THE THEORY OF OPTIMUM CURRENCY AREAS

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In Paul's view, theories are made to be broken, or at least called into question. Based on the evidence, he presents a logical case against the continued relevance of Mundell's theory of optimum currency areas, and in particular challenges its use as means of assessment of European Monetary Union.

Introduction

The theory of Optimum Currency Areas was pioneered by Robert Mundell in 1961. Conceived during the Breton Woods system of fixed international exchange rates, it was Mundell's proposition that balance-of-payments disequilibria would remain "an integral feature of the international economic system as long as fixed exchange rates and rigid wage and price levels prevent the terms of trade from fulfilling a natural role in the adjustment process". Broadly speaking, Mundell's theory advocated a system of many freely floating currencies organised around so-called optimal currency areas – an area which he defined as "the region". Due to the impracticability of organising currencies around any basis other than the nation state, the theory of Optimum Currencies has only a limited practical application, in particular to nations intending to form a currency union or to other economies in a state of transition. Mundell's thesis thus often forms the basis of analyses of the costs and benefits of the clearest example of the creation of a currency union in practice, European Monetary Union (EMU).
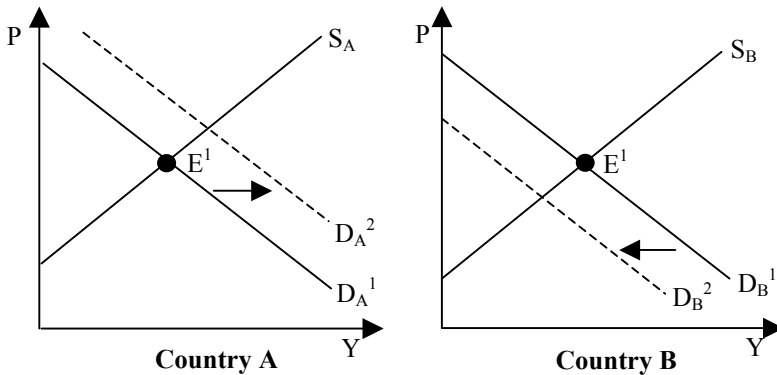
It should be first of all made clear that in this paper I do *not* aim to present an analysis of the costs and benefits of currency unions based on OCA; nor do I intend to address the question of whether the European Union constitutes an Optimum Currency Area, rather, I question the validity of the Theory of Optimum Currency Areas (OCA) itself. Having first outlined Mundell's (1961) model, I am to show that OCA is fundamentally deficient because of its roots in a static environment. I question the central assumption stemming from Mundell's early theory that exchange rate flexibility is the most effective way of adjusting for asymmetric shocks, and go on to challenge the relevance of such shocks in any case. I conclude that new measures of analysis should be sought that evaluate the greater

economic implications of currency unions rather than the narrow cost benefit analyses that form the bases of current studies.

The Theory of Optimum Currency Areas (Mundell 1961)

Mundell's theory (1961) was formulated on the prevailing Keynesian belief in the ability of national monetary and fiscal policy to manage aggregate demand and offset supply-side shocks (McKinnon 2000). The goal of Mundell's original paper (1961) was to elucidate a theory on whether it is preferable for countries to adopt a system of flexible exchange rates or to operate under a system of fully fixed exchange rates. Arising from this discussion, he asks whether there is an ideal or optimal domain within which exchange rates should be fixed. He calls this an Optimum Currency Area. Mundell's ultimate conclusion, caveats aside, seemed to come down against the idea of fixed exchange rate regimes, advocating freely floating exchange rates based around the "region".

Mundell demonstrates his theory with the use of a simple model of two entities (regions or countries) in which there is a shift in aggregate demand for goods from one country to the other. This is illustrated in fig.1 (see De Grauwe 2000). Here there is an unspecified shift in demand, say due to a change in preferences, from country B to country A. The demand curve shifts outwards for A from D_A^1 to D_A^2, and inwards for B from D_B^1 to D_B^2, moving both countries from the initial full-employment equilibrium point, E^1. At full-employment, the increase in demand in A creates upward pressure on prices and wages. If A were to fully absorb the inflationary pressures of the increase in demand, B would quickly become more competitive causing an increase in aggregate demand and restoring equilibrium. However, the tendency is for A to resist a rise in the price level, resulting in a recessive tendency on B, (as prices are generally inflexible downwards). The result of this will be a current account surplus in A coupled with moderate inflation; while B on the other hand will likely experience a current account deficit and unemployment.

