Institute for International Integration Studies

IIIS Discussion Paper

No.264 / November 2008

Exchange Rate Regime Choice with Multiple Key Currencies

Thomas Plümper
Department of Government, University of Essex

Eric Neumayer
Department of Geography and Environment, London School of Economics and Political Science

IIIS Discussion Paper No. 264

Exchange Rate Regime with Multiple Key Currencies

Thomas Plümper
Eric Neumayer

Exchange Rate Regime Choice with Multiple Key Currencies

Thomas Plümper[a] and Eric Neumayer[b]

[a] Department of Government, University of Essex, Wivenhoe Park, Colchester CO4 3SQ, UK, tpluem@essex.ac.uk

[b] Department of Geography and Environment, London School of Economics and Political Science (LSE), London WC2A 2AE, UK, e.neumayer@lse.ac.uk

Corresponding author: Thomas Plümper. Equal authorship.

Exchange Rate Regime Choice with Multiple Key Currencies

Abstract

Recent scholarship on exchange rate regime choice seeks to explain why some countries fix their exchange rate to an anchor currency, but it neglects the question to which currency countries peg. This article posits that an understanding of the choice of anchor currency also improves political economists' understanding of the decision for an exchange rate peg itself. Drawing on the 'fear of floating literature', we argue that the choice of anchor currency is mainly determined by the degree of dependence of the potentially pegging country on imports from the country or currency union issuing the key currency as well as the degree of dependence on imports from the currency area, that is, from other countries which have already pegged to that key currency. This is because an exchange rate depreciation against the main trading partners' currency increases domestic inflationary pressures due to exchange-rate pass-through. In addition, our theory claims that central bank independence and de facto fixed exchange rates are complements (rather than substitutes) since independent central banks care more than governments about imported inflation. Analyzing a pooled cross-section of 106 countries over the period 1974 to 2005, we find ample evidence in support of our theoretical predictions.

1 Introduction

The collapse of the Dollar Standard of the Bretton-Woods era in the early 1970s gave rise to an 'anything goes' exchange-rate system. Since then, governments are not only allowed "to peg or not to peg" (Berger et al. 2001) but also to intervene into the foreign exchange market whenever this deems appropriate. These two political freedoms confront governments with a trade-off between gains in economic efficiency and monetary policy credibility on the one hand and losses in monetary policy autonomy on the other. Yet, whether to stabilize or even fix the exchange rate and if so whether to publicly declare a formal exchange rate peg is not the only choice governments face.[1] Governments are also free to choose the currency to which they formally or informally stabilize or peg – a third freedom which has attracted far less academic interest.[2]

This article argues that the choice of anchor currency is mainly determined by the degree of dependence of the pegging country on imports from the country or currency union issuing the key currency as well as the degree of dependence on imports from the currency area, i.e. from

---

1 In recent years, many political economists have turned their attention from de jure pegs (Frieden 1991; Bernhard and Leblang 1999; Bernhard et al. 2003; Keefer and Stasavage 2003) to de facto pegs (Levy-Yeyati and Sturzenegger 2005; Hallerberg 2008; Simmons and Hainmueller 2008). Simmons and Hainmueller (2008) show that models which explain de jure pegs perform poorly when studying de facto pegs.

2 For example, Broz and Frieden (2006) in their thoughtful survey of recent research on exchange rate policies discuss the existence of currency areas such as the "CFA Franc Zone" (p. 588) and the "Deutschmark bloc" (p. 591), interpreting them as regional cooperation, but they review exclusively theories of exchange rate regime choice, which make no reference to the determinants of the choice of an anchor currency.

other countries that have already pegged their currency to that currency.[3] Drawing on the fear of floating approach we argue that governments try to prevent the inflationary effect of exchange rate depreciations. The prices of imported goods and services in domestic currency increase if the domestic currency depreciates against the currency of the country in which the foreign corporations produce. The inflationary effect of exchange rate depreciation can be substantial if the depreciation is significant, the depreciating country is relatively open toward imports from the foreign country against which the home country's currency depreciates or toward imports from other countries which have pegged their currency to the foreign country's currency, and corporations pass-through the price effect of the depreciation to the consumers (Shambaugh 2008).

We derive three testable hypotheses from our theory. First, a country is more likely to de facto peg its currency toward a key currency the larger its imports from the country issuing the key currency relative to its domestic gross domestic product (GDP). Second, a similar effect holds for the imports to GDP ratio relating to imports from other countries, which have themselves de facto pegged their currency to the key currency. We thus explain why the relative economic size of a key currency area – all the countries that have pegged their currency to a key currency – exerts a positive effect on the choice of this currency as anchor currency. This, in turn, increases the size of the currency area. Third, our theory predicts that de facto pegs and central bank independence are complements: countries are more likely to de facto peg their currency to a key currency the more independent their central banks from governmental interference. Time inconsistency theories of monetary institutions treat these two institutional choices as substitutes.

---

[3] We loosely distinguish between *key currencies* and *anchor currencies*. A key currency is defined by the economic size of the country issuing the currency and its political importance. It becomes an anchor currency if other countries peg to this currency on either a de facto or a de jure basis.

In the empirical section of this paper we test the predictions of our theory with respect to exchange rate regime choice with multiple key currencies. We find that imports from the country issuing the key currency and imports from countries that have already pegged to that currency explain a country's choice of exchange rate peg. Results on our third hypothesis are more mixed, but overall they suggest that greater central bank independence and de facto pegs are complements, not substitutes.

Our analysis of the choice of anchor currency contributes to the burgeoning literature on the 'political economy of exchange rate regimes'. Ever since Frieden's seminal contribution (Frieden 1992), this literature has been dominated by two approaches, one of which perceives the choice of a fixed exchange rate as a policy which lends credibility to the anti-inflationary promises of the government while the other approach highlights efficiency gains from a peg between countries, which trade much with each other, invest much in each other's economy and have sufficiently similar business cycles. We refer to these theories as the time inconsistency approach and the optimal currency area (OCA) approach, respectively.

Both approaches have difficulties in explaining the specifics of countries' exchange rate regime choice. The OCA approach cannot account for why countries at times peg their currencies to a currency issued by a country with largely incongruent macroeconomic conditions and fails to explain why countries do not choose alternative policies which boost trade and investment at much lower cost than a de facto peg. The time inconsistency approach on the other hand has difficulties in explaining to which currency countries peg (if they peg at all). Any currency which has low and stable inflation rates qualifies as anchor currency. This approach is also faced with the puzzle that many countries with low inflation policies and independent central banks nevertheless de facto peg their currency. Moreover, both approaches have a hard time explaining why countries would de facto peg their currency without officially announcing their pegging decision.

Our augmented 'fear of floating' theory of exchange rate pegs improves political economists' understanding of countries' actual exchange rate and monetary policy choices. The contribution of this article thus goes beyond merely arguing that governments choose the key currency as monetary anchor from which most of their imports stem from. In fact, not only can fear of floating explain what anchor currency countries choose, but also why they peg at all, why independent central banks and exchange rate pegs are not a substitute for each other, why governments at times do not officially announce a de facto peg, and why only a small number of currencies serve as international anchor currency.

2 The Political Economy of Exchange-Rate Regime Choice

Extant scholarship has predominantly studied the question why countries choose a fixed exchange-rate regime. According to Broz and Frieden (2001) and Bernhard et al. (2002: 708-709), the choice of such a regime has four important consequences: first, pegging "can be a substantial benefit for economies that have had difficulty in controlling inflation"; second, it lowers the exchange-rate risk and thus stimulates international trade and investment; third, it reduces the ability to use monetary policy responses to an economic shock;[4] and fourth, an exchange rate fix makes a real appreciation more likely for most countries. While the first two consequences are clearly beneficial, the third is costly and the fourth one is detrimental to a country's exporting sector but advantageous for consumers. Theories of exchange-rate regime choice differ with respect to the way they model policy-makers' optimal choice when faced with the trade-offs associated with the choice of an exchange rate regime (Obstfeld et al. 2005). We start by presenting time inconsistency (or credibility) theories, then briefly review the optimal currency area theories.

---

[4] Devereux and Lane (2003) argue that indebted countries cannot employ monetary policies and depreciation to partly offset the effect of exogenous shocks. Clark and Hallerberg (2000) stress that governments in countries with fixed exchange rate regimes may instead employ fiscal policies.

2.1. Time Inconsistency and the Theory of Credible Monetary Policy Commitments

Theories explaining the choice of exchange-rate regime by time inconsistency considerations argue that policy makers benefit from monetary stability and low inflation in the long-run, but face strong incentives to forego stability and boost economic activity in the short run (Nordhaus 1975; Bernhard et al. 2002: 693-694). Governments therefore look for a credible commitment device, which binds them to pursuing their long-term interest, thus overcoming the time inconsistency problem (Clark et al. 1998). In brief, the argument is that a fixed exchange-rate regime provides such a device: by de facto surrendering monetary policy autonomy to the monetary authority issuing the anchor currency the hands of the domestic monetary authorities are bound (Bernhard and Leblang 1999).

Contrary to early unconditional versions of these theories, recent research stresses that the choice of a fixed exchange rate regime is not merely determined by the perceived need to fight inflation by tying the hands of governments, but is additionally conditioned by a country's political and institutional setting, e.g., by the government's partisan preferences (Clark 2002; Bernhard and Leblang 1999), and the political autonomy of the dominant faction in government against veto-players (Clark and Hallerberg 2002; Hallerberg 2002). In other words, whether or not a country fixes its exchange-rate also depends on the distributional consequences of anti-inflationary policies and on whether the winners of a fixed exchange-rate system prevail over the anticipated losers in the political arena. We discuss both unconditional and conditional of time inconsistency theories of exchange rate pegs in turn.

Unconditional Time Inconsistency Theories of Exchange Rate Pegs

Time inconsistency problems occur when long term interests and short term interests clash. For example, while governments have a long term incentive to prevent inflation, in the short run they may be better off deviating from policies guaranteeing long-term price stability. This

is so because they have short-term electoral interests or influential lobby groups demand policies which increase inflation. Yet, according to Barro and Gordon (1983), monetary policies should be as predictable and credible as possible for long-term economic development. Electoral incentives are thus detrimental to stable monetary policies.

