The Evolution of the Theory of Monetary Integration

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Academic and political interest in monetary integration has existed ever since Mundell's (1961) famous study pointed to a serious omission in existing exchange rate theory that was the basis of Friedman's (1953) influential "Case for Flexible Exchange Rates". The omission involved the failure to develop criteria for the choice of geographically defined areas that benefit from the adoption of their own monetary regimes while they let their exchange rates float.

Mundell accompanied his critical analysis by the introduction of the idea that the proper size of any area operating its own monetary regime is one that meets what he called the criteria of an "optimum currency area". His specification of these criteria was sufficiently suggestive and at the same time ambiguous to stimulate much future research aimed at clarifying them. Later they were used in empirical tests for optimality.

This optimum currency area literature initially during the 1960s was mainly theoretical and often dealt with problems raised within the context of the then predominant Keynesian economic paradigm. Later studies became more numerous and empirical with the development of plans for the creation of a European Monetary Union. This trend received a new stimulus during the 1990s when the European Monetary Union slowly became operational and analysts proposed the creation of similar unions in areas like North America (Canada, the United States and Mexico), the Caribbean Islands, Central America, the Southern Cone of South America, Australia and New Zealand, French-Speaking countries of Africa, South African countries and East Asian countries.

The cumulative effect of this work and the independent demise of the Keynesian paradigm have resulted in a new level of understanding of the issues that surround the choice of areas, which increase the welfare of their component countries. One of the new insights is that countries can integrate their monetary systems through different methods: the surrender of their national monetary sovereignty to a collectively governed central bank (as in Europe); adopting a set of rules that determines the value of their currency (by operating a currency board); or by alternatively adopting a foreign currency to be the domestic legal tender (called dollarization). All three approaches have in common that central banks give up their right to set independent monetary policy for their countries.

Because of this broader approach to the surrender of national monetary sovereignty, I prefer to entitle my paper "The Theory of Monetary Integration" rather than the traditional "Theory of Optimum Currency Areas", which typically considers only the adoption of a common currency.

The next section briefly reviews the historic ups and downs in academic and political interest in fixed exchange rates and how monetary integration in effect

has increased the menu of policy options. The following section discusses the institutional arrangement available for monetary integration. This is followed by the presentation of the traditional criteria for optimum currency areas and some early extensions found in the literature. The next part analyzes two important theoretical and empirical modifications of the traditional theory that have arisen out of the demise of the Keynesian paradigm. The paper closes with a summary and conclusions for economic policy.

I. The Ups and Downs of the Fixed Exchange Rate System

Economists' views about the merit of fixed exchange rates since the middle of the 19th century to the present changed a number of times. The following traces this history from the belief in the merit of fixed exchange rates during the gold standard (operating from about the middle of the 19th century until 1914), to the beginning of the 21st century when flexible exchange rates were in vogue but countries also considered the opportunity of having fixed rates with neighbouring countries in a trading block.

Fixed Rates under the Gold Standard up to 1914

At the end of the 19th century almost all economists supported the gold standard as the optimal system for linking national currencies. The fixed exchange rates implicit in this system were considered to foster international trade and capital flows and to assure the absence of persistent inflation. The majority of the world's industrialized nations operated under the gold standard. By and large, it worked well and brought great prosperity to all countries that adhered to it. It ended with the beginning of the First World War in 1914.

1918-1945: Fixed rate commitments and the new Central Banks

While during the War and its aftermath the gold standard ceased to operate, the intellectual consensus on the merit of fixed exchange rates remained and led to attempts to restore it. However, the restoration of the gold standard ran into two serious problems. First, there were the economic dislocations and inflations that accompanied the War and its aftermath, which resulted in the need for reconstruction and led to the imposition of reparation payment obligations on Germany. Second, there were the ambitions and actions of national central banks, most of which had existed for only a short time and thus had little experience in managing their nations' monetary policy effectively.

The creation of these central banks had been advocated by a number of economists as a means for dealing with unemployment caused by business cycles and

exogenous shocks. These economic problems had occurred periodically under the gold standard and its foes argued that proper policies by central banks could avoid or at least smooth business cycles and minimized the effects of exogenous shocks.[1]

In the light of these expectations about the benefits central banks would bring, it is ironic that in the views many economists central banks generally added to the economic problems existing after the First World War by creating unnecessary recessions in some countries (as in England) and inflation in others (as in the United States and Germany).[2]

These developments resulted in the need to adjust exchange rates to maintain purchasing power parity. In addition, some exchange rate changes were used deliberately to create export surpluses and through them lower unemployment rates. Such exchange rate changes became known as "beggar-thy-neighbour policies". Practiced widely, these policies thus were not only self-defeating, they also damaged international trade and capital flows and thus reduced prosperity and welfare.

These experiences with exchange rate changes after the War and especially during the Great Depression contributed much to the evolution of the new consensus of the early 1940s: After the end of the Second World War the world needs to create a monetary system based on fixed exchange rates.

1945-1972: Fixed but adjustable rate and the IMF

This consensus could not be translated into the restoration of the gold standard because national central banks and their political masters were reluctant to give up their newly found national monetary sovereignty. The central banks expected to

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[1] The case for abandoning the gold standard was based on two additional important considerations. First, gold production was subject to random shocks and resulted in unnecessary cycles of inflation and deflation. Inflation was occurred during some periods when the discoveries of new gold deposits and extraction technologies resulted in unpredictable increases in the world supply of gold. At other times, the supply of gold was insufficient to meet demand and the world was subjected to deflationary pressures.

