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The entrapment of major holders: how big financial players shape the future of the US dollar

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Abstract The global dominance of the US dollar as the key currency of the post-Bretton Woods monetary system rests on the cooperation of private financial markets as well as foreign central banks. The latter, in particular, avoid the collapse of the dollar's value in periods of economic distress and bearish market cycles using two policies. One is the accumulation of more-than-necessary foreign exchange reserves denominated in US dollars. The second is following the Federal Reserve's interest-rate policy to assure a steady flow of investments towards the American market. This research focuses on this second practice in order to improve our still insufficient understanding of the actual drivers of foreign countries' reaction to the Fed's policy moves. The article contributes to the existing debates in international political economy regarding the determinants of macroeconomic adjustments among interdependent economies. Specifically, it assesses the role played, in this respect, by the relative size of a country's stock of foreign assets. According to the findings, corroborated through a within-between regression over a large panel of countries, in economies holding relatively less dollar-denominated securities monetary authorities are less prone to sacrifice an autonomous governance of interest rates for cushioning the consequences of imbalances in the global payment system.
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Introduction

On the empirical ground, the Federal Reserve's target interest rate is widely recognised as a primary driver of other central banks' choices over monetary policy (Gray 2013; Belke and Gros 2005; Çelik and Deniz 2010; Beckworth and Crowe 2012). Notably, the fact of getting other central banks and governments look at the

Fed's decisions before setting up their policies implies paramount consequences for the United States' capacity to pursue its own economic and political agenda autonomously. Decades of studies testify that the dominance of the US dollar on global markets, being the most used currency as unit of account, means of payment and reserve asset worldwide, represents also a cornerstone of Washington's military and political influence on global affairs (Helleiner 2009, 2013; Helleiner and Kirshner 2009; Kelly 1977; Kirshner 2008; Cohen 2009, 2011; Fields and Vernengo 2011; Eichengreen 2011; Norrlof 2010, 2014; Otero-Iglesias and Steinberg 2013; Setser 2008; Stokes 2014, Strange 1971, 1987).

Given the relevant consequences implied by this asymmetry in the politics of monetary institutions, scholars in both IR and economics have developed a vast body of literature to explain its determinants. This theoretical corpus — mostly known in International Political Economy (IPE) as the 'monetary power' debate (Cohen 2006, 2008, 2012) — aims to explain the causes of hierarchy among currencies and central banks, including the role of minor states that abandon their policy autonomy to mirror the choices made by monetary authorities in major external powers. Many of these theories, primarily, put in the spotlight the bargaining weapons in the hands of the great powers (or 'monetary leaders') to coerce or induce minor states (namely, 'monetary followers') to follow the leaders' policies in spite of possibly opposite incentives.

Despite the vast literature developed so far on the topic, our knowledge of what determines states' responses to the monetary policy of the US central bank is still partially incomplete and empirically fragile. Currently, the privilege of the American leadership is typically explained by the domestic weaknesses of minor states, or the patterns of military, trade and financial dependency exerted by the United States on the rest of the international system. Undoubtedly, these groups of variables represent the cornerstone of the political economy of monetary leadership and followership. However, empirical inconsistencies have emerged specifically during the recent crisis (2007–2009), as many countries broke their bond with the US dollar despite the fact that current theories would have predicted otherwise. Especially small countries in the Persian Gulf, Latin America and South East Asia have shown remarkable degrees of autonomy *vis à vis* the intense monetary shock conveyed by the Fed before and after the breakup of the subprime mortgage crisis.

Consequently, in this article, I add the contribution of an unexplored variable explaining monetary followership: the relative size of a country's stock of foreign assets. Proceeding from the established conclusions in political economy on the relation between size and cooperative attitudes (Olson 1965; Olson and Zeckhauser 1966) and from the intuition of Kirsher (1995) about the 'entrapment' of creditor economies in international financial transactions, I model a static game with complete information to assess strategic interactions of a debtor monetary leader with the small and medium-sized creditor countries. Therefore, I verify the intuition that countries holding relatively more dollar-denominated assets are also

the ones more incentivised to sterilise the moves of the Federal Reserve through their monetary institutions.

Empirically as well as theoretically, this study provides a significant value addition compared with previous works. Firstly, the accurate formalisation of strategic interactions within a hierarchical monetary system and the addition of a previously unconsidered variable -represent a primary theoretical contribution to the scholarly debate on power and hegemony in monetary affairs. Secondly, the statistical model tests, with counterintuitive results, variables that have been previously conceived to explain exchange-rate regimes on a diverse dependent variable like central banks' choice of interest rates. Thirdly, the model works through an up-to-date methodological tool like the within-between random effect formulation, which produces robust coefficients for panel datasets despite the compresence of time-variant and time-invariant covariates. Lastly, it provides an econometric testing for the contribution of variables that have been previously treated exclusively through case study analysis, such as military alliances.

The paper is organised as follows. The "Introduction" section introduces the general theoretical framework of the paper, revolving around the distributive conflicts and the reasons for hierarchy in the politics of a monetary system. The "The debate on hierarchy, macroeconomic adjustments and the role of minor states" section reviews the state of the art in theories designed to explain one possible outcome of this bargaining, namely, the monetary followership of minor states. In the "Alliances, entrapment and trade networks: why minor countries follow" section, I formalise a model to improve our understanding of the role played by states' financial size in this bargaining scenario, making explicit the main hypothesis of the paper. In the "Modelling leader–follower and intra-follower relations" section, I outline the model specification for the econometric test, while in the "Empirical testing: data and model specification" section, I argue about methodological issues and provide the main results with some brief comment. The final section concludes with some substantial considerations on the future of the 'dollar standard' and the consequent policy dilemmas for the United States' leadership.

The debate on hierarchy, macroeconomic adjustments and the role of minor states

The crude fact of hierarchy and subordination among central banks and currencies has been historically at the centre of the theoretical reflection on the nature and mechanisms characterising interstate relations in the monetary system. Proceeding from the seminal 'The Politics of International Currencies' (Strange 1971), and passing through 'The Geography of Money' (Cohen 1998) with its famous 'currency pyramid', the focus has often been on depicting the patently unequal and hierarchical nature of international currency markets.

Indeed, both contributions offer a taxonomy for the classification of different national currencies based on their use, popularity and strength in international financial markets. For instance, both in Cohen and Strange's schemes, we find the term 'top currency', indicating those national coinages that are massively and globally used as unit of account, reserve asset and exchange currency by both private and public actors. such as today's US dollar or the British pound in the 19th century. Continuing with Cohen's pyramid, the more updated and complete, just below in the hierarchy we find the 'patrician currency', which enjoys a wide use by states and investors as well, though it is limited either in its geographical or sectorial scope. The other five categories ('elite', 'plebeian', 'permeated', 'quasi-'and 'pseudo-currency') mark a further step towards more instability, less market trust and increasing tendency to substitution and devaluation as typically observed in deeply underdeveloped economies.

The currency pyramid represents a remarkable descriptive instrument for the analysis of international systems, but leaves unanswered the causal story about why some moneys are more stable and demanded than others, or how this hierarchy is formed and maintained. Today, for instance, the world has undoubtedly one top currency, the US dollar, while several 'patrician', 'elite' and 'plebeian' currencies have not just renounced to challenge the greenback, but are actively supporting its apical position via monetary followership. Looking at economic theory, one of the essential elements for a top currency to maintain its position in the pyramid is to enjoy a favourable distribution of macroeconomic adjustments. Being a key determinant of exchange-rate fluctuations in the system, the payment disequilibrium between the top currency issuer and its neighbours turns decisive especially when, like in this case, the supposed leader tends to accumulate excessive international liabilities.