A fixed exchange-rate regime can provide a mechanism against lax, inflationary monetary and fiscal policies. With such a regime, a government needs monetary policy to defend the exchange-rate peg and can therefore not, or at least not fully, use monetary policy to maximize its short-term utility. If the government lowered interest rates or increased deficit-financed fiscal spending to satisfy its short-term economic interests, then, in the absence of effective capital controls, the value of the domestic currency will depreciate. A government committed to honoring its fixed exchange-rate pledge must therefore refrain from engaging in such opportunistic behavior. The underlying logic is derived from the well-known Mundell-Fleming model (Mundell 1961; 1962; Fleming 1962), which in brief states that governments can only reach two of the three policy goals of stable exchange-rates, absence of capital controls and monetary policy autonomy simultaneously. Governments seeking to maintain stable exchange rates must thus either implement capital controls, which have long-term negative economic consequences, or accept a severe decline in monetary policy autonomy.

However, pegging to an anchor currency does not completely solve the time inconsistency problem since the electoral incentives faced by policy makers do not disappear. Giving-in to these incentives becomes more costly because voters may reduce support to a government which fails to defend the exchange-rate peg. Thus, the fixed exchange-rate solution simply

replaces one commitment problem by another. Credibility gains from a fixed exchange-rate system remain small when governments can easily abandon the exchange-rate peg.[5]

Unconditional time inconsistency theories of exchange-rate regime choice also suffer from their functionalistic political logic. From a political economy perspective, unconditional effects of macroeconomic variables on policies are never entirely convincing. It is therefore not surprising that *conditional* time inconsistency theories, to which we turn now, have become the norm.

Conditional Time Inconsistency Theories of Exchange Rate Pegs

Not everyone prefers low inflation and limited monetary policy autonomy to high inflation and full autonomy. On the one hand, some individuals' income largely depends on anti-cyclical monetary policies or they can shelter themselves from the adverse effects of high inflation rates. On the other hand, high inflation rates lead to income uncertainty, possible reduction of wages, a declining real value of savings and so on.

Political economists have dealt with the trade-off between inflation and monetary policy autonomy and highlighted the importance of two institutional arrangements, which under certain conditions bring inflation down: central bank independence and fixed exchange rates. With respect to the exchange rate peg political economists have developed a typology which uses the trade-off between exchange-rate volatility and monetary policy autonomy to identify and categorize interests in the choice of an exchange rate regime. Frieden and others (Frieden 1991, 2002; Frieden et al. 2001; Frieden et al. 2008; Bearce and Hallerberg 2008) have claimed that individuals who predominantly receive income from the production of tradable goods favor a fixed exchange rate since exchange rate volatility increases their risks. In con-

---

[5] Indeed, recent research has shown that while 'hard pegs' exert an anti-inflationary effect, the same does not hold true for 'soft pegs' (Bleaney and Francisco 2005).

trast, individuals generating income from the production of non-tradable goods and services ought to prefer flexible exchange rates, which allow governments to use monetary policy to stimulate domestic economic activity. As these authors readily admit (e.g., Frieden et al. 2008: 5), their theory lacks 'nuance and complexity' for the sake of clear predictive power.

One omitted aspect is the influence of constitutions (e.g. Bernhard and Leblang 1999; Keefer and Stasavage 2002) and political institutions (e.g. Hallerberg 2002). For example, Bernhard and Leblang (1999) have argued that electoral systems determine the willingness of politicians to surrender monetary policy autonomy. If small changes in votes can lead to large differences in political influence, politicians are reluctant to lose policy instruments which can be employed for winning votes. Accordingly, governments in countries with a majoritarian electoral system are less likely to provide more independence for the central bank and to fix the exchange rate.

Of course, voters exert very little influence on political choices in countries where elections are not free. In autocratic regimes, governments have little incentive to employ monetary policy for short-term electoral reasons. Therefore, exchange rate regime choice in autocracies is by and large determined by the elite's desire to appropriate rental incomes. Building upon Grossman and Helpman's (2001) seminal contribution to special interest politics, Bearce and Hallerberg (2008: 10) have made this point most clearly. However, while their argument explains why autocracies and democracies are likely to implement different economic policies, it cannot predict exchange rate regime choice without making further assumptions. Referring to Frieden's argument that individuals, which predominantly generate income from the production of non-tradable goods and services, prefer monetary policy autonomy and thus flexible exchange rates, Bearce and Hallerberg (2008: 12) argue that the median-voter "holds a policy preference for domestic monetary autonomy over exchange rate stability", because "the average national economy in the Post-Bretton Woods era has almost 50 percent of its

Gross Domestic Product (GDP) coming from the production of nontradables." Yet, Bearce and Hallerberg's argument is not entirely persuasive. That the average economy is dominated by the production of nontradables does not imply that in all economies the nontradable sector is bigger than the tradable sector. In fact, the opposite tends to be the case in small open economies. Therefore, building on Bearce and Hallerberg one can expect that small open democracies tend to peg their exchange rate, while larger, less open democracies are likely to prefer monetary policy autonomy and thus float.

Yet, political economists know surprisingly little about the exchange rate regime choice in autocracies. The most valuable insight, in this respect, has been provided by Broz (2002: 861), who states that *if* autocratic regimes seek to lower inflation, they need to rely on a "commitment technology that is more transparent and constrained (…) than the government itself." In this case, governments will choose a monetary anchor that cannot directly be influenced by the domestic elite or short-term policy considerations and peg their exchange rate to a foreign currency (rather than increasing central bank independence). However, this leaves open why (some) autocracies prefer to peg rather than to enjoy monetary policy flexibility.[6]

Problems and Puzzles

Time inconsistency theories have substantial merit: the desire to deliver low inflation rates appears to be behind some governments' decision to fix their exchange rate to a low inflation anchor currency. However, they also leave some important questions unanswered:

a) Why do some governments choose to fix the exchange rate instead of providing central bank independence for generating monetary credibility? Why do other governments fix

6 Broz (2002: 863) simply assumes that the time inconsistency problem is not exclusive to democracies.

the exchange-rate even though they have already granted monetary policy autonomy to an independent central bank?

It is not clear why, following the logic of time inconsistency theories, governments which want to tie their hands do not simply surrender monetary policy autonomy to an independent central bank with a conservative central banker who does not share the utility function of the government (Rogoff 1985) instead of using the second-best option of a fixed exchange-rate regime. Such a choice would not only be more credible: it is more difficult to revoke central bank independence (CBI) once granted than to revoke an exchange rate peg. It also has less damaging economic side-effects. Fixed exchange-rate regimes suffer from a high probability of misalignment, eventually leading to speculative attacks on the domestic currency and an increased probability of a currency crisis (Obstfeld 1996; Kaminsky and Reinhart 1999). The costs of an exchange-rate peg are especially high if the pegging country has higher inflation rates than the anchor currency. In this case, the pegging country experiences an exchange rate appreciation in real terms (though of course the nominal exchange-rate remains constant). Accordingly, the export industry loses competitiveness and the country's current account worsens.

As mentioned above, Broz (2002: 883) provides a transparency argument why autocracies prefer a fixed exchange rate regime to CBI: "For autocratic governments, a highly transparent monetary commitment such as a peg can substitute for the transparency of the political system to engender low inflation expectations." Yet, this argument would appear to solve one puzzle by creating another one, namely why some autocracies have an independent central bank, either in lieu of or in addition to a fixed exchange rate regime.[7] This leads us to another, re-

7 Furthermore, if autocracies lack transparency by definition, autocratic regimes should not profit from checks and balances. However, one can show that autocracies with checks and balances have higher economic growth rates than autocracies without (Plümper and Martin 2004).

lated problem for time inconsistency theories: If both fixed exchange rates and CBI can provide monetary policy credibility, then it is not clear why some governments, democratic or autocratic, choose both. In sum, granting independence to the central bank is the first best policy choice and the time inconsistency approach cannot explain why countries peg their exchange rate instead of or in addition to granting CBI if credible monetary policy stability is their main objective.

b) Why do governments choose different anchor currencies?

Time inconsistency theories typically do not address the question of anchor currency choice. According to its logic, any currency with compelling anti-inflationary credibility should be equally suited to become the monetary anchor for countries wishing to provide credible monetary policy stability. Yet, on the one hand some currencies (such as the Swiss Franc) never became anchor currencies despite their low inflation rate. On the other hand, the US Dollar has been the most popular anchor currency despite periods of relatively large inflation rate fluctuations, which made it less suitable as monetary anchor than currencies with a more stable inflation history. Thus, while the time inconsistency approach provides an argument why some governments choose an exchange rate peg, it cannot provide an explanation of the choice of anchor currency.

c) Why do many governments de facto peg without announcing the fact that they intend to stabilize the exchange rate to an anchor currency?

In order to achieve credibility, the commitment device must be transparent and publicly known. Time inconsistency theories have difficulty explaining why countries often de facto peg their exchange rate, but without publicly announcing a commitment to defend this peg, i.e. without a de jure peg. An unannounced peg is not transparent and therefore no commitment device because the government is not committed to defend it. Clearly, if governments

want to gain credibility for anti-inflationary policies, they have to publicly announce the exchange rate peg.

d) Why do countries with credible low inflation policies peg their exchange-rate to an anchor currency?

Time inconsistency theories also struggle to explain why countries that do not have serious problems with their inflation target still fix their exchange rate. Possible explanations need to look beyond credibility. Of course, others before us have argued that credible commitment theories do not provide the full answer to explaining fixed exchange rate regimes. Chang and Velasco (2000: 71) show that, in the developing world, "the transition to floating has taken place at the same time as average inflation rates have fallen sharply", from which they conclude that when it comes to exchange rate regime choice "the credibility consideration seems to be less compelling." Bernhard et al. (2003: 17) similarly suggest that "credibility is not the only, or perhaps not even the most important, factor influencing the choice of monetary institutions". In their view, "for very small, highly trade-dependent economies (…) the decision to peg is over-determined by OCA [optimal currency area] considerations" (ibid.), to which we turn now.