Fig.1 Aggregate Supply and Demand Curves for country A & country B

Country A · Country B

What mechanisms exist to restore equilibrium?

As implied above, if wages and prices in B were sufficiently flexible as to adjust to a lower level, then it could compete more effectively with A, restoring demand to its original level. Equilibrium would also be restored if labour were adequately mobile, such that those made unemployed in B could supply their labour in A. In this way wage pressure in A would be relieved, as would the excess labour situation in B. (Mundell makes no reference to the social desirability of the implicit shift in population from B to A.) A third means of restoring equilibrium would be if a system of fiscal transfers from the surplus country to the deficit country existed. Under a federal system, tax receipts in the surplus country would rise due to the increase in demand, financing such transfers, and ultimately facilitating B in restoring "domestic" demand.

Mundell argues that if one or more of these corrective conditions is not met, then a disequilibrium will persist in the absence of a change in exchange rate between country A and country B. "If demand shifts from the products of country B to the products of country A, a depreciation by country B or an appreciation by country A would correct the external imbalance and also relieve unemployment in country B and restrain inflation in country A. This is the most favourable case for flexible exchange rates based on national currencies" (Mundell 1961). If A were to revalue its currency, its exports would become relatively more expensive and imports relatively less expensive. This would have a downward effect on output and inflation. Concurrently, B's exports would become more competitive, and imports from A relatively more expensive thus increasing demand in B. This result would be a restoration of equilibrium.

Mundell (1961) concludes therefore that the optimal currency area is one in which there exists sufficient wage and price flexibility or labour mobility (or to a lesser extent a system of budgetary transfers), so as to negate the need for the exchange rate as an adjustment mechanism. Using Ricardo's definition of the region in terms of internal factor mobility and external factor immobility, he concludes that the optimal currency area is the region.

A critique of the Theory

In his 1961 paper, Mundell outlines the contrasting viewpoints of Meade[1] and Scitovsky[2] on a single currency for Europe. While the former believed that there was not sufficient factor mobility to consider Western Europe a region, the latter held that with monetary unification would come greater integration, provided measures were taken to facilitate labour mobility. Mundell concludes that whether or not Europe constitutes an optimum currency area is an empirical question. I do not believe that this is the case. Because of the inadequacy of OCA in a dynamic environment, most empirical studies of the EU as an optimal currency area have returned rather unconvincing results based on arbitrary measures. Here I do not intend to illustrate the various costs and benefits of currency union but to develop a criticism of the way in which these costs and benefits are formulated.

There are a number of areas of criticism of OCA theory, some of which Mundell includes as caveats to his seminal work. However, as these stipulations make OCA somewhat impractical as a means of evaluation, they do not sit well with proponents of the theory and are thus often simplified out of subsequent analyses. These criticisms can be analysed under two broad headings:

Static Analysis
- Mundell's (1961) analysis is carried out in a static environment, in which it is held that changes in the exchange rate can smooth economic shocks. This rests on the assumption that economic agents suffer from money illusion.
- I question the efficacy of the exchange rate as an adjustment mechanism.

Asymmetric Shocks
- Factor mobility is a relative rather than absolute concept. Mundell (1961) himself does not contend that "every minor pocket of unemployment arising

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[1] J. E. Meade, (Sep 1957), 'The Balance of Payments Problems of a Free Trade Area', *Economic Journal*, pp. 385-86
[2] Tibor Scitovsky, (1958) *Economic Theory and Western European Integration*, Stanford.

from labour immobility [should be counted] as a separate region". Therefore, without an absolute definition of the region, analyses that seek to answer the question of whether the EU constitutes an OCA are arbitrary, and I believe insufficient.