To recall briefly the issue, macroeconomic (or payment) imbalances are symmetric stocks of international debts and credits in different economies generated in economic systems open to trade and financial transactions as a consequence of persistent deficits or surpluses in the actors' balance of payments. If not corrected by exchange-rate fluctuations or consistent macroeconomic manoeuvres, they create market tensions that sooner or later impact on indebted economies, pushing their currencies to a painful depreciation and other forms of financial distress (Andrews 2006). In principle, policy coordination among central banks and governments could ease the deleveraging on the existing debts and avoid undesired currency fluctuations, but powerful states, especially if playing the role of international debtors, have good reasons not to give up on their policy autonomy and the stability of their coinage. This, in a nutshell, generates the conflict between these actors, generally defined as leaders or hegemons, and other countries, which are basically required to sacrifice their own policy freedom for smoothing the deleveraging of the leader's international debts (Truman 2010; Webb 1995).

For example, the problem of the so-called 'dollar standard' — the current system revolving around the dominance of the US dollar — lies in the outstanding level of foreign indebtedness reached by the American government and its private financial

sector in the last fifteen years. Should the United States bear the burdens of deleveraging on such amount of debts, the process of adjustment may imply a belt-tightening in domestic consumptions and investments or an abrupt fall of the US dollar on international currency markets. Both outcomes, needless to say, would certainly question the military, political and economic power of the United States as the sole superpower left in the post-Cold War era, as well as the top position of the greenback in the currency pyramid (Vermeiren 2010, 2013).

However, Washington has avoided these scenarios as yet through the willingness of its monetary followers to stockpile huge reserves in dollar-denominated securities and minimising the gap between the Federal Reserve's interest rate and those applied by local authorities. Thanks to low interest-rate differentials with other markets, this guarantees the flow of foreign investments to the hypertrophic US capital market, which props up the value of the dollar considerably against major world currencies. Followership, though, has not come without consequences for foreign countries. Their private and public sectors have frequently faced episodes of imported inflation, excessive exchange risk, defaults and depreciation of private firms' securities, mainly because of the scarce diversification of their assets and the dysfunctionality of an imported monetary policy.

In order to make sense of this blatantly unequal bargaining outcome, in recent years, Cohen has elaborated a second concept, 'monetary power' (Cohen 2006, 2008, 2012), establishing a general framework for the analysis of the bargaining on macroeconomic adjustments. A state's 'monetary power' consists indeed of a twofold capacity for autonomy and influence named, respectively, 'power to delay' and 'power to deflect' (Cohen 2008), whose main advantage is to increase an economy's ability to experience protracted payment imbalances with no consequences for exchange rates and policy autonomy. Concretely, while the 'power to delay' measures each actor's own capacity to ignore the pressure for adjustment coming from financial markets (for example, thanks to a huge buffer of official reserves), the 'power to deflect' concerns states' ability to shift the burden of policy adjustment onto other states by using a wide range of bargaining weapons.

The power to deflect, and particularly its outcome for small and intermediate actors in the system, represents the object of this research. More precisely, the analysis concentrates on a specific tool, peculiar to hegemonic actors with a tendency to accumulate international liabilities, that previous studies have defined as the 'entrapment' mechanism (Kirshner 1995). In brief, 'entrapment' adapts to interstate monetary relations the old-fashioned habit of bankers to grant a preferential treatment to big debtors, with the US financial system in the role of the large over-indebted obligor. Both the formal model and the speculative discussion that follow are based on the intuition that this mechanism does not operate equally for countries of different sizes, but exerts a stronger impact on the major holders of foreign assets denominated in US dollars. A complete review of the entrapment

hypothesis is provided in the next section together with other established theories on the causes of monetary followership.

Alliances, entrapment and trade networks: why minor countries follow

Contrary to monetary leaders, states with a small or intermediate weight in the international financial system cannot get away permanently with the trilemma among stable exchange rates, an open economic system, and an autonomous monetary policy (Mundell 1961, 1963; Fleming 1962). If anything, small and intermediate actors retain some possibility to maximise policy autonomy by sacrificing selectively or temporarily one of the other sides of the triangle. Nonetheless, even if they do have an alternative, many countries have historically preferred to track systematically the interest rates of some external and powerful actor to secure a stable currency and an open economic system. Vast research has aimed to detect the tools of leaders' power to deflect inducing other countries to follow this path instead of pursuing an optimal policy mix with a neutral strategy.

In this brief review section, given the focus on the United States and its allies in the present international system, I emphasise the hypotheses elaborated to explain the behaviour of creditor or surplus economies[1] operating in a hierarchical system led by a deficit/debtor leader. In order to deal with such condition, three groups of alternative explanations have been identified.

The first hypothesis links the surplus follower's trade dependency on a single external market for goods and services to its choices about exchange rate policy. The trade dependency hypothesis may be referred either to a country's imports or exports. Within the first strand, Plümper and Neumayer (2011) assess that the share of imports from both the leader country and its currency area is a strong predictor of minor economies' choice of a particular currency anchor, findings confirmed in an earlier work by Meissner and Oomes (2008).

On the other hand, theories of export dependency — also known in the scholarly debate as 'Bretton Woods II' (Dooley *et al.* 2004) or the 'mercantilist hypothesis' (Aizenman and Lee 2007) — posit that follower countries peg their currencies to an external anchor in order to develop a mercantilist export-led growth strategy (Spiro 2012; Levy-Yeyati *et al.* 2013). In other words, according to this idea, monetary followership would be functional to an export-oriented model of economic development where domestic demand and imports get compressed, while exports are channelled to the world's larger market (the United States) thanks to an undervalued exchange rate with the US dollar. Zero or low differentials in interest rates with the Fed guarantee that arbitrage opportunities do not jeopardise the link between local currencies in developing nations and the American currency, and they make easier to maintain the pegs to the dollar via foreign exchange intervention.

The second group of hypotheses considers determinant the link between the politics of money and the broader context of international security, presently

characterised by an unrivalled unipolarism pivoting on a vast network of US-led military agreements. As previously mentioned, indeed, the repercussions of a monetary leadership affect the leader's military power deeply with respect to technological development, overseas projection and availability of wartime resources (Gilpin and Gilpin 1987; Knorr 1975; Kelly 1977; Eichengreen 2011; Cappella 2013, 2014). Therefore, whenever the security of a minor state depends heavily on the military capabilities of a major power, the former is more likely to sacrifice its domestic prerogatives for preserving the economic privileges enjoyed by its security provider. Hence, followers that are also military partners acquire an interest in a strong and stable US dollar, thus improving Washington's capacity to advance its interests around the globe and purchase military-related imports from international sources. So far, a case study approach has dominated the empirical ground of this hypothesis (Murphy 2006; Mastanduno 1998; Stokes 2014; Norrlof 2010; Zimmerman 2002; Hanrieder 1989; Gavin 2003), while this research provides a broader statistical test on a larger panel of cases.

The last group of hypotheses, in which we find the so-called 'entrapment theory', relies on surplus countries' dependency on the leader's financial products, and is early modelled by Johnathan Kirshner in his seminal 'Currency and Coercion' (1995). This author argues that surplus countries, prone to hoard foreign assets denominated in the core currency during periods of economic growth, may find themselves obliged (i.e. 'entrapped') to undertake pro-cyclical policies in times of economic distress due to their dependency on the revenues and the value generated by those credits. The logic underlying this point is that creditors of the United States (whether they invest in public or private securities) use monetary and exchange rate tools to prevent excessive depreciations of the dollar *vis à vis* their domestic coinages. Otherwise, painful capital losses may be expected due to exchange rate adjustments on their assets' value, and revenues from these investments can fall significantly when converted into local currencies or other international coinages. Conversely, a strong US dollar increases the local currency revenues from overseas investments and strengthens a minor country's solvency on international markets.

