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# Choosing an exchange-rate system

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## Abstract

The focus of academic discussions of exchange rate policy has shifted in recent years. The new literature on exchange rate regime choice emphasizes considerations relating to the problems of credibility in exchange rate targeting and the connections between exchange rate regime choices and choices of monetary and fiscal policy. Arguments for exchange rate targeting are reviewed. Under most circumstances and for most countries, a system of freely floating exchange rates is likely to be a better choice than attempting to peg the exchange rate. © 1999 Published by Elsevier Science B.V. All rights reserved.

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## 1. Introduction

The exchange-rate system is an important topic in international economic policy. Policymakers and journalists often seem to treat the choice of exchange-rate system as one of the most important economic policy choices that a national government makes, on a par with free international trade. Meanwhile, the past two decades have witnessed major changes in the focus of academic discussions on alternative exchange-rate systems, and while the newer focus has yet to make its way to policy circles, it has brought economists closer to a consensus on appropriate exchange-rate policy in the face of genuine scientific uncertainty.

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Twenty years ago, a discussion of alternative exchange-rate systems would have involved mainly a discussion of the degree of wage or price rigidity, factor (mainly labor) mobility, the relative importance of common versus local shocks and real versus nominal shocks. Now, when discussions of alternative exchange-rate systems arise, the focus has shifted to largely different issues such as the credibility of monetary and fiscal policies, alternative commitment mechanisms for policymakers, and the stability and strength of the nation's financial system. This change has occurred for two general reasons. First, economists now recognize that we lack a generally accepted and well-corroborated theory of exchange rates and exchange-rate systems. Most also recognize that we lack a good theory of the real effects of monetary shocks, systematic monetary policies, and overall monetary systems and institutions. Second, the evolution of the underlying macroeconomic theory has shifted attention to these newer factors.

Still, nations must adopt *some* form of exchange-rate systems even in the face of uncertainty about key economic issues. Nations face the problem of policy making under uncertainty about the effects of their policies. Given this uncertainty, I will not argue here that one exchange-rate system is better than another at all times and in all places. However, after discussing the main economic issues involved, I will conclude that under most circumstances and for most countries, a system of freely floating exchange rates is likely to be much better than an attempt to peg the exchange rate.

## 2. Alternative systems

The common language implies a dichotomy between two systems of fixed and floating exchange rates, but this is merely a simplification of the actual continuum between systems. At one extreme, a system of pure floating (or flexible) exchange rates can be thought of as an exchange rate band with infinite bounds, while a system of pure fixed (or pegged) rates is a band with zero bounds. Real-life pegged-rate systems such as the gold exchange standard or the Bretton Woods system always have some finite bounds (such as the gold points under the former system). Similarly, target-zone systems such as the European Monetary System (EMS) involve somewhat larger finite bounds, ranging from a few percentage points around a central rate to the 30% bands of recent times. So do various hybrid systems such as crawling pegs.

In practice, we see few examples of purely floating exchange rates without direct government intervention, or purely fixed exchange rates with long intervals between realignments. Even the Bretton Woods system of fixed exchange rates, often cited by proponents of fixed rates as a major success story, lasted for only about two decades and involved realignments in 1958, 1961 and 1967. (In fact, because the system relied heavily on nonconvertibility restric-

tions prior to 1957, one can argue that the system lasted barely more than a decade.) The EMS has seen even more frequent realignments. While it is technically feasible for countries to fix exchange rates without major resource costs – despite the massive world market in foreign exchange (exceeding \$1 trillion per day) – economic and political consequences frequently prevent governments from maintaining pegs in the face of speculative attacks. As a result, the number of countries that successfully peg their exchange rates, even for a period as short as five years, is rather small. Klein and Marion (1997) conclude that Latin American pegs since the 1950s have had a mean duration of only 32 months; while this sample is not representative of overall world experience, it nevertheless illustrates the point.)

