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REFLECTIONS ON THE OPTIMAL CURRENCY AREA (OCA) CRITERIA IN THE LIGHT OF EMU

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Abstract
The objective of this paper is first to review the use that has been made of Optimal Currency Area (OCA) theory in the European Monetary Union (EMU) context. Second, to look at some of its predictions in that respect. And third, to appraise some of the new theories - or speculations - that have arisen, partly as a result of the confrontation of the theory with the data. This is an area in which politics are very important; they play an important role in the reception and interpretation of positive work. Tentative ideas and speculative hypotheses acquire the aura of accomplished fact, whilst a single empirical illustration can be given the status of a many-times confirmed demonstration. This paper tries to be more careful in these remarks. Whilst history offers some instructive lessons, as illustrated for example in the work of Bordo and Jonung (1999), the fact is that in most relevant respects EMU represents an unparalleled experiment, with corresponding difficulties for empirical work.

This paper was presented at the conference on "Monetary Union: Theory, EMU Experience, and Prospects for Latin America" held at the University of Vienna and jointly organized by the Central Bank of Chile and the Oesterreichische Nationalbank on April 14-16, 2002. Hard copies of this paper must be ordered by e-mail from Oesterreichische Nationalbank (as working paper 69). Further information, see www.oenb.co.at/ workpaper/pubwork.htm.

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Introduction

It is quite fashionable at the moment to present papers with titles approximating this one. A recent example is Mongelli (2002). This reflects the sussessful construction of a "large" EMU, comprising all but three of the current membership of the European Union and the – so far – seemingly uncomplicated performance of Euro Area monetary policy. This backdrop provides a welcome pause in which reflection on the prior use of economic theory – specifically optimal currency (OCA) theory – to appraise the EMU prospect comes as a natural activity.

My intention is to review the use that has been made of OCA theory in the EMU context, to look at some of its predictions in that respect and to appraise some of the new theories - or speculations - that have arisen, partly as a result of the confrontation of the theory with the data. This is an area in which politics are very important; they play an important role in the reception and interpretation of positive work. Tentative ideas and speculative hypotheses acquire the aura of accomplished fact, whilst a single empirical illustration can be given the status of a many-times-confirmed demonstration. I shall try to be more careful in these remarks. Whilst history offers some instructive lessons, as illustrated for example in the work of Bordo and Jonung (1999), the fact is that in most relevant respects European Monetary Union represents an unparalleled experiment, with corresponding difficulties for empirical work.

* An earlier version of fhis paper was given as an invited lecture at the 5th International Conference on Macroeconomic Analysis and International Finance held in Crete in May 2001. I am grateful to conference participants for helpful remarks and comments.

The invitation to give this lecture is a welcome opportunity for me to marshal my thoughts on a topic on which I have written a number of papers over a period of years. One result, unfortunately, is a high rate of self-citation, a luxury I would normally hope not to indulge, but which seemed natural in this context. I hope to be forgiven.

What the OCA criteria are all about

As good a place as any to start with is an adaptation of Paul Krugman's (Krugman 1990) cost-benefit representation of the OCA criteria (Figure 1). The Figure depicts the position of a country facing the option of joining with a partner country or group of countries in a currency union. The vertical measures benefits or costs, perhaps in ratio to GDP, the horizontal the degree of openness of the country with respect to its potential partner(s). The benefits schedule (BB) slopes upward from left to right indicating simply that the transactions costs saving from a common currency increases in the amount of trade. We can add to this the benefits that arise, in terms of increased competition, from the added transparency that follows the introduction of a common currency. The cost schedule (CC) represents the costs of forgoing the use of independent monetary policy and the shock-absorbing potential of the exchange rate. The downwards slope was suggested by McKinnon (1963), reflecting the idea that the greater the degree of openness to the partner countries, the higher the proportion of the consumption basket imported from them (or potentially exportable to them) and the less the likelihood that a given change in the nominal exchange rate can result in a corresponding change in the real rate: in other words, the value of an independent monetary policy and, hence, an exchange rate declines with the openness of the economy. When benefits exceed costs, the Figure says that the country should join the currency union. On the Figure I've also shown CC curves displaced above and below CC, as to C'C' and C''C''. These displacements are drawn to emphasise the point stressed by the father of OCA theory (albeit the father now disowns the child!) - Bob Mundell (Mundell, 1961) - that where the shocks impacting the economy are asymmetric to those impacting the partner economies, then the Union's single monetary policy would be less appropriate - as shown by the corresponding C'C' curve. Where the shocks are predominantly symmetric on the other hand, a curve like C''C'' would apply, making monetary union *ceteris paribus*

more desirable. Traditional OCA theory also indicates that in the presence of international labour mobility, the costs of asymmetry will be reduced: in modern parlance, this condition may be replaced by the assertion that flexible labour markets offer a better means of absorbing shocks than inflexible ones. In the same vein, the costs of asymmetric shocks, in the absence of monetary policy, may be mitigated by insurance arrangements (whether through the capital markets or via a budgetary mechanism) or by second-best idiosyncratic policies (fiscal and wage policies).

[Figure 1 hereabouts]

Krugman's way of putting the OCA argument has many strengths. One of them is that the cost-benefit framework allows one to sweep into the schedules any additional non-economic "political" benefits that might seem relevant. This shows the irrelevance of the argument sometimes mounted against OCA theory that it is a poor predictor of the actual number of currency areas, which are in general more numerous than an empirical implementation of OCA theory suggests (see e.g., Artis, Kohler and Melitz, 1998). No one thinks that the study of optimal airline size is invalidated by the observation that many countries treat airlines like flags.

