CHAPTER TWENTY EIGHT

Choosing an Exchange Rate Regime

JEFFREY A. FRANKEL
NBER; Kennedy School of Government, Harvard University

The single most important aspect of an exchange rate regime is the degree of flexibility. The matter is of course more complicated than a simple choice between fixed exchange rate and floating. One can array exchange rate regimes along a continuum, from most flexible to least, and grouped in three major categories:

- **I.** Floating corner
  - **1.** Free float
  - **2.** Managed float
- **II.** Intermediate regimes[1]
  - **3.** Target zone or band
  - **4.** Basket peg
  - **5.** Crawling peg
  - **6.** Adjustable peg

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[1]The sequence within intermediate regimes is somewhat arbitrary. For example, if the band is as narrow as $2\frac{1}{4}$% as in the European Exchange Rate Mechanism or even 1% as under Bretton Woods, then it would properly belong closer to the fixed-rate end of the spectrum. Similarly, if the adjustable peg involved a devaluation or revaluation every time a moderate shock came along, it would properly belong closer to the flexible end of the spectrum.

III. Institutionally fixed corner

    7. Currency board

    8. Dollarization

    9. Monetary Union.

This chapter reviews the state of research concerning how a country should choose where to locate along this continuum of exchange rate regimes.

The "corners hypothesis"—that countries are, or should be, moving away from the intermediate regimes, in favor of either the hard peg corner or the floating corner—was proposed by Eichengreen (1994) and rapidly became the new conventional wisdom with the emerging market crises of the late 1990s.[2] But it never had a good theoretical foundation. The feeling that an intermediate degree of exchange rate flexibility is inconsistent with perfect capital mobility is a misinterpretation of the principle of the impossible trinity. To take a clear example, Krugman (1991) shows theoretically that a target zone is entirely compatible with uncovered interest parity. The corners hypothesis began to lose popularity after the failure of Argentina's quasi currency board in 2001. Many countries continue to follow intermediate regimes and do not seem any the worse for it.

Attempts to address the optimal degree of exchange rate flexibility within a single theoretical model are seldom very convincing. Too many factors are involved. Better instead to enumerate the arguments for and against exchange rate flexibility and then attempt to weigh them up. This chapter considers five advantages of fixed exchange rates, followed by five advantages for exchange rate flexibility. We then turn to analysis of how to weigh the pros and cons to choose a regime. The answer depends on characteristics of the individual country in question.

28.1 Five Advantages of Fixed Exchange Rates

We consider here five advantages of fixing. They are (i) providing a nominal anchor to monetary policy, (ii) facilitating trade, (iii) facilitating investment, (iv) precluding competitive depreciation, and (v) avoiding speculative bubbles.

Of the five advantages of fixed exchange rates, academic economists have tended to focus most on the nominal anchor for monetary policy. The argument is that there can be an inflationary bias when monetary policy is set with full discretion.[3] A central bank that wants to fight inflation can commit more credibly by fixing the exchange rate, or even giving up its currency altogether. Workers, firm managers, and others who set wages and prices then perceive that inflation will be low in the future because the currency peg will prevent the central bank from expanding even if it wanted to. When workers and firm managers have low

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[2]Fischer (2001); Summers (1999).

[3]This is the classic model of dynamically consistent monetary policy. Barro and Gordon (1983); Rogoff (1985), and Calvo and Vegh (1994).

expectations of inflation, they set their wages and prices accordingly. The result is that the country is able to attain a lower level of inflation for any given level of output. The strength of the argument for basing monetary policy on an exchange rate target will depend on what alternative nominal anchors might be available; this topic will be explored in Section 28.6.

Another leading argument in favor of fixed exchange rates, especially popular among practitioners, is the second one on the list: the effect of currencies on international trade. Exchange rate variability creates uncertainty; this risk, in turn, discourages imports and exports. Furthermore, dealing in multiple currencies incurs transactions costs. Fixing the exchange rate in terms of a large neighbor eliminates exchange rate risk, and so encourages international trade, at least with that neighbor. Going one step farther and actually adopting the neighbor's currency as one's own eliminates transaction costs as well and thus promotes trade even more.