Despite a variety of experiences with different exchange-rate systems, the evidence suggests that the real productive and allocative consequences of the choice of systems – *aside from times of currency crises associated with speculative attacks on pegged rates* – are quite subtle. Some evidence appears in Baxter and Stockman (1989) and Flood and Rose (1995). That productive and allocative effects of the exchange-rate system are virtually undetectable is generally viewed as surprising, particularly in light of the evidence that real exchange rates (defined as the relative price of overall bundles of goods in two countries) vary substantially more under a system of floating rates than pegged rates. One would expect a substantial difference in relative price behavior would have *some* counterpart in the behavior of quantities produced, traded, or consumed.

### 3. Some economics of exchange rates

Perhaps it should not be surprising that the productive and allocative effects of the exchange-rate system are subtle. Simple neoclassical macroeconomic models with neutral (and superneutral) money suggest irrelevance of the system as part of a general property of (at least rough) irrelevance of nominal variables for the real economy.<sup>1</sup> The exchange-rate system is irrelevant in the sense that the path of the nominal money supply is irrelevant and different exchange-rate systems correspond to different paths of the nominal money supply.<sup>2</sup>

The simplest possible model of the exchange rate begins with purchasing power parity (PPP), substituting reduced forms for the equilibrium price level from each country into that relation to give a reduced form for the exchange rate. However, evidence shows large and sustained deviations from PPP in the short run and the evidence currently available is ambiguous about whether PPP

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<sup>1</sup> The conditions for irrelevance are actually stronger than this; see Stockman (1983).

<sup>2</sup> This view leaves unexplained the different behavior across systems of the real exchange rate.

holds even in the long run. With long-run data, the real exchange rate (the nominal exchange-rate adjusted by the ratio of price indexes in the two countries under consideration) is borderline unit root.<sup>3</sup> So even with the longest data sets economists have available, it remains an open question whether long-run PPP holds or not.

One might expect long-run PPP on the grounds that the sources of short-run deviations from PPP, such as transactions costs and information costs, are bounded (and perhaps become less important as people have more time to arbitrage in goods markets). Stationary bounds on the costs of arbitrage will tend to create statistically mean-stationary deviations from PPP, even if other economic variables are nonstationary. However, substantial evidence shows that prices of even internationally traded goods seem to differ systematically across countries over very long periods of time and may not be mean-stationary. So even for traded goods, long-run PPP may not hold.

Moreover, general national price levels include internationally nontraded goods as well as traded goods. Like exchange-rate systems, the dichotomy between traded and nontraded goods is shorthand for a continuum that includes goods with trading costs of varying sizes; goods that are traded only if price differentials exceed those seen in the data are then classified as nontraded goods (for that particular sample). In many data sets, the relative prices of nontraded goods (to traded goods) change systematically over time mainly because nontraded goods have a higher labor component than traded goods and labor tends to be internationally nontraded. Looking at differences in productivity growth in the traded and nontraded sectors over the long term, we see permanent changes in relative prices of nontraded goods and therefore systematic deviations from PPP in the long run. The evidence for countries at similar stages of development, however, suggests that changes in the relative prices of nontraded goods are *not* the main factor involved in changes in real exchange rates. The famous Balassa–Samuelson effect in which changes in relative prices of nontraded goods cause changes in real exchange rates is mainly an effect that distinguishes countries at different stages of development. For example, changes in the relative prices of nontraded goods are so similar across OECD countries, at least in the long run, that only a small fraction of changes in real exchange rates can be accounted for by changes in the relative-price of nontraded goods. Most of the changes in real exchange rates are associated with changes in the relative prices across countries of the same (or at least very similar) internationally traded goods.