The Figure suggests that very open countries (typically, small ones) are more likely to find currency union (or a fixed exchange rate) beneficial than larger ones, which is something we observe. On the other hand, the Figure is misleading in at least two respects. First of all it suggests that it might be possible to compute the net benefit in exact quantitative terms whereas what we find in the literature are "softer" calculations. We can find ranking or clustering being used to suggest that participation in a monetary union might be easier to recommend for some countries than for others. And we can find qualification lists, where countries are indicated to be eligible in certain ways for a monetary union if not in some others. Second, the figure hides away - as, so to speak its null hypothesis - a key assumption, namely that an independent monetary policy and exchange rate provide an efficient and first-best shock-stabilising resource. This is something we'll come back to.

The Maastricht Criteria

Now we come for a moment to the Maastricht criteria, those set by the Treaty on Economic Union, which have formed the basis for the creation in fact of the European Monetary Union. The Treaty does not mention anything redolent of the OCA criteria; and among the countries for which EMU is an option only the UK, Sweden and Finland have made much use of them on an official level.

The Maastricht Treaty criteria can be seen, in a sense, as responding to a different project appraisal from those to which the OCA criteria apply. A desire to participate in monetary union is in general taken for granted in the Treaty: the aim of the criteria is to make sure that the applicant is ready to participate in a monetary policy framework that emphasises a stability culture. This starting assumption can be thought of as "political", yet it also has a substantial economic rationale. It is arguable that no customs union, let alone a single market, can survive without some guarantee against abrupt and/or politically-motivated changes in competitiveness such as stem from nominal exchange rate changes. And, the only sure way to guarantee nominal exchange rate fixity is to go to monetary union or something similar.

In this setting 'making the criteria' is a serious incentive for reform, especially in the fiscal sphere. Despite the arbitrariness of the 3% and 60% as reference values for the deficit and debt ratios (an arbitrariness amply demonstrated by e.g., Buiter et al. (1992)), the fact is that in this context, they provided reasonable targets. The Maastricht fiscal criteria - and, afterwards - the Stability Pact (which carries forward the 3% with a medium term target of approximate budget balance) can be perceived as "good things", hastening a fiscal consolidation that was needed anyway and more certainly would be required in a monetary union where, as McKinnon (1994) has argued, the act of union amounts to a regime shift from the point of view of sustainable debt ratios.

The application of the Maastricht criteria, albeit with intensive use of the escape clause permitting a deviation in respect of the fiscal criteria, led to the formation of the European Monetary Union as we now know it, initially with 11

members and now, since the start of 2001, with the admission of Greece, 12 members. Sweden, Denmark and the UK remain outside.

What do the OCA criteria have to say about this? This takes us to the issue of the empirical implementation of the OCA criteria. An important characteristic of the implementation has been the finding that a distinction can be made - originating with Bayoumi and Eichengreen (1993) but exemplified in numerous other studies - among the potential EMU members, between a "core" and one or more "peripheral" groups. Hence we can look at the predictive value of the OCA criteria in two ways: first, we can ask whether the actual constitution of the EMU looks promising in the sense of being homogenous with respect to this grouping and whether the position of the "Outs" could be rationalized with respect to the criteria; then we can look to see whether in the two-and-a-bit years of operation of the EMU, there is any confirmation of the core-periphery distinction to be found in the differential experience of the "In" countries.

The empirical implementation of the OCA idea in the EMU context has turned largely on the question of symmetry or otherwise in the stochastic experience of member countries. One approach to this has implemented SVARs, with identification following Blanchard and Quah (1989); notably, this is the core of Bayoumi and Eichengreen's work (1993, 1996 and 1997). Another has looked at measures of business cycle synchronicity, and at tests for the presence of common features or common cycles. In the first of these lines, cycles have been measured using the H-P filter and synchronicity by reference to cross correlations of the cyclical components (e.g. Artis and Zhang 1997); nowadays it is more fashionable to identify the cycle by using the approximate ideal band-pass filter as advocated by Baxter and King (1995). Markov-switching ARs and VARs have also proved useful tools, following the example of Hamilton and then Krolzig; this procedure can also be used to identify a common cycle (see Artis et al. 1999). Estimation of the so-called classical cycle, as distinct from the growth cycle, has also been carried out and is now making a come-back (as in my paper with Juan Toro, 2000) partly as a result of Adrian Pagan's propaganda campaign in favour of it (e.g. Pagan 1997).

In this case the measure of synchronicity has to take account of the 0,1 nature of the identification of the cycle and takes the form of a non-parametric test for independence or "concordance". Nearly all these approaches agree on a pattern in which a core and a periphery of countries can be identified; a partial exception is to be found in the relatively small literature on common features. The literature based on Engle and Kozicki (1993) has sought in vain a common feature in serial correlation. The test seems to be too restrictive: Breitung and Candelon (2000) provide some reasons. On the other hand, Rubin and Thygesen's (1996) search for codependence leads them to suggest that there is little difference to be found between a core and periphery. In particular, the UK has been clearly identified as failing to share in the same cycle as the major continental countries, along with Ireland, whilst Sweden and Finland also tend to stand out in these studies as idiosyncratic. This said, it should also be added that no clear idea has been established in the literature as to what degree of idiosyncrasy is tolerable: among other things this will depend on the potential for using alternative non-monetary adjustment instruments and risk-sharing arrangements - of which more below.[1]