Academic economists have often been skeptical of this claim for three reasons. First, in theory, exchange rate uncertainty is merely the symptom of variability in economic fundamentals, so that if it is suppressed in the foreign exchange market, it will show up somewhere else, for example, in the variability of the price level. Second, logically, anyone adversely affected by exchange rate variability—importers, exporters—can hedge away the risk, using forward markets or other derivative markets. Third, empirically, it used to be difficult statistically to discern an adverse effect from increased exchange rate volatility on trade.

Each of these three arguments can be rebutted, however. To begin with, much nominal exchange rate volatility in fact appears to be unrelated to changes in macroeconomic fundamentals and appears to be the cause rather than the result of real exchange rate variability. Furthermore, many smaller currencies have no derivative markets, and even where such markets exist, they may charge costs for hedging (transactions costs plus the exchange risk premium), which limit their actual use. Thin trading is especially a problem for small and developing countries, but even major currencies do not have forward markets at every horizon that an importer or exporter might need. Finally, more recent econometric studies, based on large cross sections that include many small developing countries, have found stronger evidence of an effect of exchange rate variability on trade—especially on a bilateral basis, where far more data are available. Section 28.2 elaborates on this evidence.

The third argument is that fixed exchange rates facilitate international capital flows. The argument is closely analogous to the case of international trade flows: in theory, capital importers and capital exporters should be able to hedge currency differences, but in practice, risk premiums and transaction costs intervene, as can be observed in failures of interest rate parity conditions.

A fourth advantage of fixed exchange rates is that they prevent competitive depreciation. Competitive depreciation can be viewed as an inferior Nash noncooperative equilibrium, where each country tries in vain to win a trade advantage over its neighbors. In such a model, fixing exchange rates can be an efficient institution for achieving the cooperative solution. The architects of the

Bretton Woods system thought about the problem in terms of the ''beggar thy neighbor'' policies of the 1930s. The language of ''currency wars,'' in which governments complain that the exchange rate policies of others unfairly undercut their competitiveness, was revived yet again when big capital flows resumed in 2010.

The final argument for fixed exchange rates is to preclude speculative bubbles of the sort that pushed up the dollar in 1985 or the yen in 1995. Bubbles can be defined as movements in the price, in this case the exchange rate, that arise not from economic fundamentals but from self-justifying expectations. In the mathematics of rational expectations, the bubble is an extra term in the solution to a differential equation.

As we already noted, some exchange rate fluctuations appear utterly unrelated to economic fundamentals. It is not just that tests using standard observable fundamentals such as money supplies and income always find most variation in exchange rates unaccounted for. After all, residual variation can always tautologically be attributed to unobserved fundamentals (e.g., the much-storied ''shifts in tastes and technology''). The most persuasive evidence is a pattern that holds reliably, either across country pairs or across history: whenever a change in exchange rate regime raises nominal exchange rate variability, it also raises real exchange rate variability.[4] This observation then allows at least the possibility that, if the fluctuations that come from floating exchange rates were eliminated, there might, in fact, not be an outburst of fundamental uncertainty somewhere else. Rather, the ''bubble term'' in the equation might simply disappear, delivering less variability in the real exchange rate for the same fundamentals.

28.2 Econometric Evidence on the Bilateral Trade Effects of Currency Regimes

Economists began to take much more seriously the possibility that fixed exchange rates encourage trade with the publication of Andrew Rose's 2000 paper, ''One Money, One Market . . . ,'' perhaps the most influential empirical international economics paper of its decade. Applying the gravity model to a bilateral data set that was sufficiently large to encompass a number of currency unions led to an eye-opening finding: members of currency unions traded with each other an estimated three times as much as with otherwise-similar trading partners. Even if Rose had not included the currency union dummy, this paper would still have been important because he had bilateral exchange rate variability on the list of variables explaining bilateral trade, and it was highly significant statistically.[5] But the attention grabber was that the currency union dummy had a far larger, and highly significant effect, above and beyond the effect of bilateral variability per se. This chapter was of course motivated by the coming of EMU in 1999, even

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[4]Bahmani-Oskooee et al. (2008); Mussa (1986); Taylor (2002).

[5]The finding that a fixed exchange rate in itself also produces a statistically significant increase in bilateral trade was confirmed by Klein and Shambaugh (2006).

though estimates were necessarily based on historical data from (much smaller) countries who had adopted currency unions in the past.

