediation*, 33:33–57, 2018.

Alesina, A. Macroeconomic Policy in a Two-party System as a Repeated Game. *Quarterly Journal of Economics*, 102(3):651–678, 1987.

Backus, D. and Driffill, J. Inflation and Reputation. *American Economic Review*, 75(3):530–538, 1985.

Baker, A. Macroprudential Regimes and the Politics of Social Purpose. *Review of International Political Economy*, 25(3):293–316, may 2018.

Bartolini, L. and Drazen, A. Capital-Account Liberalization as a Signal. *American Economic Review*, 87(1):138–154, 1997.

Beckmann, E. and Stix, H. Foreign Currency Borrowing and Knowledge About Exchange Rate Risk. *Journal of Economic Behavior and Organization*, 112:1–16, 2015.

Begović, S., Adnett, N., and Pugh, G. An Investigation into the Credibility of Currency Board Arrangements in Bosnia and Herzegovina and Bulgaria. *Journal of Comparative Economics*, 44(3): 787–799, 2016.

Belabed, C. A. and Hake, M. Income Inequality and Trust in National Governments in Central, Eastern and Southeastern Europe. OeNB, 2018. Working Paper.

Bélanger, É. and Nadeau, R. Political Trust and the Vote in Multiparty Elections: The Canadian Case. *European Journal of Political Research*, 44(1):121–146, jan 2005.

Bellemare, M. F., Masaki, T., and Pepinsky, T. B. Lagged Explanatory Variables and the Estimation of Causal Effect. *Journal of Politics*, 79(3):949–963, 2017.

Bordo, M. D., Meissner, C. M., and Stuckler, D. Foreign Currency Debt, Financial Crises and Economic Growth: A Long-Run View. *Journal of International Money and Finance*, 29:642–665, 2010.

Born, B., Ehrmann, M., and Fratzscher, M. Communicating About Macro-prudential Supervision - A New Challenge for Central Banks. *International Finance*, 15(2):179–203, jun 2012.

Brambor, T., Clark, W. R., and Golder, M. Understanding Interaction Models: Improving Empirical Analyses. *Political Analysis*, 14(1):63–82, 2006.

Brown, M. and Stix, H. The Euroization of Bank Deposits in Eastern Europe. *Economic Policy*, (January):95–139, 2015.

Broz, J. L. Partisan Financial Cycles. In Lake, D. A. and Kahler, M., editors, *Politics in the New Hard Times: The Great Recession in Historical Perspective*, pages 75–101. Cornell U.P., Ithaca, NY, 2013.

Broz, J. L., Frieden, J., and Weymouth, S. Exchange Rate Policy Attitudes: Direct Evidence from Survey Data. *IMF Staff Papers*, 55(3), 2008.

Bueno de Mesquita, B., Smith, A., Siverson, R. M., and Morrow, J. *The Logic of Political Survival*. The MIT Press, Cambridge, Massachusetts, 2003.

Caballero, R. J. and Krishnamurthy, A. Excessive Dollar Debt: Financial Development and Underinsurance. *The Journal of Finance*, 58(2):867–893, 2003.

Calvo, G. A. and Reinhart, C. M. Fear of Floating. *The Quarterly Journal of Economics*, 117(2): 351–397, 2002.

Calvo, G. A. and Végh, C. A. Currency Subsitution in Developing Countries: An Introduction. *Revista de Analisis Economico*, 7(1):3–27, 1992.

Cerutti, E., Claessens, S., and Laeven, L. The Use and Effectiveness of Macroprudential Policies: New Evidence. *Journal of Financial Stability*, 28:203–224, feb 2017.

Chinn, M. D. and Ito, H. A New Measure of Financial Openness. *Journal of Comparative Policy Analysis*, 10(3):309–322, 2008.

Cho, I.-K. and Kreps, D. M. Signaling Games and Stable Equilibria. *The Quarterly Journal of Economics*, 102(2):179–221, 1987.

Chwieroth, J. M. and Walter, A. The Financialization of Mass Wealth, Banking Crises and Politics Over the Long Run. *European Journal of International Relations*, 25(4):1007–1034, dec 2019.

Citrin, J. Comment: The Political Relevance of Trust in Government. *American Political Science Review*, 68(3):973–988, 1974.

