



Title	Punts, pounds and euros : in search of an optimum currency area
Authors(s)	Thom, Rodney, Neary, J. Peter
Publication date	1996
Publication information	Thom, Rodney, and J. Peter Neary. "Punts, Pounds and Euros : In Search of an Optimum Currency Area" (1996).
Series	Centre for Economic Research Working Paper Series, WP96/24
Publisher	University College Dublin. Department of Economics
Item record/more information	http://hdl.handle.net/10197/707

Downloaded 2023-03-15T17:09:45Z

The UCD community has made this article openly available. Please share how this access benefits you. Your story matters! (@ucd_oa)



© Some rights reserved. For more information

Published in *IBAR – Irish Journal of Business and Administrative Research*, 1997

**PUNTS, POUNDS AND EUROS:
IN SEARCH OF AN OPTIMUM CURRENCY AREA***

J. Peter Neary and D. Rodney Thom

University College Dublin

November 24, 1997

* An earlier version of this paper was presented at the Dublin Economic Workshop Economic Policy Conference, Kenmare, 18-20 October 1996. Support from the Social Science Research Council of the Royal Irish Academy is gratefully acknowledged.

"What is the appropriate domain of a currency area? It might seem at first sight that the question is purely academic since it hardly appears within the realm of political feasibility that national currencies would ever be abandoned in favour of any other arrangement."

- Robert A. Mundell (1961)

1. Introduction.

Recent statements by the British Government make it clear that the UK will not participate in the first wave of European Monetary Union (EMU) and that sterling will remain outside any proposed exchange rate system between the "ins" and "outs". In contrast, the Irish Government appears totally committed to first-wave membership when Stage III starts on 1 January 1999. Hence, just as in 1979, Ireland seems destined to participate in a major monetary reform which excludes its most important trading partner. Given these facts, this paper is primarily concerned with the economic implications of Irish membership in a scenario which excludes the UK.

In order to focus our analysis, it may be useful to start by disposing of several preliminary, and hopefully uncontroversial, issues. First, we draw a distinction between the desirability of EMU *per se* and the wisdom of Irish participation without the UK. We contend that these questions are logically distinct. It is perfectly consistent to advocate the principle of monetary union but to argue for the, at least initial, exclusion of certain countries on the grounds that their participation would benefit neither their own domestic economies nor the union as a whole.¹ Put another way, the train may be leaving the station but we do not have to jump on. Before we purchase the ticket it may be prudent to enquire where the train is going, how much the ticket costs and how we might integrate with our fellow passengers.

Second, sacrificing policy autonomy by participating in EMU would be of little

¹ Indeed, one possible interpretation of the Maastricht Convergence Criteria is that they are specifically designed to ensure the exclusion of certain economies whose inclusion would adversely affect the smooth functioning of EMU (as perceived by policy makers in North-West Europe).

consequence if labour and commodity markets were characterised by a high degree of wage-price flexibility. In this scenario exogenous shocks would be absorbed by appropriate adjustments to nominal wages and prices leaving real exchange rates, or competitiveness, unaffected and the case for EMU would then hinge on the issue of potential benefits. On the other hand if, as the evidence suggests, labour markets are relatively inflexible then sacrificing policy autonomy may impose significant adjustment costs on participating economies. Once we accept that monetary and exchange rate policies may have real effects on domestic output and employment then the decision on EMU participation requires a full recognition of the costs as well as the benefits.

Third, decisions on whether to proceed with EMU and whether Ireland should participate will be driven by political as much as by economic considerations. In particular, EMU may be more generally perceived as a further step towards full political integration with obvious implications for national independence, foreign policy and, in the case of Ireland, neutrality. Unfortunately political decisions can have adverse economic implications and, while we recognise that EMU may be too important for decisions to be left to economists, we also contend that the latter have a professional obligation to offer an objective and independent analysis of the consequences, both beneficial and detrimental, of Irish participation. As in many areas of decision making, economics cannot offer definitive answers and the quote from Robert Mundell at the beginning of this paper suggests that economists might be wise to refrain from political forecasts. Nevertheless, economists can usefully explain the consequences to the policy maker and trust that the outcome will not require us to pick up the economic pieces of a badly judged political decision.

