Monetary Unions

Theory, history, public choice

Edited by Forrest H. Capie and Geoffrey E. Wood

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The Economic and Monetary Union (EMU) in which some members of the European Union (EU) have joined, has prompted much discussion of monetary union. Most of this discussion has focused on the immediate issues, such as prospects for the euro and the possibility of expanding the euro-zone. Few authors have stood back and considered either the relevant theory or what lessons might be drawn from other unions that have been formed in the past. Four of the chapters in this volume do this, and although the fifth does look directly at EMU, it does so with the aid of analytical tools not previously used on that subject.

In the second chapter Bennett McCallum reviews the extant theory of monetary unions. In the third, Michael D. Bordo and Lars Jonung look specifically at past experience for lessons that might be learned from previous unions for European monetary union, considering both national and multinational monetary unions. Discussion of the prospects for European monetary union has often focused on whether the European union is an optimal currency area and, if not, how long it might take to become one and whether there might be unacceptable costs to some part of the territory along the way. Hugh Rockoff considers these same questions in relation to the US experience, often cited as the most successful example of monetary union. Marc Flandreau adds a European historical perspective, with particular attention to the monetary union of Austria and Hungary. In the final chapter, Roland Vaubel applies public choice analysis to various institutional aspects of EMU, focusing on such critical questions as the prospects for inflation and for future enlargement of both EMU and the EU.

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Forrest H. Capie
Geoffrey E. Wood

1 Introduction

Forrest H. Capie and Geoffrey E. Wood

This book comprises the papers presented at a conference on monetary unions held at City University, London, in May 1999, along with the comments on them by their discussants at the conference. Monetary union was a much discussed subject at that time, of course prompted by the Economic and Monetary Union (EMU) in which some members of the European Union (EU) have joined, and has remained so since then. Most of the discussion, though, has been focused on that particular union. Few authors have stood back and considered either the relevant theory, whatever that might turn out to be, or what lessons might be drawn from other unions that have been formed, some durable, some not, in the past. It is the aim of four of the papers gathered together in this volume to address these issues; and although the fifth does look directly at EMU, it does so with the aid of analytical tools not previously used on that subject.

This short introductory essay provides a brief guide to the book, sets out the main points of each paper, and concludes by setting out the overall points to emerge from the conference as a whole.

The theory of monetary unions originated with a short but very well known paper by Robert Mundell (1961).[1] The paper draws attention to the problems of monetary union across a large, geographically diverse area (problems possibly exacerbated by an issue Mundell does not discuss, the area's encompassing several languages). In his paper, the one which opens this volume and which concentrates on analytical issues, Bennett McCallum considers Mundell's paper, as well as subsequent, but still pioneering, papers by McKinnon (1963) and Kenen (1969). McCallum also touches on the theory of currency crises, and an aspect of the connection between fiscal and monetary policy.

What emerges very strikingly is how little *that is operational* economic theory has to say on this subject. That certainly does not mean that it has no contribution to offer – only that it cannot be directly applied to answer, for example, whether a particular country should join EMU (or of course any other monetary union). What it very clearly can do is provide guidance on the questions to address to past episodes of monetary union. That is exactly how it is used in the papers by Michael Bordo and Lars Jonung, Hugh Rockoff and Marc Flandreau. One of these unions, the USA (studied by Hugh Rockoff) was certainly a success – at least by one criterion, which is discussed in the comment (on McCallum's paper) by Wood, and used by Anna

Schwartz in her remarks on the Rockoff paper. Bordo and Jonung seek to draw lessons for EMU from the study of a wide range of unions, and Flandreau from the experiences of a particular (pre-1914) union. Only Roland Vaubel looks directly at EMU, and, applying public choice analysis, makes predictions for its future inflation and business cycle behaviour, and considers the consequences of various still prospective members actually joining. His very striking results are discussed in a little more detail below.

We now move on to the papers, following in our discussion the order in which they appear in the book (and were presented at the conference).