An application

An OCA-based analysis that I like and would venture to typify as "canonical" is a "fuzzy clustering" analysis set out by Wenda Zhang and myself (Artis and Zhang 2002). In this analysis we set out six criteria. The variables are measured relative to Germany. They are: relative inflation; business cycle cross-correlation; labour market performance; real bilateral DM exchange rate volatility; trade intensity; and monetary policy correlation. The analysis identifies three clusters and "membership coefficients" for each country, as shown in the table (Table 1). The clusters may be called "the core" and the "Northern" and the "Southern" peripheries. In so far as the core forms a coherent group for which monetary union makes sense, countries in the peripheral groups are less strongly advised to participate. From this point of view, whilst the position of the "Out" countries - Sweden and the UK - can be rationalized

[1] It has been suggested – or implied by example – that the US provides a suitable model. Cross-correlations of shocks or business cycle deviations among States, Federal Reserve Districts or regions of the US are typically much higher that the values of correponding calculations across the EU. But

in OCA terms, and that of Denmark is nicely ambiguous, there are two members of the Northern periphery - Ireland and Finland - in the EMU, together with all of the Southern periphery: Italy, Spain, Portugal and now Greece. As the Krugman diagram makes clear this does not necessarily mean that the theory is weak, only that there are net benefits to participation in EMU not comprehended by the theory.

[Table 1 hereabouts]

The criteria might, however, be regarded as predicting inhomogeneities in the Euro-Area which will show up as problems in the working of the single monetary policy. To look at this issue further I take up a suggestion made by two Bank of Finland economists - Bjorksten and Syrjanen (1999). They calculate the interest rate given by a Taylor Rule for each constituent economy, which can then be compared with the interest rate given by the same Rule for the Euro-Area and the one actually prevailing. This calculation - which they carried out on provisional data for 1999 - is performed for revised 1999 data, for 2000, and using (OECD) forecast data for 2001 with the results shown in the accompanying graphs (Figures 2a-c) . Data on the output gap are taken from the OECD and the inflation target is taken to be 1%, as the mid-way mark in the 0-2% range set by the ECB as its translation of the Treaty's "price stability" mandate. This is a "quick" (and dirty) means of checking the suitability of the "one size fits all" monetary policy of the ECB. The overall variance of the Taylor-Rule-indicated interest rate grew sharply in 2001.

[Figure 2a-c hereabouts]

Looking at the charts in more detail, we can see that in 1999 the Southern Periphery countries were all in positive deviation – together with Ireland and the Netherlands. In 2000, this remained the case, although Finland also displayed a positive deviation. With the exception of the Netherlands (and Belgium in 2000) the core countries cluster below the line and generally close together. This is consistent with the inhomogeneity forecast from the OCA though it does not yet strongly

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this result can as well be regarded as a *result* of monetary union as it can be treated as a *precondition* for it..

confirm it. An important reason for caution in the evaluation is the difficulty of allowing for the effect of initial conditions. For some countries, joining the EMU implied a substantial policy shock as the equalization of interest rates from January 1, 1999 involved a much larger-than-average reduction from May 1998, when the decision on the membership of EMU was made.

The Adjustment Process

We know little about the adjustment process for member countries of the Euro Area for whom the single monetary policy is inappropriate. Most countries are sufficiently far from collision with the constraints of the SGP that discretionary fiscal adjustment is a possibility whilst, at least for small countries, an additional degree of freedom in stabilization policy is represented by the possibility of tri-partite decision-making. In general, however, differential inflation will result in changes in competitiveness and in real interest rates. These two effects are antithetical, in the sense that whilst excess inflation leads to a reduction in excess demand via diminishing competitiveness, it leads to an increase in excess demand through the reduction in the real interest rate (the "Walters effect"). The resultant adjustment process does not appear to be stable, and seems likely to promise an oscillatory behaviour in the absence of some policy intervention. Figure 3 illustrates the point.

[Figuire 3 hereabouts]

Is there a Lucas critique?

The usefulness of the OCA criteria in the EMU context - like other exercises in policy evaluation - depends greatly on whether the empirical implementation on past data can be relied upon to speak to the future. Thus, it is clear that what is relevant to a decision to join a currency union is not the past stochastic experience but the future, and the past is relevant to the extent that it rests on persistent fundamental features of the economy. A Lucas Critique, in a loose sense, is applicable. Thus the OCA criteria might be "endogenous" - perhaps in the special sense that they might be *easier* to

satisfy after monetary union than before (the "Pangloss-Lucas" critique?). Two rationales for this have been on offer for an endogeneity effect.

One is the *policy rationale*. The argument here is that a prime source of idiosyncratic shocks is idiosyncratic policy. Thus, for example, the reason for the UK "exceptionality" in its business cycle behaviour - and the same presumably goes for Sweden - is that monetary independence has itself bred a set of shocks. With a common monetary policy this source of idiosyncrasy would disappear. This view should appear *a priori* quite unreasonable: the rationale of policy is the stabilization of shocks. If idiosyncratic policy is abandoned, then the underlying shocks will be more fully realized. However the argument gains strength from two observations; first, there seemed to be some evidence - at least this is one reading of Artis and Zhang (1997)- that the disciplines of the ERM (which might be thought of as an 'EMU nursery') had led to a stronger synchronization of cycles among the member countries; second, there is a strong suggestion (Kontolemis and Samiei, 2001) that UK policies in the two decades before the adoption of full-blown inflation targeting had been unusually unstable. It must be said that neither argument is really conclusive. When the ERM period examined by Artis and Zhang (1997) is extended to include the period after German reunification, the appearance of strengthened business cycle affiliation with Germany disappears; in any case, as Artis and Zhang were careful to point out, the direction of causality is unclear. Did successful ERM survivors make it because their business cycles were becoming more similar anyway or did their ERM membership make their business cycles more synchronous? Unfortunately we lack the evidence of a convincing episode to show whether the common policy approach to the endogeneity of the OCA criteria is viable.