2.2. The Optimal Currency Area Approach to Exchange Rate Pegs

Optimal currency area (OCA) theories argue that a common currency is optimal between two economic areas which trade heavily with each other, invest much in each other's economies, which have similar inflation and productivity growth rates, and whose business cycles are sufficiently synchronized (Mundell 1962).[8] Subsequent research has argued that, in addition

8 Bruno and Sachs (1985) and Calmfors and Driffill (1988) argue that labor market regulation should be at least similar. Their argument, however, is based on business cycle synchronicity: they claim that if

to the aforementioned conditions, labor mobility should be high and capital markets integrated. Under these conditions, the welfare gains from trade are significant (Rose 2000), while the loss in monetary policy autonomy remains small due to the synchronicity in the business cycle (Alesina and Barro 2002).

In principle, OCA theories may come to conclude that the size of actual currency areas is either smaller or bigger than the 'optimal currency area size'. Since, however, it is difficult to imagine that governments "allow the creation of multiple domestic currencies" (Willett 2001:3), most applications of OCA theories deal with currency unions – that is with the notion that countries are smaller than the optimal size of the currency area.

Naturally, there is very little agreement on examples for an optimal currency area. Many doubt that the European Currency Union constitutes an OCA remain strong (e.g., Eichengreen 1991; Sarno and Taylor 1998; Bayoumi and Eichengreen 1999), but similar doubts can be raised whether California and Michigan, North and South Italy, East and West Germany, England and Northern Ireland and so on should be part of the same currency area. As a consequence, most scholars believe that the empirical case for OCA theories is weak: "The evidence therefore suggests that the theory of optimum currency areas has relatively little predictive power. Virtually all independent sovereign states have separate currencies, and changes in sovereign states lead rapidly to accompanying adjustments in monetary autonomy. The boundaries of states rarely coincide exactly with optimum currency areas, and changes in boundaries causing changes in currency domains rarely reflect shifts in optimum currency areas." (Goodhart 1995: 452).

---

one country has higher labor market rigidities than the other country then their response to a common economic shock will be dissimilar.

Perhaps even more difficult to answer is the question whether synchronized business cycles and high trade integration are conditions or effects of common currencies. Frankel and Rose (1998), Bayoumi et al. (1999), and Fidrmuc (2008) find empirical evidence that in the long-run a currency union brings about the conditions which are thought to be necessary for establishing a currency union. In any case, to give up one's own currency is a drastic and often unpopular decision to make, which is why we observe relatively few currency unions between independent, sovereign states (Alesina and Barro 2002).

An easier option than a currency union is to fix one's currency to an anchor currency. The positive logic of OCA theories can be straightforwardly applied to the choice of a fixed exchange-rate regime. A country will find it easier and less costly to maintain a stable exchange-rate with another currency if business cycles move relatively synchronously and macroeconomic indicators are sufficiently similar. At the same time, a fixed exchange-rate becomes more attractive when the pegging country and the other country trade intensely with each other. Accordingly, the probability of choosing a fixed exchange-rate regime is inversely related to country size and positively related to bilateral trade and similarity in macroeconomic indicators.

Bayoumi and Eichengreen (1998) augment OCA theories in this direction in their analysis of foreign exchange market interventions. In their view, trade relations and business cycle synchronicity affect the monetary policy authorities' incentive to stabilize the exchange rate. They find that the factors, which OCA theory identifies as important prerequisites for optimal currency areas, can explain patterns of intervention in the exchange market. In other words, OCA theories provide insights in governments' desire to stabilize the exchange-rate vis-à-vis other currencies.

To our knowledge, Eichengreen and Flandreau (1998) as well as Meissner and Oomes (forthcoming) were the first to utilize the OCA approach to explain the choice of an anchor

currency. Eichengreen and Flandreau analyze the rise of the gold standard (as opposed to silver and bimetal convertibility) in the late 19th century. In their view, the rush into the gold standard was triggered by France's and other countries' departure from the bimetal standard. This led to a severe increase in volatility in the relative prices of gold and silver, which in turn increased the exchange rate volatility between countries using different standards. As a consequence, between 1873 and 1908 all but a few countries (including Greece, Spain and China) that previously used either the silver or a bimetal standard switched to gold. Eichengreen and Flandreau provide multiple reasons why the 'standardization of the standards' emerged: first, debtor countries using the gold standard paid lower interest rates compared to other countries. Apparently, international operating banks believed gold standard countries were more credible. But second, and more importantly in their view, the dominant trading nation of the late 19th century, Great Britain, used the gold standard, inducing other countries to also adopt this standard in order to minimize exchange rate volatility.

Meissner and Oomes (forthcoming) make an almost identical argument to explain the incentives to peg to a certain anchor currency. In their view, the attractiveness of a potential anchor currency increases with the number of countries which have already pegged to that currency. Since a stable exchange rate reduces transaction costs to international trade, a currency becomes more attractive as an anchor currency, the larger the trade volume of this country and the more countries use this currency as anchor. Thus, the declines in transaction costs associated with using a particular currency as exchange rate anchor increases with size of the key currency area (Krugman 1984; Eichengreen and Flandreau 1998).

Both Eichengreen and Flandreau's (1998) as well as Meissner and Oomes's (forthcoming) arguments are based on the assumption of OCA theories that exchange rate volatility with the currency of large trading nations and trading blocks is detrimental to the economic development of nations. However, neither pair of authors discusses the flipside of exchange

rate pegs which OCA theories also highlight: the loss of monetary policy autonomy and the risk of experiencing a real exchange rate appreciation, which occurs if the domestic inflation rate exceeds the inflation rate of the anchor currency. While the loss in monetary policy autonomy is independent of the size of the anchor currency area and can thus be held constant in an analysis of contagion effects of anchor currency choices, the costs of a real appreciation increases in the number of countries which have already pegged to the anchor currency.

Problems and Puzzles

Yet, OCA approaches to fixed exchange rates are far from convincing. Despite their strength in identifying a strong motivation for exchange rate pegs and in clearly spelling out the potential costs of a fixed exchange rate, OCA theories also leave some important questions unanswered:

a) Why do governments at times fix their exchange-rate even though their macroeconomic conditions are largely incongruent with those of the chosen anchor currency?

OCA theories fail to explain why some governments fix their currency to another currency with largely different business cycles, growth rates, and inflation rates. For example, on March 3, 1986 Brazil replaced the crawling peg exchange rate regime with the Dollar by a fixed exchange rate regime. This peg lasted only slightly more than half a year until November 24 and had to be given up because Brazil's current account deficit rose significantly. Similarly, Argentina's most recent economic crisis was at least partly caused by the country's fixed exchange rate regime with the Dollar. Over years, Argentina fixed the Peso-Dollar exchange rate. Since Argentina's inflation exceeded that of the Dollar, the Peso appreciated in real terms, thereby adding to the country's current account deficit, until the peg had to be abandoned in early 2002.

b) Why do governments at times choose a fixed exchange rate regime even though they command over alternative policies which would increase trade and investment at a much lower cost?

Trade and investment facilitation can play an important role in a country's decision to peg its exchange rate, as examples such as South Korea, Thailand, Malaysia and Indonesia attest to. However, in other cases, OCA theories of exchange rate pegs completely fail to explain the exchange rate decision. Clearly, Brazil's and Argentina's fixed exchange rate episodes are best understood as desperate attempts to tame inflation, not as mainly driven by trade and investment facilitation. If governments in these countries had wanted to promote trade and investment, they could have simply reduced the high barriers to trade and investment rather than stabilizing the exchange rate to the Dollar. Both cases demonstrate that the OCA approach to exchange rate pegs is much better suited to tell when countries should peg than to predict when countries actually do peg (Goodhart 1995).

c) Why do many governments de facto peg without officially announcing the peg?

Similar to time inconsistency theories, OCA theories also fail to explain unannounced de facto pegs. If governments seek to promote trade and investment, they need to credibly signal exchange rate stability to economic subjects. Trade and investment are not 'one-shot' interactions, but depend on continuous long term exchange. Therefore, governments intending to significantly reduce transaction costs to cross-border business activities need to commit to long term stability of exchange rates. In this respect, an officially announced exchange rate commitment is superior to an unannounced de facto peg. Yet, many countries stabilize their exchange rate without formal commitment. Some even deny the existence of a fixed exchange rate altogether. For example, the Canadian government claims that the country has implemented a floating exchange rate since the early 1970s, even though the country imple-

mented the role-model of an unannounced de facto peg to the US Dollar until early 1999 (Plümper and Troeger 2008).

3 A Theory of Exchange-Rate Regime Choice with Competing Key Currencies

We develop our theory of exchange rate regime choice with competing key currencies in a number of steps. We start by drawing on the 'fear of floating' literature to provide an additional argument for exchange rate stabilization: preventing the import of inflation. We will then demonstrate how this framework can be used to make predictions on the decision to peg and the choice of an anchor currency. A key currency is more likely to be chosen as anchor the larger a country's imports of goods and services from the key currency country as well as the key currency area, that is, from other countries which have pegged their exchange rate against that currency. A peg also becomes more likely if a country has granted independence to its central bank. Finally, our theory can explain why countries often de facto peg their exchange rate without announcing to do so. In other words: our theory not only explains the choice of an exchange rate regime and of an anchor currency, at the same time it also solves many of the puzzles left open by extant theories of exchange rate regime choice.

3.1. Fear of Floating, Exchange-Rate Pass Through, and de facto Exchange Rate Pegs

Our argument is built on the standard workhorse model of political business cycles with rational voters. The government faces a classical loss function, in which both unemployment and inflation reduce government support. Under normal conditions, governments can use monetary policy to stimulate the economy, but since voters are rational, the effect of stimulation vanishes quickly. If, however, an unexpected shock occurs governments can reduce the interest rate or use other expansionary monetary policies to partly offset the adverse consequences, reduce the social costs of the shock and stabilize consumption and employment at the cost of a moderately rising inflation rate (Giavazza and Pagano 1988; Persson and Tabel-

lini 2000; Plümper and Troeger 2008). Since governments use monetary policy to deal with an unexpected shock, voters do not (fully) adjust their inflation expectation. However, the rational voter assumption precludes the existence of a general Phillips-curve trade-off between higher inflation and lower consumption. Monetary policy can therefore not reduce unemployment permanently.

The degree to which monetary policy authorities will offset the economic shock depends on its conservatism. More conservative authorities will respond less to an economic shock than less conservative ones. If the monetary authority rests with an independent central bank then the response to economic shocks will be very moderate. The model predicts that in the short run and with conservative monetary policy authority, the volatility of inflation is relatively low and the volatility of consumption relatively high and vice versa if the monetary policy authority is less conservative.