The first paper in the volume, by Bennett McCallum, deals with some theoretical aspects of monetary union. As is well known, the most obvious and fundamental tool to use in this area, optimum currency area theory, has so far proved non-operational. In his paper, McCallum reviews this theory and concludes that it is still in that position. The original article, by Mundell (1961), and the subsequent additions by McKinnon (1963) and Kenen (1969) have provided a list of factors relevant when deciding whether an area is optimal, but have got no further. Later work by Bayoumi and Eichengreen (1996, 1997) has gone some way beyond this, but only by producing rankings of suitability for membership of a particular union; they do not provide any way of deciding on the optimality of a union.

McCallum also discusses the history of the subject, and provides an explanation for its developing only in the 1960s; his explanation turns largely on the existence of a consensus in favour of a worldwide fixed rate system until the attack on that consensus by Milton Friedman in 1953.

In view of the comparatively limited guidance optimum currency area theory can give, what other tools of economic analysis are useful in the area?

McCallum proposes two. He considers the comparatively recently developed theory of currency crises. (He notes that this, too, dated really from Milton Friedman's 1953 paper on flexible exchange rates.) This theory is relevant because it shows that a 'fixed but adjustable' exchange rate regime, such as the EU had for some years before going to EMU, is not viable in the long term. The reason is straightforward; so long as governments wish to retain the freedom to change their exchange rates, they by implication wish on some occasions to subordinate defending the rate to some other policy objective. Knowing this is in itself sufficient to expose the currency to attack. European countries, then, had to move from the ERM (exchange rate mechanism). (In which direction they moved, fixed or floating, was of course not preordained by that body of theory.)

The paper concludes with a brief appraisal of the fiscal theory of inflation – the theory which says that price level behaviour is determined by the stock of government bonds, quite independently of whatever the money supply is doing. McCallum rejects this theory, and thereby raises questions about the purpose of fiscal rules in EMU (or any other monetary union).

Bordo and Jonung look specifically at past experience for lessons that might be learned from previous unions for European monetary union. They first survey the experience of national monetary unions – that is, those involved in nation building – looking at three specifically: the United States, Italy and Germany. They then

consider multinational monetary unions: the Latin Monetary Union and the Scandinavian Monetary Union. Some others that are noted are those that existed informally between Britain and some of its colonies in the nineteenth century. And then there are some close approximations to monetary union found in certain currency boards. These latter have become more common again recently, having been a popular institution in the nineteenth century. (The East Caribbean Currency Area is currently a multinational monetary union with a single monetary authority. Where formerly there was a currency board for the seven territories there is now a currency union.)

The strongest element in the formation of monetary unions in the past has been political. In the main they have been formed to facilitate political unification or in some cases the rationalisation of different currencies after political unification. Economic reasons can obviously play a part. Equally, the principal cause of the break-up of monetary unions (Soviet Union, Czechoslovakia, etc.) can also be found in political developments. It can be that within a political entity economic strains can develop between certain regions which can then result in the break-up of the political union.

From this survey of historical experience Bordo and Jonung draw some strong and important conclusions. The main one concerns whether or not EMU will be a national or multinational union. According to one view monetary union is being used to promote political union. Bordo and Jonung list a number of defects in EMU as it stands. These include the lack of a number of features normally found in a modern monetary system, such as lender of last resort, a central supervisory body, an accountable central bank and co-ordinated fiscal policies, and inconsistent requirements in monetary policy. They add that Europe is quite clearly not an optimum currency area. They judge, however, that EMU will move towards being a national monetary union. The likelihood is that when one region suffers a shock this will simply stimulate the moves for a larger central authority to carry out the necessary fiscal transfers to smooth the adjustment process. Their guess is that EMU will hold together and that based on historical experience it takes rather extreme circumstances such as war to break unions up.

That EMU is a political agenda rather than the economic agenda that is often presented has become more and more widely accepted. One discussant, Charles Goodhart both noted this, and was not so sanguine as Bordo and Jonung that the union would survive adverse shocks.

A major part of the economic analysis of monetary unions is concerned with whether or not the territories covered make, in the jargon, an optimum currency area. As noted in the opening paper this is not an easy concept to make operational. It is straightforward to list the basic requirements such as price flexibility, labour mobility, capital mobility and so on, but much more difficult to say at what stage the combined factors have defined an optimum currency area. The originator of the concept, Robert Mundell, has in fact come out in support of the idea that the different European states would certainly become an optimum currency area even if they are not one at present. There can perhaps be no denying that; but the questions would then be, how long would that take and might there be unacceptable costs to some

parts of the territory along the way. This in fact is the question that Hugh Rockoff addresses in relation to the United States. The United States was a political union from an early date, and that would no doubt have smoothed the monetary experience. Nevertheless, the question can still be put – might some parts of the United States have been better off with their own currencies floating against the US dollar?