Citrin, J. and Stoker, L. Political Trust in a Cynical Age. *Annual Review of Political Science*, 21:49–70, 2018.

Cooper, R. Currency Devaluation in Developing Countries. *Essays in International Finance*, 86:3–38, 1971.

Copelovitch, M. and Myren, A. Escaping the Trilemma: Macroeconomic Constraints and the Politics of Countercyclical Credit Management. 2018. Working Paper.

Cordella, T., Federico, P. M., Vegh, C. A., and Vuletin, G. Reserve Requirements in the Brave New Macroprudential World. Technical report, The World Bank, Washington, D.C., 2014.

Corrales, J. and Imam, P. Financial Dollarization of Households and Firms: Does it Differ? 2019. Working Paper.

Crespo-Tenorio, A., Jensen, N. M., and Rosas, G. Political Liabilities: Surviving Banking Crises. *Comparative Political Studies*, 47, 2014.

Dávila, E. and Korinek, A. Pecuniary Externalities in Economies with Financial Frictions. *Review of Economic Studies*, 85(1):352–395, 2018.

De Crescenzio, A., Golin, M., and Ott, A.-C. Currency-based Measures Targeting Banks: Balancing National Regulation of Risk and Financial Openness. OECD, 2015. Working Paper.

Domanski, D. and Ng, T. Getting Effective Macroprudential Policy on the Road: Eight Propositions. Bank for International Settlements, January 2011. Working Paper.

Drazen, A. *Political Economy in Macroeconomics*. Princeton Univ. Press, Princeton, NJ, 2000.

Drazen, A. and Masson, P. R. Credibility of Policies Versus Credibility of Policymakers. *Quarterly Journal of Economics*, 109(3):735–754, 1994.

Easton, D. *A Systems Analysis of Political Life*. Wiley, New York, 1965.

Epstein, D. and Zemsky, P. Money Talks: Deterring Quality Challengers in Congressional Elections. *American Political Science Review*, 89(2):295–308, 1995.

European Central Bank. The International Role of the Euro, 2015.

Fernández, A., Klein, M. W., Rebucci, A., Schindler, M., and Uribe, M. Capital Control Measures: A New Dataset. *IMF Economic Review*, 64(3):548–574, 2016.

Fidrmuc, J., Hake, M., and Stix, H. Households' Foreign Currency Borrowing in Central and Eastern Europe. *Journal of Banking and Finance*, 37:1880–1897, 2013.

Flood, R. P. and Garber, P. M. Collapsing Exchange Rate Regimes: Some Linear Examples. *Journal of International Economics*, 17(1-2):1–13, 1984.

Frankel, J. A. Mundell-Fleming Lecture: Contractionary Currency Crashes in Developing Countries. *IMF Staff Papers*, 52(2):149–192, 2005.

Frieden, J. and Broz, L. The Political Economy of Exchange Rates. In Weingast, B. and Wittman, D., editors, *Oxford Handbook of Political Economy*, pages 587–600. Oxford University Press, Oxford, 2006.

Frieden, J. A. Invested Interests: The Politics of National Economic Policies in a World of Global Finance. *International Organization*, 45(1991):425–451, 1991.

Funke, M., Schularick, M., and Trebesch, C. Going to Extremes: Politics After Financial Crises, 1870–2014. *European Economic Review*, 88:227–260, 2016.

Gelman, A. and Hill, J. *Data Analysis Using Regression and Multilevel/Hierarchical Models*. Cambridge University Press, Cambridge, U.K., 2007.

Glick, R. and Hutchison, M. Stopping 'Hot Money' or Signaling Bad Policy? Capital Controls and the Onset of Currency Crises. University of Copenhagen, 2000. Working Paper.

Glick, R., Guo, X., and Hutchison, M. Currency Crises, Capital-Account Liberalization, and Selection Bias. *Review of Economics and Statistics*, 88(4):698–714, 2006.

Goodhart, L. M. Brave New World? Macro-prudential Policy and the New Political Economy of the Federal Reserve. *Review of International Political Economy*, 22(2):280–310, mar 2015.

Greene, W. The Behaviour of the Maximum Likelihood Estimator of Limited Dependent Variable Models in the Presence of Fixed Effects. *The Econometrics Journal*, 7(1):98–119, 2004.