The same caution, ultimately, applies to the alternative endogeneity channel – the trade channel. Monetary union should cause more trade: after all, transactions costs are reduced and exchange rate volatility disappears – and, the trade that it causes may be of a type that creates a greater or a lesser degree of business cycle synchronization. In terms of Krugman's cost-benefit figure, an increase in trade in itself increases the net benefit. The endogeneity claim goes further than this, though, arguing that the increase in trade causes the CC curve to shift inwards. Intra-trade, or

more specifically intra-trade of the "components" type as opposed to that of varieties, seems likely to make shocks more common – e.g., if intra trade in cars takes the form of the movement around Europe of different bits of cars, winding up in assembly in different places, then shocks against cars will have largely symmetric effects on the countries. On the other hand, monetary union seems quite likely to promote specialization and intra-trade in varieties since the fixity of the intra-regional exchange rates removes an incentive to "scatter" production facilities across Europe. The evidence we have on this is largely limited to a single (if large) panel data exercise by Frankel and Rose (e.g., 1997) which finds positive relationships between bilateral trade intensity and business cycle synchronization. Meanwhile, the initial evidence adduced by Krugman (1993) in favour of the specialization hypothesis – that US industry is more regionally concentrated than European industry – has come into dispute from two directions. First, alternative forms of measurement and sample data throw up different results; second, it may be argued that the Krugman effect is an effect of capital market integration, which is not strictly the same thing as monetary union. Whilst suggestive, the Frankel-Rose exercise lacks a strong time dimension and the monetary union dummy in it is insignificant. In two other studies Rose has attempted to gauge the effect of monetary union on trade – the first leg of the endogeneity via trade argument – with remarkable results. In Rose (2000) a large panel data exercise produced the remarkable result that monetary unions produce 3 to 4 times the increase in trade that might be expected simply as a result of reducing exchange rate volatility to zero. This finding has been criticised as based on a small sample which, moreover is unrepresentative of the EMU project; the monetary unions in the study turn out to be, more frequently not, unions between postage stamp countries and larger neighbours. Some of the same criticism could apply to a later study (Rose and Wincoop 2001) where the monetary union effect is found to be still very large, if not so enormous. And, again the time dimension of the panel is not strong. Underneath these studies and the relevance of examples drawn from the US is the question of what we mean by "monetary union"; if we mean simply that the countries share the same currency then it is hard to see why there should be any dramatic additional effects on trade over and above those that could be inferred from a reduction in exchange rate volatility. But monetary unions are often coterminous with countries and we have ample evidence from studies like Engel and Roger's

(1996) "How wide is the border?" that crossing the border means more than changing a currency: there is also a difference in corporate law, in stock exchange and commercial regulation and a myriad other features, many of them individually "small", which conspire together to produce a large diversion of trade.[2]

In respect of the EMU we are gathering evidence that not even capital market integration is a guaranteed product simply of a single currency. The curiosity here is that the first years of EMU have been disappointing relative to expectations in their lack of impact on capital markets; this led directly to the setting-up of the Lamfalussy Committee.[3] That Committee was charged with identifying ways in which European capital market integration is being held up by the persistence of differences in law, custom and practice. Its recommendations for removing these obstacles are expected to be carried out rapidly. All of them could have been recommended without the presence of a single currency; yet it has taken the creation of the latter to produce the effort. Is this an effect, then, of monetary union? Choosing to consider that it is *not* allows me to avoid discussing here the interesting ideas about risk-spreading and diversification that have stemmed recently from the work of Oved Yosha and his colleagues (see for example Asdrubali et al. 1996).

I should like now to return to what I earlier referred to as "the OCA null", the assumption of the theory that an independent monetary policy and exchange rate represent an effective and indeed first-best stabilization resource. Since the original formulation of the approach was undertaken in the period of "fix-price" economics it was natural to assume that nominal and real exchange rates were the same thing (though the downward slope of the CC curve concedes that the assumption might not be so sound when the worker's consumption basket is full of imported goods). Widespread abandonment of this assumption during the inflationary 70s and 80s

[2] Rogoff's "nail soup" story (Rogoff, 2001), illustrates the point. Rogoff writes (ibid. p6): "There is a good analogy in the old fable of nail soup. A beggar, trying to talk his way out of the cold, claims that he can make a most delicious soup with only a nail. The farmer lets him in , and the beggar stirs the soup, saying how good it will taste, but how it could be even better if he could add a leek. After similarly convincing his host to contribute a chicken and all sorts of other good things, the beggar pulls out the magic nail and, indeed, the soup is delicious. The euro is the nail."

[3] To be a little more precise, there has been a strong integrative impact on the bond markets and the money markets, an arguably *negative* effect on banking markets and rather little effect in the equity markets.

seems to have been premature, to judge by the non-inflationary devaluations of the Lira and Pound Sterling in the 1992 crisis, and is in any case inappropriate in circumstances where there is a real shock. Yet there seems on the other hand to be disturbing evidence of the capacity of foreign exchange markets to host exhibitions of the herd instinct and economists have largely abandoned the pre-floating faith in the equilibrating properties of the foreign exchange market. It is an empirical question whether or not the exchange rate acts like a shock-absorber, or to the contrary (as Buiter (1999) emphasizes) is a source of shocks. Michael Ehrmann and I attempted recently to answer this question in the context of an SVAR model (Artis and Ehrmann, 2000). The model, and its restrictions, derive from the standard SVAR monetary policy model, and is applied to data for four open economies facing a monetary union or similar option with a bigger neighbour, viz the UK, Sweden, Canada and Denmark. The aim of the analysis is to see whether monetary policy is effective for output and inflation, whether the foreign exchange rate absorbs demand and supply shocks or on the contrary reacts mainly to shocks arising in the foreign exchange market itself; more tentatively, the analysis also aims to identify whether shocks are predominantly symmetric or asymmetric. This gives rise to a "qualification list" in which one can score the features that constitute evidence favourable to the view that an independent monetary policy and exchange rate act as a stabilization resource (see Table 2). The analysis gives nil marks to monetary policy and the exchange rate in the case of Denmark and Sweden, a middling mark in the case of Canada and a higher mark – but one well short of 100% – in the case of the United Kingdom.