Rose's remarkable tripling estimate has been replicated in various forms many times. But no sooner had he written his paper than the brigade to "shrink the Rose effect"[6]—or to make it disappear altogether—descended en masse. These critiques sometimes read to me as "guilty until proven innocent."

It is understandable that a threefold effect was greeted with much skepticism, as this is a very large number. There are five grounds for skepticism, as I classify them. The critiques need to be assessed.

The first critique is the proposition that one cannot necessarily infer from cross-sectional evidence what would be the effect in real time of countries adopting a common currency. Most pre-1999 members of currency unions had essentially never had their own national currencies, but instead used an external currency at least since independence. In such cases as Panama or most of the CFA countries in Africa, the currency arrangement goes back more than a century. In other cases, such as the Eastern Caribbean Currency Area, the currency dates from postwar independence.

Second are allegations of missing variables. The statistical association between currency links and trade links might not be the result of causation running from currencies to trade but might arise instead because both sorts of links are caused by a third factor, such as colonial history, remaining political links, complementarity of endowments, or accidents of history. Another alleged missing variable is a country's "multilateral resistance" to trade or a more specific measure of remoteness from the rest of the world.

The third critique also concerns causality: the endogeneity of the currency decision. Countries choose as partners for currency links the neighbors with whom they trade the most, rather than the other way around. Thus, the correlation observed for currency unions among other countries may be spurious.

Fourth, the estimated effect on trade simply seems too big to be believable.

Fifth, Rose's evidence came entirely from countries that were either small (e.g., Ireland and Panama) or *very* small (e.g., Kiribati, Greenland, and Mayotte). Thus, it was not clear that the estimates could be extended to larger countries such as the members of the euro. If the currency union effect were substantially more important in small and highly trade-dependent countries, that could explain subsequent small estimates for Europe.

While each of these five arguments has some validity, to each there is a better response than one might expect.

28.2.1 TIME-SERIES DIMENSION

First, regarding the time dimension, a logical interpretation is that, even if the full comparative static effects were to hold in the very long run after a change in regime, they might not show up in the short run, due to very substantial lags. Even 30 years may not be enough to demonstrate long-run effects. Panama

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[6]The phrase is from Baldwin (2006).

reports sending more than half its exports to the United States; perhaps one reason is that it has been on the US dollar for over a 100 years. We know that other gravity influences such as colonial ties leave an effect on bilateral trade many decades after the cause has been removed.

Subsequent research on currency unions using time-series data finds that a substantial share of the tripling that Rose had estimated from the cross-sectional data, which is presumably the long-run effect, shows up within a few decades of a change. Using a 1948–1997 sample that includes a number of countries, which left currency unions during that period, Glick and Rose (2002) find that trade among the members was twice as high in the currency union period as afterward. This suggests that roughly two-thirds of the tripling effect may be reached within three decades of a change in regime. (This reasoning assumes symmetry with respect to entry into and exit from currency unions.)

28.2.2 OMITTED VARIABLES

The second objection concerns the possible influence of omitted factors. Rose in fact did a thorough job of controlling for common languages, colonial history, and remaining political links. The large estimated effect of a common currency remains. It seems very possible that there remain other omitted factors (including accidents of history) that influence both currency choices and trade links. Nevertheless, Rose's various extensions of the original research—these robustness tests together with the time-series results (Glick and Rose) and the common use of fixed effects—reduce some of the force of this critique.

The omitted variable that is probably of the greatest concern to the critics comes from the influential Anderson and van Wincoop (2001) paper and is usually called the *multilateral resistance term*. This takes into account the average size of a specific determinant of trade for a region. More concretely, in a cross-sectional context, the variable may come down to "remoteness." A country's remoteness is defined as *average distance* from all trading partners, a weighted average based on the sizes of the trading partners; it is expected to have a positive effect on trade between a pair of countries, controlling for the more obvious negative effect of the distance between them bilaterally. Rose and van Wincoop (2001) find that taking multilateral resistance into account should, a priori, knock the estimated value of the euro on bilateral trade down from tripling to 58% (among the original euro members).[7] Even if one goes along with van Wincoop in imposing the constraint, the currency union term apparently remains high

[7]If I understand correctly the aspect of the Anderson and van Wincoop (2001) theory that leads to numerical estimates of the effects of borders and currencies that are sharply reduced in magnitude, it is the property that the elimination of borders or currency differences within a region theoretically entails substantial diversion of trade away from the rest of the world and thus an increase in multilateral resistance. The model's insistence on the role of trade diversion may be too doctrinaire. Such trade diversion from currency unions, whatever its basis in theory, is not observed in the data, by and large. (Frankel and Rose, 2002; Micco et al., 2003. For example, the United Kingdom does not appear to have lost trade to euroland as a result of the euro.) Thus, the argument for imposing the constraints from this particular theory may not be as strong as it otherwise would be.