Grilli, V. and Milesi-Ferretti, G. M. Economic Effects and Structural Determinants of Capital Controls. Technical Report 3, International Monetary Fund, 1995.

Gyöngyösi, G. and Verner, E. Financial Crisis, Creditor-Debtor Conflict, and Populism. 2020. Working Paper.

Hainmueller, J., Mummolo, J., and Xu, Y. How Much Should We Trust Estimates from Multiplicative Interaction Models? Simple Tools to Improve Empirical Practice. *Political Analysis*, 27(2): 163–192, 2019.

Healy, A. J., Persson, M., and Snowberg, E. Digging into the Pocketbook: Evidence on Economic Voting from Income Registry Data Matched to a Voter Survey. *American Political Science Review*, 111(4):771–785, 2017.

Hetherington, M. J. The Effect of Political Trust on the Presidential Vote, 1968-96. *American Political Science Review*, 93(2):311–326, 1999.

Hibbs, D. A. Political Parties and Macroeconomic Policy. *American Political Science Review*, 71(4): 1467–1487, 1977.

Hooghe, M., Marien, S., and Pauwels, T. Where Do Distrusting Voters Turn if There is No Viable Exit or Voice Option? The Impact of Political Trust on Electoral Behaviour in the Belgian Regional Elections of June 2009. *Government and Opposition*, 46(2):245–273, apr 2011.

Ilzetzki, E., Reinhart, C. M., and Rogoff, K. S. Exchange Arrangements Entering the 21st Century: Which Anchor Will Hold? National Bureau of Economic Research, 2017. Working Paper.

Ilzetzki, E., Reinhart, C. M., and Rogoff, K. S. Exchange Arrangements Entering the Twenty-First Century: Which Anchor will Hold? *The Quarterly Journal of Economics*, 134(2):599–646, 2019.

Jeanne, O. Foreign Currency Debt and the Global Financial Architecture. *European Economic Review*, 44(4):719–727, 2000.

Jeanne, O. Why do Emerging Market Economies Borrow in Foreign Curency? In *Other People's Money: Debt Denomination and Financial Instability in Emerging Market Economies*, pages 190–217. University of Chicago Press, Chicago, 2005.

Jeanne, O. Macroprudential Policies in a Global Perspective. In *Prospects for Asia and the Global Economy*. Federal Reserve Bank of San Francisco, 2013.

Jeanne, O. and Korinek, A. Managing Credit Booms and Busts: A Pigouvian Taxation Approach. *Journal of Monetary Economics*, 107:2–17, 2019.

Jones, E. and Matthijs, M. Rethinking Central Bank Independence. *Journal of Democracy*, 30(2), 2019.

Kastner, S. L. and Rector, C. Partisanship and the Path to Financial Openness. *Comparative Political Studies*, 38(5):484–506, jun 2005.

Keele, L. The Authorities Really Do Matter: Party Control and Trust in Government. *Journal of Politics*, 67(3):873–886, 2005.

Korinek, A. The New Economics of Prudential Capital controls: A Research Agenda. *IMF Economic Review*, 59(3):523–561, 2011a.

Korinek, A. Foreign Currency Debt, Risk Premia and Macroeconomic Volatility. *European Economic Review*, 55:371–385, 2011b.

Korinek, A. and Sandri, D. Capital Controls or Macroprudential Regulation? *Journal of International Economics*, 99(S1):S27–S42, 2016.

Kropko, J. and Kubinec, R. Why the Two-Way Fixed Effects Model Is Difficult to Interpret, and What to Do About It. 2018. Working Paper.

Krugman, P. A Model of Balance of Payments Crises. *Journal of Money, Credit and Banking*, 11(3): 311–325, 1979.

Laeven, L. and Valencia, F. Systemic Banking Crises Revisisted. International Monetary Fund, 2018. Working Paper.

Levy Yeyati, E. Financial Dollarization: Evaluating the Consequences. *Economic Policy*, 21(45): 61–118, 2006.

Lipscy, P. Y. Democracy and Financial Crisis. *International Organization*, 72(4):937–968, 2018.

McCarty, N. and Meirowitz, A. *Political Game Theory*. Cambridge University Press, Cambridge, U.K., 2007.