Rockoff traces US experience from the origins of the monetary union, which dates from the ratification of the constitution in 1788. Prior to that, currency varied among the different colonies. The central question that he puts is, might the United States have been better off if some of the regions had had their own currency? He shows that there were bitter disputes over the 150 years after ratification. Typically what happened was that one region would experience a shock – commonly a fall in demand for an agricultural product – and the local banking system would suffer, leading in turn to falling money supply and real income.

In the Civil War there were effectively three monetary regions: the East and the mid-West used greenbacks; the South had a confederate dollar; and the Pacific coast stayed on gold. But after the war there was a long struggle towards acceptance of reunification. Rockoff shows too that in terms of optimum currency area criteria some regions differed highly from others, and that in many ways they were separable currency areas.

The most extreme experience was the great depression of 1929–32. While the whole country suffered there were big differences. It was at that point, argues Rockoff, that important institutional changes were made such as the development of federally funded transfer programmes which 'redistributed reserves lost through interregional payments deficits'. These and the increasing integration of the labour market helped to bring the United States closer to an optimum currency area. But the answer to the question 'How long did it take the United States to become a optimum currency area?' is roughly 150 years.

Marc Flandreau is perhaps best known for his work on bimetallism and the working of the French monetary system in the middle of the nineteenth century; and that of course included the relationship with the Latin Monetary Union. He raises here the question as to how useful the study of historical experience can be for guidance on the sustainability of modern monetary unions. He points out, correctly in our view, that most of the arrangements that went under the name of 'monetary unions' can be found in the nineteenth century when most countries adhered to some form of metallic monetary standard. So unions such as the Latin Monetary Union or the Scandinavian Monetary Union turn out on closer examination not to be monetary unions of the kind we currently have in mind but, rather, simply currency unions. The countries involved simply agreed to accept each others' currency. Given that these were coins with specified metal content there was little to get excited about and much of the activity was already taking place without any formal agreement. These unions had no common monetary policy and no common central bank. There were other monetary unions. There were those of the Swiss states, the Italian Kingdoms and the German States. But these were of course essentially attempts at political union. The driving force was political union; and different currencies had to be rationalised in order to facilitate political union or as a sensible practice after political union was achieved, or some combination of both of

these. Insofar as the European monetary union is supposed to be about separate states and not political union, these latter examples should be of little interest to us. And yet, as Charles Goodhart at this conference stressed, European monetary union is a political agenda and has been carried along with 'devilish cleverness by a politically astute clique intent on achieving their own ends'.

Be that as it may, Flandreau tried instead to find an experience which might fit our purposes more closely – a monetary union between separate independent states; this is found in the alliance between Austria and Hungary. This was an arrangement whereby both countries surrendered monetary sovereignty to a common central bank but retained fiscal sovereignty. The Habsburg monarchy operated without the kind of agreement that exists in Europe today to keep public expenditure within certain limits. There were great pressures to raise public spending in the nineteenth century to promote economic development and it was left to the capital market to discipline the fiscal authorities. The 'compromise of 1867' was the agreement struck between the two countries for a period of ten years and reviewed regularly until 1917. Flandreau traces the monetary and fiscal experience of this union. He shows how the two states were continuously concerned about their reputation in the market. There was some competition over reputation and as they standardised their debt instruments the market could better read the price signals.

This is an extremely interesting use of history which escapes from many of the limitations that apply to studies of other monetary unions.