Fourth, if the UK decides to join EMU we shall take it as given that Ireland will also participate. Hence, we explicitly assume that:

- At least Germany, France and a group of smaller _satellite_ economies will proceed towards EMU when Stage III of the Maastricht timetable commences in 1999.
- The UK does not participate in EMU.
- Ireland is deemed to satisfy the Maastricht Convergence Criteria and has the option to participate or not.²

Given these assumptions the issue is whether Ireland should participate in a monetary union which comprises the European "core" but excludes our major trading partner, the UK. We will attempt to make a contribution to this debate by focusing on several characteristics of the Irish economy which can be used as indicators of whether participation in EMU could impose significant costs. In particular, would the loss of policy autonomy generally, and the exchange rate option in particular, increase the cost of adjusting to shocks such as a rapid sterling depreciation or a rise in world oil prices?

In its 1996 report on the *Economic Implications for Ireland of EMU*, the Economic and Social Research Institute addresses these questions by using a macro-econometric model to simulate a range of scenarios. Their general conclusion is that Ireland could expect modest net gains from participation in EMU and that some of these gains would persist even if the UK remained outside the currency union. Although we shall offer several criticisms of the ESRI report, it is not our intention to refute their general conclusions. To do so would require a detailed analysis of the structure of the underlying model, its identifying assumptions and the estimation methods used.³ Rather, we take a simpler approach which uses the so-called theory

² On a strict interpretation of the Maastricht Treaty any country which is deemed to satisfy the criteria will be required to participate in Stage III. Hence, we are also assuming that, as in the case of Sweden, this requirement will not be enforced.

³ One potential problem with the ESRI simulations is that in all cases they give point estimates for the economic variables of interest. To take one example from a very large number of cases,

of Optimum Currency Areas (OCA's) to focus on the costs of participation in EMU. We conclude that there is at least a *prima facie* case that EMU membership may prove costly and that the potential benefits would have to be significant to justify abandoning the exchange rate option in favour of a common currency.

2. The Theory of Optimum Currency Areas.

The theory of OCA's goes back to Mundell (1961) who was primarily concerned with identifying conditions which would minimise the costs of abandoning exchange rate flexibility in favour of a common currency across different economies. In its simplest form the theory is based on the idea that when a group of countries experience similar economic disturbances they require similar responses and there may be little cost to abandoning policy autonomy in favour of a unified response. For example, if France and Germany are equally dependent on imported oil supplies a rise in the world oil price should have similar effects in each economy, and the appropriate adjustment mechanism to achieve given targets for, say, employment and inflation should be the same for both economies. When this is the case, the existence of independent currencies retaining the option of using the exchange rate as a policy instrument may not be of any significant advantage to either economy. Hence, when economies share common characteristics and experience similar disturbances the costs of switching to a single currency with a unified central bank may be relatively low. On the other hand, an oil-exporting economy

Table A4.2.2 forecasts an unemployment rate of exactly 10.4% for the year 2004 on the Ireland in and UK out scenario. How much faith can we put in this and the other multitude of forecasts? The only sensible answer can be virtually none because we are never told what the relevant confidence intervals are. When faced with this type of forecast the appropriate response is to ask a question such as, at what significance level would the underlying model reject the hypothesis that the 2004 unemployment rate will be, say, 15.4% or higher? Unless this type of question is addressed, it is difficult to assign any value to the simulation results in assessing the potential net benefits of Irish participation in EMU.

such as the UK might wish to adjust to changing prices in a radically different manner than either France or Germany. If the UK were to find it advantageous to retain the exchange rate option then it is plausible that the costs of participating in a common currency area may be higher than in non-oil-producing economies.