Second, the mining and refining of gold was considered to involve an expensive waste of resources that could be avoided through the use of paper money. This paper money was virtually costless to produce and could meet the economies' demand for transactions balances and the holding of wealth.

[2] Friedman and Schwarz (1963) blamed faulty monetary policy by the Federal Reserve Bank, the US central bank created in December 1913, for producing too much money and causing the inflationary boom of the 1920s. This boom was followed by the inevitable correction that culminated in the famous stock market crash of 1929 and the development of a recession. The Fed allowed this recession to develop into the Great Depression by its contraction of the money supply when an increase was needed.

use this sovereignty to deal with the economic dislocations caused by the Second World War. They also embraced the popular notion that the Great Depression was evidence of a fundamental flaw in free market economies, which they and economic planners could correct successfully.

In the end, the perceived benefit of fixed exchange rates and the desire of central banks to remain sovereign resulted in a compromise. The world community agreed on the creation of a new international monetary system which required countries to maintain fixed exchange rates but allowed revaluations if they experienced a fundamental disequilibrium in their payments balances. The existence of these conditions was to be adjudicated by a supervising and administrative agency.

Out of this consensus emerged the International Monetary Fund (IMF), which was created in 1945 at Bretton Woods, New Hampshire. To assist countries in balance of payments disequilibrium and running out of reserves in the defence of their fixed exchange rate, the IMF was endowed with financial resources that it could lend to such countries.

The IMF system worked well for a decade or so, but then came under attack from two separate sources. First, the fixed exchange rates were seen as an obstacle to countries' ability to gain lower unemployment rates by accepting higher rates of inflation. This concept is known as the Phillips-curve trade-off. Governments embraced it very readily since it allowed them to buy electoral favours through spending increases that did not need to be matched by tax increases while at the same time it reduced unemployment.

The trouble for the monetary system developed because countries that accepted higher rates of inflation suffered balance of payments deficits that could be corrected only through currency devaluations. Fixed exchange rates stood in the way of such devaluations and demands developed for allowing greater exchange rate flexibility.

The second challenge to the system stemmed from the view articulated most powerfully by Milton Friedman (1953) that the exchange rate was nothing but the price of the national currency and could not be fixed without creating in the longer run the same kinds of problems known to arise from the fixing of the price of a commodity like milk. Sooner or later, there would be unsustainable excess supplies or shortages.

As a result of these pressures[3], the IMF system of fixed but adjustable parity exchange rates was abandoned in the early 1970s. Exchange rate devaluations were allowed and often encouraged by the IMF to correct fundamental balance of payments problems.

For the present purposes of analysis the main effect of the end of the basic official commitment to fixed exchange rates was that many countries, free from the exchange rate constraint, engaged in expansionary monetary policies to lower unemployment and stimulate economic growth. The results of these policies were the Great Inflation of the 1970s, which was accompanied by great exchange rate volatility, commodity shortages and stagflation - the coexistence of inflation and high unemployment. These conditions were exactly the opposite of what the Phillips curve paradigm had predicted.

1980s – mid 1990s: Fixed rate benefits recognized

These problems of the 1970s coincided with the publication of economic theories challenging the validity of the Keynesian paradigm and the concept of the Phillips-curve trade-off. One of these challenges arose from the revival of the quantity theory of money (often derogatorily referred to as monetarism), others from rational expectations and real business cycle theories.[4] As a result of these developments, policy makers during the 1980s once again turned their attention to the goals of price stability and the maintenance of fixed exchange rates.

The consensus on the merit of these policies was also applied to developing countries. These nations were urged by the IMF to commit themselves to the maintenance of fixed exchange rates, partly in order encourage international trade and capital flows and partly to provide obstacles to the use of monetary policy by politicians in the pursuit of their own goals.

Mid 1990s – present: Flexible rates considered superior

However, in the middle of 1990s the outstanding economic performances of several major developing countries ended in the wake of severe balance of payments problems and domestic financial crises. These crises culminated with the devaluation of the currencies of the Asian Tiger countries (Thailand, Malaysia, Singapore, Indonesia and South Korea) and of the Mexico, which was caught in the "Tequila Crisis". In the aftermath of these turbulent events, the economies of these countries declined significantly and most went through a prolonged period of stagnation.

[3] The Bretton Woods system was also criticized for its central use of the US dollar, which provided the US government with benefits unavailable to other countries.
[4] For a more detailed discussion of these challenges to Keynesian models see Part IV below.

For the present purposes of analysis the proximate and ultimate causes of these financial crises are not important. It is sufficient to note that fixed exchange rate commitments were seen as the key problem in the development of these crises. As a result, the IMF officially changed its policy recommendations. It switched from encouraging fixed exchange rates to discouraging them.

Monetary Integration – Fixed and flexible rates combined

During all of these developments a separate strain of thinking about fixed versus flexible exchange rates continued to grow. It developed out of Robert Mundell's (1961) critical response to Friedman's (1953) argument noted in the introduction that flexible exchange rates are optimal. Mundell asked why, if flexible rates and a national currency are optimal, it would not be good for small states like West Virginia in the United States or regions in other countries to have their own flexible currency? This question about the appropriate domain for a currency was not mentioned in Friedman's original paper and he has since acknowledged its theoretical and empirical significance.[5]

Mundell's work and the research of many analysts resulted in the development of criteria for deciding when an association of countries benefits from having a fixed exchange rate for trade and capital flows among themselves, while they maintain a flexible rate of their common currency towards the rest of the world. This concept represents a very useful method for resolving the conflict between the contrasting and frequently changing consensus views over the benefits from fixed and flexible exchange rates.