(i) compared to its standard error, (ii) compared to what we all thought before 2000, and (iii) compared to what happens to the FTA (free trade area) term when it is too knocked down by imposing the van Wincoop constraint.

28.2.3 ENDOGENEITY OF THE CURRENCY DECISION

The endogeneity of a country's choice of exchange regime is perhaps the most intractable problem with the Rose-style estimates. After all, optimum currency area theory suggests that countries should peg if they are small and open and should peg to the partners with which they trade a lot.[8] El Salvador decided to adopt the dollar because it traded a lot with the United States, rather than the other way around. In that case, the Rose finding would be spurious. Controlling for exogenous third factors such as colonial history is a partial correction, but not a complete one, because they do not completely determine trade patterns.

Many of the critiques of the Rose results, after pointing out a problem of omitted variables or endogeneity or one of the other legitimate problems, offer a purported way to address it and then report that the currency union effect disappears. Some of these responses in effect throw out most of the data in the name of addressing the (correctly emphasized) issues of endogeneity or country size; or they do something similar: put in a great many dummy variables or fixed effects, often one for every pair of countries. But since the finding of statistical significance arose only when Rose put together a large enough data set for it to show up,[9] there is not that much information gained in reducing the data set sharply and then noticing the loss in statistical significance. Most of the statistical power lies in the cross-country variation. Throw that out, and one may be left with little.

That said, the complete bilateral data set is so large and the statistical relationship is so strong that there is some firepower to spare, and it is worth using some of it to try to get at the problems of endogeneity and missing variables. Including fixed effects for countries and/or years has become standard. The results generally hold up. Adding fixed effects for *pairs* of countries in the basic specification is a bit more problematic, although reasonable as a test for robustness. When Rose (2001) tries the matching estimator of Persson (2001) on a larger data set, he still finds a significant (although smaller) effect.

One response is a before-and-after study such as Glick and Rose. It eliminates the problem that Panama has always been on the dollar because it has always traded with the United States, much as Luxembourg has long had a currency union with Belgium, because it has always traded with Belgium. Rather these results show that when a country enters or leaves a currency link, its bilateral trade responds accordingly. But none of this is to deny that endogeneity remains a likely problem. For example, an evolution in trade patterns may come first,

[8]McKinnon (1963).

[9]Earlier gravity studies had not found major evidence of currency link effects on bilateral trade, presumably because the data sets were too small to include many examples of countries with institutionally fixed exchange rates.

with the currency decision following. In theory, Ireland may have switched its currency allegiance from Britain to the Continent in response to shifting trade patterns rather than as a cause of them. Attempting to deal with the endogeneity problem should be a priority.

One response is to look at a sort of "natural experiment" designed to be as immune as possible from this sort of endogeneity argument. The experiment is the effect on bilateral trade of African CFA members of the French franc's 1999 conversion to the euro. The long-time link of CFA currencies to the French franc has clearly always had a political motivation. So, CFA trade with France could not in the past reliably be attributed to the currency link, perhaps even after controlling for common language, and former colonial status. But with the advent of the euro, 14 CFA countries woke up in the morning and suddenly found themselves *with the same currency link to Germany, Austria, Finland, Portugal*, and so on, as they had with France. There was no economic/political motivation on the part of the African countries that led them to an arrangement whereby they were tied to these other European currencies. It turns out that CFA trade with these other European countries rose with the advent of the euro (Frankel, 2010). This suggests that the monetary union's effect on trade can be declared causal.

28.2.4 IMPLAUSIBLE MAGNITUDE OF THE ESTIMATE

Fourth, although those who claim that the tripling number is too large to sound plausible have a point, they tend to neglect two counterarguments. In the first place, the estimated effect of currency unions is on the same order of magnitude as the estimated effects of FTAs or, if anything, larger.[10] When one applies some of the variant estimation strategies, such as the Rose–van Wincoop reparameterization, so that the estimated effect of currency unions falls, the estimated effects of regional trading arrangements tend to fall in tandem. The point estimates, significance levels, *and necessary methodological qualifications*, are comparable across the two kinds of unions: FTAs and currency unions.