Given this example, the theory of OCA's suggests that monetary union may be more attractive to France and Germany than to the UK. However, there is no presumption that France and Germany should form a monetary union or, if they do, that the UK should be excluded. If France and Germany have little to gain from participating in a monetary union then the fact that they would experience minimal costs by doing so is not, by itself, sufficient justification for adopting a common currency. Conversely, although the UK may find it relatively costly to participate in a monetary union with France and Germany it is possible that the benefits may be sufficiently high to outweigh the costs. In this context the use of the term "optimum" is unfortunate. Economists normally think of an optimal situation as one where the marginal costs of an action are just offset by the marginal gains. Hence, an individual country may find it optimal to participate in a common currency area if the benefits are greater than the costs while the monetary union will find it optimal to include an additional economy if the marginal benefit is at least as great as the marginal cost to the union as a whole. Because of its focus on the costs of sacrificing policy autonomy, the theory of OCA's cannot provide the full picture and should not be used as a definitive rationale for policy decisions. Nevertheless, by highlighting the circumstances in which exchange rate policy may reduce the costs of adjusting to disturbances, the OCA approach provides a useful starting point by signalling circumstances in which individual economies may experience significant difficulties in the transition from a national to a common currency.

In an Irish context the costs of EMU participation can be best illustrated by a scenario

which includes a sharp depreciation of sterling. If Purchasing Power Parity (PPP) held continuously this would be of little consequence because domestic prices and wages would adjust to maintain competitiveness with no implications for employment and output. However, most evidence suggests that while PPP holds in the longer run changes in real exchange rates can persist for significant periods. Indeed, results reported in the ESRI study suggest that nominal prices take three to four years to respond to exchange rate shocks while the full response period for wages is closer to four years.⁴ Hence, given a loss of competitiveness Ireland would face an adjustment problem in which it would have to respond to higher unemployment and lower net exports. With an independent currency, the Irish authorities have the option of combining devaluation with expenditure-reducing policies. In a monetary union the former would be unavailable putting full emphasis on changes in expenditure, which should be increased to compensate in part for the loss in competitiveness. Consequently, the choice is between two adjustment paths. Both would imply higher unemployment but in the first this would be moderated by the inflationary effects of a devaluation.

This simple example serves to illustrate two important points. First, if it can be shown that the type of adjustment problems experienced by the Irish economy are not typical of those experienced by the European "core" then we would have to be very confident that EMU could deliver sufficient benefits to offset the losses associated with the unavailability of the exchange rate option in adverse economic circumstances. In this respect the theory of OCA's with its emphasis on the (a)symmetry of shocks can prove a useful starting point for any assessment of EMU. Second, most of the previous argument becomes redundant if labour markets are characterised by wage flexibility and/or a high degree of labour mobility. If nominal wage levels

⁴ We note that this evidence supports the view that exchange rate policy does have real effects in the short to medium term.

were to decline in response to a currency depreciation then competitiveness, or the real exchange rate, would be unaffected and currency fluctuations would have no implications for output and employment. Unfortunately, most evidence suggests that European labour markets are relatively inflexible and that nominal wages adjust slowly to exogenous shocks. In the case of Ireland, the ESRI report not only confirms the hypothesis of slow wage adjustment in response to exchange rate changes but also suggests that labour market conditions in the UK have a greater impact on Irish wages than do conditions in our potential EMU partners.⁵ Further, the issue of labour market flexibility is of more than mere academic interest. For example, in a paper delivered to the Irish Institute of European Affairs the Bundesbank President Hans Tietmeyer expressed the view that:

In the event of an asymmetric shock ... the countries in the monetary union must, on a point of principle, be responsible themselves for achieving the necessary flexibility through internal measures. (Dublin, March 15th 1996)

Given that EMU will eliminate monetary and exchange rate flexibility and, via the proposed stability pact, greatly restrict independent fiscal policy, we must interpret "flexibility through internal measures" as referring to adjustments within the domestic economy and the labour market in particular. Hence we might reasonably expect that serious preparation for EMU would include a comprehensive overview of domestic labour market institutions. Unfortunately we are not aware if such a programme is either ongoing or even at the planning stage.