These considerations suggest replacing the PPP equation for exchange rates with the alternative statement that the relative price of two bundles of goods either produced or consumed in each of two countries equals  $eP^*/P$ , where  $P$

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<sup>3</sup> See, for example, Engel (1996) and the references cited there.

and  $P^*$  represent the home-currency nominal prices of those bundles of goods and  $e$  represents the nominal exchange rate (expressed as the nominal price of foreign currency). Then  $eP^*/P$  is the relative price of the home-good bundle in terms of the foreign-good bundle. A similar statement can be made for individual (or disaggregated categories of) goods. At this stage of generality, it matters little whether these price differences across countries reflect equilibrium relative prices of different goods, or the results of international price discrimination by monopolistic sellers, or the results of other kinds of border-related arbitrage costs.<sup>4</sup>

With additional assumptions, one can equate the international relative price  $eP^*/P$  with the marginal rate of substitution in consumption evaluated at equilibrium allocations, or  $U_2(x,y)/U_1(x,y)$ , where the utility function is evaluated at equilibrium consumptions  $(x,y)$ . This equation implies that the exchange rate equals the ratio of prices of these bundles of goods across countries,  $P/P^*$ , adjusted for the marginal rate of substitution in consumption evaluated at equilibrium allocations. In this way, *any* exogenous changes in the economy that affect equilibrium consumption allocations (or the marginal-rate-of-substitution function) affect either the exchange rate or the policy actions used to peg it. In particular, after substituting reduced forms for the price levels  $P$  and  $P^*$  and for equilibrium real allocations in the economy, this equation gives a reduced form for the equilibrium floating exchange rate. Under a pegged-rate system, in contrast, it can be solved for the change in the price level or the marginal rate of substitution in consumption that government policies must engineer to keep the exchange rate pegged.

This very simple model of the exchange rate is not very successful empirically. Both measurement problems and a deficiency of the model probably play a role in this lack of success. It is difficult to measure the marginal rate of substitution in consumption at equilibrium allocations. Economists have little direct information on the marginal-rate-of-substitution function itself and, in addition, lack good measures of consumption. Second, the model ignores apparently important factors that cause short-run deviations between the marginal rate of substitution and the relative price, such as information costs, transportation costs, taxes, or price discrimination.

Nevertheless, these *real* reasons for deviations between the marginal rate of substitution and the relative price (such as information costs or price discrimination) cannot by themselves induce differences in the allocative properties of alternative patterns of *nominal* variables and hence of alternative *nominal* exchange-rate systems. For that, we would require some direct

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<sup>4</sup> Engel (1993) and Engel and Rogers (1996) provide evidence on the (large) border effect, holding fixed geographical distance.

connections between real and nominal variables. While few economists doubt that nominal variables (such as monetary policy actions) affect the real economy, due to problems such as nominal price sluggishness, there is considerable controversy over the question of whether any real effects stem from *systematic* differences in monetary policy – such as a monetary *rule* to peg the exchange rate rather than a monetary *rule* to peg the path of the price level or nominal interest rates. Speculative attacks aside, the exchange-rate system affects real economic variables only if (a) a *systematic* component of monetary policy affects real economic variables or (b) the exchange rate system alters monetary, fiscal, or other policies so as to affect real variables. For examples of the latter, imagine that a system of pegged exchange rates prevents a central bank from creating non-systematic changes in the money supply (or short-term domestic interest rate). Of course, the central bank could have refrained from creating non-systematic changes in the money supply even under a flexible-rate system. If we credit the exchange-rate system for this change in monetary policy, then we may conclude that the exchange-rate system matters because it affects real variables. Similarly, unpredictable foreign disturbances under a system of pegged exchange rates may require a central bank to create non-systematic changes in the money supply; in this case, it is reasonable to blame the pegged exchange-rate system for creating those changes in monetary policy and their consequences. Unfortunately, much of the traditional analysis of alternative exchange-rate systems is based on models that fail to distinguish between systematic and non-systematic components of monetary policy and fail to consider optimized monetary (and fiscal) policy under a floating-rate system.

#### 4. Arguments for each system

The main arguments for pegged exchange rates fall into three categories:

1. The traditional arguments that nations with similar economic structures that experience similar exogenous shocks can benefit from a common currency or a fixed exchange rate.
2. The argument that pegging the exchange rate provides credibility and perhaps a commitment to monetary policy.
3. Arguments that floating exchange rates reflect largely non-fundamental noise so that a floating-rate system creates variability, uncertainty, and over- or under-valuation of currencies.