As noted in the introduction, the countries that formed the European Monetary Union and created the Euro as its unified currency have embraced this concept. In a sense, the exchange rates between the member countries are now so fully fixed that they have disappeared.[6]
The initial success of the European Monetary Union has led to the development of proposals for groupings of countries to consider similar institutional arrangements. The remainder of this paper discusses the criteria that should underlie such

[5] I cannot find a citable reference for this proposition. However, he in a private conversation when I asked him what he thought about Panama's use of the US dollar in place of a national currency, he replied that "I never would advocate that Panama have its own currency. The country simply is too small."

[6] However, it should be noted that member countries have retained their sovereign right to reinstitute their central bank and allow it to pursue an independent monetary policy. Thus, if at any time, any member country considers the costs of monetary union to be greater than the benefits, it could restore its currency and float its exchange rate. However, withdrawal from the European Currency Union in practice involves the difficult and time-consuming process of meeting certain requirements that were designed to protect the system from the actions of governments that act in their short-run domestic political interest and could not be in the longer run interest of their country.

regional monetary integration plans. Several papers presented at this symposium discuss the analytical and empirical issues surrounding a number of such possible regional integration projects.

II. Alternative Methods for Fixing

Before I discuss the criteria for welfare maximizing monetary integration, it is important to analyze in more detail the different ways in which exchange rates can be fixed and the integration accomplished.

To start with, it is important to remember that the traditional method of fixing a country's exchange rate that was used throughout most of the 20th century involved the commitment of the central bank to intervene in the foreign exchange market to keep it at a specified level. For a long time, it was believed that under these conditions, the country could enjoy the full benefits of being able to set interest rates for the optimal stabilization of its economy. This belief was justified during the postwar years when most countries controlled their international capital flows. The closed economy Keynesian model reflected in the LM-IS curve analysis provided the theoretical background for such policies.

However, when capital controls were removed during the 1950s and 1960s it became increasingly clear that central banks could not freely set interest rates to stabilize their domestic economies. The balance of payments including capital flows introduced a severe constraint. Thus, if they opened up gaps between their national and international interest rates, massive capital flows required them to buy or sell foreign exchange in such large quantities that either they ran out of reserves or lost control of their domestic money supply. The Mundell-Fleming model introduced the foreign exchange market and capital flows into the LM-IS model and led to the general conclusion that if the elasticity of international capital flows was very high, fixed exchange rates and monetary sovereignty were incompatible.[7] Countries only could have national monetary sovereignty if they had flexible rates. If they insisted on having fixed rates, they could not have monetary sovereignty.

This analysis led to the search for methods on how and to whom monetary sovereignty could be surrendered if countries wanted to reap the benefits of a fixed

[7] See Fleming (1962) and Mundell (1962).

exchange rate in dealings with their most important trading partners. Fixing an exchange rate while simultaneously giving up national monetary sovereignty became known as the policy of hard currency fix, in contrast with the soft currency fix of earlier times.

This dichotomy between traditional and hard fixing of the exchange rate is fundamental to an understanding of the merit monetary integration policies. Under a hard fix, the periodic and seemingly unavoidable payments disequilibria and exchange rate adjustments characteristic of the soft fix cannot take place. There no longer are payments imbalances that require central bank intervention and therefore exchange rate crises are impossible.

Methods for Hard Fixing

Hard currency fixing can take place through any one of the following institutional arrangements:

1. The country's own currency is replaced by the US dollar, euro, yuan, yen or other major currency for use in domestic transactions and contracts.

2. The country joins other countries in a formal monetary union and gives up its right to make monetary policy to a common central bank. It adopts the same common currency used by all other countries in the union.

3. The country retains its own currency and commits itself to a currency board arrangement,[8] changing its domestic money supply in a fully specified and automatic response to payments imbalances.

4. It retains its own currency but gives up national monetary sovereignty explicitly by committing itself to the maintenance of convertibility of its currency against the target currency. It differs from a currency board arrangement by not binding itself to a fully specified and automatic rule guiding the transmission of payments imbalances to the domestic money supply.

Examples of countries that use these different types of hard currency fixes are as follows. The first arrangement is used in Panama and Ecuador, where US dollars circulate. The euro has seen use in some Balkan countries in place of domestic currencies. The second arrangement involving a common currency, the euro, is used by members of the European Economic Community. The third arrangement

[8] For an analysis of currency boards see Hanke (2002). Hanke (2003) provides an insider's analysis of what went wrong with the currency board in Argentina.

has been used in several countries and for different time periods, the most notable of which recently has been in Argentina. Hanke (2002) provides a list of all countries that presently have or at some time in the past have had currency boards.

Variant of the Currency Board

The fourth arrangement has been proposed by Courchene and Harris (1999) (2000) and Grubel (2005b) for a hard fix of the Canadian against the US dollar. Under this arrangement, Canada would revalue its currency and create the New Canadian dollar at an exchange rate of one to one to the US dollar. The rate of exchange would be chosen to maintain Canada's competitiveness.