In this paper, I in fact expand upon and refine this hypothesis by adding to its mechanism the effect of *relative* financial size. Indeed, Kirshner's argument does not evaluate the different incentives distinguishing countries with a larger or a smaller financial stock, and looks exclusively at the effect of financial dependency on exchange rate regimes rather than focusing on monetary policy as a whole. The intuition which is demonstrated in the next sections is the exact opposite. Being large creditors of a major systemic actor entails an incentive to followership just if the holder is a price-maker, or at least an influential actor, on the foreign exchange market. In contrast, small relative holders of core-currency assets see no advantage in sacrificing their sovereign prerogatives to support the system when their contribution is almost ineffective as regards market dynamics.

Modelling leader–follower and intra-follower relations

The key argument of this article is that current theories, although able to account for a good part of the variance in states' attitude towards the Fed, still seem incomplete against the empirical picture of the last decades and the theoretical insight of a possible divide between medium-sized and small powers underpinning states' choices.

The case for small economies abandoning a previous followership to the Fed has significantly characterised the global economic stage before and after the financial meltdown of 2008 and the beginning of a hyper-expansive monetary cycle in the United States. To mention but a few examples, in 2005, Malaysia dropped its currency peg to the dollar and tightened monetary policy to fight inflationary pressures. Kuwait followed in 2007 with a similar dynamic. Also in 2007, in the Persian Gulf, Qatar and Oman, albeit formally anchored to the US dollar, started to diversify their foreign assets and diverge from the Fed's benchmark interest rates (Abbas 2007; US Department of State 2008). The same strategy of high interest rates plus foreign exchange intervention was observable in Venezuela, at least as long as oil prices remained high before the crisis and Caracas' foreign reserves were increasing.

Notably, all the mentioned actors showed compelling motives for maintaining their followership to Washington according to current theories — military and political commitments, tight trade relations, or the dependency on the US capital market — yet, these failed to exert enough grip on policymakers given the pressure of the opposite economic incentives to defect. By contrast, major financial hubs living a similar situation in macroeconomic terms, such as South Korea, Hong Kong, Saudi Arabia or Japan, did not defect. From the theoretical perspective, this suggests the existence of a multilevel bargaining scenario, where the incentives deployed by the leader to induce followership do not wield the same effect on small and intermediate powers, respectively.

Below the leader–follower bargaining level, indeed, minor states are also in conflict among themselves to shift as much as possible of the cost of smoothing the payment system onto their neighbours. Small holders (in relative terms) of securities and other assets denominated in the core currency enjoy a scarce power to modify market prices in the system, specifically as regards the exchange rate. Major holders, in contrast, can cause the collapse of a currency on foreign exchange markets by massively selling their holdings or simply by stopping to buy core-currency assets, and this, paradoxically, may ostensibly weaken their bargaining position. Thus far, although some authors have conceived of the possibility of a major/minor holder divide affecting states' decisions (Setser 2008; Steiner 2013), they have never gone beyond sporadic and anecdotic mentions of specific instances.

Instead, proceeding from these scope conditions, I propose a generalisable game-theoretical scheme depicting the interaction among potential followers in a

hierarchical system characterised by the free circulation of trade and capital flows. In this model, the leader is assumed to play autonomously as nature move, and potential followers choose between two alternative moves: followership and neutrality. Likewise, major holders (if more than one) are assumed to cooperate for the stability of the core currency. Non-leader actors, whatever their relative financial size, hold the following utility function:

$$U_i = S - F_i - k_i C_{\text{INS}} + \gamma_j F_j \tag{1.1}$$

$$U_j = S - F_j - k_j C_{\text{INS}} + \gamma_i F_i \tag{1.2}$$

where, in this specific case, i is a major holder and j is a small holder. Other variables in the formula are defined as follows.

$$S = \mu\left(\gamma_i F_i + \gamma_j F_j\right) U_i = S - F_i - k_i C_{\text{INS}} + \gamma_j F_j \tag{2}$$

where variable $S \in [0, 1]$ and represents the payoff for currency stability,[2] which is universally enjoyable by all countries once produced (public good). The stability of the core currency is a product of the policy coordination among minor states, where $F_{i,j}$ represent the policy move of each actor, valued 1 if states follow the leader's monetary moves and 0 if they remain neutral. The contribution of each state is weighted for its relative financial size:

$$\gamma_{i,j} = \frac{\text{stock of core} - \text{currency assets held by country } i,j}{\text{total core-currency liabilities held by foreign actors}}$$

The parameter is $\gamma_{i,j} \in [0, 1]$. It represents the share of assets and reserves denominated in the core currency held by private or public investors in any given country. Accordingly, $\gamma_i + \gamma_j = 1$. Lastly, $\mu \in [0, 1]$ discounts the action of states i and j for the 'health' of the core currency on international financial markets and other economic conditions of the whole system. When $\mu = 1$, the core currency is convincingly held by foreign markets and central banks thanks to the strengths of its own fundamentals, thus, the followership of minor states is entirely active in maintaining its top status. Conversely, when $\mu < 1$, the efficacy of the actions of followers in favour of the core currency weakens due to a negative multiplier implying frictions in the market. Moving on to another variable:

$$C_{\text{ins}} = 1 - S^3 = 1 - \mu\left(\gamma_i F_i + \gamma_j F_j\right) \tag{3}$$

The variable C_{ins} (costs of instability), multiplied by the parameter k, measures the selective (country-specific) cost paid by each potential follower in case the public good (core currency stability) is under produced. Following Eq. (3) indeed, $C_{\text{ins}} = 0$ if $S \approx 1$, while $C_{\text{ins}} = 1$ whenever the coordination among followers fails and the public good is not provided adequately ($S \approx 0$)0.[3] In order to weigh these

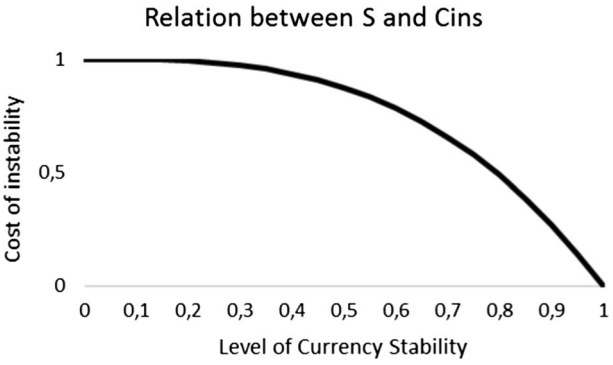

Figure 1 Relation between C_{ins} and S (with $\mu = 1$).

costs for the importance of country-specific incentives, the parameter $k \in [0, 1]$ measures the impact of domestic factors, economic or military dependencies in determining the relevance of a stable core currency for policymakers in peripheral countries. A graphical representation of the relation between S and C_{ins} (with a constant $k = 1$) is available below Figure 1.

In the previous discussion over the nature of strategic interactions in asymmetrical monetary systems, it has been emphasised that monetary and exchange-rate coordination, while essential for the preservation of currency stability *vis à vis* macroeconomic imbalances, is a liability for minor countries given the importance of policy autonomy to manage essential economic and political exigencies. This is why $F_{i,j}$, not pondered for γ, holds a negative sign. In contrast, the last variable means that in any possible situation states prefer to share the burden rather than going alone in supporting the leader's currency, of course weighing the contribution so that each partner can contribute to the common effort.

