



FRANCESCO GIAVAZZI AND CARLO A. FAVERO: REVISITING “IMMEDIATE CHALLENGES FOR THE EUROPEAN CENTRAL BANK”

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HM Treasury invited Francesco Giavazzi to revisit the 1998 paper ‘The Immediate Challenges for the European Central Bank’¹ co-authored with Carlo Favero and Rudi Dornbusch, with particular reference to three challenges identified in the paper: to “tread the narrow path between an institutional revolution and uninterrupted continuity with the Buba”; to “conduct a European policy”; and to “develop a grip of the monetary mechanism in the European economy.” (p. 52).

I. INTRODUCTION²

1. This paper reviews, in the light of developments in the euro area since the start of EMU and also of some new research we have conducted on this subject, the way the ECB has dealt with three challenges that were pointed out, prior to the start of EMU, in DFG (Dornbusch, Favero and Giavazzi, 1998). The three challenges were:

- (a) To “tread the narrow path between an institutional revolution and uninterrupted continuity with the Buba”;
- (b) To “conduct a European policy”; and
- (c) To “develop a grip of the monetary mechanism in the European economy.”

2. Section 2 of this paper discusses issues (a) and (b), which are closely related.

3. Section 3 analyses developments in the monetary transmission mechanism. Beyond discussing whether monetary transmission within the Euro area has become more symmetric since the start of the EMU, we also ask whether, in the past five years, the asymmetries between the UK and the Euro area economies have remained significant, or have weakened.

4. In Section 4 we briefly discuss developments in the spreads among Euro-denominated bonds issued by different Euro area countries and in asset swap spreads within each country. This issue had not been anticipated in DFG, but has lately become significant in connection with the difficulties the Growth and Stability Pact has run into.

¹ Dornbusch, R., Favero, C. and Giavazzi, F. (1998) ‘The Immediate Challenges for the European Central Bank’, *Economic Policy* 26, April, pp. 17-64.

² We thank Andrea Civelli for discussions and research assistance.

2. ECB MONETARY POLICY: WALKING A TIGHTROPE BETWEEN THE BUNDESBANK AND THE FED

5. DFG (1998) concluded that:

“The ECB must tread the narrow path between an institutional revolution and uninterrupted continuity with the Buba. The capital markets will be unforgiving if they see anything less than Bubanness. But the political community will be unforgiving if they do not see a genuine preoccupation with being European. The ECB must also conduct a European policy. It cannot get itself to accept solving every local problem by excessive regionalization of its policy; it must work on the broad picture of stabilizing European prices, not putting a lid on German inflation or a floor under French deflation. The challenge is to shift the discussion to European averages and credibly work with these.”

6. Four years down the road, how did the ECB behave? Figures 1 to 3 in the Appendix help us understand two issues that were mentioned in the paragraph quoted above:

- (a) whether the ECB has run a truly “European” policy, i.e. whether, in setting policy rates the bank has been concerned with Euro area data, or has given special attention to data from a subset of the Euro area economy, for instance to German data only;
- (b) whether the ECB, in setting policy rates, has given to the twin objectives of price stability and output growth the same weight the Bundesbank would have given, or instead it has behaved more like the U.S. Federal Reserve.

7. Each Figure reports a Taylor rule and the actual policy rate set by the ECB (EUONIA). The Taylor rule includes the one-month lagged policy rate, the contemporaneous output gap and deviations of the contemporaneous 12-months ahead inflation expectation from the inflation target, exogenously set at 2 per cent. Inflation expectations are from “Consensus Forecast” available on Datastream.

8. With three years of data we are unable to estimate the parameters of a Taylor rule for the ECB: we thus use, alternatively, the parameters estimated for the Bundesbank and for the Fed.

9. The coefficients of the Taylor rules estimated for the Bundesbank (over the interval 1987:1-1998:12) are 1.95 on expected inflation and 0.30 on the output gap. The degree of persistence (coefficient on the lagged policy rate) is 0.93 and the equilibrium nominal policy rate 4.7 per cent.

10. The coefficients of the Taylor rules estimated for the Fed, over the same interval, are 1.10 on expected inflation and 0.79 on the output gap. The degree of persistence is 0.88 and the equilibrium nominal policy rate identical: 4.7 per cent. The sample over which the two rules are estimated starts with the Greenspan chairmanship and ends with the creation of the ECB. As expected, the Fed appears to give a higher weight than the Bundesbank to the output gap, relative to deviations of inflation expectations from the 2 per cent target.

11. Using these parameters, and data on the output gap and inflation expectations in Europe, we compute the policy rate consistent with the Taylor rules from January 2000 to September 2002. The end date is determined by the availability of observations on the output gap – last available observation September 2002. In each Figure we also report 95 per cent confidence bounds for the Taylor rule.