The New Canadian dollar bills would have printed on them the federal government's commitment to exchange one Canadian against one US dollar on demand. Under these conditions and after some experience, the New Canadian dollar can be expected to be used in all transactions at par with the US dollar and circulate freely in both countries.[9]

This proposed system has the advantage over a formal monetary union that the Government of Canada can adopt it unilaterally.[10] It has the advantage over the use of the US dollar by allowing Canada to retain the seigniorage from the issuance of the currency, which is equal to the difference between the face value of bills and coins put into circulation and the cost of producing them.[11] It would also allow the retention of national symbols on the circulating notes, which is important to some nationalists in Canada.

Importantly, the proposed system has the advantage over the classical currency board arrangement in that it is based on rules that specify outcomes rather than rules. By so doing the system avoids problems stemming from changes in economic and financial conditions that were not foreseen in the development of the rules and which have been important in the demise of Argentina's currency board in the 1990s.

The fundamental issue facing all methods for hard currency fixes is the credibility of governments' commitment to their maintenance. This credibility is greater the more there are formal commitments to other nations. For this reason, the treaty

[9] Such a side-by-side circulation of moneys issued by different institutions can be observed in Great Britain, where bank notes issued by some banks in Scotland circulate in England and are readily accepted at par with the notes issued by the Bank of England.

[10] Such unilateral action is consistent with Canadian requests for a seat on the table of US monetary policy makers to provide information about conditions in Canada and possibly a vote in decision on policy in the longer run.

[11] In recent years the profits of the Bank of Canada have been about $3 billion, which is paid to the federal government to be spent like tax revenue on public goods and services.

establishing the euro is most likely to last. The other three arrangements are the product of unilateral decisions, which can be revoked without foreign diplomatic complications at the will of any government. The prospect that new, democratically elected governments will do so will always be there and considered by markets in their assessment of exchange rate risk.

However, this prospect will be influenced heavily by the size of the benefits net of the costs derived from the hard fixing. The remainder of this paper deals with these benefits and costs and thus is essential in the full assessment of the usefulness of the different kinds of hard currency fixes just discussed.

III. Traditional Benefits and Costs from Hard Currency Fixing

The traditional analysis of the merit of hard currency fixing found in the original optimum currency area literature finds benefits that take the form of lower transactions costs in foreign exchange markets and lower risk premiums on interest rates in capital markets. The costs consist of greater economic instability resulting from the inability to engage in monetary policies that stabilize aggregate demand and minimize unemployment.

Transactions Cost Savings

The main benefit from hard currency fixing arises from the savings in resources that are associated with the reduced need to operate spot, forward and futures currency markets, as well as the identification of and protection against exchange risk. It also eliminates the exchange rate risk remaining for some transactions for which markets offer no cover.

A special survey has been used in Europe to estimate the savings resulting from the shrinking of foreign exchange departments of banks, firms and governments and the number of currency dealers made possible by the introduction of the euro. The estimated savings were between .3 and .4 percent of national income of the average member country.[12]

It should be remembered that transactions costs for countries in the union remain for dealings in the currencies of countries outside the union. However, these costs are much reduced from their pre-union levels since for all member countries most of their trade and capital flows are with other members that use the same currency.

[12] The original estimate is reported in "Delors Commission Report" (1989).

Casual evidence suggests that the introduction of the euro has indeed reduced the size of foreign exchange transactions and the number of institutions and employees needed to execute them, though there have been no publications estimating the value of the actually realized savings. Many people who have traveled to and within Europe have happily enjoyed the very obvious benefits of not having to exchange and hold the many currencies that had needed in earlier times. They are likely to be certain that the monetary union provided many benefits.

While all of these savings in transactions costs may be small in relation to national income, they can easily involve substantial absolute sums. For example, estimates of savings made by the Bank of Canada equal to .4 percent of Canada's national income are equal to C$5 billion or a little less than half of the country's annual spending on defense in recent years.

The economic impact of these savings in the longer run goes beyond the immediate savings of real resources since these savings are equivalent to the reduction of tariffs on trade, capital flows and travel, which are known to lead to substantial increases in international exchange and welfare. Dynamic analysis involving computable general equilibrium models have documented such gains by incorporating into the process of adjustment to lower transactions costs the increased specialization of trade in different varieties of goods and services (intra-industry trade) that give rise to special kinds of scale economies,[13]

Interest rates

Before the creation of the euro, interest rates on bonds issued by central governments of European countries in their own currencies often were much higher than those issued by the government of Germany, which enjoyed the lowest rates of any government in Europe. The reason for this premium on some national interest rates was due to the financial markets' assessment of a country's risk relative to that of Germany in three dimensions: default, liquidity and exchange rate.

The importance of the exchange rate risk has become clear in the approximately five years leading up to the introduction of the euro in 1999. The gaps between the yields on the bonds issued by Germany and by the governments of Italy and Spain, for example, often were over 5 percentage points through the middle 1990s.

[13] For the concept of intra-industry trade see Grubel and Lloyd (1975). Harris and Cox (1983) apply the concept in a computable general equilibrium model to estimate the gains from a North American Free Trade Zone.

Thereafter these gaps narrowed rapidly and reached near zero by 1999, where they have been since.[14]

About six years later, there remain small yield differences on bonds issued by different countries in Europe. Since the exchange rate risk has been eliminated, these differences reflect the risk of default and the relative lack of liquidity. These same factors cause interest rates on bonds issued by US states to differ. In Europe, however, differences due to the default risk in particular are modified by the existence of some guarantees and the way in which the European Central Bank intervenes in money markets.[15]

Bris et al. (2002) found that the introduction of the euro also has lowered the cost of capital for firms inside the union relative to that of firms outside it. This benefit is attributed to the fact that under flexible exchange rates firms cannot eliminate all exchange risk in their markets for outputs, inputs and capital. Under the hard fix of the European Monetary Union, this risk has been eliminated and capital markets no longer discount future expected income streams of firms for this risk.