As regards the choice of an exchange-rate peg, we argue that governments often prefer to stabilize exchange-rates because a currency appreciation weakens domestic producers of tradable goods and services while a currency depreciation makes consumers worse off and – this is most important – leads to an increase in inflation since the price of imported goods rises. This latter argument follows the 'fear of floating' literature, which addresses an important feature of exchange rate regimes, namely the phenomenon "that countries that say they allow their exchange rate to float mostly do not – there seems to be an epidemic case of 'fear of floating'" (Calvo and Reinhart 2002: 379).[9] Calvo and Reinhart identify the prevention of

9 The fear of floating literature is thus not so much interested in explicit, formal de jure exchange rate pegs, but rather in the actual behavior of monetary authorities which de jure have implemented a flexible exchange rate regime.

imported inflation as one of two reasons why countries may wish to fix their exchange rate without necessarily officially announcing the peg.[10]

From the perspective of an opportunistic government, the optimal exchange rate thus brings about the political support-maximizing combination of consumption and inflation. Deviations from this optimal exchange rate, which either increase or decrease inflation and consumption too much are politically costly. The effect of a change in the exchange rate on inflation and consumption is, however, not identical for all countries. Rather, this effect is much smaller in large and closed economies than in small open economies. In other words, the political cost of exchange rate volatility depends on trade openness. An exchange rate depreciation affects inflation the more the larger the import to GDP ratio. In addition, the effect of a currency depreciation on inflation also depends on what is known as 'exchange-rate pass-through' (Hausmann et al. 2001; Plümper and Troeger 2008): the extent to which corporations pass on exchange-rate effects to consumers. Exchange-rate pass through can be close to one, as in the case of fuel prices, or relatively moderate, as in the case of imported cars in the US. It clearly depends on whether importers compete with local producers and on the competitiveness of markets. However, recent research has demonstrated that, on average, exchange-rate pass-through is much closer to one than to zero.[11]

In sum, the effect of a currency depreciation on domestic inflation roughly follows a simple formula: depreciation times exchange-rate pass-through times imports from the key currency country divided by the domestic country's GDP. Assume the country's exchange-rate depre-

10 The other reason is that exchange-rate fluctuations reduce the ability of many countries to borrow in global capital markets. High exchange-rate volatility leads to a risk-premium demand from international investors, which can be prevented by fixing one's exchange-rate to a currency or basket of currencies.

11 See Hausmann et al. (2001), Shambaugh (2008), Campa and Goldberg (2005) and Devereux et al. (2006) for evidence in support of the exchange-rate pass-through hypothesis.

ciates by 10 percent, of which 80 percent are passed-through by importers to consumers and imports from the key currency country sum to 10 billion Dollars while the country's GDP is 50 billion Dollars. In this case, and keeping everything else including the exchange rate to other currencies and monetary policy constant, the inflation rate increases by 0.1 x 0.8 x 0.2 = 0.016, i.e. 1.6 percent. In reality, the inflationary effect will be slightly smaller since changes in relative prices affect consumer behavior. However, the incentive to stabilize the exchange rate still increases with the imports to GDP ratio and the pass-through rate.

With governments in fear of floating, pegging on a de facto basis remained popular amongst countries even after the collapse of the Bretton Woods system of fixed exchange rates. We find that on average around 50 percent of independent countries de facto peg their currency – see figure 1.[12] At least according to our measure, pegging was most attractive in the mid-1980s and in the early 2000s. While in the mid-1980s this boom was caused by more governments pegging to the Dollar, the recent increase almost exclusively stems from countries choosing the Euro as anchor currency. Many of these countries of course are Eastern European countries whose dependence on imports from Euro zone and Euro area countries is high.

[12] See section 4 for a definition of what constitutes a de facto peg. We use two different thresholds of currency value correlations, which are indicated in the figure as the 0.6 and 0.9 thresholds, respectively.

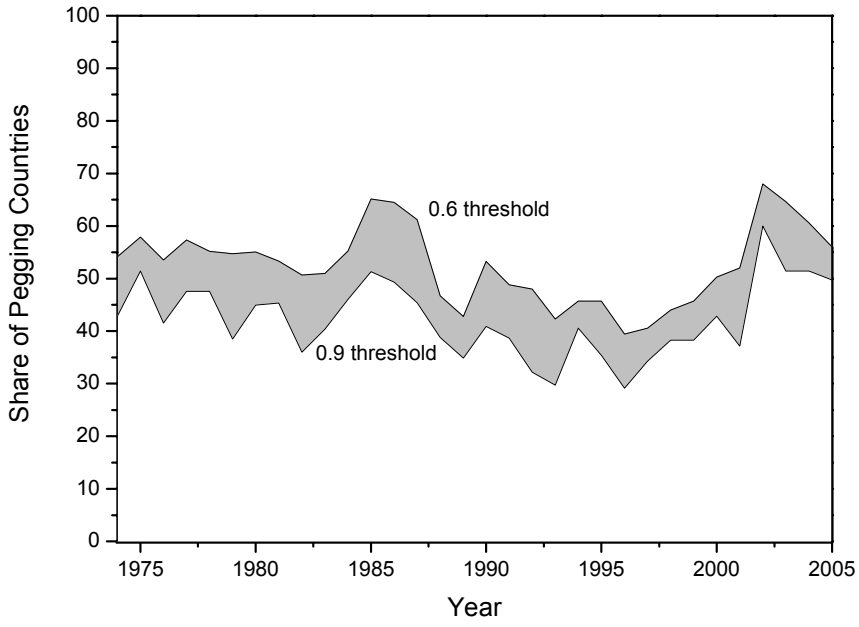

Figure 1: Share of Countries with De Facto Pegs, 1974 to 2005.

3.2. The Choice of Anchor Currency with Competing Key Currencies

So far, we have discussed the incentives of countries to peg their currency. With more than one potential anchor currency governments not only have to decide whether or not to peg. They also need to choose an anchor currency among competing key currencies. In making this decision, governments are facing a further trade-off, which adds to the Mundell-Fleming trade-off between monetary policy autonomy and a stable exchange rate: If governments stabilize the exchange-rate against one key currency, their exchange-rate with other currencies may become more volatile.

Thus, the choice of an anchor currency is not only influenced by absolute import dependence. Rather, it also depends on relative trade flows, or in other words, on the relative dependence on imports from multiple key currency countries. The larger the share of imports from one

key currency country relative to imports from other key currency countries, the more likely the country pegs to this currency. This is because the import of inflation will be strongest if the country's currency were to depreciate relative to this key currency. Accordingly, our model predicts that countries peg to the key currency from which they import the most goods and services. For example, Canada and Mexico are more likely to peg to the Dollar, while Hungary and Poland are more likely to seek a Euro peg.

Indeed, if we ignore the case of the 'transferable ruble' and its role in Council of Mutual Economic Assistance (CMEA) trade relations, only four key currencies served as main anchor currencies for sovereign countries since 1973: the US Dollar, the British Pound, the French Franc, and the Deutsche Mark, with the latter two currencies now being united in the Euro. Perhaps surprisingly, no country pegged to the Japanese Yen or the Swiss Franc, two countries with historically low inflation rates.

Table 1: De facto Pegs to Key Currencies across Time

Year:	1975	1980	1985	1990	1995	2000	2005
threshold: 0.9							
Dollar	30	45	56	46	43	42	57
Franc	17	19	14	14	15	n.a.	n.a.
Pound	19	2	1	0	0	0	0
D-Mark	19	6	12	8	8	n.a.	n.a.
Euro	n.a.	n.a.	n.a.	n.a.	n.a.	38	36
Total:	85	72	83	68	66	80	93
threshold: 0.6							
Dollar	35	52	76	60	52	54	65
Franc	19	24	15	16	20	n.a.	n.a.
Pound	22	4	0	0	0	0	0
D-Mark	21	10	14	12	13	n.a.	n.a.
Euro	n.a.	n.a.	n.a.	n.a.	n.a.	41	40
Total:	97	90	105	88	85	95	105

Over the period 1973 to 2005, the Dollar accounted for between 35 and 75 percent of all pegs, with low points at the start of the post-Bretton Woods era and at the beginning of the 1980s (see table 1). However, in most years the Dollar was the preferred anchor currency for the

majority of pegging countries. This dominant role would appear anomalous given that the United States' share of world exports never exceeded 16 percent during this period. How to explain the Dollar's dominance? And why did countries only accept these four currencies as their exchange rate anchor?

3.3. Contagious Effects of Exchange Rate Pegs

We argue that governments look beyond their relative import share from key currency countries. They also consider their relative import share from key currency areas, i.e. from countries which themselves have pegged their exchange rate to the key currency. Since the Dollar was the dominant currency of the Bretton Woods system, and since many countries maintained their Dollar peg despite the collapse of the Gold-Dollar standard, imports from the Dollar area always by far exceeded imports from the US.[13]

This is important because if a country's currency depreciates against the Dollar, it inevitably also depreciates against currencies pegged to the Dollar. For example, if the Brazilian Real depreciates against the Dollar, imports from Argentina become more expensive if the Peso is pegged to the Dollar. Of course, the Brazilian government will not give exactly equal consideration to a devaluation against the Dollar as to a devaluation against currencies pegged to the Dollar. This is because a potential devaluation against a currency that is pegged to the Dollar may lead to an increase in the probability that the government of the foreign country issuing the pegged currency realigns the peg or starts floating. Hence, governments should take imports from countries which are pegged to a key currency into lesser consideration than imports from the key currency country itself when calculating the inflationary effects of a currency devaluation. While the inflationary effect of imports from the key currency solely depend on exchange rate pass-through, the inflationary effect of imports from countries which

---

[13] For a similar argument see Meissner and Oomes (forthcoming).

have pegged to the key currency results from exchange-rate pass through times the probability that these countries' currencies do not depreciate against the key currency.