The main arguments for floating exchange rates also fall into three categories:

1. The traditional arguments that nations with different economic structures that experience idiosyncratic shocks can benefit from a floating exchange rate.

2. Arguments that a pegged exchange rate prevents the use of monetary policy for other (domestic) objectives and that there are alternative or better commitment devices for policy.
3. Arguments that a system of pegged exchange rates creates misalignments, controls on international trade and financial flows, and in the face of speculative attacks, ultimately breaks down in a costly currency crisis. So the three main arguments for each system are parallel, involving: (1) traditional issues, (2) monetary policy, and (3) uncertainty and crises.

## **5. Traditional arguments**

Traditional models, with nominal wage or price sluggishness, emphasized a large set of factors that affect the desirability of fixed or floating exchange rates. According to those models, the benefits of flexible exchange rates between two countries are larger when the shocks affecting those countries (or their economic structures) are more different. If two countries tend to experience common exogenous shocks (e.g. to productivity or aggregate demand) and share economic structures (so that they react similarly to those shocks), then the equilibrium real exchange rate between those two countries will seldom change much. On the other hand, the equilibrium real exchange rate may change a lot if the two countries experience disparate shocks or respond very differently to common shocks. Under the latter conditions, changes in nominal exchange rates may allow the real exchange rate to adjust in the short run when nominal prices are sticky. In that sense, changes in exchange rates substitute (even if only imperfectly) for the adjustment of nominal prices. Milton Friedman (1953) compared this argument for floating exchange rates with the argument for daylight savings time – it is easier to reset clocks than to reset the times of every activity. A similar argument can apply to nominal wage rigidity: while nominal prices can adjust, nominal-wage stickiness induces short-run changes in real wages and employment. If a change in the real exchange rate can be accomplished at least partly through a change in the nominal exchange rate, these undesirable short-run results of changes in price levels can be mitigated. These arguments for floating exchange rates becomes stronger as the real social cost (in terms of foregone output, for example) of changes in nominal prices becomes larger.

Similarly, the benefits of floating exchange rates are larger when economies experience more (or larger) real shocks or foreign nominal shocks and fewer (or smaller) domestic nominal shocks. According to this argument, fixed exchange rates prevent domestic money-supply shocks and subsequent real effects and allow the balance of payments (rather than nominal GDP) to adjust to domestic money-demand shocks. In contrast, floating rates help prevent domestic effects of foreign nominal shocks. Accordingly, the greater the ratio of real

shocks and foreign nominal shocks to domestic nominal shocks, the greater the benefits of floating rates. In the same way, the benefits of exchange rate adjustment are smaller if the underlying shock is temporary rather than permanent. So the larger the ratio of permanent or long-lived shocks to short-lived shocks, the greater the benefits of a floating rate system.

Traditional discussions also emphasized various factors that affect the economy's difficulty in adjusting to a shock, such as the degree of factor (mainly labor) mobility. By providing an alternative margin of substitution for the economy to adjust, greater factor mobility reduces the benefits of floating exchange rates. Similarly, greater nominal wage and price variability, appropriate fiscal policies, and other types of economic flexibility can reduce the benefits of floating exchange rates. These arguments all presume that a benefit of floating rates is that exchange rate changes help the economy respond appropriately to exogenous shocks; the benefits of floating rates are obviously smaller if changes in exchange rates instead reflect mainly non-fundamental noise.

## 6. Monetary policy

An argument that has found expression in real-life policy decisions asserts that pegging the exchange rate provides a reasonably credible commitment to non-inflationary monetary policy. By leaving little room for discretionary policy, particularly long-term discretionary policy, the system also provides a nominal anchor and may directly affect expectations. A government has limited ability to exercise short-term discretionary monetary policy while pegging the exchange rate (as when countries with pegged rates have temporarily sterilized the effects of international reserve flows on the domestic money supply). Fixed exchange rates without severe controls on international trade and financial flows make *long-term* discretionary monetary policy impossible.