[Table 2 hereabouts]

Where does all this leave the OCA criteria? Still, I suggest, as the first useful framework to consult, and one that can be quantified to a useful, though not conclusive extent, but with an accretion of qualifications and doubts. There is still plenty of work for researchers to do to clarify how these doubts and qualifications run!

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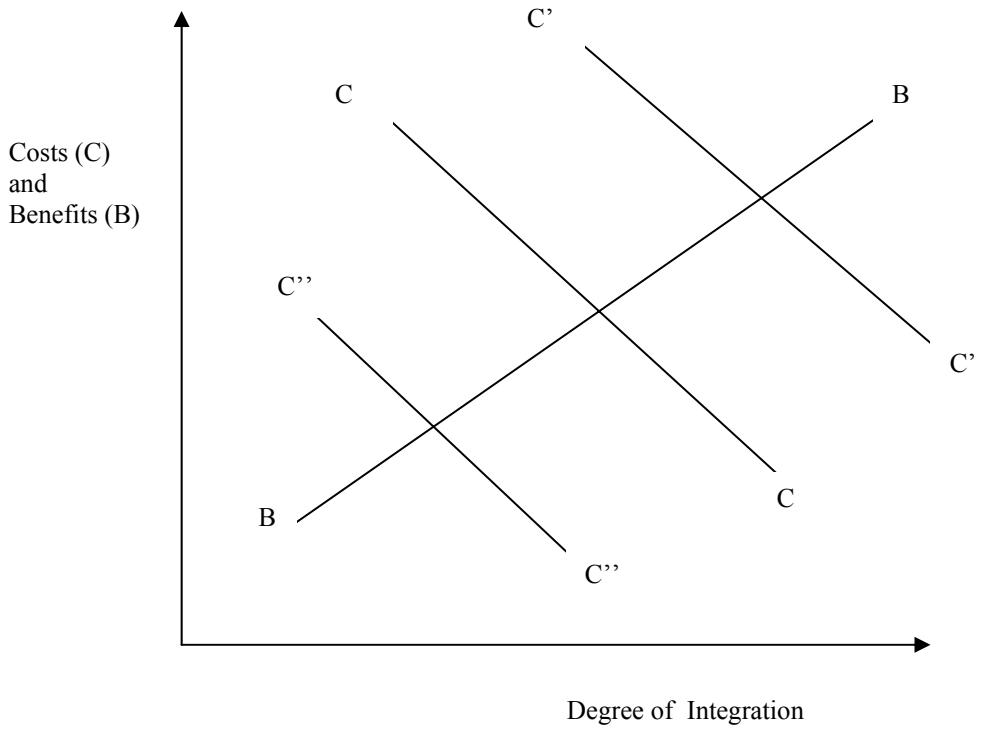
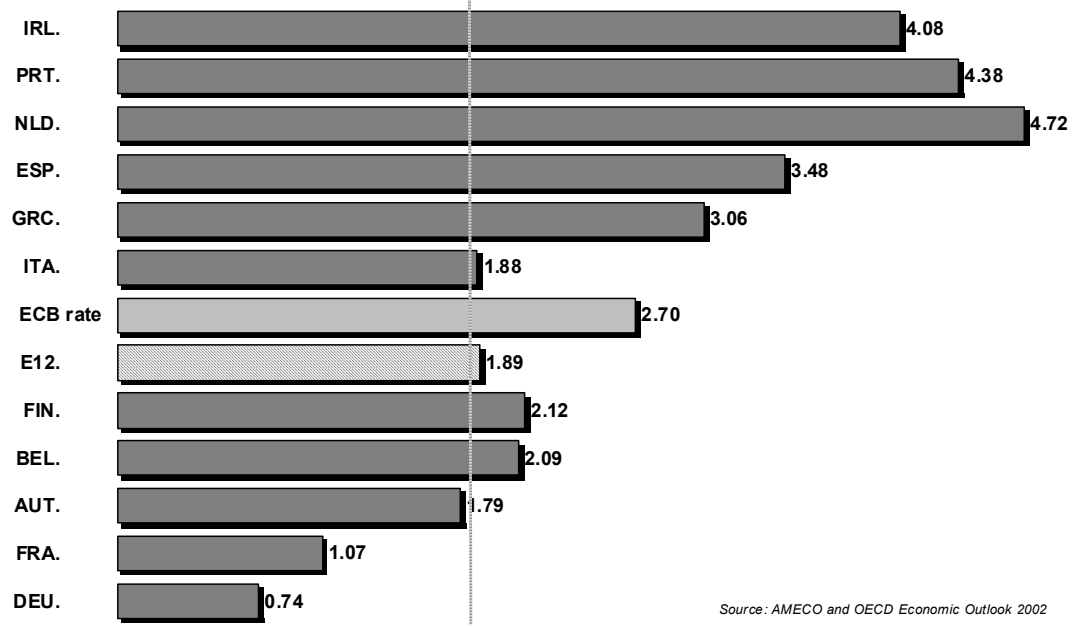
Figure 1. Costs and benefits of participating in a Monetary Union