Finally, to assess the divide of bargaining power between major and minor holders of core currency assets, I assume $\gamma_i \approx 1$ since the core currency stability is guaranteed solely with the unilateral coordination of a primary owner. Conversely, $\gamma_j \approx 0$ in small holders, since their effect on market prices, by definition, is slightly positive or null. For simplicity, in this model it is also assumed $\mu = 1$ and $k_{i,j} = 1$.[4] After many simplifications, the resulting utility functions look as follows:

$$U_i(\mu, k_i, \gamma_j) = F_i^3 - 1 \tag{4.1}$$

$$U_j(\mu, k_j, \gamma_i) = 2F_i + F_i^3 - F_j - 1 \tag{4.2}$$

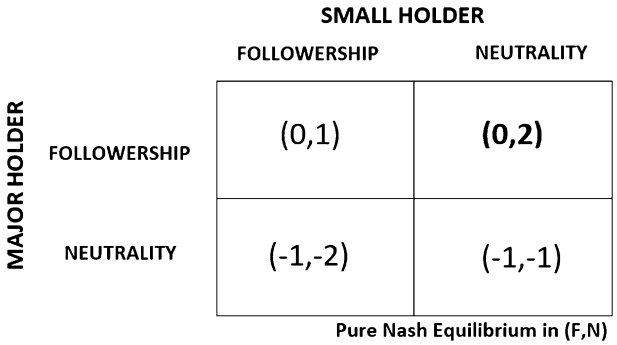

Figure 2 Payoff matrix of the strategic interaction between major holder (*i*) and small holder (*j*).

Lastly, actual policy moves along the range followership–neutrality can be inputted into the model, producing the following payoff scheme: Figure 2[5]

With this simple modelling, I suggest that countries' expected influence over global dynamics has a consequence for their preference for followership or neutrality in monetary policy. Indeed, it is easy to note that major holders deciding to follow the leader, and possibly peg their currency, experience a positive feedback effect due to the maximisation of the core currency stability (S) and the minimisation of the costs of instability (C_{ins}). This effect, thanks to the huge volumes of transactions managed by investors in these countries, largely overweighs the disutility of followership due to the loss of control over important and politically relevant policy areas. Importantly, this is why F_i in Eq. 4.1, the simplified version of the initial utility function U_i, turns its sign from negative to positive in major holders.

In contrast, small holders enjoy the stability of major currencies, a low instability cost and the advantage of major countries' followership independently from their own policy moves. With this three parameters being totally exogenous, they face the very simple choice between tying their hands to an ill-designed monetary policy or letting major holders sacrifice their autonomy to guarantee a high 'S' and a low 'C_{ins}' to the whole system. For small holders, as shown in Eq. 4.2, the utility function is mostly determined by the value of F_i (namely, the major holder's move), while their own move exerts neither a positive nor a negative impact on the system. Nevertheless, followership can still have a negative country-specific effect due to its domestic drawbacks on the quality of economic policies and political consensus, generating the Nash equilibrium condition in which both players have no incentives to shift to another strategy.

To conclude, in agreement with the results of the model, the empirical part will test the following hypothesis:

In surplus economies, other conditions being equal, the higher the share of outstanding core currency assets held by the public and private sectors, the more monetary authorities are likely to follow the leader's central bank.

Empirical testing: data and model specification

In its complete form, the analysis relies on a panel of 84 countries, whose data are available, at best, from 1983 to 2014. The sample, however, is unbalanced, so that the real time span and the number of units available for the tests decrease to 15 years whenever the key independent variable is included.[6] Overall, the equations employed to test my hypothesis present two main specifications named **Model 1** and **Model 2**. The first assesses the impact of regressors on *differential*, a continuous dependent variable calculated as the difference in interest rates between any single country and the United States. The second model is a logistic regression testing data on variable *followership2*, which scores 1 when minor states follow and 0 if they remain neutral. A detail of the calculation to construct *followership2* is shown in Figure 3 below.[7] All mentioned data are provided by the IMF — International Financial Statistics dataset.

Model 1

$$\begin{aligned} differential = {} & \alpha + \beta_1 differential_{t-1} + \beta_2 CapitalOpenness + \beta_3 TradeOpenness \\ & + \beta_4 Population + \beta_5 Democracy + \beta_6 Per\text{-}capitaGDP \\ & + \beta_7 ExportsToUS + \beta_8 InflationDifferential + \beta_9 GDP\text{-growth} \\ & + \beta_{10} ExpenditureDifferential + \beta_{11} OilProducer + \beta_{12} Alliance \\ & + \beta_{13} DollarHoldings + \varepsilon \end{aligned}$$

Model 2

$$\begin{aligned} followership2 = {} & \alpha + \beta_1 CapitalOpenness + \beta_2 TradeOpenness + \beta_3 Population \\ & + \beta_4 Democracy + \beta_5 Per\text{-}capitaGDP + \beta_6 ExportsToUS \\ & + \beta_7 InflationDifferential + \beta_8 GDP\text{-growth} \\ & + \beta_9 ExpenditureDifferential + \beta_{10} OilProducer + \beta_{11} Alliance \\ & + \beta_{12} DollarHoldings + \varepsilon \end{aligned}$$

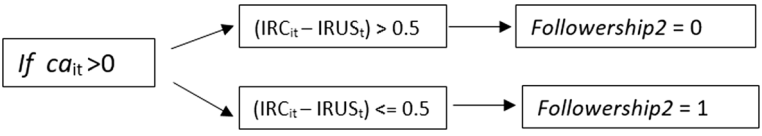

Figure 3 Criteria for the binary operationalisation *of neutrality and followership*.

In the next section, I estimate the statistical coefficients for actors' financial size while discounting for the contemporaneous effect of three groups of control variables: comparative-institutional, Taylor Rule-based and international-structural ones. A detailed description of all the covariates is available in the Appendix, while here I limit the discussion to the key variables described in the third section (international-structural) and to the innovations proposed by this research.

The third set of control variables pertains to the factors related to trade dependency, military affairs and financial entrapment. First, I test the 'trade networks' hypothesis on a variable accounting for the volume of exports to the United States scaled by total exports in merchandise for each country. The choice to show only the results for export dependency is due to the greater popularity of the 'mercantilist hypothesis' among scholars, but omitted tests have been successfully conducted on import-related variables and export-to-GDP, showing similar results. According to theory, I expect *dollexp* to show a negative coefficient in **Model 1** and a positive one in **Model 2**. Data on trade shares are from the World Development Indicators dataset at the World Bank, while bilateral trade flows are from the Direction of Trade Statistics at the IMF.

Second, I evaluate the role of military alliances by defining the variable *alliance*, a dichotomous measure of value 0 if no security relationship is in place between each country and the United States, and 1 if I classify the actor as an ally of the Unites States.[8] Inter-temporal variations in a country's status as 'ally' are possible. Other things being equal, I assume alliances to reduce policy autonomy, and thus I expect the coefficient to be negative in **Model 1** and positive in **Model 2**.

To conclude, the entrapment hypothesis is assessed through the key explanatory variable of this research, that is, the relative size of foreign economies' stock of dollar-denominated assets. It is measured with the following continuous variable:

$$dollarholdings = \frac{\text{stock of US dollar assets held by country}_i}{\text{total US dollar liabilities held by foreign actors}}$$

Other things being equal, the smaller *dollarholdings*, the more states are expected to free ride on their larger neighbours whenever domestic conditions make it desirable. In mathematical terms, I expect again a negative coefficient for *dollarholdings* in **Model 1** and a positive sign in **Model 2**. Data on countries' and total stocks of the US external debt are provided by the Treasury International Capital System (TIC).