In his penetrating paper (updated to June 2002) Roland Vaubel applies public choice analysis – in particular the median voter theorem, the theory of the political business cycle and the economic theory of bureaucracy – to various institutional aspects of EMU. He is concerned with the behaviour of EMU institutions rather than directly with EMU itself, although, of course, the behaviour of the institutions clearly has implications for EMU. The institutions he focuses on are the European Central Bank (ECB) and the EU's Council of Ministers. The results (to which Vaubel attaches a reminder that they are the mid-point of a confidence interval and not a precise forecast – a warning which of course all econometric work should carry) are striking. Whatever methods he uses produce significantly higher inflation than the current ECB target – the predicted rates all exceed 5 per cent pa. There will, as a result of the timing of elections, very likely be a boom between 2002 and 2004. The effects of the Euro on unemployment are ambiguous in sign but certainly distributed very unevenly across the area.

And what of EMU (and, of course, EU) enlargement? Vaubel considers both Eastern prospective members of the EU, and existing non-EMU countries in the EU. Here too the results are fascinating. Of the Eastern countries, only Slovenia and Hungary are well suited to EMU membership; and of all the current EU countries, the UK is the least suitable for membership. There are many more results in this fascinating paper. The two discussants express some reservations – as does Vaubel, who points out that 'The analysis of this article – like most empirical research – is merely suggestive'. Doubts are raised both about aspects of the econometrics and about the relevance of certain parts of public choice analysis. Nevertheless the paper is important, and remains so even should every one of its predictions be falsified. Its fundamental importance lies in showing how the tools of a particular, and very

specialised, area of economics can be applied, and in showing how very important they are. For the rigour of the analysis demonstrates persuasively that simply hoping or asserting that matters will work out well for some institutional design is insufficient. Supporters of the design must argue their case before putting the model they have designed into operation. Faith, hope and trusting that men of goodwill will always produce good results is not enough. Quoting from the conclusion of this paper gives a striking and important example of the dangers lying in that 'blind optimism' approach. 'It is easy to agree on an inflation target and leave open how it might be attained. If it is not attained it might be attributed to factors other than monetary policy. After all, failure to attain the target will not be sanctioned.'

Conclusion

The papers that we have reviewed contain a great deal that is both interesting and enlightening on the subject of monetary unions. But the main general focus seems to be that there is as yet no body of analysis which can give guidance on the optimality of prospective unions. The theory is still, very much like the theory of customs unions, a collection of useful points and particular cases. Nevertheless, there is one point that runs through all the papers: the importance of the political dimension. The economic analysis of monetary unions, actual or prospective, is important; but carrying it out without consideration of political pressures and institutions would provide at best a partial and quite easily a misleading view.

Note

1 Mundell is sometimes hailed as the 'father of EMU'. But he surely receives this title not on the basis of the above cited paper, but on the result of a much less well known one, 'Some uncommon arguments for common currencies', published in 1973. This subsequent paper, which focused on the possibility that with flexible exchange rates uncertainty about the future course of rates could disrupt the international capital market, has suffered neglect (compared at least to his 1961 paper) and has yet to be followed up.

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2 Theoretical issues pertaining to monetary unions

Bennett T. McCallum

Introduction

The purpose of this paper is to review the economic theory relevant to the subject of *monetary unions*, in principle to provide a background for the remainder of the conference. This is a difficult assignment, for there is only a small bit of theory that is directly and strongly relevant to the topic, whereas the amount of theory that is of possibly significant relevance is huge – too large to cover in a single paper of moderate length. Accordingly, I have had to make some difficult and debatable choices regarding content.

The one theoretical topic that is of clear and direct relevance is the theory of optimal currency areas, since the basic purpose of that analysis is to specify conditions under which it is (or is not) economically advantageous for a group of economies to adopt a single currency. But direct relevance does not imply that an extensive discussion of this topic is appropriate because, on the one hand, its central propositions are well known and, on the other hand, the essential concepts involved are perhaps so difficult to measure as to render the theory virtually non-operational. Accordingly, just one section of the paper, the next, will be devoted to the subject of optimal currency areas.

A second topic that seems worthy of some review is the recently prominent theory of exchange-rate (and other financial) crises. This topic is relevant because one of its main practical messages is, as I understand it, that with unregulated international financial flows the relevant choice for a group of economies is between currency union and floating exchange rates. In other words, the apparent intermediate option of a fixed but possibly adjustable exchange rate is actually close to infeasible. Accordingly, a short review of this literature is in order and will be attempted in the third section.