- I challenge both the significance and likelihood of asymmetric shocks based on regional diversity

OCA as a Static Analysis

Mundell's (1961) theory is based on "a post-war Keynesian mindset in believing that national monetary and fiscal policies could successfully fine-tune aggregate demand to offset private sector shocks on the supply or demand sides." (McKinnon 2000). The theory of OCA therefore rests on the assumption of "stationary expectations", or in other words it presumes that agents do not try to anticipate future changes in the price level, exchange rates, interest rates or government policy. The essence of the theory is that the flexible exchange rate system can act a "device whereby depreciation can take the place of unemployment where the external balance is in deficit, and appreciation can replace inflation when it is in surplus." (Mundell 1961;657). Stemming from this, it is often considered that one of the costs of a monetary union is that countries have different preferences towards inflation on the one hand and unemployment on the other (De Grauwe 2000). This implies that there exists a trade off between the two. However, it is now widely accepted that in the long run the Phillips curve is vertical; or simply put, we now believe that in the long run such a trade off does not exist.

In any case one may question the validity of the use of exchange rate policy as an adjustment mechanism in the real world, and thus we are forced to question the basic tenet on which the argument for flexible exchange rates rests. Monetary policy can only be used to stabilise output and unemployment about their trend paths, but the paths themselves are determined by supply side factors; rate of capital formation, investment in human capital through training and education, technological progress and the size of the labour force. Monetary policy cannot in the long run alter real economic variables. Or in other words, in the long run, money is neutral (McDonald & Deardon 1999). If we held a monetarist viewpoint such as this, then the exchange rate would cease to have any role in stabilising the economy. Even if we accept the role of monetary policy in the short-term, one is forced to weigh the substantial longer-term costs verses the short-term benefits. As Mundell himself recognises,

> "The argument is based on money illusion: The community is unwilling to accept variations in real income through changes in money prices, but it

will accept the same changes in real income through adjustments in the rate of exchange. A flexible exchange system may then be interpreted as a device for providing a more acceptable means (than employment changes) of altering the real income of the community. But what if money illusion is absent? Then, it is argued, there is no reason for changing to a system of flexible exchange rates: If internal prices were as flexible as exchange rates, it would make little economic difference whether adjustments were brought about by changes in exchange rates or by equivalent changes in internal prices."

(Mundell 1968; 153)

Furthermore, historically there exists no evidence to support any relationship between observed exchange rate changes and external shocks that would have required such an adjustment. The result obtained by Canzoneri *et al*[3] that exchange rates rarely move in the direction that economic theory suggests, simply confirms the often observed phenomenon of volatile and irrational movements in bilateral exchange rates. This implies that flexible rates may exacerbate rather than smooth the consequences of economic shocks, entirely contradicting the key assumptions of OCA.

As Mundell stipulates in his original theory, there is an upper limit to the optimal number of currencies. As the currency area grows smaller, trade increases as a proportion of GDP, and "flexible exchange rates become both less effective as a control device for external balance and more damaging to internal price stability" (McKinnon 1963 pp.719). In other words, any degree of money illusion that existed in the short term would be quickly eroded. In the terminology of the model outlined above, it is assumed that the community in country B is unaware of the real effect on income of the devaluation. That is, while it would not accept a drop in nominal wages per se, it will tolerate a fall in the value of the currency, which translates into reduced purchasing power of imports. This effect is magnified when the proportion of imports is relatively larger in B, thus necessitating a limit to the optimum number of currency areas. As we will later see, the problem with OCA stems from the fact that there is no way of evaluating what this optimum number is.

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[3] Canzoneri M., Valles J., & Vinals J., (1996) *Do exchange rates move to address international macroeconomic imbalances?*, CEPR Discussion Paper no. 1498.

The Existence of Asymmetric Shocks

Mundell (1961) states, "The argument for flexible exchange rates based on national currencies is only as valid as the Ricardian assumption about factor mobility". Ricardo's definition of the region is as an area where the factors of production are internally mobile and externally immobile. The rationale for seeking a definition of the "region" or more particularly the "optimum currency area" is found in the belief that different regions will experience asymmetric economic shocks requiring independent exchange rate policy to deal with them. The question economists have since asked is whether the EU can be considered a region in this sense, and thus, an "optimum currency area".