Methodological notes and results

Before running the main regressions reported below, a baseline version of the model has been tested for the presence of time-fixed effects, cross-sectional dependence/contemporaneous correlation, heteroscedasticity and serial correlation.

Inconsistencies have been found in all these aspects except for cross-sectional dependence/contemporaneous correlation.

The first problem has been addressed in two ways: first, by including year-dummy variables in both models. Second, by adding the variable *usrate* to the regressions, representing the deviation of the yearly interest rate in the United States from the average of US interest rates along the whole sample (1983–2014). Supposedly, in years where the American policy was comparatively more restrictive, surplus countries found following the Federal Reserve System's policy stance less problematic. In contrast, when the US embarks on monetary expansions, inflationary drawbacks in minor states are more likely to discourage other central banks from following. Both solutions are showed in the report tables, and present negligible differences in their results.

Secondly, heteroscedastic residuals have been addressed by estimating Huber/White-corrected standard errors, while serially correlated errors have been avoided, in **Model 1**, with the inclusion of a one period-lagged dependent variable in the baseline GLS estimator (Keele and Kelly 2006; Bond 2002; Beck and Katz 1995).[9] Similarly, the regressions on **Model 2** include a temporal dummy variable (omitted in the report tables) to model possible violations of the temporal independence assumption of binary regression analyses (Beck *et al.* 1998).

Last but not least, a cogent methodological note concerns the choice between fixed and random effects models. Here, following a recent trend in methodological research (Bartels 2008; Bell and Jones 2015; Dieleman and Templin 2014; Leyland 2010), all regressions are within-between random effects models. The within-between RE formulation models explicitly the effect of time-invariant unit-specific characteristics, avoiding an incorrect estimation of coefficients due to the covariance of the error term with the regressors (heterogeneity bias), and allows for the use of random effects in any case, with all the expected advantages in terms of theoretical soundness of the model. In mathematical terms, a within-between model looks as follows:

$$y_{it} = \beta_0 + \beta_1(x_{it} - \bar{x}_i) + \beta_4\bar{x}_i + \beta_2 z_i + (u_i + e_{ij})$$

where β_1 estimates the within-country effect of time-varying covariates on a mean-centred variable depurated by the effect of its time-invariant component. Indeed, $\bar{x}_i$ represents the mean of each country's values over the time span included in the sample (e.g. the average of Japan's per capita GDP from 1983 to 2014). β_4 is an estimation of the country-specific effect of the permanent component of time-varying covariates measured by $\bar{x}_i$; for instance, the fact that, say, Switzerland, is on average richer than Zambia, regardless of the inevitable intra-year variations in its per-capita income. β_2 estimates instead the contribution of time-invariant

contextual variables (z_i) to the dependent variable, while ($u_i + e_{ij}$) represent the components of the error term.

All regressions are computed with Stata ver. 12.1 and include only country-year observations with a positive current account balance. The results are visible in tables below Tables 1, 2, 3 and 4.

The findings of statistical tests provide a notable contribution to the debate on monetary power and the adjustment conflict in International Political Economy. The first thing to note is that results confirm the key hypothesis brought forward in this research. In both models, states with a larger relative weight in the global system are more likely to sacrifice their monetary autonomy for appeasing the changes in the Federal Reserve's policy. The separate estimation of the between and within effect of financial size suggests that larger financial powers are structurally more prone to follow than small holders, while within-country variations are rare and ineffective. Probably because countries are not affected by entrapment until they overcome a threshold — possibly around 1–2 per cent of total liabilities — and just a minority fraction of intra-state variations in 'dollar holdings' implies movements beyond or across this threshold. Looking at the 30-year period considered in this analysis, the core group of major holders has seen just one major change, consisting in the decline of Germany and the rise of China.

According to coefficients in **Model 1**, especially when interest-rate differentials are below 1500 basis points,[10] foreign central banks reduce their gap *vis à vis* the Federal Reserve by 30 basis points for any 1-unit increase in the country's share of dollar-denominated holdings. Likewise, the effect of *dollarholdings* is even clearer in **Model 2**, where it shows a substantial, correctly signed and statistically significant impact on the dependent variable in all model specifications. Concretely, this means that a 1-unit higher share of dollar assets by any country-year unit determines a 50–70 per cent greater probability that the actor ignores its own economic imperatives to push its rates below or around the US yardsticks deliberately.

Finally, the other noticeable element emerging from the tests is that regression analysis on interest rates, and with a different methodology, has given only a partial confirmation of the established conclusions in the literature based on the exchange-rate regime and fixed effect models. On the one hand, most of the domestic and institutional characteristics (capital account openness, political regime, economic development, etc.) deemed to drive policy choices in this field turned out determinant with the same direction as predicted by theory. On the other hand, though, international factors (namely, trade and military dependency), which had performed so well in case studies or past analysis, did not show the same robustness on a wider selection of country-year observations.

Table 1 Regression table for Model 1 — within effect

	Differential (time-fixed effect)	*Differential (US rate control)*	*Differential (time-fixed effect)*	*Differential (US rate control)*	*Differential <15 (time-fixed effect)*	*Differential <15 (US rate control)*
Lagged	0.118	0.116	0.540	0.565	0.330	0.320
	(0.053)*	(0.056)*	(0.092)***	(0.094)***	(0.138)*	(0.131)*
Capital openness	−3.204	−3.670	1.098	−0.226	0.830	0.154
	(2.027)	(2.348)	(1.215)	(1.741)	(0.890)	(1.076)
Trade openness	0.020	0.017	−0.002	0.005	−0.002	−0.001
	(0.015)	(0.014)	(0.008)	(0.010)	(0.006)	(0.006)
Population	0.000	−0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Democracy	0.115	0.167	0.129	0.130	0.062	0.055
	(0.124)	(0.122)	(0.066)	(0.076)	(0.047)	(0.052)
Per capita GDP	−2.821	−5.323	−0.550	−1.208	0.338	−1.478
	(2.900)	(1.953)**	(1.490)	(1.128)	(1.286)	(1.059)
Export to US on total exports	2.443	6.423	2.731	0.362	3.099	4.044
	(4.518)	(5.657)	(4.937)	(5.905)	(3.770)	(3.703)
Inflation differential	−0.009	−0.008	0.003	0.006	−0.020	−0.018
	(0.015)	(0.015)	(0.023)	(0.027)	(0.009)*	(0.008)*
GDP growth differential	−0.140	−0.143	−0.044	−0.010	0.042	0.077
	(0.073)	(0.099)	(0.076)	(0.089)	(0.028)	(0.027)**
Govnt expenditure differential	−0.133	−0.092	0.029	−0.003	−0.030	−0.061
	(0.095)	(0.073)	(0.057)	(0.048)	(0.050)	(0.049)
Oil producer	−2.875	−3.368	−0.451	−0.717	−0.542	−0.896
	(2.260)	(2.215)	(1.100)	(1.278)	(0.658)	(0.792)
Alliance	−0.629	−0.738	−1.375	−1.240	−0.674	−0.572
	(1.756)	(1.810)	(0.625)*	(0.683)	(0.481)	(0.473)
Usrate		−0.580		−0.349		−0.348

Table 1 (Continued)