Despite this additional difficulty, the pegging decision of one country will often affect the probability with which other countries peg and the currency to which other countries peg. The more countries maintain a peg to the Dollar, for example, the larger the Dollar currency area becomes and the larger therefore the inflationary effect of an exchange rate devaluation against the Dollar. Pegging will thus be contagious: the more countries peg to one currency, the more attractive this currency becomes as anchor currency for other countries since the relative import share of the key currency area increases with the number of pegging countries. Moreover, if a de facto fixed exchange rate with a key currency causes an increase in trade with the key currency area relative to trade with other economic areas, as some argue (Rose 2000), then the choice of a key currency is moderately self-enforcing. The implication is that not many key currencies can co-exist with each other and smaller ones are vulnerable to lose their status as anchor currency as the Pound experience shows. With currently only two remaining anchor currencies (Euro and Dollar), it will be interesting to see whether another currency could join this exclusive club in the future.

3.4. *Why Central Bank Independence and a (De Facto) Peg are not (Perfect) Substitutes*

An important difference between time inconsistency and fear of floating approaches concerns the predicted effect of CBI on exchange rate regime choice. For the time inconsistency approach, a fixed exchange rate and CBI are functional equivalents and thus substitutes. Either institution should be enough to deliver low inflation. This leaves us to believe that the effect of CBI on the probability of pegging a country's fixed exchange rate is negative.

From the perspective of the fear of floating approach the opposite is the case. Independent central banks should have a stronger anti-inflationary bias than central banks which are con-

trolled by the government. Therefore, independent central banks in countries expecting an exchange rate depreciation are more likely to stabilize their exchange rate in order to prevent the import of inflation. Accordingly, CBI increases the likelihood that a country pegs its currency.

3.5 Why Some Governments prefer a De Facto Peg over a Jure Peg

As mentioned already, on average around 50 per cent of countries pegged the exchange-rate of their currency to one of the key currencies. Strikingly, many countries that have de facto pegged their exchange rate never officially announced a de jure peg. In our dataset, in 17 per cent of country-years governments de facto pegged their currency according to our definition, but officially floated their currencies according to Bearce and Hallerberg (2008).

Neither the time inconsistency nor the OCA approach provide a good explanation for why countries would want to peg de facto, without an officially announced de jure peg. From the perspective of time inconsistency theories, de facto pegs look like a missed opportunity, because the anti-inflationary credibility emanating from such pegs must always be lower than the anti-inflationary credibility which governments can gain from an officially announced peg. Similarly, the OCA approach argues that fixed exchange rates lower transaction costs to trade, but while a de facto relatively stable exchange rate may also reduce transaction costs to a certain extent, by officially announcing the peg governments increase their commitment to actually stabilize the exchange rate and thereby lowering corporations' perceptions of exchange rate risks. This in turn should lead to lower transaction costs for international business activities.

The fear of floating approach explains why governments prefer de facto over de jure pegs. Governments face a trade-off between avoiding the import of inflation (when the currency depreciates) and the desire to maintain monetary policy autonomy to limit the effects of

asymmetric economic shocks. For managing this trade-off, an officially announced peg is not needed. De facto stable exchange rates suffice to prevent the import of inflation. Yet, at the same time, a peg which has never been officially announced allows governments to respond to asymmetric shocks at lower cost because reneging on an officially announced commitment is politically costly.

3.6. Hypotheses

Our theory allows us to derive several hypotheses, of which we put the three most important ones to an empirical test here:[14]

H1. A country is more likely to peg its currency to a specific key currency the higher its imports from the key currency country relative to GDP.

H2. A country is more likely to peg its currency to a specific key currency the higher its imports from the key currency area relative to GDP.

H3. A country is more likely to peg its currency to any key currency the more independent its central bank.

4 Research Design and Empirical Analysis

In this section, we test the three main hypotheses derived from our 'fear of floating' theory, controlling for alternative explanations of the choice of de facto fixed exchange rate regimes. Clearly, crucial to our tests is the definition of a de facto peg. We base the coding of an exchange rate peg on the correlation of the value of a country's currency, expressed in Special Drawing Rights (SDRs), with each one of the key currencies, also expressed in SDRs, using data from IMF (2007a) as source. We use two different thresholds. Our first operationaliza-

14 In future research, we will test further predictions derived from our theory, which due to space constraints is beyond the scope of this paper.

tion of a 'de facto peg' requires that the country's currency is correlated above .6 in the current year as well as in the previous two years with a key currency. In case the domestic currency is thus correlated with more than one key currency, we attributed one of them as the one to which the domestic currency is pegged, based on the strength of correlation as well as past exchange rate pegs. Using a correlation above .6 as the cut-off point for declaring a currency peg may be regarded as too generous. For the second, alternative peg decision, we have therefore used a correlation above .9 as the much more stringent cut-off point. For both tests, we estimate a multinomial logit model since we assume that a country can peg to only one of the key currencies, where the base outcome is the absence of a peg. In a robustness test, we relax the assumption and allow for the fact that countries at times stabilize their currency to more than one key currency.

To test our first two hypotheses, we use data on bilateral imports to generate two variables. One variable measures the value of imports of goods and services from key currency countries. Imports data are taken from IMF (2007b) and Gleditsch (2001), while GDP data are sourced from World Bank (2007). The second variable measures imports from key currency areas, i.e. from countries which have themselves pegged to a specific currency. This variable represents a dyadic spatial lag, capturing the spatial dependence of countries' pegging decisions with respect to key currencies.[15] Denote the country of interest as *i*, all other potentially pegging countries as -*i* and the key currency countries as *j*, then this variable captures the spatial effect emanating from countries -*i* on the exchange rate peg choice of country *i* with re-

---

[15] See Franzese and Hays (2008) for an extensive discussion on how to estimate spatial lags, Plümper and Neumayer (2008) on specifying spatial models, and Neumayer and Plümper (2008) on the options available in the spatial analysis of dyadic data. The introduction of a spatial lag leads to a small endogeneity bias. It is likely to be too small to justify employing instrumental variable or maximum likelihood techniques to account for the endogeneity, which are not readily estimable in a multinomial logit model.

spect to key currency countries *j*, where the weighting matrix consists of imports of country *i* from countries –*i*, relative to the GDP of the importing country *i*.[16]

Testing our third hypothesis is rendered difficult by the absence of a direct measure of CBI for a large group of countries over a long period of time. In its stead, we use data on the turnover rate of central bank governors – a widely used proxy variable in the literature (Cukierman and Webb 1995; Keefer and Stasavage 2003). Our specific measure is the square root of the number of times the central bank governor was replaced within the last 5 years, multiplied by minus one to make this a measure of central bank independence rather than dependence. The square root was chosen because the relationship between turnover rate and central bank independence is likely to be non-linear with a negative first and positive second derivative. Dreher et al. (2008) provide the source data. This variable is clearly a crude proxy for CBI. While a high turnover rate suggests large-scale government interference into the central bank's affairs, a low turnover rate may not imply the absence of such interference if the long-standing governor is an obedient servant of government orders such that the government sees no need to replace him or her. We use this variable for lack of a better alternative – direct measures of CBI are typically existent only for single years and for a subset of countries, not for a large cross-sectional time-series sample.

In addition, we include a number of control variables, which are defined in detail in appendix 1, namely inflation history, economic size, democracy and per capita income. To control for temporal dependence, following Beck et al. (1998) we include two sets of cubic splines, one accounting for the time the currency was pegged to any key currency, another set of cubic splines accounting for the time the currency was not pegged. Our sample covers 106 coun-

---

[16] The weighting matrix is not row-standardized since the variable of interest to us is the sum of import to GDP ratios from countries, which have pegged their currency to a key currency.

tries, being restricted only by the availability of data.

Table 2 reports the results from multinomial logit estimation covering the years 1974 up to the year before the introduction of the Euro (1998), whereas table 3 covers the period 1999 to 2005, both using correlations above .6 as cut-off point. Appendices 2 and 3 similarly cover the pre- and post-Euro era, but using correlations above .9 as cut-off point instead.

Table 2. Multinomial logit results of exchange rate pegs to key currencies (1974-98).

	Franc	D-Mark	Pound	Dollar
imports from France [(a)]	75.98***	-29.84**	34.23***	-13.77**
	(9.441)	(12.29)	(12.34)	(6.146)
imports from Germany [(a)]	-64.12***	16.50***	16.33***	-20.72***
	(18.24)	(6.001)	(6.292)	(6.707)
imports from UK [(a)]	-6.444	4.129	-0.442	-0.480**
	(11.59)	(2.942)	(1.039)	(0.240)
imports from USA [(a)]	-32.19***	-4.303	0.0982	0.291***
	(6.346)	(2.919)	(0.878)	(0.0871)
imports from Franc area [(a)]	57.66***	42.47***	-10.90	5.758
	(8.640)	(10.03)	(13.40)	(7.847)
imports from D-Mark area [(a)]	-4.189	32.57***	-8.325	0.0693
	(4.930)	(4.911)	(6.636)	(2.938)
imports from Pound area [(a)]	-11.61	21.85	28.43**	-45.92
	(26.46)	(28.08)	(12.03)	(30.11)
imports from Dollar area [(a)]	-37.96***	-22.86***	-45.10***	2.766***
	(5.500)	(8.365)	(9.386)	(0.916)
central bank independence	0.446*	0.380	0.617**	0.0964
	(0.245)	(0.275)	(0.287)	(0.110)
high inflation history	-1.611	-3.352***	-29.88***	0.553***
	(1.429)	(0.908)	(0.437)	(0.199)
log gdp	-0.238**	0.750***	-0.640**	0.0569
	(0.102)	(0.171)	(0.259)	(0.0440)
level of democracy	-0.512*	1.590***	-0.274	0.473***
	(0.304)	(0.386)	(0.712)	(0.116)
democracy * log gdp	0.0257**	-0.0638***	0.0226	-0.0216***
	(0.0128)	(0.0156)	(0.0328)	(0.00493)
per capita income	0.000283*	0.000357***	0.0000742	0.0000826**
	(0.000148)	(0.0000840)	(0.000177)	(0.0000398)
squared per capita income	-11.2e-09	-9.61e-09***	-8.64e-09	-3.69e-09**
	(7.69e-09)	(2.36e-09)	(6.79e-09)	(1.62e-09)
Constant	4.440*	-22.83***	12.39**	-1.017
	(2.326)	(4.285)	(5.642)	(1.027)
Observations	2081	2081	2081	2081
Pseudo R-squared	0.55	0.55	0.55	0.55

(a) divided by GDP of pegging country
Note: cubic peg splines and cubic non peg splines included

Concentrating first on the pre-Euro era (table 2), we find evidence for the predictions derived from our 'fear of floating theory' of the choice of exchange rate pegs. We find that imports from France and the Franc area, from Germany and the D-Mark area as well as from the US and the Dollar area, respectively, increase the probability of pegging to the Franc, the D-Mark and the Dollar, respectively. Interestingly, higher imports from the Franc area also have a positive effect on the likelihood of an exchange rate peg to the D-Mark. The likely reason for this finding is that France itself stabilized its exchange rate toward the D-Mark for many years during this period. It is less clear why higher imports from the UK do not provide an incentive to peg the exchange rate to the Pound (higher imports from the Pound area do, however). Also somewhat anomalously, a de facto peg to the Pound seems to become more attractive if countries import more German and French goods and services. Still, we find broad support for the predictions of our theory that exchange rate pegs follow import flows.