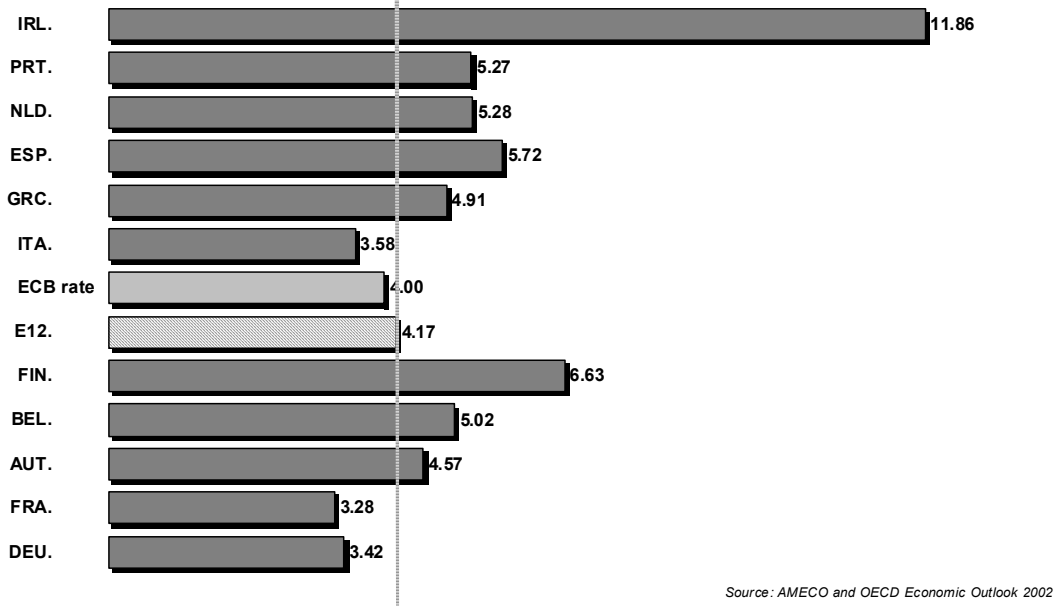
Source: adapted from Krugman (1990)

Figure 2a Taylor-Rule- indicated interest rates, 1999



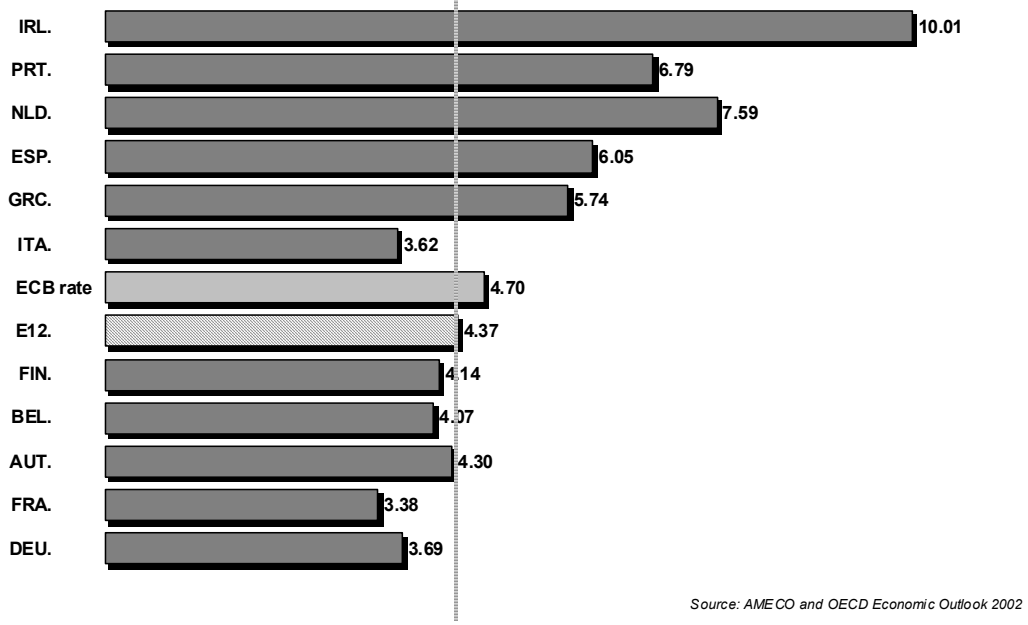
Source: AMECO and OECD Economic Outlook 2002