Firstly, one should recognise that the region is a relative rather than absolute concept. There is no precise elucidation on what degree of factor mobility there should be to adequately constitute a "region". Therefore any attempts to empirically evaluate Mundell's theory return arbitrary results (notable examples are Bayoumi & Eichengreen (1994)[4] in Eichengreen [1997] & Von Hagen (1994)). Because it is not at all clear how much regional diversity should be tolerated before one considers there to exist multiple distinct economic entities, Eichengreen (1997) writes, "some standard of comparison is required" (pp.51). The most often used unit of comparison is the United States, where studies generally find there to be a marginally greater correlation of economic shocks than in the EU. This is generally the basis for concluding that the EU does not constitute an OCA, even though as McDonald & Deardon (1999) point out, the principal difference between the US and EU regarding unemployment is not in terms of divergence but rather flexibility of wages and labour markets. Either way, comparison of itself should not concern us as its results are subjective.

Once again, there is no prescription of how close the correlation of shocks should be. If one adopts a stringent interpretation, then many existing single currency areas are made up of multiple regions in themselves. (Examples include the UK, Canada or Italy prior to EMU.) Developments in Europe therefore pose greater problems. Undoubtedly, European integration, especially since the single market programme (1986-1992), has blurred the distinction between economic regions. De Grauwe (2000) acknowledges that economic and monetary integration (aside from the political connotations) are mutually reinforcing processes. Even though the impact of EMU on the integration of the labour market may prove to be negligible,

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[4] Bayoumi, T & Eichengreen B., *Shocking aspects of European Monetary integration*, in Giavazzi F., & Torres F., (eds.) (1994), A*djustment and Growth in the European Monetary Union*, Centre for Economic Policy Research, Cambridge University Press:Cambridge.

given social and historical differences[5], monetary union does facilitate the full integration of capital markets and financial services with the subsequent benefits accruing from scale economies and the reduction in risk premium. Even though the greater integration of the European Union since the single market programme has led to limited convergence of key economic fundamentals such as unemployment and GDP growth, business cycles have become more correlated across the member states (McDonald & Deardon 1999). This process tends in turn to make a monetary union more attractive.

It is ironic that the one of the most convincing arguments against the validity of OCA comes from Mundell himself. In his Madrid papers of 1970[6], he adapts his analysis of exchange rate theory to factor-in uncertainty, and places the focus on the forward-looking nature of the foreign exchange market. He focused on how "future exchange rate uncertainty could disrupt the capital market by inhibiting international portfolio diversification and risk sharing." (McKinnon 2000). Most models based on OCA fail to adequately recognise such network effects. Dowd and Greenaway (1993) state, "The value of a particular currency to a user depends on how many others use it as well". In other words, currencies benefit from economies of scale. In this respect, we may in future see the Euro benefit in terms of the transition to an international currency, increasing liquidity and potentially lowering interest rates across the Eurozone.

Mundell argued in "Uncommon Arguments for Common Currencies" (1973 b) that, "Rather than moving toward more flexibility in exchange rates within Europe the economic arguments suggest less flexibility and a closer integration of capital markets."[7] Economic theory backs up the observation that that since EMU, governments are able to borrow on a unified EU capital market. This means if countries were to experience an asymmetric shock, the deficit financing associated with attempts to stabilise demand in one country will only have negligible impact on the interest rate and thus other countries (McDonald & Deardon 1999). Thus, it counters the idea that asymmetric shocks undermine a currency union by showing that a common currency can in fact mitigate against asymmetric shocks by portfolio diversification. Evidence of this can be found in that Eurozone interest rates are now lower than the prevailing average interest rate that persisted prior to unification

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[5] Clearly only time will tell, as there is little worthwhile empirical evidence available as yet.