12. Here are how the three Figures differ:

- Figure 1 uses Bundesbank parameters, the Euro area output gap and expectations on 12-months ahead Euro area inflation,
- Figure 2 uses Bundesbank parameters, the German output gap and expectations on 12-months ahead German inflation,
- Figure 3 uses Fed parameters, the Euro area output gap and expectations on 12-months ahead Euro area inflation.

13. The first observation is the remarkable performance, in Figure 3, of a Taylor rule that uses the Fed parameters applied to Euro area data. Because our rule stops in September 2002, we cannot tell by how much the November 2002 cut deviated from this rule. But up to then the interest rate decisions of the ECB are remarkably close to what the Fed would have done, had it been faced with Euro area data.

14. If monetary policy in the Euro area had been assigned to the Bundesbank (Figure 1) interest rates would have been quite different from those chosen by the ECB – though the differences always fall inside the 95 per cent confidence bounds. The Bundesbank, in particular, would have been less aggressive in cutting interest rates after September 11.

15. The results in Figure 2 indicate that, had the ECB behaved like the Bundesbank, the cuts following September 11 are more consistent with German data than with Euro area data. Since the Fall of 2001 the rule based on Bundesbank parameters and German only data tracks actual ECB decisions quite well.

16. These results suggest that the ECB has not simply followed the Bundesbank, only concerned with inheriting German reputation. The monetary policy decisions of the new central bank have been different from those the Bundesbank would have made, and closer to the way the Fed would have behaved faced with Euro area macroeconomic conditions.

3. CONVERGENCE IN THE TRANSMISSION MECHANISM OF MONETARY POLICY

17. DFG (1998) argued that:

“The ECB must develop a grip of the monetary mechanism in the European economy. That task is complicated because financial structures and the wage-price process differ widely. Our research shows that the monetary process differs significantly across countries. Moreover, that process is sure to evolve in part as a result of the financial industry restructuring that is already underway and is accentuated by the common money. Shooting at a moving target in the fog is no easy task.”

18. In DFG we had highlighted the different structure of the financing of firms and households across Europe, and pointed to the possibility that interest rate changes might affect output and inflation differently from one Euro area country to another. This might result, we suggested, in the output cost of controlling inflation being unevenly distributed across the Euro area.

19. The introduction of the Euro has quickened the pace of financial restructuring in the Euro area: the market for corporate bonds, in particular, previously almost non-existent, has grown significantly. Are the relative roles of banks and markets in the financing of firms and households more similar today, across EMU, than they were five years ago? This is the

question we ask in this section, with one twist: looking ahead to the possibility that the UK might join EMU, we also ask whether the asymmetries between the UK and the rest of the Euro area have remained as large as they were five years ago, or have diminished.

The financing of firms and households: have the asymmetries faded away?

20. The transmission mechanism of monetary policy depends importantly on the institutional structure through which the activities of households and firms are financed. Examples include whether house purchase is financed by fixed or variable rate mortgages and whether firms make more use of equity or bank finance.

21. In DFG we documented the importance of the differences in the structure of financial systems, both between different member states within EMU and between the EMU average and the UK. Have these differences been converging or diverging since the Euro was launched?

Firms

22. Our findings for firms are based on data from two samples. The first is taken from a recent report by the European Central Bank on the financial structure of nine Euro area countries; this we augment with UK data from the UK Office of National Statistics. The second sample is an annual study by R&S (Ricerca & Sviluppo, the research branch of the Italian investment bank Mediobanca) on the 256 largest industrial and telecommunication firms that operate in Europe, the US and Japan.

23. For non-financial companies, Table 1A reports the structure of the liabilities, as a percentage both of GDP and of total liabilities of the sector. By the end of 2000 the UK was close to the Euro area average, whether we look at equities or loans, and whether we measure them as shares of total liabilities or relative to GDP. For companies, substantial convergence in financial structure has taken place.

24. Asymmetries remain more marked for the largest corporations (Table 1B). Even here, however, convergence has been significant. Particularly striking is the change in the role of markets in the financing of German companies: from one third to two thirds of total borrowing.

The financing of German firms

25. The sharp change in the sources of funds for German companies, and the enhanced role of corporate bonds, as opposed to bank loans, is confirmed in Figure 4. The Figure shows the evolution of the spread between the yields on government bonds and corporate bonds rated BBB of similar maturities. Spreads are shown for Germany and for the UK, a country where the corporate bond market has always been active. The increase in the German spread, which has now reached levels quite similar to those observed in the UK, is another indication of the growth of the corporate bond market in Germany – a market where yields now reflect, much better than they did in the past, the creditworthiness of private borrowers.