3. Some Evidence.

The theory of OCA's suggests that economies best suited to monetary union should

⁵ Additional support for this view can be found in a recent study by Curtis and FitzGerald (1996) who conclude that "... UK labour costs play a major role in determining labour costs in Ireland." (page 335)

exhibit common characteristics such as flexible labour markets, similar trade structures and correlated business cycles. In this section we consider some evidence on these characteristics. Most of this evidence is not new and it is far from conclusive. However, it unambiguously suggests that Ireland is not typical of the European core and that the costs to participation in EMU may not be trivial.

This evidence is summarised by Figures 1 to 6.⁶ Figures 1 to 4 give descriptive statistics for a number of European economies while Figures 5 and 6 shed some light on the degree of synchronization between business cycles.

Figure 1 reports simple correlations between inflation and growth rates in Germany and potential EMU members over 1960 to 1990. The data appear to identify a core whose inflation and growth performance is similar to Germany. This core includes Austria, Denmark, Belgium, France and the Netherlands but excludes Ireland.

Figure 2 illustrates each country's intra-EU trade as percentages of their total imports and exports. Although Ireland appears to be highly integrated with its EU partners, **Figure 3** shows that this result disappears once the UK is eliminated from the sample.

Figure 4 provides further evidence on trade structures based on rankings reported by Gros (1996). The vertical axis plots a ranking which indicates similarity in trade structure while the horizontal axis plots a ranking for intra-industry trade.⁷ When trade structures are similar and/or trade is primarily intra-industry trade, the potential for asymmetric shocks is correspondingly

⁶ Figures 1 and 5 use the results reported by Bayoumi and Eichengreen (1994); Figure 4 is based on Table II.I in Gros (1996); Figures 2 and 3 are computed from statistical tables in the *European Economy* (various issues). Figure 6 uses results reported by Artis and Zhang (1997).

⁷ The first is based on correlation coefficients between the shares of 70 products in aggregate intra-EU exports and the intra-EU exports of each member state. The second is based on Grubel-Lloyd indices.

reduced. Unfortunately, Ireland is ranked tenth on trade structure and eleventh on intra-industry trade.

Figure 5 illustrates correlations between demand (nominal) and supply (real) shocks. These correlations are based on results reported by Bayoumi and Eichengreen (1994) who use a structural vector autoregression (VAR) approach to estimate the extent of shocks to inflation and growth rates. In this methodology demand is represented by inflation and supply by output growth. Shocks are estimated as that part of each series which cannot be explained by its own history or the history of the other variables in the system. Structure is added by permitting real shocks to have permanent effects on both output and inflation while nominal shocks have permanent effects on inflation only. The results are reported as correlations with corresponding German residuals. We are, of course, keenly aware that this methodology is not free from criticism and is by no means universally endorsed by the majority of economists and econometricians.⁸ Nevertheless, the results appear intuitively sensible in that they identify a European core similar to that revealed by the previous evidence. Once again, Ireland does not belong to that group.