Results are similarly consistent with our hypotheses in the period after the Euro introduction (table 3). Note that in this period, no country pegs its currency to the Pound according to our definition, which is why the Pound is excluded in the post-Euro estimations. Higher imports from Euro countries and the Euro area raise the likelihood of a Euro peg, higher imports from the US and from the Dollar area raise the likelihood of a Dollar peg. Unexpectedly, higher imports from the Euro area also make a peg to the Dollar more likely, but they raise the likelihood of a currency peg to the Euro even more, which keeps this result consistent with our expectations.

Table 3. Multinomial logit results of exchange rate pegs to key currencies (1999-2005).

	D-Mark	Dollar
imports from Eurozone [(a)]	13.02***	-27.90***
	(4.637)	(5.545)
imports from USA [(a)]	-7.155***	0.485***
	(1.677)	(0.135)
imports from Eurozone area [(a)]	42.79***	32.76***
	(9.148)	(8.721)
imports from Dollar area [(a)]	-19.78**	10.20***
	(9.269)	(2.594)
central bank independence	1.407***	0.659**
	(0.469)	(0.279)
high inflation history	-0.134	0.381
	(0.538)	(0.339)
log gdp	0.545**	0.392**
	(0.247)	(0.181)
level of democracy	2.107***	2.078***
	(0.794)	(0.645)
democracy * log gdp	-0.0875***	-0.0913***
	(0.0329)	(0.0272)
per capita income	0.0000788	0.000179*
	(0.0000838)	(0.000108)
squared per capita income	-1.51e-09	-10.7*e-09*
	(2.79e-09)	(5.05e-09)
Constant	-14.47**	-7.699*
	(6.042)	(4.160)
Observations	654	654
Pseudo R-squared	0.68	0.68

(a) divided by GDP of pegging country
Note: cubic peg splines and cubic non peg splines included

As concerns central bank independence, relevant to our third hypothesis, greater CBI renders more likely a peg to the Franc and the Pound as well as to the Euro after its introduction. It has no effect on a peg to the D-Mark, but the estimated coefficient is correctly signed and not far off statistical significance. Greater CBI also makes countries peg to the Dollar, but only in the period after the establishment of the Euro.

Our estimates also reveal that countries are more likely to peg their currency to the Dollar and less likely to the D-Mark and the Pound if they have suffered from high inflation in the past, but have achieved moderate inflation in the current period. This result is not simply due to a

Latin American effect as it upholds if we add a Latin American or a full set of regional dummy variables to the estimations (results not shown). If we run a simple logit model in which a peg to *any* key currency is the dependent variable, then we find a history of high inflation to have a positive impact on the likelihood of peg (results not shown). As it seems, a history of high inflation induces countries to peg as time inconsistency theories argue, but they strongly prefer the Dollar to other key currencies, which time inconsistency theories cannot easily explain, especially since the Dollar typically had more volatile and higher inflation rates than for example the D-Mark.

Following an argument by Bearce and Hallerberg (2008), suggesting that small open democracies peg their exchange rate, while larger, less open democracies prefer to let it float, we have interacted the democracy variable with economic size. If the argument is correct, then one would find a negative interaction effect. With the exception of pegs to the Franc and to the Pound, we do find such a negatively signed and statistically significant interaction effect, which supports Bearce and Hallerberg's theory.

Lastly, results for the per capita income and income squared variables provide some evidence for a non-linear effect of per capita GDP on currency pegs: by and large, higher per capita income first raises and then lowers the likelihood of a peg. In other words, relatively rich and relatively poor countries tend to be more inclined to let their currency float than middle-income countries. This finding is consistent with Alesina and Wagner's (2006) argument that countries with high liabilities but poor institutions – i.e. typically relatively poor countries – are unlikely to maintain fixed exchange rates and thus have to float, whereas relatively rich countries do not need to peg to an anchor currency to achieve monetary policy stability as they have good alternative institutions that can achieve this goal.

If we take a more stringent cut-off point of .9 correlation as the basis for deciding on de facto pegs, we find the results to be very similar to the ones with the lower cut-off point (see ap-

pendices 2 and 3). Higher imports from the UK now lower the likelihood of a peg to the Pound, whereas higher imports from the Dollar area no longer exert a significantly positive effect on a peg to the Dollar. Countries with greater CBI are no longer more likely to peg to the Franc. These and some other small changes in estimation results relating to the control variables notwithstanding, our hypotheses are still largely confirmed by the results even if de facto pegs are only counted when the value of currencies correlate very highly at or above .9 in this and the last two years with a key currency.

5 Robustness

The preceding section has demonstrated that the predictions derived from our theory find ample support and are by and large independent of whether we choose a higher or lower threshold or exchange rate correlations for defining a de facto peg. In this section, we briefly discuss the results from six additional robustness tests, each of which addresses another potential concern. First, we re-analyze our models using competing classifications of de facto exchange rate pegs. Second, we relax the dichotomous conception of an exchange-rate peg and examine the co-movement of exchange rates. Third, we tackle the possibility of reversed causality, namely that a peg increases imports. Fourth, we account for competing political explanations of exchange rate pegs, namely the colonial history of a country. Fifth, we recode French Franc pegs taking the French peg to the D-Mark into account. Sixth, we use the lagged dependent variable rather than cubic splines to account for temporal dependence in the data and include regional dummy variables to account for some unobserved heterogeneity.

Definition of De Facto Exchange Rate Pegs

Definitions of de facto exchange rate pegs will never be uncontroversial. Our definition of de facto exchange rate pegs, for example, depends on choosing a threshold and the minimum period of co-movement in the exchange rate. Over the last years, other researchers have

suggested other proxies for de facto pegs, proxies that make different but of course equally contestable assumptions. Reinhard and Rogoff (2004) classify an exchange rate regime as de facto peg if black market exchange rates exist, if a peg is announced and the exchange rate behavior accords with the announced peg decision, or if the exchange rate stays within a narrow band to a key currency. Shambaugh (2004) solely focuses on the stability of the exchange rate to a potential anchor currency using narrow bands over "sufficient lengths of time" (Shambaugh 2004: 318) as the criterion to avoid coding errors caused by relatively calm periods and allowing for realignments. In order to check that the results are not specific to our particular definition of de facto pegs, we have estimated the model with both Reinhard and Rogoff's (2004) and Shambaugh's (2004) classification of pegs to key currencies. We find again support for our hypotheses.

Continuous Measure of Exchange Rate Stability

Unique currency pegs to key currencies neglect the possibility that countries may wish to stabilize their currency against more than one key currency. In this case, governments seek to achieve relative exchange rate stability to a set of key currencies without fully pegging to a single currency. In this case, neither our, Shambaugh's nor Reinhard and Rogoff's classification of de facto exchange rate pegs would correctly identify the country's peg decision. For this reason, we put our theory to an additional test using the full variation in the data by estimating a seemingly unrelated regression (SUR) model. In these estimations, we use the correlations between a country's currency and the four key currencies as the (seemingly unrelated) dependent variables. Again, our results uphold.

Reversed Causality: The Effect of Fixed Exchange Rates on Trade

In a series of influential papers, Rose (2000, see also Frankel and Rose 2002) has argued that exchange rate stability between two currencies increases trade between the two countries

issuing these currencies. This argument of course gives rise to a serious concern, namely that our estimation results are spurious and simply caused by the effect of pegs on trade.

In principle, there are two ways of tackling this potential problem. First, one can use instruments for a country's imports from key currency countries. Gravity models of international trade (Isard 1954, Helpman et al.2008) suggest a set of exogenous instruments such as the size of the two countries, distance, and common language. Alternatively, one can simply remove the increase in imports from a key currency country after the peg decision from the data. In other words, if a country de facto pegs from 1992 to 1996, we use the imports from the key currency country in 1991 for the subsequent five years as well. This effectively eliminates any potential reverse effect of pegs on imports and even discriminates against the prediction of our theory because for most countries and most years, imports tend to increase even in the absence of an exchange rate peg. Hence, we can even be more confident that our results are not caused by reverse causality. This exercise leads to slightly smaller coefficients for imports from France on the decision to peg to the Franc and for imports from Germany to peg to the D-Mark, but to a slightly larger coefficient for the effect of imports from the US for a peg to the Dollar. More importantly, however, all substantive results remain in order, so that we see no reason to be concerned that the results reported in section 4 are spurious and caused by reverse causality.

Colonial History

An obvious competing explanation, at least for some of the early and long-lasting peg decisions, are close political and possibly economic ties between former colonies and their colonial powers. In many cases, and especially so for the French Franc zone, colonial ties are difficult to disentangle from economic dependencies, but there are reasons to believe that peg decisions followed a political rather than an economic rationale. To account for this competing explanation we controlled for colonial ties in two ways. First, we used a simple

dummy variable coded as one if a country was a colony of either France or the UK. And second, we used the number of years of these colonial relations in the 20th century as a proxy for the strength of these ties. While colonial ties measured in either way turn out to be significantly related to peg decisions, all our results turn out to be robust to the inclusion of these variables.

Re-Coding Franc Pegs and Euro Era

We have mentioned above that France has stabilized its exchange rate toward the D-Mark for many years during the post-Bretton Woods period. This begs the question whether the French Franc can be regarded as a key currency at all. Our results are robust to counting pegs to the D-Mark and pegs to the French Franc as a peg to a single D-Mark/Franc currency, either over the entire period or from 1983 onwards, when France pegged its currency more consistently toward the D-Mark. Results are also robust toward starting the Euro era with the year 1994, the year which marked the beginning of strict monetary cooperation between EMU countries.