Figure 2b Taylor-Rule-indicated interest rates, 2000



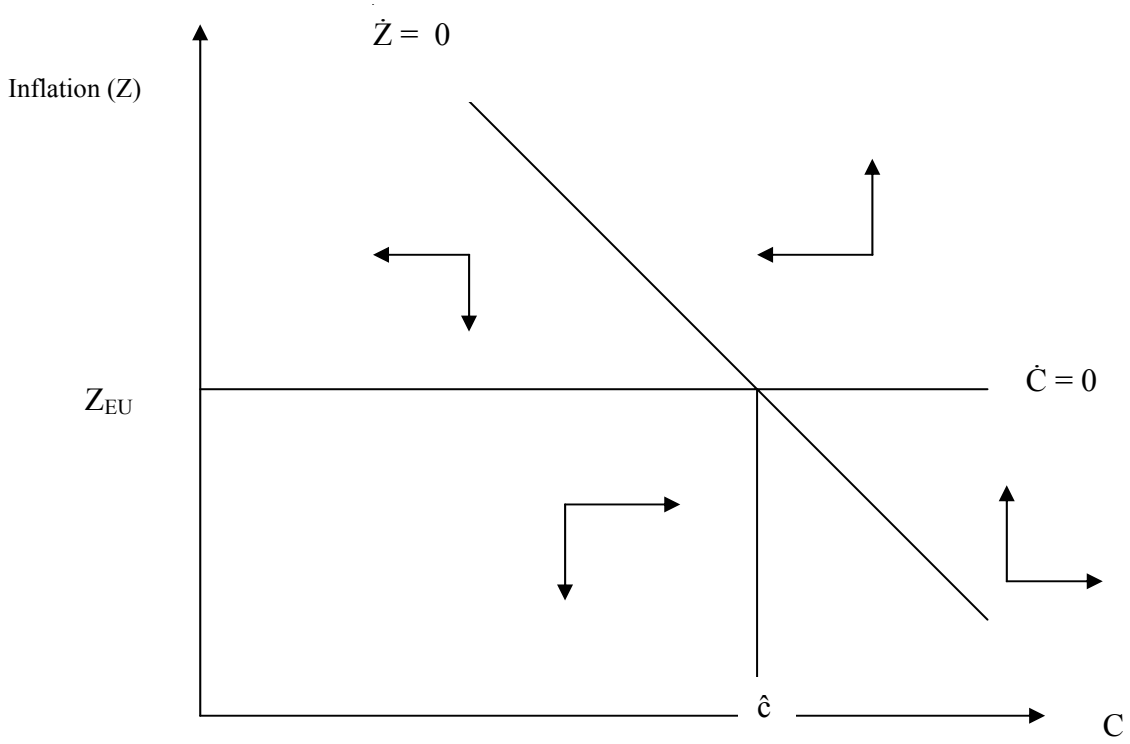
Source: AMECO and OECD Economic Outlook 2002

Figure 2c Taylor-Rule-indicated interest rates, 2001



Source: AMECO and OECD Economic Outlook 2002

Figure 3. The Intra-Area adjustment problem



The Figure describes the intra-Area adjustment problem for a small economy, negleting the rest of the world. The adjustment depends on the interraction of the "Walters effect" and a competitiveness effect. Inflation (Z) is plotted on the vertical, competitiveness (C) on the horizontal. The schedule of zero excess demand (Ż = 0) slopes down from left to right, balancing the Walters effect against the competitiveness effect of excess inflation. Competitiveness is unchanging (ċ = 0) when inflation is proceeding at the EU rate (Z_{EU}) . The equilibrium real exchange rate (inverse competitiveness) is at ĉ, below the point where the two schedules intersect. The phase diagram arrows of motion indicate that the system is not stable, nor globally unstable, with a potential for oscillation.

Table 1. A Fuzzy Clustering Analysis with OCA criteria

	Two clusters				Three clusters				
	I	II	Cluster vector	Silhouettes: s(i)	I	II	III	Cluster vector	Silhouettes: s(i)
France	**80.2**	19.8	I	.31	**62.7**	19.9	17.4	I	.25
Italy	27.0	**73.0**	II	.42	11.6	18.5	**69.9**	III	.48
Netherlands	**89.0**	11.0	I	.75	**87.3**	7.0	5.7	I	.71
Belgium	**91.9**	8.1	I	.68	**87.9**	6.1	6.0	I	.68
Denmark	42.2	**57.8**	II	.18	22.8	**58.7**	18.5	II	.51
Austria	**78.7**	21.3	I	.59	**66.7**	16.2	17.1	I	.59
Ireland	17.4	**82.6**	II	.61	8.4	**75.8**	15.8	II	.59
Spain	13.0	**87.0**	II	.68	8.1	28.7	**63.2**	III	.30
Portugal	17.4	**82.6**	II	.64	2.1	4.9	**93.0**	III	.70
Sweden	5.6	**94.4**	II	.72	3.2	**86.8**	10.0	II	.54
Finland	18.5	**81.5**	II	.64	6.1	**82.5**	11.4	II	.70
Greece	25.9	**74.1**	II	.56	8.1	15.5	**76.4**	III	.64
UK	15.3	**84.7**	II	.67	5.3	**82.9**	11.8	II	.66
Average silhouette width per cluster	.58	.57			.56	.53	.60		
Average silhouette width of whole data set	.57					.57			
Normalized Dunn' coefficient	.43					.45			

Notes:

1. Bold figures indicate the largest membership coefficients.

Source: Artis and Zhang (2002)

Table 2. A qualification list for monetary union established via an SVAR analysis

Criterion	Canada	Denmark	Sweden	UK
Supply and demand shocks predominantly symmetric	+	+	+	-
Monetary policy has little effect on output	-	+	+	-
Exchange rate not very responsive to supply and demand shocks	+	+	+	+
Exchange rate largely driven by shocks in the exchange market	-	(+)	+	+
Exchange rate shocks distort output and/or prices	NA (+)	+	-	+

Source: Artis and Ehrmann (2000)

Note: a positive sign indicates "favourable to monetary union".

Discussion

David Archer
Assistant Governor, Reserve Bank of New Zealand

This is a good paper: easy to read, informative and thought-provoking. One comes away from the paper with the sense of having agreed with a lot, and learned something. And that is how is should be.

But I think Professor Artis too readily accepts the premise implicit in the title, that EMU had something to do with the theory of optimal currency areas. On the few occasions that I was present at pre-EMU conferences where the prospect of EMU was under discussion, only the Anglo-Saxon (mainly north-American) economists present were approaching the issue from the perspective of optimal currency area analysis. The European economists present either recognised the paramount place of political motivations, or focused on other facets of the economic analysis.

Maybe – and it is highly likely – that I simply wasn't at enough, or the right conferences.