[6] Mundell R. A., (1973) (a), *Uncommon Arguments for Common Currencies*, in H.G. Johnson & A. K. Swoboda, *The Economics of Common Currencies*, Allen and Unwin, pp. 114-132
Mundell R. A., (1973) (b), *A Plan for a European Currency*, in H.G. Johnson & A. K. Swoboda, *The Economics of Common Currencies*, Allen and Unwin, pp. 143-172

[7] Mundell R. A., (1973) (a), *Uncommon Arguments for Common Currencies*, in H.G. Johnson & A. K. Swoboda, *The Economics of Common Currencies*, Allen and Unwin, p.150

(McKinnon 2000)[8]. Furthermore, the term structure of financing in Europe has been lengthened with lower portfolio risk. "Eliminating currency risk within the greater European Economy is a remarkable benefit – as Mundell correctly foresaw in his second incarnation" (McKinnon 2000).

"Only if one concludes that external shocks and the exchange rate are important for unemployment should one conclude that the costs of EMU could be high" (Gros & Thygesen 1998, p.271). We must therefore attempt to establish the likelihood and importance of asymmetric demand shocks. Gros & Thygesen (1998) go on to state that it is not at all clear "how such a shock could materialise in a modern environment, where all member countries export and import predominantly a large number of industrial products, only slightly differentiated from those of their trading partners." Because the nature of trade in Europe is predominantly intra-industry, and most economies are based on a similar (although not identical) industrial structure, and because it is difficult to imagine economy wide changes that are caused by sudden changes in technology or tastes, it is more difficult to envisage a specific country shock in demand versus an industry shock that would affect a number of economies in the same way. If shocks are sector specific, then we are more likely to see shocks concentrated at regional rather than national level[9]. De Grauwe & Vanhaverbeke[10] show that there is greater diversity between the regions of countries than between the countries of the EU, indicating that the experience of shocks is likely to average out across the Union as a whole, neutralising their effect.

There is another important element to add to this discussion of asymmetric shocks. It is sometimes argued that the most significant domestic shocks we could envisage may in fact be caused by independent monetary and fiscal policies (McDonald & Deardon 1999). In this way, by sacrificing monetary policy and restraining fiscal policy as Euro members have, the possibility of self-induced asymmetric shocks may be reduced. This issue was brought to the fore by a recommendation from the ECOFIN Council to the ECB that, in January 2001, Ireland's fiscal position was inappropriate and in need of retrenchment. This stemmed from its belief that excessive public sector spending was overheating the Irish economy and amplifying Ireland's above-average inflation rate[11]. It seems however, that this prognosis was incorrect. The difference in inflation rates between

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[8] It should be stated however, that this is not conclusive evidence considering the slowdown of economic growth, which has prevailed across Europe from around the time the euro was introduced.

[9] This idea is often associated with Paul Krugman

[10] De Grauwe P., & Vanhaverbeke W., (1993) *Is Europe an Optimum currency area?: Evidence from regional data*, in Paul R. Mason and Mark P Taylor (eds) *Policy issues in the operation of currency unions*, Cambridge University Press:Cambridge, pp.111-129

[11] Euro area inflation averaged 2.5-3% while Irish inflation averaged 4.5-5% at this time.

Ireland and the EU is often explained via the operation of the Balassa-Samuelson hypothesis (see for example McCoille & McCoy 2002). It proposes that the inflation differential is due to higher productivity in the traded goods sector putting upward pressure on wages and prices across the economy. One may however doubt the significance of the Balassa-Samuelson effect in Ireland for a number of reasons[12].

It is my view that the situation arose neither from domestic fiscal policy, nor from differentials in productivity between the traded and non-traded sectors of the Irish economy, but from the country's disproportionate exposure to foreign currencies, in particular the US dollar and UK pound sterling. While there has been a moderate increase in the level of trade with fellow member states, Ireland's predominant trading partners remain the UK (c. 15% of Irish GDP) and the US (c. 8% of GDP). This contrasts with EU trade with the US of less than 1% (Gros 2001). Until recently, the Euro had persisted at an undervalued level against sterling and the dollar, which impacted greatly on Ireland's current account balance and placed upward pressure on prices and wages. The result has been a consistently higher rate of inflation prevailing in Ireland than in the EU.