Lagged Dependent Variable and Regional Dummies

Beck et al. (1998) recommend using temporal splines rather than the lagged dependent variable to account for serial correlation and temporal dependence in limited dependent variable models. If, however, we ignore this advice and add the lagged dependent variable, our results still turn out to be robust. Similarly, the introduction of regional dummy variables, following World Bank country classification, to account for some unobserved heterogeneity – though often significant – do not alter our substantive results much.

6 Conclusion

Political economists have long since argued that the choice of a fixed exchange rate regime is influenced by a government's aspiration to fight inflation. Our theory concurs with this claim.

However, where the dominant theory submits that governments borrow monetary policy credibility from the anchor currency, we have argued that governments peg because they seek to avoid the inflationary pressures from an exchange rate devaluation. Our theory identifies the relative size of imports from the key currency countries and the key currency areas as main predictors of this choice. The results from our empirical estimations provide ample support for these predictions. Of course, existing theories and our own theory are not mutually exclusive. Governments from different countries or even different governments from the same country may simply have different motives for pegging. Our theory is thus best regarded as a supplement, not a substitute, to existing approaches.

Importantly, however, our theory not only complements existing approaches, but also solves remaining puzzles of the traditional approaches. To start with, our theory can explain why some countries see no need to officially announce their exchange rate peg. The time inconsistency problem cannot be overcome with an unannounced de facto peg; similarly, trade and investment are best promoted by an officially announced de jure peg. But the import of inflation can be perfectly prevented without such an announcement. Of note, our theory does not predict that countries prefer de facto to de jure pegs. But it explains why countries choose to peg without announcement, whereas previous theories would predict that governments benefit from announcing a peg that they do not intend to defend.

Second, our theory predicts that a country's decision to peg to an anchor currency increases the respective key currency area and therefore the probability that other countries follow suit. In other words, pegging is contagious. This holds especially true if a large trading nation joins a currency area. Our theory can thus explain why the rise of the D-Mark and later the Euro went hand in hand with the factual demise of the British Pound as anchor currency. The growing attractiveness of the D-Mark and later the introduction of the Euro created a large currency zone, making it attractive for many countries which import heavily from these

countries to peg to the D-Mark and the Euro. In a world of contagious pegging, there is no space for many anchor currencies and the smaller ones need to make way. Therefore, the number of anchor currency must necessarily be small – much smaller than the number of currencies stable enough to provide a suitable anti-inflationary commitment.

Finally, our theory argues, contrary to time inconsistency approaches, that central bank independence and de facto pegs are complements, not substitutes. We have found some, perhaps limited evidence for this proposition. However, given the absence of a direct measure of CBI for a large cross-sectional time-series panel and our reliance on a crude proxy variable, the turnover rate of central bank governors, we admit that the jury is still out on this question and call for future research to study it in more detail.

While we contend that our theory has solved some existing puzzles, our research has also let to the identification of new puzzles. Most importantly, researchers should seek a theoretical answer to why countries with a past history of high inflation but currently low to modest inflation prefer to peg their currency to the Dollar rather than to other key currencies. We suspect that political elites in developing countries may wish to minimize the risk of domestic currency devaluation against the Dollar because they have moved large sums of money into foreign accounts denominated in Dollar during periods of high inflation. Exploring this issue is no easy task and may not be possible in a large-N study. Much of when and to whom countries peg their currency therefore still remains to be studied and it promises to remain a fruitful area of research for both quantitative and qualitative scholars.

Appendix 1: Definitions and data sources for control variables.

High inflation history: Set to 1 if current inflation, as measured by GDP deflator, is below 20 per cent, while post-1970 inflation has been above 50 per cent in at least one year. The reason is that countries with a history of high inflation have an incentive to peg their currency, following time inconsistency theories, but can only do so at reasonable cost if they have already managed to reduce current inflation to a relatively low level. Source: World Bank (2007).

log gdp: Gross domestic product at official exchange rates (logged). Source: World Bank (2007).

per capita income: Gross domestic product per capita at official exchange rates (logged). Source: World Bank (2007).

Level of democracy: 21-point measure of institutionalized democracy. Source: http://www.cidcm.umd.edu/polity/

Appendix 2: Table 2 with higher exchange rate peg threshold (correlation above 0.9).

	Franc	D-Mark	Pound	Dollar
imports from France [(a)]	72.03***	-10.29	26.84**	-22.07***
	(10.77)	(11.34)	(13.09)	(5.464)
imports from Germany [(a)]	-70.03***	14.74***	13.76*	-13.49**
	(22.17)	(5.201)	(7.259)	(6.247)
imports from UK [(a)]	-20.81	0.655	-0.922**	-0.436*
	(27.12)	(7.395)	(0.423)	(0.257)
imports from USA [(a)]	-29.26***	-4.078	0.373	0.295***
	(8.884)	(4.572)	(0.252)	(0.0723)
imports from Franc area [(a)]	85.24***	21.23	-29.28	-0.544
	(13.41)	(15.68)	(19.61)	(9.912)
imports from D-Mark area [(a)]	-20.88	32.34***	-1.467	1.944
	(14.10)	(5.318)	(8.117)	(3.661)
imports from Pound area [(a)]	-105.6	18.44	69.15*	4.373
	(126.7)	(41.24)	(35.69)	(25.16)
imports from Dollar area [(a)]	-47.23***	-16.90***	-52.89***	1.455
	(12.97)	(5.394)	(13.62)	(0.899)
central bank independence	0.445	-0.0356	0.886**	0.0922
	(0.296)	(0.263)	(0.417)	(0.116)
high inflation history	-7.969***	-3.909***	-45.05***	0.327*
	(1.653)	(1.276)	(0.454)	(0.196)
log gdp	-0.138	0.563***	-0.0157	0.0725*
	(0.146)	(0.180)	(0.145)	(0.0435)
level of democracy	-1.431***	1.398***	1.302**	0.348***
	(0.462)	(0.412)	(0.530)	(0.122)
democracy * log gdp	0.0627***	-0.0577***	-0.0448**	-0.0174***
	(0.0195)	(0.0166)	(0.0223)	(0.00517)
per capita income	0.000576***	0.000382***	-0.000240	0.000114**
	(0.000157)	(0.0000738)	(0.000199)	(0.0000524)
squared per capita income	-0.0000000341***	-9.95e-09***	3.48e-09	-7.27e-09**
	(9.02e-09)	(2.13e-09)	(5.58e-09)	(2.89e-09)
Constant	0.363	-18.75***	-2.806	-1.999**
	(3.148)	(4.543)	(3.423)	(1.009)
Observations	2081	2081	2081	2081
Pseudo R-squared	0.53	0.53	0.53	0.53

(a) divided by GDP of pegging country
Note: cubic peg splines and cubic non peg splines included

Appendix 3: Table 3 with higher exchange rate peg threshold (correlation above 0.9).

	D-Mark	Dollar
imports from Eurozone [(a)]	8.815***	-17.90***
	(2.103)	(3.449)
imports from USA [(a)]	-8.221**	0.360***
	(3.985)	(0.106)
imports from Eurozone area [(a)]	36.68***	25.18***
	(9.888)	(7.496)
imports from Dollar area [(a)]	-17.59**	7.798***
	(8.509)	(2.119)
central bank independence	0.651*	0.576**
	(0.389)	(0.266)
high inflation history	-1.072*	-0.0945
	(0.566)	(0.302)
log gdp	0.379*	0.379**
	(0.208)	(0.156)
level of democracy	2.064***	1.876***
	(0.548)	(0.531)
democracy * log gdp	-0.0870***	-0.0826***
	(0.0229)	(0.0223)
per capita income	0.000198**	0.000221**
	(0.0000781)	(0.0000965)
squared per capita income	-4.14e-09*	-0.0000000132***
	(2.42e-09)	(4.89e-09)
Constant	-11.01**	-8.726**
	(5.081)	(3.681)
Observations	654	654
Pseudo R-squared	0.61	0.61

(a) divided by GDP of pegging country
Note: cubic peg splines and cubic non peg splines included

References

Alesina, Alberto and Robert J. Barro 2002. Currency Unions. *Quarterly Journal of Economics* 117(2): 409-436.

Alesina, Alerto and Alexander F. Wagner 2006. Choosing (and reneging on) Exchange-Rate Regimes. *Journal of the European Economic Association* 4(4): 770-799.

Barro, Robert J. and David B. Gordon 1983. A Positive Theory of Monetary Policy in a Natural Rate Model. *Journal of Political Economy* 91(4): 589-610.

Bayoumi, Tamin, Lucio Sarno and Mark P. Taylor 2002. European Capital Flows and Regional Risk. *The Manchester School* 67(1): 21-38.

Bayoumi, Tamin, and Barry Eichengreen. 1998. Exchange-rate Volatility and Intervention: Implications of the Theory of Optimum Currency Areas. *Journal of International Economics* 45(2): 191-209.

Bayoumi, Tamin and Barry Eichengreen 1999. Operationalizing the Theory of Optimum Currency Areas, in: Richard Baldwin, Daniel Cohen, Andre Sapir and Anthony Venables (eds.): *Market Integration, Regionalism and the Global Economy*. Cambridge: Cambridge University Press, 187-215.

Bearce, David H. and Mark Hallerberg 2008. Democracy and De Facto Exchange Rate Regimes, unp. manuscript, University of Pittsburgh.

Beck, Nathaniel, Jonathan N. Katz and Richard Tucker. 1998. Taking Time Seriously: Time-Series-Cross-Section Analysis with a Binary Dependent Variable. *American Journal of Political Science* 42 (4): 1260-1288.

Berger, Helge, Henrik Jensen and Guttorm Schjelderup 2001. To peg or not to peg? A Simple Model of exchange Rate Regime Choice in Small Economies. *Economics Letters* 73(2): 161-167.

Bernhard, William, J., Lawrence Broz, and William Robert Clark. 2002. The Political Economy of Monetary Institutions. *International Organization* 56(4): 693-723.

Bernhard, William, and David Leblang. 1999. Democratic Institutions and Exchange-Rate Commitments. *International Organization* 53(1): 71-97.

Bleaney, Michael and Manuela Francisco 2005. Exchange Rate Regimes and Inflation: Only Herd Pegs make a Difference. *Canadian Journal of Economics* 38(4): 1453-1471.