	Differential (time-fixed effect)	*Differential (US rate control)*	*Differential (time-fixed effect)*	*Differential (US rate control)*	*Differential <15 (time-fixed effect)*	*Differential <15 (US rate control)*
		(0.084)***		(0.123)**		(0.082)***
Dollarholdings			−0.089	0.036	−0.106	−0.021
			(0.110)	(0.078)	(0.085)	(0.057)
_Cons	11.070	16.568	6.003	5.482	12.071	10.825
	(6.964)	(5.508)**	(4.193)	(2.649)*	(3.860)**	(3.608)**
N	703	703	467	467	429	429

Robust standard errors in parentheses.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 2 Regression table for Model 1 — between effect

	Differential (time-fixed effect)	*Differential (US rate control)*	*Differential (time-fixed effect)*	*Differential (US rate control)*	*Differential <15 (time-fixed effect)*	*Differential <15 (US rate control)*
Lagged	0.118	0.116	0.540	0.565	0.330	0.320
	(0.053)*	(0.056)*	(0.092)***	(0.094)***	(0.138)*	(0.131)*
Capital openness	−4.404	−5.241	−2.192	−2.341	0.658	0.439
	(3.432)	(3.445)	(2.254)	(2.467)	(1.564)	(1.559)
Trade openness	−0.005	−0.003	0.007	0.005	0.008	0.008
	(0.009)	(0.009)	(0.005)	(0.005)	(0.006)	(0.006)
Population	−0.000	−0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Democracy	0.381	0.393	0.151	0.167	0.086	0.109
	(0.145)**	(0.140)**	(0.076)*	(0.085)*	(0.067)	(0.068)
Per capita GDP	−1.471	−1.346	−0.731	−0.508	−1.284	−1.258
	(0.766)	(0.771)	(0.382)	(0.391)	(0.462)**	(0.447)**
Export to US on total exports	1.943	3.189	0.854	1.612	1.384	1.818
	(4.184)	(4.264)	(2.418)	(2.795)	(2.460)	(2.428)
Inflation differential	−0.005	−0.005	−0.000	0.003	−0.021	−0.021
	(0.017)	(0.017)	(0.022)	(0.026)	(0.009)*	(0.008)**
GDP growth differential	−0.084	0.047	−0.170	−0.068	−0.130	−0.009
	(0.399)	(0.392)	(0.219)	(0.210)	(0.249)	(0.239)
Govnt expenditure differential	−0.263	−0.266	−0.078	−0.100	0.069	0.055
	(0.118)*	(0.110)*	(0.082)	(0.088)	(0.048)	(0.045)
Oil producer	5.834	6.117	2.734	2.632	1.294	1.543
	(2.254)**	(2.209)**	(1.410)	(1.385)	(0.746)	(0.728)*
Alliance	−0.629	−0.738	−1.375	−1.240	−0.674	−0.572
	(1.756)	(1.810)	(0.625)*	(0.683)	(0.481)	(0.473)
Usrate		−0.580		−0.349		−0.348

Table 2 (Continued)

	Differential (time-fixed effect)	*Differential (US rate control)*	*Differential (time-fixed effect)*	*Differential (US rate control)*	*Differential <15 (time-fixed effect)*	*Differential <15 (US rate control)*
		(0.084)***		(0.123)**		(0.082)***
Dollarholdings			−0.009	−0.002	−0.331	−0.319
			(0.136)	(0.140)	(0.157)*	(0.152)*
_Cons	11.070	16.568	6.003	5.482	12.071	10.825
	(6.964)	(5.508)**	(4.193)	(2.649)*	(3.860)**	(3.608)**
N	703	703	467	467	429	429

Robust standard errors in parentheses.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 3 Regression table for Model 2 — within effect

	Followership2 (year fixed effect)	*Followership2 (US rate control)*	*Followership2 (year fixed effect)*	*Followership2 (US rate control)*
Capital openness	2.416	3.276	0.160	1.382
	(1.369)	(1.110)**	(1.363)	(1.196)
Trade openness	0.036	0.029	0.018	0.023
	(0.013)**	(0.010)**	(0.012)	(0.010)*
Population	−0.000	−0.000	−0.000	−0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Democracy	0.030	−0.010	0.205	0.198
	(0.079)	(0.065)	(0.098)*	(0.088)*
Per capita GDP	−0.012	3.223	0.142	3.261
	(2.168)	(1.437)*	(2.514)	(1.818)
Export to US on total exports	5.892	0.555	−3.816	−4.974
	(5.953)	(4.988)	(7.976)	(6.902)
Inflation differential	−0.005	−0.002	0.006	0.007
	(0.004)	(0.003)	(0.009)	(0.008)
GDP growth differential	−0.051	−0.080	−0.066	−0.053
	(0.061)	(0.048)	(0.085)	(0.068)
Govnt expenditure differential	0.035	0.094	−0.035	0.016
	(0.090)	(0.061)	(0.084)	(0.065)
Oil producer	5.716	4.786	4.251	3.915
	(3.080)	(2.159)*	(1.727)*	(1.469)**
Alliance	−1.015	−0.546	0.208	0.051
	(1.238)	(0.899)	(0.544)	(0.466)
Usrate		0.763		0.636
		(0.104)***		(0.107)***
Dollarholdings			0.419	0.068
			(0.331)	(0.268)
_Cons	1.979	1.307	−11.317	−13.204
	(0.417)***	(0.404)**	(24.270)	(22.039)
N	678	678	435	435

Robust standard errors in parentheses.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Conclusions: the strategic dilemma of the US leadership

The major/small holder mechanism, described by the theoretical model and confirmed through statistical tests, is consistent with the current behaviour of the major financial players in the dollar standard. As documented in recent studies

Table 4 Regression table for Model 2 — between effect

	Followership2 (year fixed effect)	*Followership2 (US rate control)*	*Followership2 (year fixed effect)*	*Followership2 (US rate control)*
Capital openness	0.909	1.052	1.109	1.356
	(2.660)	(1.979)	(1.552)	(1.386)
Trade openness	0.013	0.005	−0.002	−0.005
	(0.011)	(0.008)	(0.006)	(0.005)
Population	0.000	0.000	−0.000	−0.000
	(0.000)*	(0.000)	(0.000)	(0.000)
Democracy	−0.336	−0.298	−0.150	−0.192
	(0.110)**	(0.083)***	(0.061)*	(0.054)***
Per capita GDP	1.350	1.066	0.666	0.674
	(0.661)*	(0.495)*	(0.313)*	(0.297)*
Export to US on total exports	1.577	−1.009	−3.471	−3.413
	(4.394)	(3.368)	(3.288)	(2.934)
Inflation differential	−0.007	−0.003	0.004	0.006
	(0.007)	(0.005)	(0.009)	(0.008)
GDP growth differential	−0.631	−0.554	−0.476	−0.461
	(0.339)	(0.250)*	(0.194)*	(0.167)**
Govnt expenditure differential	−0.006	0.000	−0.038	−0.019
	(0.085)	(0.062)	(0.042)	(0.035)
Oil producer	−4.400	−4.059	−4.310	−3.961
	(1.490)**	(1.133)***	(0.855)***	(0.765)***
Alliance	−1.015	−0.546	0.208	0.051
	(1.238)	(0.899)	(0.544)	(0.466)
Usrate		0.763		0.636
		(0.104)***		(0.107)***
Dollarholdings			0.787	0.510
			(0.206)***	(0.162)**
_Cons	1.979	1.307	−11.317	−13.204
	(0.417)***	(0.404)**	(24.270)	(22.039)
N	678	678	435	435

Robust standard errors in parentheses.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

(Norrlof 2014; Stokes 2014), these actors have continued to accumulate dollar assets in the aftermath of the 2008 financial meltdown despite the risks created by the Federal Reserve's hyper-expansive policy to counteract the crisis. During the spill-over of the subprime bubble in the US real economy, the rounds of

quantitative easing and the lax credit policy deployed by the Fed have been a viable and advantageous way out of alternative solutions, such as politically painful economic reforms and fiscal austerity.