Figure 6 uses results reported by Artis and Zhang (1997) to gauge the extent to which business cycle activity in a range of EU economies is correlated with the corresponding German and American cycles. In each case, business cycles are equated to deviations from the long-run trend in output and estimated by using the Hodrick and Prescott filter. Hence the results indicate the extent to which cyclical activity in each country is synchronized with cycles in the reference economies. As with previous evidence the data identify a core European grouping consisting of France, Austria, Belgium and the Netherlands, all of which have cyclical activity closely

⁸ We note that exactly the same observation holds for the large-scale macro-econometric approach favoured by the ESRI.

correlated with that in Germany. However, in five EU states, including Ireland, cycles appear to be more closely synchronised with the United States than with Germany, suggesting that periods of recession and expansion in these economies do not coincide with equivalent periods in the core countries. This evidence suggests that the type of counter-cyclical policy which is typically required in these five economies may differ from that in the core grouping with the implication that the former may experience significant adjustment problems if they were to participate in a monetary union with the latter. Finally, it is of some interest to note that at least three of these countries, Denmark, Sweden and the UK, have already announced their intention to opt out of Stage III. Hence, Ireland is once again left as an outlier. Not only is cyclical activity in Ireland out of sync with the core but, unlike other countries in the same position, Ireland appears to be set on a course which will require domestic policy makers to accept decisions which may be counter to the best interests of the Irish economy.

Taken together these results appear to be fairly conclusive. The data suggest a grouping consisting of France, Germany and some of its "satellite" economies which appear to be the most suitable candidates for closer monetary integration. Unambiguously, Ireland is not a member of this core. In terms of macroeconomic characteristics, trade structure and synchronization of business cycles, Ireland appears to be an outlier. Hence the costs of participation in EMU may not be trivial. As ever, this conclusion must be qualified in several respects. First, although the costs may be high the benefits derived from lower currency transactions costs, reduced exchange rate volatility and interest rate effects may be sufficient to outweigh the costs. These issues are considered in the next section. Second, it is possible that factors such as the structure of trade and the nature of shocks may be endogenous to the integration process and that participation in EMU could reduce the apparent asymmetries between Ireland and the European core. For example, as demand shocks are to a large extent the

result of policy autonomy, the move towards a unified monetary policy should be associated with greater symmetry in nominal disturbances. Also, to the extent that transactions costs and exchange rate volatility and uncertainty act as barriers to trade, their elimination may lead to closer integration and a reduced incidence of asymmetric shocks.⁹ This effect is, however, ambiguous. If integration is associated with greater diversification and intra-industry trade then, other things equal, it should be associated with closer correlation between business cycles. On the other hand, as suggested by Krugman (1991), the opposite is more likely if faster integration is manifested in regional specialisation and inter-industry trade.

As a final piece of evidence we consider the possible implications of a sterling depreciation against the core currencies. Rather than attempting to forecast future events we use recent data to illustrate how movements in the DM/£ exchange rate might affect Irish competitiveness. Figure 7 uses daily data to illustrate the behaviour of the DM/£IR and DM/£ exchange rates since the switch to wide ERM fluctuation bands in early August 1993. While it is clear that the £IR appreciated against sterling following the latter's sharp depreciation in early 1995 and depreciated as sterling rose over late 1996-97, it is also notable that it tracked movements in sterling quite closely. Hence movements in the DM/IR£ rate appear to be, in part, driven by the corresponding DM/£ rate. This suggests that the Central Bank may have been targeting the effective exchange rate with movements in sterling being partially, but not fully, accommodated by off-setting £IR adjustments against the DM.¹⁰ However, the move to wide ERM bands did not require any ERM currency to abandon the type of DM peg which characterised Irish exchange rate policy from 1987 to the 1992 currency crisis. Hence Figure 8

⁹ See, for example, Frankel and Rose (1996).

¹⁰ See Thom (1995) for a full analysis.

simulates the £/EIR exchange rate on the assumption that the authorities had reverted to their previous "franc fort" strategy by fixing the DM/£IR at the rate which prevailed at the end of July 1993. While this is not identical to full EMU it is instructive in that such a policy would also imply a loss of autonomy.¹¹ On the evidence of this simulation it is clear that a DM peg would have resulted, at least temporarily, in a much greater appreciation and loss of competitiveness against sterling in 1995. Likewise, the IR£ depreciation in 1996-97 would have been more severe leading to, possibly, inflationary pressures on the domestic economy. Unfortunately we are not aware of any evidence to suggest that the Irish economy is currently, or will be by the start of Stage III in 1999, better suited to accommodate this type of adjustment than it was in September 1992. Further, a DM peg was, and still is, open to the Irish authorities but, on the basis of revealed preference, competitiveness appears to be a major concern in determining exchange rate policy. More importantly, with national currencies a DM peg can, whether "irrevocably fixed" or not, be abandoned. Once we move to full EMU this option will be automatically closed.