In the second place, the estimated effects of currency unions are almost as big as the famous estimated effects of borders (home bias), for example, in the Canada–US context, which is at least as big as a factor of three.[11] This home bias is surprising but is a fact of life. Something needs to explain it, and there are not very many candidates other than exchange rate variability. Thus, the Rose findings remain a challenge to the traditional views of international economists, who believed that trade barriers were far more important than either currency differences or other remaining barrier frictions.

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[10] If critics were to apply the same tough standards to both customs unions and currency unions, they would likely find the estimated magnitude at least as large in the latter case as in the former.

[11] Important studies of the effect on trade quantities, using the gravity model, are Helliwell (1998); McCallum (1995); and Nitsch (2000). Analogous studies of the effect on price arbitrage are Engel and Rogers (1996) and Parsley and Wei (2001).

28.2.5 COUNTRY SIZE

The fifth critique was the claim that the result from pre-1999 currency unions is relevant only for small countries, which are highly trade dependent, and not relevant for larger countries such as those in Europe. A partial response has been possible all along: there has been no evidence of the monetary union effect varying with size, within the available sample. But if one suspects a threshold effect, above which the monetary union effect diminishes, and one posits that euro members are the first to be big enough to lie above that threshold, then this could explain the gap. The question whether the largest economies are truly different can only be answered with data from those countries. Fortunately, the euro experiment is now more than 10 years old, and so we should hope to be able to answer the question. Estimation of the euro's effect, nested within the larger sort of data set used by Rose that captures trade among all countries, confirms a much smaller boost to intraunion trade, but the effect is at least statistically above zero and explicit tests show that the discrepancy in magnitude is not explained by the larger size of euro countries.[12]

In short, the surprising finding that currency unions have a surprisingly large effect on trade among members, similar in magnitude to the effect of free trade areas, still stands.

28.3 Five Advantages of Floating Exchange Rates

As there are five advantages to fixed exchange rates, there are also five advantages to flexible exchange rates. They are (i) national independence for monetary policy, (ii) allowing automatic adjustment to trade shocks, (iii) retaining seigniorage, (iv) retaining lender-of-last-resort capability, and (v) avoiding speculative attacks.

The leading advantage of exchange rate flexibility is that it allows the country to pursue an independent monetary policy. The argument in favor of monetary independence, instead of constraining monetary policy by the fixed exchange rate, is the classic argument for discretion, instead of rules. When the economy is hit by a disturbance, such as a fall in demand for the goods it produces, the government would like to be able to respond so that the country does not go into recession. Under fixed exchange rates, monetary policy is always diverted, at least to some extent, to dealing with the balance of payments. This single instrument cannot be used to achieve both internal balance and external balance.

Under the combination of fixed exchange rates *and complete integration of financial markets*, which, for example, characterizes EMU, the situation is more extreme: monetary policy becomes altogether powerless to affect internal balance. Under these conditions, the domestic interest rate is tied to the foreign interest rate. An expansion in the money supply has no effect: the new money flows out

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[12]Frankel (2010). The estimate that the euro has boosted intraunion trade by only about 15% confirms the findings of others, such as Micco et al. (2003).

of the country via a balance-of-payments deficit, just as quickly as it is created. In the face of an adverse disturbance, the country is unable to use monetary policy to counter its effects. After a fall in demand, the recession may last until wages and prices are bid down, or until some other automatic mechanism of adjustment takes hold, which may be a long time. By freeing up the currency to float, on the other hand, the country can respond to a recession by means of monetary expansion and depreciation of the currency. This stimulates the demand for domestic products and returns the economy to desired levels of employment and output more rapidly than would be the case under the automatic mechanisms of adjustment on which a fixed-rate country must rely.

The unfortunate reality is that few countries, especially few developing countries, have been able to make effective use of discretionary monetary policy. But even if one gives up on deliberate changes in monetary policy, there is a second advantage of floating: that it allows automatic adjustment to trade shocks. The currency responds to adverse developments in the country's export markets or other shifts in the terms of trade by depreciating, thus achieving the necessary real depreciation even in the presence of sticky prices or wages. The argument goes back to Meade (1951) and Friedman (1953).