They have been possible, however, because the United States has played the card of monetary power heavily, inducing foreign central banks and the financial world to keep on investing in dollar assets for not incurring further and more serious losses on their financial wealth. Thanks to major holders' support, the dollar depreciated at a stable and bearable rate between 2007 and mid-2008 — when the increasing trade deficit and the oil bubble fuelled its weakness against major world currencies. Subsequently, a few months before the Lehman Brothers bankruptcy, it rebounded for a while enjoying the appetite for safe assets of international investors worried by the worsening state of the global economy. During this phase indeed, and even more at the pick of the crisis in the winter of 2008, entrapped governments and central banks around the world favoured this process by repeatedly renovating their support and trust in the US dollar and the American economy.

Now, the model delineated in the pages above offers a useful instrument to assess the evolution of the current international system through the position of US dollar followers within it. For example, the huge injection of liquidity that flooded international markets in the years following the 2008 economic downturn, despite the present willingness of major holders to prop up the greenback, has made the key currency more vulnerable to excessive depreciations in the future. Hence, given the weakness of alternative drivers such as export dependency and military ties, the key to predict if major holders will still grant a future to the US dollar as the next crisis comes is to identify an element able to break their financial entrapment in the dollar-centred system, and evaluate the US policy dilemmas in front of it.

Actually, a possible, and probable, fact able to overthrow the greenback in the medium term is the rise of potential monetary competitors that may take advantage of followers' fears and discontent about the US 'deficit-prone' leadership. Generally, all recent studies propose as future development of the monetary arena either the rise of an international condominium with the Chinese renminbi, or the emergence of a multipolar a-centred system with multiple key currencies (Bowles and Wang 2008; Cohen 2009; Cohen and Benney 2014; Eichengreen 2011; Helleiner 2013; Kirshner 2014). Up against both these perspectives, showing major followers denying the dollar its safety net in the next, and inevitable, downward cycle, the strategic dilemma of the United States is two-fold.

On the one hand, it could aim at strengthening the current mechanisms of currency leadership, relying further on the instrument that this research confirms as essential for inducing external support to the dollar standard: the entrapment of foreign actors in a web of financial dependencies. In this case, the results obtained here suggest concentrating scarce resources on potential large creditor followers, given their greater bargaining weakness and capacity to relieve the dollar system from its heavy imbalances. Concretely, this implies for Washington to be cautious

in tightening its monetary policy, so as to maintain a strong outflow of dollars to foreign markets and avoid an excessive appreciation of its coinage that would open a window of opportunity for diversification to foreign actors. The downside of this strategy, of course, is the pretence of curing the disease with its own cause, which exposes the US' fragile primacy to a panic-driven run on the greenback triggered by some black swan, a destabilising political or economic event (see, in particular, Rickards 2011).

On the other hand, though, the alternative suggested by many scholars in both IR and economics — namely, the unilateral correction of macroeconomic imbalances through the progressive tightening of monetary stimulus and a fresh round of fiscal retrenchment (Eichengreen 2011; McKinnon 2009; Rickards 2011) — is by no means exempt from underlying risks. Indeed, the fiscal and monetary contraction would make the dollar better equipped to tolerate the reduction of its transactional network that accompanies the rise of attractive alternatives, but can hardly be able to prevent new monetary competitors from extending their influence on the present US followers. If anything, a full-blown austerity risks prompting widespread domestic discontent, leading to political unviability, and offering the incentives to major holders for shifting to a neutral stance under favourable conditions given its short-term beneficial effect on the greenback. In addition, this is even truer considering that the plummet of oil prices, which traditionally accompanies any rise of the greenback, will force energy producers to sell their dollar assets progressively, and this happens while China has definitively shifted its exchange rate policy to a managed basket peg since December 2015.

Notes

1 In principle, one could argue that the wide category of 'surplus' economies or states includes both long-term international creditors and countries experiencing a temporary surplus on the current account. The two actors actually have different incentives and may behave differently. However, in this research, this distinction is assumed as uninfluential, and all surplus observations are supposed to behave like long-term surplus accumulators. The empirical tests confirm that this assumption is realistic, especially because very short-term surpluses are very difficult to appear frequently.

2 Ideally, $S = 1$ designates immutably fixed exchange rates or single currency regimes, while $S = 0$ ep. resents a pure floating market-driven exchange-rate fluctuation.

3 C_{ins} is not the simple reverse of S because empirical cases, for example the repeated devaluation of the pound sterling in 1931, 1949 and 1967 or the plunge of the greenback from 2002 to 2008, demonstrate that a certain degree of currency instability is tolerable by strongly engaged followers without generating a run on the leader's assets or reducing their interest in supporting the core currency. The mathematical relation between C_{ins} C_{INS} d S is de. signed by assumption.

4 By doing so, both the major and the small holders are supposed to have a full political or economic interest in maintaining the stability of the core currency, so that the role of expectations emerges more clearly.

5 The existence of a dominant strategy for one of the two players is sufficient to compute a pure strategy equilibrium even without specifying that, for major holders, since γi is low but slightly greater than zero, $(F,F) > (F,N)$ and $(N,F) > (N,N)$, even if their values have been approximated in the payoff matrix.
6 Actually, the main problem concerns precisely to the scarcity of data for the 1980s and 1990s about the stocks of dollar-denominated securities in different countries.
7 The choice to consider as followers those central banks that keep the benchmark rate at the leader's level is due to include many cases where sudden interest-rate shifts by the Federal Reserve need some months to be replicated by other central banks due to procedural and decision-making delays. Similar tests have been conducted on a dependent variable scoring 1 just in case the differential was 0 or negative. Results are similar but with larger standard errors.
8 To be defined as ally, a country must fall in at least one of these three categories: (a) member of a formalised alliance agreement included in the Correlates of War Formal Alliances dataset (version 4.1); (b) major non-NATO ally as defined by the Nunn Amendment to the Title 10. Section 2350a f the United States Code and officially designated by the US Government; (c) country that stipulated agreements for highly specific arms transfers but does not fall under point 1 or 2 e.g. Agreement relating to the transfer of F-86 aircraft to Saudi Arabia, November 1965).
9 Regressions on the most complete specification of **Model 1** have been tested also with alternative estimators to verify the robustness of results. Clustered OLS and fixed effect GLS showed almost the same outcomes, characterised by the unique estimation of within-variance coefficients. Similarly, omitted regressions with a Generalised Method of Moment estimator is used to take into account the Nickell bias affecting fixed effect dynamic panel models. In this case, results confirm previous tests except for the significance of the two trade-related variables.
10 It represents more than 85 per cent of the main dataset.