The lower interest rates and costs of capital experienced in countries that are members of the euro zone create favorable conditions for greater capital deepening and thus higher labor productivity.

Traditional Costs of Hard Currency Fixing

The main argument against hard currency fixes is that they completely deprive countries of their ability to use exchange rate adjustments and monetary policy to deal with economic shocks that destabilize the national economy.[16] Such shocks in the past were due to natural catastrophes like bad harvests or earthquakes; or due to political developments like terrorist attacks; or due to energy price increases, like those caused by the creation of OPEC in the 1970s.

The Bank of Canada, for example, insists that the country's heavy reliance on the export of natural resources makes its entire economy vulnerable to changes in their world prices and demand. During a world commodity boom the industries producing commodities raise their prices, offer higher wages and prices for capital

[14] These developments are shown in graphs found in Grubel (2005b).
[15] There is an expectation that the European Community would not allow the national government of any member country to default on its debt, which is in implicit guarantee. Buiter and Sibert (2005) attributed the small risk premiums on national bonds to the practice of the European Central Bank to buy them at par in the process of engaging in open market operations.
[16] This general argument is found in a large number of studies of the European Monetary Agreement. A good representation of the argument is in Eichengreen (1992) and Eichengreen and Bayoumi (1997).

to attract resources needed to increase output for sale abroad and thus impose inflationary pressures on the entire economy.[17]

During such inflationary commodity booms Canada's the external value of the flexible exchange rate increases, which has the effect of reducing the domestic currency revenues received by producers for a given quantity of exports, which in turn leads to cuts in output and demand for labor and capital and thus lowers inflationary pressures. At the same time, the higher exchange rate decreases the export and increases the import of goods and services other than commodities, which further reduces aggregate demand and thus domestic inflationary pressures.

The Bank of Canada uses interest rate increases to reinforce these exchange market developments. The higher interest rates attract foreign capital, which in turn raises the exchange rate even more. The higher interest rates also dampen domestic demand driven by higher incomes from the resource boom, which otherwise might cause inflation.

The analogous analysis applies when there is a slump in world commodity markets. Under these conditions a lower exchange rate, assisted by lower Bank of Canada interest rates maintains aggregate demand and full employment.

However, the need for exchange rate changes in the face of a given external shock depends greatly on the extent to which this shock also affects the country's main trading partner. For example, if the US and Canada relied to the same degree on natural resource revenues and they had otherwise closely integrated economies, the exchange rate between the two countries would not have to change or change only little in the face of changes in world prices for natural resources. Adopting a hard currency fix therefore would result in little cost in terms of greater macro-economic instability since both countries require the same interest rate for stabilization of aggregate demand.

This fact has given rise to the notion that the need for flexible exchange rates depends on the extent to which the industrial structures of two possible partners in a monetary union is the same. The dissimilar this structure is, the higher is the cost of common external shocks. The classical studies on optimum currency areas therefore focused on the similarity of industrial structures in countries contemplating monetary union.

However, the Keynesian paradigm also sees problems from the loss of national monetary sovereignty in the case where countries have the same basic industrial structure, but not the same types of industries. For example, consider that both

[17] See Thiessen (1999) and Murray (2000)

countries in a proposed union rely heavily on agriculture in their national output, but one grows oranges and the other grows wheat. Under these conditions, if the prices of oranges go up and those for wheat go down, one country needs a higher and the other lower interest rate to deal with the macro-economic disequilibria.

Since monetary union between these two countries allows the existence of only one interest rate, monetary policy cannot be used optimally in both countries to restore equilibrium and macro-economic costs of unemployment and lost output are the result. In the light of this reasoning, some empirical studies of the merit of monetary unions examined the extent to which external shocks are asymmetric, that is they affect industries differently in each country. The greater the asymmetry in external shocks, the greater is the cost of hard currency fixing. [18]

It is not surprising that the classical studies found that the industrial structures of all countries differ to some degree and that exogenous shocks are not symmetrical. These studies concluded that for all countries considered the cost of hard currency fixing was high and obviously larger than the estimated small micro-economic benefits.

On these grounds, many economists opposed the creation of the European Monetary Union and the creation of the euro. They predicted that the high costs of such a union would prevent it from ever coming into effect. When it became obvious that their predictions were wrong and the union was formed, they predicted its early demise. Indications are that the union has been successful and that it will last for some time to come.

At the same time, some analysts tend to blame persistent economic and political problems in countries of the union on the existence of a common currency and predict that they will eventually result in dissolution of the monetary union. Others argue that the recurrent problems of some countries are due to other factors like structural imbalances, excessive union power and political instabilities, which in fact have become less significant with the new monetary system.

Only time will tell which of these interpretations of recent and likely future events are correct, whether the problems will be considered soluble through the restoration of national monetary sovereignty and whether forces opposing the monetary union are strong enough politically to achieve their aim.

[18] See Eichengreen and Bayoumi (1997) for a fuller discussion of the concepts of symmetric and asymmetric and the role they play in the analysis of monetary unions.