The third and fourth advantages of a flexibly managed currency are two important advantages of an independent central bank that the government thereby retains: seigniorage and lender-of-last-resort ability. The central bank's ability to earn seigniorage is partially lost if the rates of money creation and inflation are limited to those of the external currency to which it is pegged and which it must hold as foreign exchange reserves. Seigniorage is lost *entirely* under a rigid institutional commitment such as a currency board, dollarization, or—certainly—full monetary union.

The central bank's ability to act as a lender of last resort for the banking system depends, to a degree, on the knowledge that it can create as much money as necessary to bail out banks in difficulty. In the 1990s, some claimed that a country that moved to the firm-fix corner and allowed foreign banks to operate inside its borders, such as Argentina, would not need a lender of last resort because the foreign parents of local banking subsidiaries would bail them out in time of difficulty. Unfortunately, Argentina's experience in 2001 disproved this claim.

The fifth argument for a flexible exchange rate corresponds to the fifth argument in favor of fixing. Recall that the case for stabilizing the exchange rate arose from a disadvantage of free floating: occasional speculative bubbles (possibly rational, possibly not) that eventually burst. However, for a country that stops short of full dollarization, pegged exchange rates are occasionally subject to unprovoked speculative attacks (of the "second-generation" type[13]).

This disadvantage of pegging became even more evident in the 1990s than previously: a tendency toward currency mismatch, that is borrowers' effectively unhedged exposure in foreign currency (possibly rational, possibly not), ending badly in speculative attacks and multiple equilibrium. Some even argue for

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[13]Obstfeld (1986).

floating on the grounds that it would be beneficial to introduce gratuitous volatility into the exchange rate in order to discourage unhedged borrowing in foreign currency.[14] Although that may sound implausible, emerging markets that introduced more exchange rate variability after the currency crises of the 1990s do seem to have reduced currency mismatch in the subsequent round of capital inflows (2002–2007), and thereby to have coped better with the shock of the 2008–2009 global financial crisis. Countries in the outer periphery of Europe, especially Eastern Europe, did not do this, and they are the ones that initially suffered the most from the global recession.

The bottom line, however, is that overvaluation, excessive volatility, and crashes are possible in either regime, peg, or float.

28.4 How to Weigh Up the Advantages of Fixing Versus Floating

Which dominate: the advantages of fixing or the advantages of floating? Empirical attempts to evaluate performance are hampered by the fact that de facto exchange rate regimes frequently differ from de jure: countries do not in practice follow the regime that they have officially declared. Many governments that say they float in fact do not float.[15] Many governments that say they peg do not in fact hold the peg for long.[16] Many governments that say they follow some version of a basket, in fact fiddle surreptitiously with the weights in the basket.

Some studies have attempted to classify countries according to their de facto exchange rate regime and then to test which categories have superior economic performance, judged by growth and other measures. This literature is entirely inconclusive. To oversimplify the findings of three important studies only a little: Ghosh et al. (2000) found that hard pegs work best, Levy-Yeyati and Sturzenegger (2001, 2003) concluded that floats perform best, and Reinhart and Rogoff (2004) found that limited flexibility is best!

Why such different answers? There are two major reasons, one relatively more pedestrian and the other more enlightening. First, the de facto classification schemes do not correspond to each other. A country's currency may be classified by one author as pegged and by another as floating.[17],[18] To that extent, it is no surprise that the authors get different answers as to performance. Secondly,

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[14]Eichengreen and Hausmann (1999); Velasco and Chang (2006), and Arteta (2005).

[15]This is the "fear of floating" of Reinhart (2000) and Calvo and Reinhart (2002).

[16]Klein and Marion (1997); Obstfeld and Rogoff (1995).

[17]Frankel, Jeffrey, Sergio Schmukler and Luis Servén. 2000. Verifiability and the Vanishing Intermediate Exchange Rate Regime. Brookings Trade Forum 2000, edited by Susan Collins and Dani Rodrik. Washington DC: Brookings Institution.