But there is another reason why the premise that EMU and OCA theory have a lot to do with each other seems a bit strange. OCA theory, at least in its original incarnation, involves the choice between

- floating exchange rates and currency union
- in a world of no capital mobility to speak of, and hence
- the ability to continue to run independent monetary policy within the union.

That does not seem to have been the choice that EMU partners were confronted with. Rather, the EMU choice was shaped by

- a pre-existing preference for exchange rate stability within the region,

- recognition (especially after 1992) that achieving exchange rate stability in the presence of high capital mobility probably meant foregoing the option to adjust the peg, and
- an absence of independent monetary policies even prior to union, given that German monetary policy already dominated the determination of interest rates within the region.

As a consequence, even setting aside the vitally important strategic imperatives that drove the key political actors, it seems that the monetary policy considerations really boiled down to something quite different from the choice described by OCA theory. The choice was either to have the common monetary policy determined by the Bundesbank in relation to German economic considerations, or instead create a regional institution with a regional focus to determine the common monetary policy. The alternative of floating currencies within Europe did not seem to be on the table.

Nonetheless, it is conceptually possible to apply OCA analysis to the EMU situation, as a potentially useful thought experiment. In doing so, of course, one needs to move beyond Mundell and allow for the effect of a high degree of cross border capital mobility. High levels of capital mobility change things in quite substantial ways that should be incorporated in the Krugman diagram that Professor Artis draws on.

In particular, with greater and greater capital market integration, the notion of truly independent monetary policy disappears. With very high capital mobility, real interest rates within one monetary jurisdiction cannot depart very far from global real interest rates without driving the exchange rate around. Hence, faced with a divergence between the cyclical position of one's own country and that of other countries, a central bank either has to allow inflation to wander off target, or allow the exchange rate fully to reflect the difference between the cycles. The interest rate channel of the transmission mechanism has been neutered by the readiness of capital to flow; the exchange rate channel is all that remains. As a consequence, even if the floating exchange rate dampens the effect of shocks originating in the tradable sector, it now transmits to the tradable sector shocks originating in the non-tradable sector

This is an extreme representation, and clearly overstates the case. In a less extreme form, New Zealand experienced this during the 1990s. The UK has been

experiencing the same issue over recent years. Amongst the floaters, only Singapore (to my knowledge) seems to have discovered a way to moderate the exchange rate consequences of cyclical gaps while still achieving their domestic inflation objective. There is enough here to add to existing question marks around the optimality of the "OCA null", as Professor Artis nicely puts it, in a world of high capital mobility.

Thus far, I have – in keeping with Professor Artis – focussed on the macroeconomic stability issues associated with currency regime choice. But it seems to me that macroeconomics is not where the real issues are, at least the macroeconomics of the business cycle. That may also have been true in the context of EMU; it certainly is true in the context of New Zealand, where currency union is an active topic of discussion, at least in some circles.

Before identifying what I think the real issues are, let me note the irony of a country like New Zealand considering currency union. In fact, it is an irony of the current taste for currency unions. One of the main reasons to consider giving up monetary sovereignty is because of the absence of a local nominal anchor. In New Zealand we pioneered inflation targeting; inflation targeting has now clearly shown itself to be capable of providing a robust nominal anchor, thereby providing a vital element previously missing from the floating exchange rate option. Just as floating exchange rates have been provided with nominal anchors, more countries are considering opting for permanently fixed rates.

Where are the real issues, and why is it wrong to focus the discussion of currency union on business cycle macroeconomics? Because

- in normal times, most countries' business cycles roughly co-vary with the business cycle of their trading partners,
- in this context, the exchange rate does not play a particularly valuable shock-buffering role, and
- the type of idiosyncratic shock for which a move in the exchange rate will provide really useful buffering is rare indeed.

Thought of from this perspective, to evaluate the worth of an independent currency, we should be using the analysis of risk management and insurance rather than the

analysis of time series macro-econometrics. If, in normal times, the costs associated with the existence of currency risk and transaction costs outweigh the benefits of the shock absorption provided by an independent currency, the net cost can be thought of as an insurance premium. What is one buying with that insurance premium? The ability for the currency to move, and thereby reduce the adjustment costs that will follow, from an extreme idiosyncratic shock. The analysis should therefore be focusing less on the centre of the distribution, as occurs with most econometric applications of OCA theory cited by Professor Artis, and more on the extreme tails of the stochastic experience of countries.

To be sure, one still needs to assess the scale of the insurance premium that might be associated with maintaining an independent currency in normal times. That insurance premium might of course be negative.

Interestingly, the main argument being put forward by proponents of currency union in New Zealand – the argument for the insurance premium being positive – is in the domain of micro-economics rather than macro-economics. The argument starts the familiar idea that the existence of currency risk acts as a non-tariff barrier to international trade. That restricts integration of the small tradable New Zealand economy with larger and more diverse economies, and in turn limits potential scale and dynamic gains. Productivity levels, and productivity growth rates are both reduced relative to what could be achieved with a higher level of international integration. In this regard, the Andy Rose evidence, if valid, is of great significance, but not so much for the light that it casts on the covariance of business cycles and the role of the exchange rate therein, but instead for the light that it casts on the extent to which dynamic gains from trade might be affected. Likewise, the endogeneity issue is important, not so much for the implications of changing industrial structure for business cycle patterns, but instead for the implications for trend growth.

To conclude, Professor Artis does a nice job in this paper of treating the OCA issues. But those issues are probably better thought of in the context of potential monetary unions other than EMU, and as aiding our understanding of the risk premium that floating exchange rate countries might be paying in order to preserve the option of exchange rate adjustment when the really big idiosyncratic shock strikes.

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