Mian, A., Sufi, A., and Trebbi, F. Resolving debt overhang: Political constraints in the aftermath of financial crises. *American Economic Journal: Macroeconomics*, 6(2):1–28, 2014.

Miller, A. H. Political Issues and Trust in Government. *American Political Science Review*, 68(3): 951–972, 1974.

Morris, S. and Shin, H. S. Unique Equilibrium in a Model of Self-Fulfilling Currency Attacks. *American Economic Review*, 88(3):587–597, 1998.

Obstfeld, M. Rational and Self-Fulfilling Balance of Payments Crisis. *American Economic Review*, 76(1):72–81, 1986.

Obstfeld, M. The Logic of Currency Crises. In Eichengreen, B., Frieden, J., and von Hagen, J., editors, *Monetary and Fiscal Policy in an Integrated Europe*, pages 62–90. Springer-Verlag, Berlin, 1995.

Obstfeld, M. Models of Currency Crises with Self-fulfilling Features. *European Economic Review*, 40(3-5):1037–1047, 1996.

Oesterreichische Nationalbank. OeNB Euro Survey, 2019.

Ostry, J. D., Ghosh, A. R., Chamon, M., and Qureshi, M. S. Tools for Managing Financial-Stability Risks from Capital Inflows. *Journal of International Economics*, 88(2):407–421, 2012.

Quinn, D. The Correlates of Change in International Financial Regulation. *American Political Science Review*, 91(3):531–551, 1997.

Quinn, D. P. and Inclan, C. The Origins of Financial Openness: A Study of Current and Capital Account Liberalization. *American Journal of Political Science*, 41(3):771–813, 1997.

Rajan, R. G. *Fault Lines: How Hidden Fractures Still Threaten the World Economy*. Princeton Univ. Press, Princeton, NJ, 2010.

Ranciere, R., Tornell, A., and Vamvakidis, A. Currency Mismatch, Systemic Risk and Growth in Emerging Europe. *Economic Policy*, 25(64):597–658, 2010.

Rodik, P. The Impact of the Swiss Franc Loans Crisis on Croatian Households. In Değirmencioğlu, S. M. and Walker, C., editors, *Social and Psychological Dimensions of Personal Debt and the Debt Industry*, pages 1–304. Palgrave Macmillan, London, U.K., 2015.

Rodriguez, M. and Wu, T. The Effect of Capital Controls and Prudential FX Measures on Options-Implied Exchange Rate Stability. Federal Reserve Bank of San Francisco, 2013. Working Paper.

Schindler, M. Measuring Financial Integration: A New Data Set. *IMF Staff Papers*, 56(1):222–238, 2009.

Singer, D. A. *Regulating Capital: Setting Standards for the International System*. Cornell U.P., Ithaca, NY, 2007.

Singer, M. M. and Carlin, R. E. Context Counts: The Election Cycle, Development, and the Nature of Economic Voting. *Journal of Politics*, 75(3):730–742, 2013.

Steinberg, D. A. *Demanding Devaluation: Exchange Rate Politics in the Developing World*. Cornell U.P., Ithaca, NY, 2015.

Steinberg, D. A. Economic Interests and Voter Attitudes about Currency Crises: Evidence from Turkey. 2019. Working Paper.

Steinberg, D. A., Koesel, K. J., and Thompson, N. W. Political Regimes and Currency Crises. *Economics and Politics*, 27(3):337–361, 2015.

Stellinga, B. and Mügge, D. The Regulator's Conundrum: How Market Reflexivity Limits Fundamental Financial Reform. *Review of International Political Economy*, 24(3):393–423, may 2017.

Verner, E. and Gyöngyösi, G. Household Debt Revaluation and the Real Economy: Evidence from a Foreign Currency Debt Crisis. 2020. Working Paper.

Visconti, G. Economic Perceptions and Electoral Choices: A Design-Based Approach. *Political Science Research and Methods*, pages 1–19., 2017.

Warner, Z. Conditional Relationships in Dynamic Models. 2019. Working Paper.

Weingast, B. The Congressional-Bureaucratic System: A Principal Agent Perspective (with applications to the SEC). *Public Choice*, 44(1):147–191, 1984.

Yeşin, P. Foreign Currency Loans and Systemic Risk in Europe. *Federal Reserve Bank of St. Louis Review*, 95(3):219–235, 2013.