[18]Bénassy-Quéré et al. (2004); Frankel (2003) and Frankel and Xie (2010). Tavlas et al. (2008) survey the classification studies. One reason for big differences in classification outcomes is big differences in methodology. A more fundamental problem is that many countries in fact do not typically follow any single regime for longer than a year or so without changing parameters, if not changing regimes altogether.

and more interestingly from an economic viewpoint, the question as to what exchange rate regime is best should depend on the circumstances of the country in question. No single exchange rate regime is right for all countries. This proposition may sound obvious, but there are some who tend to recommend hard pegs for all, some who tend to recommend floating for all, and some who tend to recommend intermediate regimes such as target zones for all.[19] Although some of the aforementioned studies include regressions that condition on some country variables, the list of variables is not extensive or definitive.

We need a framework for thinking about the characteristics that suit a country or other geographic area for fixing or floating or intermediate regimes, the characteristics that determine the relative weight that should be placed on the advantages and disadvantages considered above. The traditional framework was the theory of optimum currency areas, which focused on trade and stabilization of the business cycle. Thinking has evolved since then. In the 1990s, a focus on financial markets and stabilization of speculation added some additional country characteristics to the list, such as a need to import credibility from abroad. More recently, factors such as financial development and terms of trade volatility have made a comeback.

An optimum currency area is sometimes defined broadly: as a region that should have its own currency and own monetary policy. I prefer a definition with more content. First, let us note that smaller units tend to be more open and internationally integrated than larger units. Then, an OCA can be defined as *a region that is neither so small and open that it would be better off pegging its currency to a neighbor nor so large that it would be better off splitting into subregions with different currencies.* "Openness" here means international integration along many dimensions, of which trade is just the first.

28.5 Country Characteristics That Should Help Determine the Choice of Regime

A list of criteria that qualify a country for a relatively firm fixed exchange rate, versus a more flexible rate, should include at least the following nine characteristics:

1. Small size and openness, as reflected, for example, in the ratio of tradable goods to GDP (McKinnon, 1963). Advantages of fixing, such as facilitation of trade, tend to be larger for these countries and advantages of floating, such as discretionary monetary policy, tend to be smaller.[20]

2. The existence of a major-currency partner with whom bilateral trade, investment, and other activities are already high or are hoped to be high in the future. In theory, a country can peg to a basket of foreign currencies if

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[19] Frankel (1999). An example from each of the three schools, respectively: Hanke and Schuler (1994); Larrain and Velasco (2001), and Williamson (2000).

[20] Romer (1993).

necessary to match a geographically diversified trade pattern. But, in practice, a peg to a single dominant trade partner, if one exists, is simpler and more credible.

3. *Symmetry of shocks*. This term refers to high correlation of cyclical fluctuations between the home country and the country that determines policy regarding the money to which pegging is contemplated. The condition is important because, if the domestic country is to give up the ability to follow its own monetary policy, it is better if the interest rates chosen by the larger partner are more often close to those that the domestic country would have chosen anyway.[21]

4. *Labor mobility*. When monetary response to an asymmetric shock has been precluded, it is useful if workers can move from the high unemployment region to the low unemployment region. This is the primary mechanism of adjustment across states within the monetary union that is the United States. Mundell (1961) focused on labor mobility when he originally coined the term optimum currency area.

5. *Countercyclical fiscal transfers*. Within the United States, if one region suffers an economic downturn, the federal fiscal system cushions it; one estimate is that for every dollar fall in the income of a stricken state, disposable income falls by only 70 cents. Such fiscal cushions are mostly absent at the international level. (Even where substantial transfers exist, for example, in the European Union, they are rarely very countercyclical.)

6. *Countercyclical remittances*. In any given year, inflows or outflows of migration are a relatively small fraction of the labor force. Emigrants' remittances, however, (i) constitute a large share of foreign exchange earnings in many developing countries, (ii) are variable, and (iii) appear to be countercyclical.[22] They seem to respond to the *difference* between the cyclical positions of the sending and receiving country. This makes it a bit easier for a country such as El Salvador, for example, to give up the option of setting its monetary policy differently from what the United States does. Remittances will achieve some of the smoothing.[23]

7. *Political willingness to give up some monetary sovereignty*. Some countries look on their currency with the same sense of patriotism with which they look on their flag. It is not a good idea to force subordination to the US dollar (or the euro or any other foreign currency) down the throats of an unwilling public. Otherwise, in times of economic difficulty, the public is likely to blame Washington, DC (or Frankfurt).