Proponents of floating exchange rates respond that there are alternative and perhaps better commitment devices. An exchange rate peg is simply one form of monetary rule. A better monetary rule might involve the nominal money supply, the price level, the rate of inflation, or the growth rate of nominal GDP. Each of these rules, if implemented in place of an exchange rate peg, makes long-term discretionary monetary policy impossible. Certainly there is little reason to believe that a policy of pegging the exchange rate is more credible than alternative institutional arrangements such as the following:

- Independent central banks (which high inflation countries usually lack) or currency boards.
- Payment schemes for central bankers that set rewards and penalties to discourage inflation or economic-performance requirements for continued employment of central bankers, as in New Zealand.



- Regulations on the portfolio of assets and liabilities of central banks to affect their incentives.
- Constitutional requirements for central bank actions or performance.

There is also little reason to believe that adoption of pegged exchange rates serves as a more dramatic policy move (that might affect expectations directly) than adoption of alternative monetary rules or institutions. Adoption of pegged exchange rates might signal other policy changes (such as more responsible monetary policies), but pegged exchange rates are unlikely to be a better signal than the adoption of other monetary rules or institutional changes.<sup>5</sup> Experience demonstrates that a system of pegged exchange rates among fiat currencies does not constitute a credible commitment to monetary policy.

A related and prominent argument for a pegged exchange-rate system asserts that the system provides a nominal anchor in a disinflationary environment. When a country disinflates successfully, the fall in the opportunity cost of holding money raises the real demand for money. If a country disinflates by reducing the growth rate of the nominal money supply, this rise in real money demand requires either a one-time fall in the price level or one-time increase in the nominal money supply. In other words, the growth rate of nominal money must temporarily exceed the inflation rate during the transition to lower inflation. If the disinflation policy is not fully credible, people may believe that this excess of money-growth over inflation reflects a retreat in disinflationary policy, reducing the real demand for money. In this case, inflation will rise and the disinflationary policy may fail. However, a pegged exchange-rate system can ameliorate this problem by linking the domestic price level to the foreign price level. With a pegged exchange rate, the increase in real money that occurs with successful disinflation materializes through an increase in nominal money that occurs naturally as part of the policy of pegging and does not signal a retreat from disinflationary policy. Argentina's successful disinflation experience is frequently cited in favor of this argument.<sup>6</sup>

This represents perhaps the strongest argument for pegged exchange rates, although it applies to a limited set of circumstances – high-inflation countries attempting credible disinflationary policies. Even in such cases, however, a

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<sup>5</sup> Drazen and Masson (1994) have argued that a system of pegged exchange rates might even be counterproductive in its signaling. A “tough policy” such as pegging the exchange rate may raise the unemployment rate and thereby create incentives for looser policy later, such as abandoning the peg. In such a case, the initial tough policy actually reduces credibility.

<sup>6</sup> Argentina's currency-board experience is also frequently cited in favor of the more general argument that a pegged-exchange-rate policy, particularly with the institution of a currency board, provides a mechanism for commitment to a stable monetary policy.

similar argument can be made for any alternative monetary rule that provides a nominal anchor – such as a rule specifying the *level* (not simply rate of change) of the nominal money supply or the price level. The caveat in footnote 5 also applies here.<sup>7</sup>

While proponents of a pegged exchange-rate system argue that its merit is commitment and prevention of discretionary monetary policy, proponents of floating rates often argue the merits of *not* committing monetary policy to peg the exchange rate. Without a pegged exchange rate, monetary policy can be either discretionary – if that is desirable – or can be subjected to an alternative monetary rule designed to achieve domestic price stability (or some alternative goal).<sup>8</sup> While even the *possibility* of discretionary policy may raise inflationary expectations, proponents of floating rates argue that alternative monetary rules can reduce that possibility just as well, or better than a pegged exchange-rate system.