Third, the topic of monetary union envisions a single currency for economies that have distinct governments and thus, to some extent, potentially distinct fiscal authorities. Consequently, the subject of the relationship between fiscal and monetary policies arises. As a whole, this subject is too extensive to be reviewed here. A particular issue that has quite recently been the subject of considerable theoretical attention, however, is the so-called "fiscal theory of price level determination." This is a topic of fundamental importance that has been developed in a number of writings that are theoretically sophisticated and rather difficult to comprehend without

extensive study. It is also a topic in which I have taken some prior interest. An exposition of the issues is therefore provided in the fourth section of the paper. It should be clearly stated at the outset that, due to my previous involvement, this presentation does not pretend to be a balanced, unbiased overview but is instead a partisan attempt to justify a particular position regarding this theory – the position that I consider to be most appropriate.

Finally, there is a short summary of the paper.

Optimal currency areas

The optimal currency area concept was introduced, as is well known, by Mundell (1961). Despite appearances, the foregoing should be regarded as a striking statement because it is surprising that such a basic idea would not have been developed previously. Nevertheless, the statement is, as well as I have been able to determine, correct. I will return to this point below, and will offer an explanation for the reason that the concept had not been developed previously, but for the moment let us continue the substantive theoretical discussion. The crucial tradeoff identified by Mundell is, according to my own textbook,[1] that "an extension of the area over which a single currency prevails enhances [microeconomic] efficiency but reduces the possibility of monetary policy responses to shocks [or conditions] that affect various subareas differently" (McCallum 1996: 258). The wider the area, that is, the greater are the efficiency benefits of possessing a single medium of exchange and medium of account,[2] but the smaller the area, the greater are the possibilities of tailoring monetary policy to (temporary) local needs. Somewhere between one currency for the entire world and one for each country (or for each city, or neighborhood, . . .) lies the optimum. The plot of net benefits versus number of currencies might be quite flat, of course, over a wide range that includes the optimum.

In a sense, the foregoing is all there is to be said in terms of pure theory, but most authors would discuss the topic at somewhat greater length. The recent and highly regarded graduate level textbook by Obstfeld and Rogoff (1996: 632–4) sustains the discussion for approximately two full pages by listing four main benefits and four main costs to a pair of countries from having a common currency. These are, in the words of Obstfeld and Rogoff, as follows, with benefits listed first.

B1 Reduced transaction costs from currency conversion . . .
B2 Reduced accounting costs and greater predictability of relative prices for firms doing business in both countries.
B3 Insulation from monetary disturbances and speculative bubbles that might otherwise lead to temporary unnecessary fluctuations in real exchange rates. . . .
B4 Less political pressure for trade protection because of sharp shifts in real exchange rates.

C1 Individual regions in a currency union forgo the ability to use monetary policy to respond to region-specific macroeconomic disturbances. . . .

C2 Regions in a currency union give up the option to use inflation to reduce the real burden of public debt. . . .
C3 . . . Political and strategic problems arise in determining how member countries split seignorage revenues. . . .
C4 Avoiding speculative attacks in the transition from individual currencies to a common currency can be a major problem. . . .

Here it would appear that B1, B2, B3, C1, and C2 accord nicely with the simple statement expressed above whereas C4 represents only a transitional difficulty[3] and B4 and C3 are basically political rather than economic in nature. If I were making a list of the Obstfeld–Rogoff type, however, I would add another distinct benefit as follows: the existence of a common currency tends to bring a greater degree of integration to financial and non-financial markets in the two countries.

Merely stating that this optimization problem exists does nothing, obviously, to solve it for any two actual countries such as the UK and Germany. The relevant issue for the present paper is what theoretical writings have to say about the way in which the optimization problem should be handled in practice. In his original paper, Mundell (1961) emphasized factor mobility, especially labor mobility, as a crucial consideration. Subsequent contributions by McKinnon (1963), Kenen (1969), and others have proposed other criteria for consideration. In particular, McKinnon emphasized openness, measured by the share of tradable goods in a country's output, whereas Kenen focussed on the extent of product diversification in production. For an extensive review of this literature, including references to many additional authors, see Ishiyama (1975) or Tower and Willett (1976).