8. *Level of financial development*. Countries seldom float without first having developed financial markets. Aghion et al. (2005) argue that fixed rates

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[21] Bayoumi and Eichengreen (1994); Mundell (1961).

[22] Frankel (2011), and other references cited therein.

[23] Sophisticated theories of intertemporal optimization say that regular capital flows should play the smoothing role too. In practice, however, private capital flows do not appear to be countercyclical. Kaminsky et al. (2005); Mendoza and Terrones (2008); and Reinhart and Reinhart (2009).

are better for countries at low levels of financial development; because financial markets are thin, the benefits of using exchange rate flexibility to accommodate real shocks are outweighed by costs of financial shocks. As markets develop, exchange flexibility becomes more attractive. They proxy financial market development by the ratio of Private Credit to GDP and estimate 40% as the threshold above which flexibility dominates. Similarly, Husain et al. (2005) find that only for richer and more financially developed countries do flexible rates work better than fixed rates, in the sense of being more durable and of delivering higher growth without inflation.

9. *Origin of shocks*. An old textbook wisdom holds that fixed rates work best if shocks are mostly internal demand shocks (especially monetary), but floating rates work best if shocks tend to be supply shocks or real shocks (especially external trade shocks). The theory is that floating rates can automatically accommodate or adjust to real shocks. Developing countries tend to be more prone to real or supply shocks than advanced economies. Natural disasters are one variety of supply shocks; Ramcharan (2007) finds empirically that floating countries weather them better. Terms of trade fluctuations are a more common variety of real shock. Again, high variability in the terms of trade makes it more likely that a floating exchange rate dominates a pegged exchange rate. Support for the effectiveness of floating rates in dealing with terms of trade shocks comes from Broda (2004); Edwards and Yeyati (2005); Edwards (2011), and Rafiq (2011).[24]

28.6 Alternative Nominal Anchors

A government or central bank that is impressed with the advantages of exchange rate flexibility cannot simply opt for a float and figure that it is then finished with the choice of currency regime. It must also consider, if the exchange rate is not to be the anchor for monetary policy, what is to be the nominal anchor instead (and how tightly to commit to it).

There are a variety of possible candidates for nominal anchor. Two are historical anachronisms: the price of gold under the gold standard and the money supply under monetarism. Neither of them has been a popular choice in recent decades. Two more candidates are economists' proposals to address the difficulties of the first two: a commodity standard would soften vulnerability to big fluctuations in a single commodity (the gold market) and nominal income targeting would negate the effect of big fluctuations in velocity (i.e., in the money market). Neither of those two has ever been tried, for some reason.

The leading candidate in recent years has been inflation targeting (IT). There are many variations on this approach to monetary policy: focusing on headline versus core CPI, price level versus inflation, forecasted inflation versus actual, and so forth. Some interpretations of IT are flexible enough to include output in

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[24]Because small countries tend to be less diversified in their exports, criterion 9 can sometimes be at odds with criterion 1.

the target at relatively short horizons. But all orthodox interpretations focus on the CPI as the choice of price index. This choice may need rethinking in light of heightened volatility in prices of oil, minerals, and agricultural products and, therefore, in the terms of trade in many countries.

A CPI target can lead to anomalous outcomes in response to terms of trade fluctuations. If the price of imported oil or food rises on world markets, a CPI target induces the monetary authority to tighten money enough to appreciate the currency—the wrong direction for accommodating an adverse movement in the terms of trade. If the price of the export commodity rises on world markets, a CPI target *prevents* monetary tightening consistent with appreciation as called for in response to an improvement in the terms of trade. In other words, the CPI target gets it exactly backward.

One alternative is to use a price index that reflects a basket of goods produced, including those exported, in place of an index that reflects the basket of goods consumed, including those imported. It could be an index of export prices alone or a broader index of all goods produced domestically.[25] The argument is that one wants to accommodate the terms of trade, allowing the currency to appreciate when the export prices go up, not when import prices go up.

Theoretical models of IT typically miss the issue of terms of trade vulnerability, either because they are not designed for open economies or else they rely on well-functioning international capital flows for the accommodation of trade shocks. But a model that ignores the tendency for international finance to disappear in times of trouble is not very useful for choosing an exchange rate regime.

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[25]For Pegging the export price index (PEPI), see Frankel (2005). For product price targeting (PPT), see Frankel (2011).

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