Currently, economists have only a little evidence on what type of monetary rules – or institutions to proscribe and enforce such rules – work best. More generally, we have only a small amount of evidence on the effects of alternative exchange-rate systems. A real problem with obtaining evidence on the *effects* of an exchange-rate system is that the system itself is endogenous. This makes it difficult to sort its *causes* from its effects, and to determine the magnitudes of those effects. Recent attempts to find underlying conditions that predict the choice of exchange-rate system, such as Edwards (1996), may eventually help economists to separate causes from consequences (e.g. by suggesting instrumental variables for the exchange-rate system), but we remain a long way from having that evidence now. An interesting application of this point appears in Gould (1996), which explores the endogenous choice of fixed exchange rates or a money-supply target for a disinflation program. Gould shows that, in contrast to the common view that exchange rate-based disinflations lead to booms while money-based disinflations lead to recessions, the output effects of the two policies are essentially identical once one conditions on the level of reserves and the rate of inflation. These results cast doubt on one commonly-cited benefit of pegged exchange rates; at the same time they underscore the problem that the

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<sup>7</sup> Another counter-argument to the nominal-anchor argument for pegged rates in a disinflationary environment appears in recent work by Gould (1996), who argues that – in contrast to the common view that exchange rate based disinflations lead to booms while money-based disinflations lead to recessions – the output effects of the two types of disinflationary policy are essentially identical once one conditions on the initial level of reserves and the rate of inflation.

<sup>8</sup> More accurately, nations can adopt *different* discretionary monetary policies under floating exchange rates. Similarly, they can adopt *different* monetary rules, or the same monetary rules with different exogenous shocks can lead to different outcomes for nominal prices.

endogeneity of exchange rate regimes interferes with our ability to obtain evidence about the effects of those regimes.

A related issue concerns the political economy of policy choice. Perhaps the conditions that lead a country to choose one sort of exchange-rate system, or one sort of monetary rule, also tend to produce other types of economic policies. This compounds the difficulty of determining which characteristics of an economy *cause* a particular exchange-rate system or monetary policy and which are its *consequences*.

## 7. Uncertainty and crises

Does a floating exchange-rate system create variability, uncertainty, and varying misalignment (overvaluation or undervaluation) of currencies as floating exchange rates reflect largely non-fundamental noise? Does a pegged exchange-rate system create misalignments of currencies, controls on international trade and financial flows, and, in the face of speculative attacks, ultimately break down in a costly currency crisis?

Proponents of pegged rates argue that a floating rate system creates variability and uncertainty that have direct costs as well as indirect costs as they reduce free international trade, investment, and growth. Advocates of floating rates respond that floating rates don't *cause* variability or uncertainty, they merely *channel* it in certain directions. Variability and unpredictability of exchange rates, they argue, reflect variability or unpredictability of underlying shocks and government policies. They note that under systems of essentially floating exchange rates in recent decades, despite this variability, international trade in goods and services has expanded dramatically, and sophisticated financial markets have developed around the world.

Moreover, systems of pegged exchange rates are notorious for creating uncertainty about devaluations, and policy responses to the threat of speculative attacks. Those policy responses may include regulations and controls on international trade in goods, services, and financial assets. Not only are such controls very costly, but the uncertainty of such controls cannot be hedged well in financial markets. In contrast, financial markets offer numerous ways to hedge the daily exchange-rate fluctuations observed under floating-rate systems. In that sense, a system of floating exchange rates may offer *less* uncertainty than a system of pegged rates.

The evidence on these issues is not all in. When economists have compared the performance of countries under pegged and floating exchange-rate systems, they have found only one stark difference between the two systems. Real exchange rates vary significantly more under floating-rate systems than under pegged-rate systems. However, in contrast to the nearly universal expectations of economists, there is very little evidence of differences in the behavior of

economic *quantities* under the two systems.<sup>9</sup> This is a puzzle for future research to confront.

This puzzle is related to another: available evidence suggests that floating exchange rates do *not* merely *channel* uncertainty to real exchange rates from other economic variables. There is little evidence that other economic variables show any difference in variability or unpredictability across exchange-rate systems. (Some evidence shows that less exchange-rate variability tends to be associated with greater levels of international trade, holding fixed other determinants of trade.) Pegging the exchange rate appears to reduce substantially the variability and unpredictability of real exchange rates without much affecting other economic variables – see Baxter and Stockman (1989) and Flood and Rose (1995) – despite the presumption of nearly every theoretical model that it should. This constitutes one of the greatest unresolved puzzles in international macroeconomics and requires a strong caveat on *any* policy advice related to the exchange-rate system.