4. The Benefits of EMU.

What economic benefits for Ireland can be set against the likely costs of EMU without the UK outlined in previous sections? International transaction costs would of course be reduced (though by much less than if the UK were to join); some of the benefits of the Single Market might be more easily realised; and "England's difficulty could be Ireland's opportunity" if some of the non-EU foreign investment now pouring into the UK were to be diverted into

¹¹ This identification of a DM peg with full EMU is also consistent with the ESRI simulations which assume that post-EMU euro interest rates will equal pre-EMU DM rates. See ESRI, p. 153.

Ireland by the prospect of secure access to EMU markets. However we note that, somewhat paradoxically, these inflows appear to be unaffected by British scepticism about EMU and continuing uncertainty surrounding the future relationship between sterling and the euro. Consequently, these claimed benefits may be difficult to quantify and could prove illusory.

The same cannot be said for the prospect of lower interest rates, which has been highlighted by many commentators as a major gain from participating in EMU and which forms the core of the ESRI's favourable assessment.¹² There are a number of steps in their argument. First, post-EMU euro interest rates are assumed to equal pre-EMU DM interest rates (ESRI, p. 153); second, after our accession to EMU Irish government interest rates are assumed to equal those in the EMU as a whole (ESRI, p. 26); finally, the fiscal benefits of lower interest payments are assumed to be fully passed on to consumers, which reduces pressure for wage increases and so results in lower labour costs (ESRI, p. 59).¹³ We consider each of these assumptions in turn.

If Ireland alone were to enter a monetary union with Germany, we would not expect the future path of German interest rates to be affected. However, after the formation of EMU, monetary policy will be determined by the new European Central Bank (ECB) not by the Bundesbank. Will euro interest rates follow the same path as DM interest rates would have? Much will depend on the credibility of the ECB, the list of initial participants and developments in other large European countries. Notwithstanding the safeguards built into its constitution, the

¹² Their central forecast of medium-term effects on GNP attributes a 1.7% gain per annum to lower interest rates, compared with only 0.1% from reduced transactions costs. This is more than enough to offset their estimated loss of 1.4% per annum arising from reduced competitiveness and associated risks in the event of the UK's not participating. (See ESRI, Table 6.1, page 159.)

¹³ In FitzGerald and Honohan (1997), the benefits of lower interest rates are assumed instead to come in the form of increased investment in the corporate and housing sectors.

ECB may find itself initially obliged to set higher interest rates in order to establish its anti-inflationary credentials with the markets. This, for example, could well be the case if countries such as Italy and Spain with historically weak reputations for credibility are among the initial participants. Also, consider a scenario where French unemployment continues to rise and the National Front seems set to improve on its 15% share of the vote. It is quite plausible that the French government's response would be to try and use diplomatic or other pressure to relax either monetary or fiscal constraints, which in turn could prompt a rush from euros and a jump in EMU interest rates. In the light of these uncertainties, it is surely brave to assume that EMU and DM interest rates will prove to be identical.

Even if euro interest rates are as low as predicted, will the Irish government have access to borrowing at premium rates? Many authors, including McKinnon (1997), have noted the possibility that some EMU member governments may be perceived as having a higher risk of default. The ESRI dismiss this as unrealistic in the Irish case (p. 26). They are surely right for normal conditions and for most of the smaller EU economies. But, given the market's perception of the importance of sterling, Ireland might be an exception. Can we be sure that the Irish government would be seen as a premium borrower if its fiscal position were to deteriorate rapidly in the wake of a significant sterling depreciation?