IV. Simple Modifications of the Keynesian Model

While many studies in the Keynesian tradition focused on the similarity of industrial structures and the incidence of symmetric and asymmetric shocks, some theorizing discovered that even within that analytical framework, there were several characteristics of countries that reduced the macro-economic costs of currency fixing.

First, the most fundamental modification of the analysis involves the notion that the macro-economic costs of economic shocks are a decreasing function of the economy's wage and price flexibility.[19] One of the most fundamental theorems of economics is that if there were a daily auction for all prices and wages, there would be no shortages or surpluses of any commodities or labor.

Second, the cost of dealing with shocks is a decreasing function of the perfection of capital markets. For example, if cold weather damages the citrus crop in Florida, private capital flows allow the regional economy to sustain itself during such a period of distress.[20] In a sense, capital flows between regions with temporary booms and declines are part of an insurance scheme. Regions with booms pay premiums; those in difficulties receive payouts on their insurance contracts.

Third, the greater is the mobility of labor within the currency union, the lower are the costs of adjusting to external shock. Theoretically, the greater US labor mobility relative to that existing in Europe can explain the observed lower unemployment rate in the United States.

Fourth, the greater are fiscal transfers from central governments to regions in economic distress, the smaller is the cost of dealing with external shocks in each region. Europe has much fewer such transfers than does the United States and therefore countries in the union may be expected to suffer more from external shocks than do US states.[21]

Fifth, a random distribution of natural, technical or demand-driven shocks within a currency area will average out more; the greater is the domain of a common currency.[22] For example, in the United States a simultaneous bumper crop of apples in Washington State can offset a bad citrus harvest in Florida. As a result,

[19] Discussions of this issue are found in Johnson and Swoboda (1973).
[20] This argument has first been advanced by Ingram (1973)
[21] Much is made of the absence of such labor mobility and of a central government providing assistance to regions in distress in Europe by Eichengreen and Bayoumi (1997).
[22] See Kenen (1969).

macro-economic stability in the United States as a whole is greater than it would be in the two states separately if they had their own currencies. Measures of macro-economic stability in this context are unemployment rates and price indices.

Sixth, the greater average price stability in a currency union is especially important since it increases the usefulness of money and the efficiency of the financial sector in the union, which in turn raises average incomes.[23]

Seventh, almost all of the studies that estimate the macro-economic costs of economic shocks assume that they are generated exogenously. In fact, however, studies of past economic shocks indicate that most have been caused by the affected countries' own faulty monetary and fiscal policies.[24]

Faulty national monetary policy may be due to political pressures to make macro-economic conditions serve the interest of politicians, including the monetization of fiscal deficits. Such faulty policies can also be the result of honest errors in judgment due to the use of inappropriate theoretical models or misleading or incomplete statistical information.
In properly designed monetary unions, as the one in Europe, the central bank's monetary policy decisions are free from political influence. It also has larger resources available for the collection and analysis of economic data than did the central banks of member countries. As a result, the incidence of faulty monetary policies is reduced.

However, there is always the risk that such a central bank of a monetary union will also make errors in policy formulation or is influenced by political forces. If and when these errors occur, there is a good chance that they will have smaller effects on economic prosperity of the member countries because they trade mainly with each other and are much less open to the rest of the world than each member country was when it had its own currency and suffered the consequences of faulty policies by its national central bank.[25]

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[23] An elaboration of this argument and empirical evidence on its importance is found in Klein (1977). He found that during historically periods when the variance of prices changes was small experienced more rapid rates of economic growth than periods when price variance was high, ceteris paribus.

[24] See Belke and Gros (1999) and Pentecost and Sessions (2002). Moreover, many global shocks that are external to individual countries, like the energy price increases of the 1980s, are endogenous to the world in that the crisis was provoked by excess demand driven by faulty policies in the most important industrial countries simultaneously, which could have been avoided if the policies of these countries had originated with one central bank operating in a monetary union among these countries. See below for the argument that the union's central bank itself might have caused the same or even greater inflation.

[25] More detailed analysis and empirical evidence is found in Grubel (2005a) and (2005c).

Some of the modifications of the basic optimum currency area models just discussed were mentioned in some of the many studies of the costs and benefits of monetary unions. However, the conclusions reached in these studies almost always were dominated by the concern over the effects of exogenous shocks on unemployment and lost output that was conditioned by the dominance of the Keynesian paradigm. The idea that monetary union is likely to influence the level of wage and price flexibility, the perfection of financial markets, the quality of monetary policy and others never entered the analysis. Making these conditions endogenous to the formation of a monetary union in fact represents one of the two fundamental challenges to the traditional models of optimum currency areas to be discussed next.

V. Fundamental Challenges to Optimum Currency Area Models

Two fundamental challenges to the optimum currency area models and studies developed in recent years. The first arose naturally from the demise of most of Keynesian economics. The second is based on the fact that the traditional model is static, assuming implicitly that economic conditions and institutions are not affected by the creation of a monetary union. In fact, most of the modifications of the traditional model presented in the preceding section are to some degree endogenous to the existing exchange rate regime.

The Demise of Keynesian Economics

In its simplest, vulgar version Keynesian economics is concerned with the manipulation of aggregate demand to create full employment through the use of monetary and fiscal policies. An important extension of the basic model involved the idea that unemployment could be reduced by inflation – the famous Phillips-curve trade-off.