After reflecting on some of these writings, my own impression was that there is significant merit to several of the proposed criteria, in other words, that no one of them is itself sufficient. Furthermore, each of the criteria is extremely difficult to implement quantitatively. So when I began this paper, I found it difficult to avoid the conclusion that the optimal currency area (OCA) concept is, in practice, non-operational. Consequently, my first draft expressed the opinion that, although the concept reflects an important and interesting tradeoff, in actual practice one can not go far beyond the rather limp conclusion that currency unions 'will be relatively more attractive for small, open economies that engage in a large volume of international trade (relative to their size)' whereas 'floating rates . . . are more suitable for large and relatively self-contained economies' (McCallum 1996: 225).

Since writing the first draft, I have seen a pair of papers by Bayoumi and Eichengreen (1996, 1997) whose purpose is to operationalize the OCA concept. Their approach in the 1997 paper is to develop quantitative measures or proxies pertaining to size, trade linkages, and dissimilarity of aggregate shocks for different European countries each considered relative to Germany.[4] An index of unsuitability for membership in the contemplated currency area is constructed (for each country except Germany) by using coefficients obtained in a cross-section regression whose dependent variable is the variability of bilateral exchange rates with Germany. This index indicates that Austria, Belgium, Ireland, the Netherlands, and Switzerland would be relatively suitable for inclusion in the union, whereas Denmark, Finland,

Norway, Portugal, Spain, Sweden, and the United Kingdom would be relatively unsuitable. These groupings seem sensible enough that I would have to agree that Bayoumi and Eichengreen have made notable progress toward operationalization of the OCA theory.[5]

Nevertheless, it must be recognized that their approach yields only rankings of suitability, not actual cost–benefit measures that would indicate where the line separating included versus excluded currencies should be drawn. Accordingly, one could still argue that true operationality of the OCA concept has not been achieved. To emphasize this point, it might be argued that if there was ever a situation that cried out for application of the OCA calculus, it was the January 1999 creation of the European Monetary Union. But Bayoumi and Eichengreen's (1996) review of numerous studies indicates that they do not actually provide estimates indicating which countries should, and which should not, be members of the Euro area. The European Union publication *One Market, One Money* presented some worthwhile analysis – especially in its attempt to estimate the resource savings of a single currency rather than truly fixed exchange rates among national currencies – but all in all it too seems not to pass the test.[6]

Let us now return to questions relating to the history of the optimum currency area's crucial tradeoff concept. Was Mundell (1961) actually the first to express it clearly? Yeager (1976) mentions another publication of the same year, namely Balassa (1961: 263–8). But examination indicates that the latter gives consideration to the type of costs and benefits implied by the tradeoff, without ever posing the issue in terms of an 'optimal area' concept. Indeed, the same can be said for an earlier publication by Yeager himself (1959a). In addition, some other earlier writings of relevance are cited by Ishiyama (1975) and by Willett and Tower (1970). But even if one were to conclude that the concept had been clearly formulated by someone prior to Mundell, which is debatable, it would nevertheless be striking that its formulation did not occur until some date not long before 1961. So let us move on to the more interesting question, *why* did this recognition not come sooner?

To the latter question there is, I believe, a rather clear-cut (although conjectural) answer. It is that prior to the 1950s, the predominant position among international and monetary economists was that some metallic monetary standard should be adopted by all countries. The most common position was that the *same* monetary standard, typically the gold standard, should prevail everywhere.[7] Then, in the absence of restrictions on gold flows, there would be a unified monetary system; the fact that different units of account would be used in different countries would not negate the existence of a unified medium of exchange and medium of account.[8] Furthermore, even if different metals were used by some countries, there would be no scope for floating exchange rates or for the associated possibility of tailoring monetary policy to different conditions in different regions.

The great break with this orthodoxy came, of course, with the publication of Friedman's 'The Case for Flexible Exchange Rates' (1953). This, together with other pro-floating rate writings, including Lutz (1954), Sohmen (1957), and Yeager (1959b), altered the intellectual climate enough to permit the relevant issues to arise. In Friedman's essay there is no attempt to balance off the benefits and costs of floating

rates, but that is so because the paper's task was to persuade analysts of the existence of benefits. But in this task the paper was successful enough that within a few years Mundell could take a more balanced perspective and look for an optimizing tradeoff.