Finally, granted that the Irish government benefits from lower interest rates, will this necessarily lead to an improvement in competitiveness? Three points are relevant here. First, using the fiscal windfall to reduce taxes would be a sensible strategy. But no recent Irish government has exhibited this type of prudence nor have they shown any zeal in tackling the tax-induced barriers to flexibility in the labour market. On past performance, it is much more likely that the fiscal benefits of lower interest rates would be used to finance spending or to postpone tax reform further. The gain to the nation as a whole would then not show up in any

pro-employment or pro-growth effects to counterbalance the probable decline in competitiveness relative to the UK. Second, since countries such as Spain and Italy would benefit even more from lower interest rates in the event of their joining EMU, the potential loss of relative competitiveness to the Irish economy could be even greater. Third, in contrast to the core economies Ireland is currently experiencing falling unemployment and rapid economic growth. In these circumstances lower interest rates are likely to raise demand and lead to further increases in the prices of non-tradables such as housing. Joining EMU could then worsen competitiveness even without any depreciation of sterling, initially reinforcing but ultimately choking off the current Irish boom. This possibility, of course, simply highlights the lack of synchronization between economic activity in Ireland and the European core.

5. Conclusions.

The evidence presented in this paper suggests that there are significant asymmetries between Ireland and the European core. In the tradition of the literature on Optimum Currency Areas this implies the possibility of non-trivial costs if Ireland were to join a monetary union with countries such as France and Germany. At the very least, this suggests that the case for Irish entry without the UK is far from clear. We thus disagree with the recent ESRI report which concludes that Ireland would gain from participation even if the UK were to remain outside the common currency area. We have suggested that the ESRI underestimates the likely costs of a severe depreciation of sterling and overestimates the employment gains from lower interest rates. The Irish economy is characterised by high labour costs and low labour-market flexibility. Even the ESRI is not optimistic that EMU membership alone will alter this rapidly (p. 24). Until these structural deficiencies are tackled directly it seems foolish to risk temporary but severe losses of competitiveness against our main trading partner.

References

- Artis, M.J. and W. Zhang (1997): "On identifying the core of EMU: An exploration of some empirical criteria," Centre for Economic Policy Research, London, Discussion Paper No. 1689.
- Baker, T., J. FitzGerald and P. Honohan (eds.) (1996): *Economic Implications for Ireland of EMU*, Dublin: Economic and Social Research Institute. [Cited as ESRI (1996).]
- Bayoumi, T. and B. Eichengreen (1994): *One Money or Many? Analyzing the Prospects for Monetary Unification in Various Parts of the World*, Princeton Studies in International Finance, No. 76.
- Curtis, J. and J. FitzGerald (1996): "Real wage convergence in an open labour market", *The Economic and Social Review*, 27, 321-340.
- FitzGerald, J. and P. Honohan (1997): "EMU: Reaching a narrow verdict," *Irish Banking Review*, Spring, 15-23.
- Frankel, J.A. and A. K. Rose (1996): "The endogeneity of the optimum currency area," National Bureau of Economic Research, Working Paper No. 5700.
- Gros, D. (1996): "Towards Economic and Monetary Union: Problems and prospects," Centre for European Policy Studies, Brussels, Paper No. 65.
- Krugman, P. (1991): *Geography and Trade*, Cambridge, Mass.: MIT Press.
- McKinnon, R.I. (1997): "EMU as a device for collective fiscal retrenchment," *American Economic Review*, 87, 227-229.
- Mundell, R.A. (1961): "A theory of optimum currency areas," *American Economic Review*, 51, 657-664.
- Thom, D.R. (1995): "Irish exchange rate policy under wide ERM bands," Centre for Economic Research, Department of Economics, University College Dublin, Working Paper No. 95/15, November.