This simple Keynesian paradigm received mortal blows from three different theoretical developments and empirical findings. The first of these is associated with the writings of Milton Friedman (1953) on the quantity theory of money and related topics. Friedman's theories were tested successfully in his own publications with Anna Schwartz (1963) and by a number of his students who worked under his supervision at the University of Chicago. These studies verified a strong relationship between the quantity of money and inflation, the absence of a long-run relationship between inflation and unemployment and the crucial role played by faulty monetary policy in creating and extending the Great Depression. These studies also showed that there are unpredictable lags of unpredictable length that follow changes in interest rates set by central banks.

Second, Robert Lucas (1972) argued that the success of Keynesian policies is based on the unrealistic assumption that workers suffer from money illusion, which means that they can be induced to accept work in the expectation of higher nominal wages without them realizing that their real wages will be unchanged or lowered by inflation. Lucas argued that money illusion did not exist in a world of workers with rational expectations. His models explained the main empirical puzzle confronting Keynesian models in the 1970s, which was the co-existence of high unemployment and inflation, which was known as "stagflation".[26]

Third, Finn Kydland and Robert Prescott (1990) developed the theory that cycles in business activity and unemployment were caused by cycles in the development of new technologies that influenced the demand for labor and investment. The existence of and damage done by such cycles cannot be influenced by Keynesian monetary and fiscal policies designed to increase aggregate demand but always work themselves out as market incentives induce proper adjustments in the use and supply of labor.[27]

These challenges to the Keynesian paradigm are responsible for strong pessimism among many economists about the usefulness of monetary policy in dealing with endogenous and exogenous shocks. This pessimism implies that the costs from the loss of national monetary sovereignty either do not exist or they are much smaller than had been assumed in many studies of the benefits and costs of hard currency fixes.

In spite of the theoretical and empirical questions about the usefulness of monetary policy, central banks do exist and through time have improved their ability to maintain price and economic stability. However, this fact does not distract from the main conclusion for the analysis of the costs and benefits from monetary union: The less useful monetary policy is in dealing with economic shocks, the smaller are the losses arising from the surrender of monetary sovereignty through the adoption of hard currency fixes. The new, fundamental challenges to Keynesian orthodoxy certainly have challenged the conclusions about the great costs of monetary unions that have been reached by most past studies.

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[26] Lucas' argument was central in the context of optimum currency area theory in a paper by McKinnon (1963).

[27] Friedman's work became known as monetarism, Lucas' as rational expectations theory and Kydland-Prescott's as real business cycle theory. All three authors received Nobel prizes for their contributions.

The preceding analysis is highly simplified and fails to mention the contributions of other economists and many qualifications to the basic findings. The literature surrounding these contributions is very large and cannot be cited here. Readers can find the relevant references on the personal web sites of the three Nobel laureates.

The Endogeneity of Institutional Characteristics

The traditional modifications to the assessment of the costs of losing national monetary sovereignty discussed above in Part IV refer to existing conditions that are treated as unalterable givens in the literature that first developed them. In fact, however, the most important of these modifications are conditioned by the exchange rate regime itself and are likely to change when a hard currency fix changes the environment in which the institutions function.[28]

Thus, unemployment rises when workers led by their unions refuse to accept lower wages, to retrain or to seek employment in other industries in response to exogenous changes in technology or consumer preferences that reduce the demand for their services. Similarly, unemployment increases when workers insist on higher wages that are not matched by productivity gains. Increases in unemployment due to such causes were frequent in many countries of Western Europe for several decades after the Second World War.

During this period governments responded to the higher unemployment that developed in response to exogenous changes or excessive union demands by the creation of inflationary monetary and fiscal policies, which were considered to be appropriate according to the Keynesian economic models in vogue at the time. While the inflation reduced unemployment, it also caused balance of payments deficits and the subsequent devaluation of the national currency. The inflation also resulted in lower real wages, which typically was considered to be an exogenous shock and led to a repetition of labor's demands for higher wages.

The cycles of unemployment, inflation, currency depreciation and renewed unemployment were repeated many times and led to cumulatively large effects. Between 1950 and 1990 the Italian lira lost 95 percent of its value, while that of the US dollar and German mark fell 82 and 71 percent, respectively.[29]

It is important to note that during this period workers acted rationally. They enjoyed higher real wages, at least temporarily, than they would have otherwise

[28] The best literature reference to this view is Frankel and Rose (1997).

[29] For a complete list of countries and the rates at which their currencies have depreciated see Park (no date). The idea that inflation is caused ultimately by the excessive wage demands of unionized labor is at the core of Post-Keynesian economics, which concludes that governments should control these wage demands and stop accommodating them through inflationary monetary policies. Governments resist the imposition of such controls because the controls are difficult and costly to operate and tend to become instruments of rent-seeking and political favoritism. Most governments instead in recent years have embraced price stability and deal with the high unemployment rates due to the labor market imperfections by the use of generous unemployment compensation systems. They also count on market forces to limit the power of unions, forces which are enhanced by taking their countries into large currency unions.

and they knew that if unemployment developed, government would inflate the economy and depreciate the currency. Employers' willingness to give into workers' demands was based on the same expectations. Politicians in a democratic system could not afford to break the cycle, as other parties would promise to carry on with the cycle and win the next election.

However, the loss of national monetary sovereignty broke one of the key chains in the cycle. Politicians no longer could promise to use the traditional inflationary monetary policy to relieve unemployment in their countries. As a result, the vicious cycle of unemployment, inflation and currency depreciation has ended. Workers and their unions have become less militant and they are more willing to retrain and move from declining to rising industries.