Another development was necessary, furthermore, before Friedman's. Since the main benefit of a floating exchange rate is that it permits monetary policy to be different in different regions, and therefore to be usable for offsetting demand shocks that would have undesirable (albeit temporary) effects on output and employment, there needed to be professional recognition that monetary policy could be useful in this way. In other words, there needed to be recognition of the possibility of monetary stabilization policy of the type that we now call Keynesian. It is my own belief that Keynes's *General Theory* (1936) was largely unsuccessful as an undertaking in economic theory, but it succeeded spectacularly in calling the profession's attention to the importance of considering short-run issues. The point, from the perspective of the present discussion, is that the recognition of some role for monetary stabilization policy provides one potential benefit for floating exchange rates, i.e. for the possible optimality of more than a single worldwide currency. This particular role is not strictly necessary, for different countries could have different preferences regarding long-run average inflation rates – perhaps for public finance reasons – but the stabilization role is more prominent and would remain relevant even if average inflation preferences were the same everywhere.[9]

The discussion to this point has proceeded as if floating rates and currency unions were the only possibilities. In other words, we have not mentioned the possibility of countries with fixed but potentially adjustable exchange rates. Experiences during recent years – most prominently in Europe in 1992 and 1993, Mexico in 1994–5, and Asia in 1997–8 – have strengthened the belief that the fixed-but-adjustable arrangement is illusory for the reason that was spelled out so effectively by Friedman (1953). This reason, of course, is that fixed (but adjustable) rates tend to invite speculative attacks. In Friedman's words:

> Because the exchange rate is changed infrequently and only to meet substantial difficulties, a change tends to come well after the onset of difficulty, to be postponed as long as possible, and to be made only after substantial pressure on the exchange rate has accumulated. In consequence, there is seldom any doubt about the direction in which an exchange rate will be changed, if it is changed. In the interim between the suspicion of a possible change in the rate and its actual change, there is every incentive to sell the country's currency if a devaluation is expected . . . or to buy it if an appreciation is expected.
>
> (Friedman 1953: 164)

Friedman's argument is rather compelling and may seem more convincing now than ever before. Nevertheless, a more formal literature concerning speculative attacks on exchange rates has built up over the past 20 years, and deserves some attention in any review of theory relevant to the topic of monetary unification. To provide a brief review is the purpose of the next section of the paper. Comments on the currency-board possibility will be included toward the end of this next section.

The theory of currency crises

The currency crisis or speculative attack literature came to prominence with writings by Krugman (1979) and Flood and Garber (1984a). Extensive recent reviews of the theory by Flood and Marion (1998), Marion (1999), and Garber and Svensson (1995) indicate clearly, however, that the crucial ideas were present somewhat earlier in a comparatively neglected paper by Salant and Henderson (1978).[10]

The simplest and cleanest model is one developed by Flood and Garber (1984a). As a preliminary step, let us consider how a *floating* exchange rate would behave in a small open economy in which prices are highly flexible, so that employment and output are always close to their "natural rate" levels. The analytical framework typically utilized in the literature is normally described as also requiring uncovered interest parity, purchasing power parity, and constant values for output and the real interest rate in the home economy. The following presentation indicates how the latter three requirements can be dispensed with.

Let M_t be the stock of base money, P_t the price level, S_t the price of foreign exchange, Q_t the real exchange rate, Y_t the rate of output, and R_t the nominal interest rate. For all of these except the last, let lower case letters denote logarithms, e.g. $s_t = \log S_t$; for the last we have $r_t = R_t - E_t \Delta p_{t+1}$, the real interest rate. Also, let "*" denote a foreign or rest-of-world variable. Then we write the model as follows.