Broz, J. Lawrence. 2002. Political System Transparency and Monetary Commitment Regimes. *International Organization* 56(4): 861-887.

Broz, J. Lawrence, and Jeffrey A. Frieden. 2001. The Political Economy of International Monetary Relations. *Annual Review of Political Science* 4: 317-343.

Broz, J. Lawrence, and Jeffrey A. Frieden. 2006. The Political Economy of Exchange-Rate Regimes. In: Barry R. Weingast and Donald A. Wittman (eds.): *The Oxford Handbook of Political Economy*. Oxford: Oxford University Press, 587-597.

Bruno, Michael and Jeffrey Sachs 1985. *Economics of Worldwide Stagflation*. Cambridge: Harvard University Press.

Calmfors, Lars and John Driffill 1988. Bargaining Structure, Corporatism and Macroeconomic Performance. *Economic Policy* 3(6): 14-61.

Calvo, Guillermo A., and Carmen M. Reinhart. 2002. Fear of Floating. *Quarterly Journal of Economics* 117(2): 379-408.

Campa, José Manuel, and Linda S, Goldberg. 2005. Exchange-Rate Pass-Through into Import Prices. *Review of Economic Studies* 87(4): 679-690.

Chang, Roberto and Andrés Velasco. 2000. Exchange-Rate Policy for Developing Countries. *American Economic Review* 90 (2): 71-75.

Clark, William Roberts, and Mark Hallerberg. 2000. Mobile Capital, Domestic Institutions, and Electorally Induced Monetary and Fiscal Policy. *American Political Science Review* 94(2): 323-345.

Clark, William Roberts. 2002. Partisan and Electoral Motivations and the Choice of Monetary Institutions under Fully Mobile Capital. *International Organization* 56(4): 725-749.

Clark, William Roberts, Usha N Reichert, Sandra Lynn Lomas and Kevin Parker 1998. International and Domestic Constraints on Political Business Cycle in OECD Countries. *International Organization* 52(1): 87-120.

Clark, William Roberts and Mark Hallerberg 2002. Mobile Capital, domestic Institutions, and Electorally Induced Monetary and Fiscal Policy. *American Political Science Review* 94(2): 323-346.

Cukierman, Alex and Steven B. Webb 1995: Political Influence on the Central Bank: International Evidence. *World Bank Economic Review* 9(3): 397-423.

Devereux, Mick and Philip Lane. 2003. Understanding Bilateral Exchange Rate Volatility. *Journal of International Economics* 60(1): 109-132.

Devereux, Mick, Philip Lane, and Juanyi Xu. 2006. Exchange-Rates and Monetary Policy in Emerging Market Economies. *Economic Journal* 116(511): 478-506.

Dreher, Axel, Jan-Egbert Sturm and Jakob de Haan. 2008. Does High Inflation Cause Central Bankers to Lose Their Job? Evidence Based on A New Data Set. *European Journal of Political Economy*, forthcoming.

Eichengreen, Barry 1991. Is Europe an Optimum Currency Area? Working paper 3579. Cambridge (Mass.): National Bureau of Economic Research.

Eichengreen, Barry and Marc Flandreau. 1998. The Geography of the Gold Standard. In Jorge Braga de Macedo, Barry Eichengreen and Jaime Reis (eds.). *Currency Convertibility. The Gold Standard and Beyond*. Routledge: London.

Fidrmuc, Jarko 2008. The Endogeneity of the Optimum Currency Area Criteria, Intra-Industry Trade, and EMU Enlargement. *Contemporary Economic Policy* 22(1): 1-12.

Fleming, J. Marcus. 1962. Domestic Financial Policies under Fixed and under Floating Exchange-Rates. *IMF Staff Papers* 9: 369-379.

Frankel, Jeffrey A. and Andrew K. Rose 1998. The Endogeneity of the Optimum Currency Criteria. *Economic Journal* 108(449): 1009-1025.

Frankel, Jeffrey A. and Andrew K. Rose 2002. An Estimate of the Effect of Common Currencies on Trade and Income. *Quarterly Journal of Economics* 117(2): 437-466.

Franzese, Robert and Jude C. Hays. 2008. *Spatial-Econometric Models of Interdependence*. Book prospectus.

Frieden, Jeffry A. 1991. Vested Interests. The Politics of National Economic Policies in a World of Global Finance. *International Organization* 45(4): 425-451.

Frieden, Jeffry A. 2002. Real Sources of European Currency Policy. Sectoral Interests and European Monetary Integration. *International Organization* 56(4): 831-860.

Frieden, Jeffry, P. Ghezzi and E. Stein 2001. Politics and Exchange-Rates. A Cross-Country Approach to Latin America. In: Jeffry Frieden and E. Stein (eds.): *The Currency Game. Exchange Rate Politics in Latin America*. Baltimore: John Hopkins University Press, 21-63.

Frieden, Jeffry, David Leblang and Neven Valev 2008. *The Political Economy of Exchange Rate Regimes in Transition Economics*, unp. manuscript, Harvard University.

Giavazzi, Francesco, and Maro Pagano. 1988. The Advantage of Tying One's Hand: EMS Discipline and Central Bank Credibility. *European Economic Review* 32(5): 1055-1082.

Gleditsch, Kristian S. 2002. Expanded Trade and GDP Data. *Journal of Conflict Resolution* 46 (5): 712-724.

Goodhart, Charles A.E. 1995. The Political Economy of Monetary Union. In B. Peter Kenen (ed.). *Understanding Interdependence. The Macroeconomics of the Open Economy*. Princeton: Princeton University Press, 450-505.

Grossman, Elhanan and Gene M. Helpman 2001. *Special Interest Politics*. Cambridge (Mass.): MIT Press.

Hallerberg, Mark. 2002. Veto-Players and the Choice of Monetary Institutions. *International Organization* 56(4): 775-802.

Hausmann, Ricardo, Ugo Panizza and Ernesto Stein 2001. Why do Countries Float the Way they Float? *Journal of Development Economics* 66(2): 775-802.

Helpman, Elhanan, Marc Melitz and Yona Rubinstein. 2008. Estimating Trade Flows. Trading Partners and Trading Volumes. *Quarterly Journal of Economics* 123(2): 441-481.

IMF. 2007a. *International Financial Statistics*. Washington DC: International Monetary Fund.

IMF 2007b. *Direction of Trade Statistics*. Washington DC: International Monetary Fund.

Isard, Walter. 1954. Location Theory and Trade Theory. A Short-Run Analysis. *Quarterly Journal of Economics* 68. 305-322.

Kaminsky, Gracia L., and Carmen M. Reinhart. 1999. The Twin Crises. The Causes of Banking and Balance of Payments Problems. *American Economic Review* 89(3): 473-500.

Keefer, Philip, and David Stasavage. 2002. Checks and Balances, Private Information, and the Credibility of Monetary Commitments. *International Organization* 56(4): 751-774.

Keefer, Philip and David Stasavage 2003. The Limits of Delegation. Veto Players, Central Bank Independence, and the Credibility of Monetary Policy. *American Political Science Review* 97(3): 407-423.

Levy-Yeyati, Eduardo and Federico Sturzenegger 2005. Classifying Exchange Rate Regimes: Deeds vs. Words. *European Economic Review* 49(6): 1603-1635.

Meissner, Christopher M. and Nienke Oomes (forthcoming): Why do Countries Peg the Way they Peg? The Determinants of Anchor Currency Choice. *Journal of International Money and Finance*.

Mundell, Robert A. 1961. A Theory of Optimum Currency Areas. *American Economic Review* 51(4): 657-665.

Mundell, Robert A. 1962. The Appropriate Use of Monetary and Fiscal Policy for Internal and External Stability. *IMF Staff Papers* 9: 70-79.

Neumayer, Eric and Thomas Plümper (2008). Spatial Effect in Dyadic Data. Working Paper. London School of Economics and Political Science and University of Essex.

Nordhaus, William 1975. Political Business Cycle. *Review of Economic Studies* 42(2): 169-190.

Obstfeld, Maurice 1996. Model of Currency Crises with self-fulfilling Features. *European Economic Review* 40(3-5): 1037-1047.

Obstfeld, Maurice, Jay C. Shambaugh, and Alan M. Taylor. 2005. The Trilemma in History: Tradeoffs among Exchange Rates, Monetary Policies, and Capital Mobility. *Review of Economics and Statistics* 87(3): 423-438.

Persson, Torsten, and Guido Tabellini. 2000. *Political Economics.* Cambridge (Mass.): MIT Press.

Plümper, Thomas and Christian W. Martin 2004. Democracy, Government Spending, and Economic Growth. A Political-Economic Explanation of the Barro Effect. *Public Choice* 117(1-2): 27-50.

Plümper, Thomas and Vera E. Troeger 2008. Fear of Floating and the External Effects of Currency Unions. *American Journal of Political Science* 52(3): 656-676.

Plümper, Thomas and Eric Neumayer (2008). Model Specification in the Analysis of Spatial Dependence. Working Paper. London School of Economics and Political Science and University of Essex.

Rogoff, Kenneth S. 1985. The Optimal Degree of Commitment to an International Monetary Target. *Quarterly Journal of Economics* 100(4): 100-124.

Rose, Andrew K. 2000. One Money One Market, Estimating the Effect of Common Currencies on Trade. *Economic Policy* 30: 9-48.

Sarno, Lucio and Mark Taylor 1998. The Behavior of Real Exchange Rates During the Post-Bertton Woods Period. *Journal of International Economics* 46: 281-312.

Shambaugh, Jay C. 2004. The Effect of Fixed Exchange Rates on Monetary Policy. *Quarterly Journal of Economics* 119(1): 301-352.

Shambaugh, Jay C. 2008. A New Look at Pass-through. *Journal of International Money and Finance* 27(4): 560-591.

Simmons, Beth and Jens Hainmueller 2008. Can Domestic Institutions Explain Exchange Rate Regime Choice, unp. manuscript, Harvard University.

Willett, Thomas D. 2001. *The OCA Approach to Exchange Rate Regimes. A Perspective on Recent Developments*. unp. manuscript, Claremont Graduate University.

World Bank. 2007. *World Development Indicators on CD-Rom*. Washington DC: World Bank.

Institute for International Integration Studies
The Sutherland Centre, Trinity College Dublin, Dublin 2, Ireland