Zucco, J., Cesar. When Payouts Pay Off: Conditional Cash Transfers and Voting Behavior in Brazil 2002-10. *American Journal of Political Science*, 57(4):810–822, 2013.

A Mathematical Appendix

A.1 Proof of Proposition 3.4

Proof. Consider the following set of strategies and beliefs as an equilibrium candidate: The H-type policymaker always sets $\psi = 1$. The L-type policymaker mixes between restricting and not restricting with δ denoting the probability that she restricts borrowing, $\Pr(\psi = 1|\theta_i = \theta_L)$. Conditional on observing $\psi = 1$, the speculator mixes between attacking and refraining from attacking the peg, where λ denotes the probability that she attacks. Conditional on observing $\psi = 0$, the speculator always attacks.[41]

As in the pooling equilibrium, it is never optimal for the H-type policymaker to restrict borrowing, since the peg never breaks, even under a speculative attack. This implies that the speculator must hold the belief $\Pr(\theta_i = \theta_H|\psi = 0) = 0$. Note that this implies that $\Pr(\theta_i = \theta_L|\psi =$

[41] This equilibrium is similar to the partial-pooling equilibrium (Case 3) in Epstein and Zemsky (1995), discussed also in McCarty and Meirowitz (2007).

$0) = 1$, so that the speculator always attacks when she observes $\psi = 0$. The speculator uses Bayes' rule to formulate beliefs when $\psi = 1$, so that:

$$\begin{aligned} \Pr(\theta_i = \theta_H | \psi = 1) &= \frac{\Pr(\psi=1|\theta_i=\theta_H)\Pr(\theta_i=\theta_H)}{\Pr(\psi=1|\theta_i=\theta_H)\Pr(\theta_i=\theta_H)+\Pr(\psi=1|\theta_i=\theta_L)\Pr(\theta_i=\theta_L)} \\ &= \frac{\alpha}{\alpha+\delta(1-\alpha)} \end{aligned} \tag{18}$$

with $\Pr(\theta_i = \theta_L | \psi = 1)$ formulated analogously.

If the L-type policymaker mixes strategies, then the speculator must be indifferent between attacking and not attacking the currency when $\psi = 1$. This requires that

$$\Pr(\theta_i = \theta_H | \psi = 1)(-t) + \Pr(\theta_i = \theta_L | \psi = 1)(f(\theta_L) - e^* - t) = 0 \tag{19}$$

$$\frac{-t\alpha}{\alpha + \delta(1-\alpha)} + \left(1 - \frac{\alpha}{\alpha + \delta(1-\alpha)}\right)(f(\theta_L) - e^* - t) \tag{20}$$

which is satisfied for

$$\delta = \frac{\alpha t}{(1-\alpha)(f(\theta_L) - e^* - t)} \tag{21}$$

We require that this probability be less than or equal to one, which imposes a condition on α:

$$\alpha \leq 1 - \frac{t}{f(\theta_L) - e^*} \equiv \hat{\alpha} \tag{22}$$

This condition highlights why it is necessary for the speculator to also mix strategies in an equilibrium. If the speculator pursues the pure strategy in which she attacks with certainty if (10) holds, there is no $\delta \leq 1$ such that mixing strategies is optimal for the L-type policymaker—she can profitably deviate by fully restricting borrowing. Thus, uncertainty about the speculator's strategy serves to sustain the partial-pooling equilibrium.

If the speculator mixes strategies, the L-type policymaker must be indifferent between setting $\psi = 0$ and $\psi = 1$. This requires

$$\begin{aligned} \lambda(y - \beta\gamma_0) + (1-\lambda)(y + \beta(y - e^* F_0)) = \\ \lambda(y + e^* F_1 - \beta\gamma_1) + (1-\lambda)(y + e^* F_1 + \beta(y - e^* F_1 - e^* F_0)) \end{aligned} \tag{23}$$

which simplifies to

$$\lambda = \frac{(1-\beta)e^* F_1}{\beta(\gamma_1 - \gamma_0 - e^* F_1)} \tag{24}$$

Note that this probability is less than or equal to one if

$$\frac{e^* F_1}{\beta} \leq \gamma_1 - \gamma_0 \tag{25}$$

which is true by assumption 3.1. □