Critics of floating exchange rates argue that this variability of exchange rates reflects mainly non-fundamental noise and creates alternating overvaluations or undervaluations of currencies. Presumably, such misalignments would be associated with economic costs that would appear in the behavior of output, employment, or international trade – yet there is little evidence linking changes in exchange rates with such measures.<sup>10</sup> (For example, evidence suggests that real exchange rates are essentially unrelated to business cycles or to differences in business-cycle conditions across countries, making real exchange rates appear unrelated to the largest fluctuations in aggregate employment.) Nevertheless, available evidence is not sufficiently strong that one should rule out significant costs of observed exchange-rate variation under floating rates.

The costs of currency misalignments, however, are likely to be much higher under pegged exchange-rate systems than under floating rates. Historically, countries with pegged rates have frequently experienced clear overvaluation or undervaluation of their currencies – in the sense that they were forced to place controls on free international trade in goods and financial assets in order to maintain the pegged rate and eventually abandoned it.<sup>11</sup> Evidence tends to suggest that the danger of misalignments is greater under a pegged exchange-

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<sup>9</sup> When the relative price of goods in two countries varies more under one system, one would expect differences in the behavior of such *quantities* as output, consumption, investment, or trade, which ought to be related to that relative price. However, there is very little evidence of such differences in the behavior of quantities.

<sup>10</sup> Of course, the equilibrium real exchange rate is unobservable, and estimates of overvaluation and undervaluation (relative to equilibrium) are highly suspect and better described as guesses than estimates.

<sup>11</sup> More precisely, the countries chose not to alter monetary or fiscal policies that were inconsistent with maintaining the pegged rate.

rate system than under a floating-rate system. This should not be surprising – Friedman’s “daylight savings time” analogy is consistent with the view that the economy can adjust more easily to equilibrium if the exchange rate can change with market conditions.

The main cost of pegged exchange-rate systems is associated with their periodic breakdowns. These costs vastly exceed any estimates of the direct costs of misalignments under either system. They include the effects of speculative attacks and the policies that governments undertake to postpone them – such as controls on international trade and financial flows – and ultimately to deal with them. In recent years, Great Britain, Mexico and other countries have each spent tens of billions of dollars over brief intervals trying (unsuccessfully) to forestall speculative attacks. Mexico spent more than \$50 billion to support the peso in 1994; expenditures of this magnitude are not limited to developing countries; England may have lost over \$7 billion within *a few hours* trying to support the pound in September 1992. Although economists remain uncertain about the exact mechanisms that generate currency crises – for example, whether they follow of necessity from certain initial conditions, policies, and shocks, or represent one of multiple self-fulfilling equilibria – it appears that these high costs are endemic to pegged exchange-rate systems. And even these costs may be dwarfed by the costs of economic distortions from controls, regulations, and taxes that governments often put in place to try to postpone currency crises and devaluations.

The third type of cost associated with breakdowns in pegged exchange-rate systems derives from the other effects of those breakdowns or the policies associated with them, as illustrated by the recent Mexican recession. While macroeconomists continue to debate the sources of recessions, the implications of one prominent theory are particularly important for the choice of an exchange-rate system. That theory emphasizes connections in modern economies between monetary and credit systems. Interrelated monetary and credit systems have developed partly as a market solution to adverse-selection and moral-hazard problems in financial markets. However, this intertwining of monetary and credit systems creates new problems. It creates connections that underlie Irving Fisher’s “debt-deflation” hypothesis, recently revived by Bernanke (1995), Mishkin (1992), and others. In the present context, it creates a connection between exchange-rate crises and bank crises.