At first glance, the inflation differential may seem attributable to an asymmetric demand shock, requiring independent exchange rate policy to deal with it; however, this need not be the case. If we agree with the supposition that the above average inflation rate is not a long-run state of equilibrium, then in the absence of labour mobility across the Union, flexible wages and prices are a necessary mechanism for Ireland to achieve an appreciation of its real exchange rate. As Irish competitiveness is eroded by inflation, the economy would be restored to a slower and more sustainable growth rate, with the inflation differential disappearing over time. The concern may be that while inflation is pushing Ireland towards that state of equilibrium, a rise in the value of the euro[13] could lead to a greatly overvalued

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[12] The reason for this is three-fold (Gros 2001)

    i.   Throughout the period 1991-2000, Ireland's exchange rate with the synthetic euro remained stable, and average inflation was the same for Ireland as in the Euro area.

    ii.   The Irish price level has always remained close to the Euro area, even when its income was much lower. The Balassa-Samuelson hypothesis would have anticipated Irish prices rising in relation to EU prices with the growth in Irish productivity since 1990, but this did not occur until more recently.

    iii.   Furthermore, the Balassa-Samuelson effect emphasises the role of labour immobility between states in maintaining wage and price differentials. However, this is not the case for Ireland because of the high degree of labour mobility between the UK and Ireland. Rising Irish wages thus reflect the higher productivity of the UK economy.

[13] It reached parity with the dollar in Q4 2002, and has remained above 1:1 in the early months of 2003. ECB Monthly Bulletin, December 2002, & February 2003.

Irish real exchange rate. Although economic theory suggests that this could bring about a quicker return to equilibrium at a lower rate of inflation, such a process would not be without its costs. Further unknowns are imposed by the threat of deflation in key euro member states,[14] as well as the uncertain outcome of War in the Middle East. Ultimately the point remains that inflation as a result of asymmetric trade profiles, or as implied by differential growth rates (the Balassa-Samuelson Hypothesis) need not be long-term in nature, and may be seen as part of an internal adjustment mechanism. Therefore, we may still view with some doubt the existence and importance of asymmetric shocks. Although the full implications of this are yet to play out, it does not appear to contradict the fundamentals of the critique as presented so far.

Conclusion

As Eichengreen describes, OCA is often used as the basis upon which a cost-benefit analysis of EMU is carried out. "In Mundell's paradigm, policymakers balance the saving in transactions costs from the creation of a single money against the consequences of diminished policy autonomy. The diminution of autonomy follows from the loss of the exchange rate and of an independent monetary policy as instruments of adjustment." (Eichengreen 1997 pp 1-2). I would rather analyse the implications of EMU within a much broader framework. Despite the desire to empirically quantify the costs and benefits of a currency union based on the original OCA, or even a modified OCA incorporating some of the dynamic factors outlined above, such analyses are still fundamentally flawed in the assumption that one can exclude the greater economic effects that evidently do exist. If this were not the case, countries would simply not consider the formation of a currency union or the adoption of an anchor currency. It is my conclusion that the costs and benefits presented by OCA analysis return only marginal results, which are in any case predicated upon arbitrary standards.

As yet, there does not appear to be a comprehensive alternative to OCA. However, if future attempts were to address the deficiencies in the theory outlined above, this would go some way to presenting a more complete case for or against EMU. Again, despite the multitude of empirical studies that have been carried out, most discussions of EMU are unfortunately driven towards the same vital, yet uninstructive conclusion,

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[14] The stance of the ECB has begun to move in response to this. ECB interest rates were cut to their current all time low of 2.5% on 6th Mar 2003 (Irish Times Business Supplement 7th Mar 2003, p.3).

"…EMU is about much more than a simple calculation of economic costs and benefits. For the EU, economic integration has always been a means to political unification, rather than an end in itself. The commitment of the key member states to the ideal of political union means that EMU must be seen as part of a wider commitment to a unified, peaceful Europe rather than a limited exercise in trading off economic costs for economic benefits."

(McDonald & Deardon, 1997;114)

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