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Appendix

The first group of control variables refers to domestic and institutional characteristics of the actors involved. Among these variables, *capital openness* measures a country's level of *de jure* openness to cross-border financial transactions with a continuous normalised index ranging from 0 to 1. It has been computed and made available by Chinn and Ito (2008) and further updated in 2014. Drawing on the established conclusions in the literature (Bordo and Flandreau 2003; Bordo 2003; Lin and Ye 2011), as well as on the Mundell-Fleming trilemma, I expect a negative relation between the level of capital openness and the degree of monetary autonomy in each unit. Secondly, the variable *democracy* employs the widely used indicator for the assessment of political regimes elaborated by the Polity IV Project. In accordance with the existing literature on exchange-rate regimes (Leblang 1999; Broz 2002; Steinberg and Walter 2012; Steinberg and Shih 2012), I expect less democratic states to be more likely to sacrifice domestic exigencies to engage in monetary policy coordination. Thirdly, I control for the level of economic development of the state-year unit through the variable *per capita GDP*, consisting of the natural logarithm of per capita GDP, whose value is likely to be negatively related to interest rate differentials and positively related to *followership2*. Fourthly, variable *trade openness* measures the sum of a country's total exports and imports scaled by current GDP in order to assess the level of trade openness of each actor. I expect the states that are more dependent on global markets to be more prone to peg to the dollar and less to an independent monetary policy. In addition, variable *population* is the number of inhabitants for any country-year unit of the sample. Finally, *oil producer* is a dummy variable identifying those economies that are over-dependent on oil exports. I consider oil producers all countries whose crude oil exports are above 30 per cent of total goods export. Data are from the World Bank — World Development Indicators dataset and FMI — International financial Statistics. Obviously, I consider long-term oil exporters to be more interested in the preservation of a stable US dollar, and thus I expect a negative relation with *differential* and a positive one with *followership2* Table 5.

Moving on to the covariates based on the Taylor Rule, it must be noted that their role is to identify those cases where actual economic conditions, diverging from those in the United States, would call for an autonomous management of a state's monetary tools. Otherwise, there is a high risk to interpret as followership what, in fact, is nothing more than a sound economic policy. In this context, I control for the effect of inflation rates (*inflation differential*) and yearly GDP growth (*GDP growth differential*) by computing the differential between each country and the same indicators in the United States. Contextually, I check the impact of government expenditure through the variable *govnt expenditure differential*, discounting the

Table 5 Descriptive statistics of main independent variables

Variable		*Mean*	*SD*	*Min*	*Max*	*Observations*
Capital openness	Overall	0.62702	0.374549	0	1	$N = 991$
	Between		0.327985	0	1	$n = 79$
	Within		0.183925	−0.10575	1.425	T-bar = 2.5443
Democracy	Overall	4.19749	6.992661	−10	10	$N = 1038$
	Between		5.978831	−10	10	$n = 82$
	Within		2.694933	−10.9136	16.75305	T-bar = 2.6585
Per capita GDP	Overall	8.91876	1.506773	4.963101	11.14323	$N = 1022$
	Between		1.559616	5.203496	10.95285	$n = 81$
	Within		0.249268	7.574446	10.24079	T-bar = 2.6173
Exports to US on GDP (%)	Overall	3.54186	4.532805	0	40.4069	$N = 1056$
	Between		3.990593	0	20.46016	$n = 83$
	Within		1.779188	−6.33445	26.71418	T-bar = 2.7229
Export to US on total exports	Overall	0.09888	0.109603	0	0.841253	$N = 980$
	Between		0.128356	0	0.66485	$n = 79$
	Within		0.047228	−0.31008	0.510689	T-bar = 2.4051
Population	Overall	284580.5	725287.8	132019	8358363	$N = 2609$
	Between		605705.6	1325256278	4100232	$N = 84$
	Within		393662.1	−2597545	6371739	T-bar = 31.0595
Total trade on GDP (%)	Overall	68.71283	49.5248	9.796629	397.93	$N = 2520$
	Between		45.76408	17.72947	292.7911	$N = 83$
	Within		17.7542	−42.20044	199.0343	T-bar = 30.3614
Inflation differential	Overall	18.7845	125.3593	−13.6589	1925.028	$N = 999$
	Between		80.25821	−2.66028	513.4035	$n = 80$
	Within		107.2862	−493.835	1461.225	T-bar = 2.4875
GDP growth differential	Overall	0.71840	5.632273	−54.2858	32.50507	$N = 1030$
	Between		4.264242	−28.4907	7.16096	$n = 82$
	Within		4.922623	−47.8322	38.95862	T-bar = 12.561
Govnt expenditure differential	Overall	1.08942	5.839082	−14.051	23.4526	$N = 1018$
	Between		5.133999	−10.6454	16.09405	$n = 83$
	Within		2.668316	−13.518	15.73581	T-bar = 2.2651
Alliance	Overall	0.24889	0.432563	0	1	$N = 1129$
	Between		0.422689	0	1	$n = 83$
	Within		0	0.248893	0.248893	T-bar = 3.6024
Oilproducer	Overall	0.26208	0.440004	0	1	$N = 931$
	Between		0.399181	0	1	$n = 79$
	Within		0.136363	−0.59999	1.185161	T-bar = 1.7848
Dollarholdings	Overall	1.53434	3.142504	0.0000305	21.2135	$N = 563$
	Between		2.818386	0.0000437	15.94748	$n = 74$
	Within		1.001577	−6.079185	9.463789	T-bar = 7.6081

Table 6 List of countries included in the full sample (1983–2014)

Albania	Croatia	Latvia	Russian Federation
Armenia	Cyprus	Lesotho	Rwanda
Australia	Denmark	Macedonia, Fyr	Saudi Arabia
Austria	Ecuador	Malawi	Singapore
Azerbaijan	Egypt	Malaysia	Slovak Republic
Bahrain	Fiji	Malta	Slovenia
Bangladesh	Finland	Mexico	South Africa
Belarus	Germany	Moldova	Spain
Belgium	Ghana	Mongolia	Suriname
Bolivia	Greece	Morocco	Swaziland
Botswana	Hungary	Mozambique	Sweden
Brazil	Iceland	Netherlands	Switzerland
Bulgaria	India	New Zealand	Syrian Arab Republic
Burundi	Indonesia	Nigeria	Tanzania
Canada	Ireland	Norway	Thailand
Cape Verde	Israel	Pakistan	Trinidad and Tobago
Chile	Italy	Paraguay	Turkey
China: Hong Kong	Japan	Peru	Uganda
China: Mainland	Jordan	Philippines	United Kingdom
Colombia	South Korea	Portugal	Venezuela, Rep. Bol.
Costa Rica	Kuwait	Romania	Zambia

Table 7 Descriptive statistics of dependent variables

Variable		*Mean*	*SD*	*Min*	*Max*	*Observations*
Differential	Overall	4.44501	8.65616	−6.5	58.9	$N = 839$
	Between		9.36969	−2.556	57.1694	$n = 72$
	Within		4.85655	−24.309	48.8916	T-bar = 11.65
Followership2	Overall	0.359858	0.480244	0	1	$N = 842$
	Between		0.322747	0	1	$n = 72$
	Within		0.346896	−0.5776	1.319857	T-bar = 11.69

coefficients for the inverse relation highlighted by a recent literature between the direction of public spending and that of monetary policy (Bearce 2007). These are the main components of the prototypical inward-oriented policy rule elaborated by Taylor, which calibrates interest rates in order to minimise the volatility of output gap and price movements (Taylor 1993). Overall, these control variables include all the major determinants of interest-rate differentials emphasised by similar analysis in monetary economics (Knot 1998). They are expected to show a positive coefficient in Model 1 and a negative one in Model 2. All data are taken from the World Development Indicators dataset at the World Bank Tables 6, 7, 8.

Table 8 Observations dropped after influential outliers' control

Country	*Year*	*Differential*
Croatia	1992	1886.39
Peru	1989	857.36
Israel	1984	820.77
Peru	1988	739.34
Belarus	1994	474.50
Israel	1985	436.07
Israel	1983	301.62
Macedonia FYR	1993	292.00
Peru	1990	282.59
Belarus	1993	207.00
Azerbaijan, Rep of	1994	194.50
Turkey	2000	176.70
Bulgaria	1996	174.75
Russian Federation	1995	154.50
Bolivia	1984	140.87
Belarus	1999	114.50

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