Connections between exchange-rate crises and bank crises make the stability of a country’s financial system a key factor in the choice of exchange-rate system. Speculative attacks on a pegged exchange-rate can lead to banking-system crises. Those banking-system crises can in turn promote even worse problems for foreign exchange markets. Similarly, banking-system crises can create speculative attacks on a pegged exchange rate. Crises in currency markets and credit markets can feed on each other. This interrelationship – the fact that we have the same set of institutions for the allocation of credit in an

economy as we have for promoting transactions services – means that monetary arrangements such as an exchange-rate system can affect the real economy through these credit channels. The importance of these credit channels in developed countries remains controversial. Not everyone agrees that those channels are the major factors in business cycles. Nevertheless, there is enough evidence to worry about those issues and to believe that they may be worse in developing countries – because in countries with less-developed financial systems, business firms may depend even more heavily on the banking system (rather than direct acquisition of funds in capital markets) than in more developed countries. These possibilities – and the risk they create – constitute another major disadvantage of pegged exchange rates. They also suggest that the benefits of floating exchange rates are particularly high for countries with less-developed or less-stable financial systems or for those that cannot count on domestic or multinational institutions to provide immediate and substantial assistance in the event of a financial crisis.

Are crises an inevitable result of pegged exchange rates? Not technically, in the sense that economists can devise models in which credible pegs, with no crises, are possible. But history and political economy suggest that periodic crises *are* an inevitable part of pegged exchange-rate systems between differing fiat currencies. The political temptation to make use of short-run independence of monetary policy (e.g. through sterilization of reserve flows) under pegged exchange rates, combined with the impossibility of long-run independence, creates misalignments and conditions that lead to attacks. Governments find it tempting politically to try to use domestic monetary policy for domestic objectives, even under pegged-rate systems. While this can be successful in the short run, it cannot be successful in the long run. The temptation of governments to try creates situations in which governments must either devalue or establish controls and regulations on international trade and financial flows. This happened often in the past, and there is no reason to believe the future will differ. Political forces contribute to instability of pegged exchange-rate systems.

## **8. Policy choice under uncertainty**

Countries face (as usual) a decision under uncertainty – they must choose an exchange-rate system and associated monetary policy without full information on the consequences of that choice. They must weigh the arguments and the costs of errors from adopting pegged exchange rates with the costs of errors from adopting floating rates. They must evaluate the alleged benefits of each system and the opportunities for achieving those benefits through alternative, substitute means. They must also evaluate methods of reducing the potential costs of each system.

Countries clearly have alternatives to a pegged exchange rate as a commitment mechanism for monetary policy. They also have clear ways to reduce whatever costs are associated with variability and uncertainty in exchange-rates under a floating-rate system, such as development of financial instruments that allow people to hedge risk. However, alternative ways of achieving the benefits of a floating-rate system, such as greater wage and price flexibility or alternative ways of reducing the costs associated with speculative attacks on pegged rates, are much more elusive. These considerations suggest a distinct advantage to floating exchange rates over pegged exchange rates. Despite these apparent advantages, this conclusion carries risk because economists lack good, well-corroborated theories of either exchange rates or business cycles.

Informal cost–benefit analysis of alternative exchange rate systems appears to give a strong advantage to floating exchange rates. The evidence suggests that the real productive and allocative consequences of the choice of systems under normal conditions are quite subtle. The most significant benefit of a pegged exchange rates is its role as a commitment mechanism and nominal anchor, but countries may have good substitutes for achieving price stability.<sup>12</sup> Meanwhile, the costs of pegged exchange rates may be very high due to the possibility of speculative attacks. Therefore, under most conditions, the case for floating exchange rates (or for a common currency) is compelling.

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<sup>12</sup> The only exception to this may be for a country that has experienced hyperinflation and has no other clear, credible mechanism for commitment to a responsible monetary policy. It can easily be argued that Argentina in recent years has been such an exception. Nevertheless, after a country successfully reduces inflation with a pegged exchange rate, it would be wise to seek institutional changes to raise credible commitments to responsible policies in a way that allows the ultimate adoption of floating exchange rates.

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