In other words, labor market flexibility has increased as a result of the adoption of the hard currency fix. In this sense, the degree of labor market flexibility is endogenous to the exchange rate regime and the introduction of a hard currency fix reduces the cost that otherwise was argued to be associated with the loss of national monetary sovereignty.

The analysis just applied to labor market flexibility is also relevant to the efficiency of capital markets and the level of interest rates, for reasons discussed in Part I. The greater capital market efficiency and lower interest rates result in more private capital flows between regions suffering from an economic shock and regions experiencing economic booms. Such flows compensate to a considerable degree for the lack of financial transfers through a strong federal government.

The adoption of a common currency also has some, if relatively minor effect on labor mobility across borders. Such labor flows are encouraged because consumer prices, wages, taxes and other factors determining real living standards in different countries can be compared more readily since they are expressed in the same currency.

The strength with which the forces coming from hard currency fixing influence institutions depends on many factors. Advocates of the currency board in Argentina had hoped that it would lead to greater labor market flexibility and reforms of the country's arcane system of provincial financing. While the hard currency fix brought outstanding prosperity to the country for a number of years, reforms of the institutions needing them did not take place and they continued to cause economic dislocations and imposed great costs on the public and politicians. The hard fix was abandoned as public discontent over these adverse consequences

exceeded the poorly understood and underestimated benefits created by the currency board.[30]

Ecuador is involved in another experiment worth watching.[31] The country's labor market rigidities, political system biased towards deficit spending, the excessive regulation of the private sector and other problems have caused the economy to remain stagnant for a long time. In an effort to deal with these problems, a courageous government introduced one of the politically most confrontational forms of hard currency fixing: It replaced the domestic currency with US dollars.

It remains to be seen whether interest groups in Ecuador will be forced by the dollarization to surrender their privileges and make the economy more flexible. For some time, progress has been reasonable, but the discovery of petroleum resources and the aspirations of the native population in 2005 have led to political turmoil, which may well bring about an end to dollarization.

V. Summary and Conclusions

This paper presented the arguments for and against the hard fixing of currencies, starting with an account of the history and current conventional wisdom on the merit of fixed and flexible exchange rates. It pointed to an important dichotomy in the nature of fixed exchange rates: soft fixing accompanied by the retention of national monetary sovereignty and hard fixing that requires countries to give up the practice of making monetary policy.

At present, many economists and the International Monetary Fund favor flexible exchange rates. However, at the same time a relatively small group of economists favors hard currency fixes for small countries.

The case for such hard fixes rests on the view that they bring substantial reductions in transactions costs and exchange risk premiums on interest rates. Other benefits consist of better monetary policy that is free from political influences and that can draw on larger resources to determine appropriate actions.

The case for hard fixes is strengthened by the critical evaluation of past studies of their costs. These studies were based on Keynesian models of the causes of unemployment and the ability of monetary policy to reduce it successfully. They are flawed because they do not account for the limited usefulness of monetary policy in dealing with unemployment as was demonstrated by new economic

[30] For an account of Argentina's experience with currency boards see Hanke (2003), who was intimately involved in the creation of the board as an adviser.
[31] For an early account of the Ecuador experiment see Emanuel (2002).

theories developed during and after the 1970s. These studies of the costs and benefits of hard currency fixes are also flawed because they fail to understand the endogeneity of many of the institutional characteristics lowering the costs of losing national monetary sovereignty.

The analysis presented shows that the issues surrounding the merit of hard currency fixes are numerous and complex. Economists have neither the theoretical tools nor empirical data to produce numbers that are needed in a traditional, rigorous analysis of the costs and benefits discussed above. However, Frankel and Rose (2002) have succeeded in approaching the issue through an ingenious and novel method.

These authors used a gravity model to measure the influence that distance, common borders of countries, past colonial relationships and other variables have on the level of trade between pairs of countries. They added to this widely used list of variables one for the existence of a hard currency. They found that this new variable is statistically significant. Countries with hard currency fixes have much higher levels of trade, given all of the country's other characteristics.

The authors also found that the higher is a country's level of foreign trade relative to national income, the higher is its per capita income. Combining the finding that currency fixing results in more trade and more trade results in higher income, they were able to estimate the impact of a hard currency fix on national income.

To illustrate the quantitative importance of this effect they considered conditions for Canada and found that the adoption of a hard currency fix by that country would increase its trade by 184 percent and its GDP per capita by 37 percent over 20 years.

The authors were surprised by the size of this effect and attempted to manipulate assumptions that are always necessary in such studies so as to bias downward the results as much as possible. Their efforts resulted in only a small change in their best estimate. They also admitted that their results might be biased upward because the basic data in the gravity model involved many small countries while Canada in comparison is large.

However, until economists can produce better empirical studies of the effects of hard currency fixes on income and welfare, the Frankel-Rose study must be taken as strong evidence that the micro-economic benefits by a large margin are greater than the macro-economic costs.

There remains one other issue not considered here. It involves the importance of political opposition to hard currency fixes, which is often based on nationalism

and the coincidence with domestic policy objectives of politicians. Whether or not the expected income and welfare gains from hard currency fixing are large enough to overcome these forces requires another paper written by a political scientist rather than an economist.[32]

[32] For an analysis of the forces involved in the political debate see Hefeker (1997) and Cohen (1998) and (2002).

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