$$y_t = b_0 + E_t y_{t+1} + b_1 r_t + b_2(x_t - E_t x_{t+1}) + \eta_t \qquad b_1 < 0,\ b_2 > 0 \tag{2.1a}$$

$$m_t - p_t = c_0 + c_1 y_t + c_2 R_t + \varepsilon_t \qquad c_1 > 0,\ c_2 < 0 \tag{2.1b}$$

$$x_t = a_0 + a_1 q_t + a_2 y_t + a_3 y^*_t + \xi_t \qquad a_1,\ a_3 > 0,\ a_2 < 0 \tag{2.1c}$$

$$q_t = s_t - p_t + p^*_t \tag{2.1d}$$

$$R_t = R^*_t + E_t \Delta s_{t+1} + \zeta_t \tag{2.1e}$$

$$y_t = \bar{y}_t \tag{2.1f}$$

Here (2.1a) and (2.1b) reflect dynamic optimizing versions of relations of the IS and LM type that have been justified by McCallum and Nelson (1999), among others, with the former augmented by trade flows, x_t representing the log of exports minus the log of imports. The value of x_t is modelled in (2.1c) as depending on the real exchange rate and income levels at home and abroad. Equation (2.1d) is an identity; (2.1e) represents uncovered interest parity with a random, time-variable risk premium, and (2.1f) assumes that, with price flexibility, output equals its (exogenous) market-clearing natural rate value, $\bar{y}_t$. The terms η_t, ε_t, ξ_t, and ζ_t represent exogenous stochastic shocks.

Of course, we also have the identities

$$r_t = R_t - E_t \Delta p_{t+1} \tag{2.2}$$

$$r^*_t = R^*_t - E_t\Delta p^*_{t+1}, \tag{2.3}$$

so these plus (2.1d) permit us to rewrite (2.1e) as

$$r_t = r^*_t + E_t q_{t+1} - q_t + \zeta_t \tag{2.4}$$

Then it can be seen that relations (2.1a), (2.1c), (2.1f), and (2.4) comprise a subsystem that determines the dynamic behavior of y_t, q_t, x_t, and r_t given exogenous processes for η_t, ξ_t, ζ_t, $\bar{y}_t$, and all foreign variables. Consequently, we can substitute (2.1d) and (2.1e) into (2.1b) to obtain

$$m_t - (s_t + p^*_t - q_t) = c_0 + c_1\bar{y}_t + c_2(R^*_t + E_t\Delta s_{t+1} + \zeta_t) + \varepsilon_t \tag{2.5}$$

and the latter can be expressed as

$$m_t - s_t = \gamma + \alpha(E_t s_{t+1} - s_t) + v_t \qquad \alpha < 0, \tag{2.6}$$

where v_t is a highly composite stochastic term, with $Ev_t = 0$, that reflects the behavior of numerous variables, all of which are exogenous to s_t and m_t.

Thus we end up with equation (2.6) to describe the behavior of the exchange rate in a flexible-price economy. Because it is of the same form as the Cagan (1956) formula for money demand, except with s_t appearing where p_t usually appears, the behavior of the exchange rate in this setting is quite familiar. In particular we know that, on average over an extended period of time, the exchange rate will depreciate at the rate of growth of the money stock: if the money stock grows at the rate μ, then the exchange rate will depreciate at the rate μ. Crucially, we also know that the desired level of $m_t - s_t$ at any time will be negatively related to μ, since smaller real money holdings are desired when their expected depreciation rate is high. This simple and familiar model provides a convenient vehicle for the analysis in the currency crisis literature. To keep matters as simple as possible, while still making the basic points, the stochastic disturbance term v_t is often neglected, i.e. the case of perfect foresight is utilized. In what follows, we shall follow that common practice. Then we find, via simple rational expectations (RE) analysis, that with $m_t = m_{t-1} + \mu$ the exchange rate behaves as

$$s_t = -\gamma - \alpha\mu + m_t \tag{2.7}$$

After these preliminaries, let us now consider an economy with a fixed exchange rate. We have specified that s_t is the log of the exchange rate and now we suppose that its value is fixed at the value $\bar{s}$; i.e. we have the fixed rate $s_t = \bar{s}$. To maintain this value, the log of M_t must be kept constant at (say) $\bar{m}$. But suppose that the government of the economy in question engages in another activity besides exchange-rate fixing that requires positive growth at the rate μ of the domestic credit portion of the monetary base. (Let $M = \mathrm{DC} + \mathrm{FR}$, where M is the base, FR is the stock of foreign exchange reserves, and DC is the domestic credit portion of M.) To keep M_t constant