Households

26. What about households? Table 2 indicates that household borrowing keeps exhibiting considerable diversity across the EU. UK households borrow significantly more than the Euro area average – though not as much as in the Netherlands. In all countries, the principal source of household borrowing is the domestic banking system: here there is greater uniformity, and the UK is closer to the Euro area average. Within bank borrowing, the principal component is usually for house purchase. Again, the UK exceeds the Euro area average.

The maturity of bank loans to firms and households

27. An important aspect in the transmission mechanism is the maturity of bank loans. For instance, UK households borrow more than their continental counterparts: whether this makes them more vulnerable to changes in interest rates depends on how the maturity of loans differs between the UK and the Euro area.

28. Data on the maturity of loans is not easily available. Some information is reported in Table 3. For corporations the share of loans with maturity shorter than one year – those more exposed to changes in policy rates – does not vary significantly, with the exception of Italy and Portugal, where the average maturity is shorter than the average. Data on the maturity of households loans is too incomplete to draw conclusions.

Summing up

29. Our tentative conclusion is that historical differences in structure of financial systems have been substantially eroded in the last decade. Within the Euro area, the adoption of market instruments in the financing of firms has been most marked in Germany, France and Finland, who have moved towards the practices prevalent in the UK and US. The UK financial structure, moreover, is becoming more like that of EMU countries, and has moved further in that direction even during the short time since the launch of the Euro, though differences persist within the Euro area itself. Our data refer to the end of 2000. The following two years might have witnessed additional convergence in financial structures.

30. These findings may explain why the large research project on monetary transmission conducted by the ECB has mostly failed to find evidence in favour of significant cross-country differences in the macroeconomic effects of interest rate changes.

31. Convergence in European financial structures probably reflects factors that go beyond the Euro: financial market integration promoted by the Single Market initiative and in part a response to global competition in financial markets. Since both of these forces will remain in place, further convergence may occur between different member states of the Euro area. The UK is already remarkably close to the Euro area average. This is unlikely to change, whether the UK enters EMU or not.

32. In relation to households, we are unable to reach any definite conclusion. UK households borrow more than their Euro area counterparts, spend more of this borrowing on house purchase, and are more exposed to loans at variable interest rates. Would UK households therefore be more exposed if the UK adopted the euro?

33. What would ‘exposed’ mean? Since the launch of the euro, the European Central Bank has changed interest rates less frequently than the Fed or the Bank of England, and indeed has often been criticised for acting too slowly rather than too quickly. So membership of the Euro area would not necessarily leave UK households facing greater uncertainty about the burden of interest rate payments than at present.

4. ASSET SWAP SPREADS AND THE GROWTH AND STABILITY PACT

34. One of the reasons for the Growth and Stability Pact was the concern that markets would be unable to send the right signals by widening interest rate spreads on the bonds issued by countries which run unsustainable fiscal policies. Figure 5 documents the convergence in 10-year government bond yields in the four largest Euro area economies – which include Italy, a high-debt country – and in Belgium, also a high-debt country. Spreads on German bonds have fallen to around 10 basis points, quite independently of debt and deficits. For comparison, we have reported in Figure 5 the spread on UK government bonds: this has also converged, although such spread includes an exchange rate risk which is absent from Euro area bonds.

35. Do the yields on Euro area government bonds recognize the sharp differences in debt and deficits across member countries? What has been the market reaction, as reflected in bond spreads, of the difficulties the Growth and Stability Pact has run into?

36. An interesting way to understand what lies behind the convergence of bond yields is to consider asset swap spreads. These spreads measure the difference between the yield on a 10-year swap (the fixed rate component of a contract in which a flow of variable interest payments is exchanged for a flow of fixed rate payments) and the yield on a 10-year government bond. Asset swap spreads thus measure the relative default risks of the two assets. Spreads are typically positive, and a reduction in their level signals a fall of the risk associated with the private contract, compared with that on government paper.

37. Figure 6 and Table 4 show the evolution of asset swap spreads on 10-year instruments for the four large Euro area countries, plus Finland and Belgium. As above, we also report UK asset swap spreads for comparison. The interesting observation is the recent change in spreads. Since April 2002, as the fiscal problems of France and Germany have become apparent, the risk premium on private contracts in both countries has fallen, signalling that the relative quality of French and German government bonds has deteriorated. This has not happened in the rest of the Euro area. In Finland, one of the Euro area countries with the best fiscal performance, spreads have widened.

38. Eyeballing the data is no alternative to serious statistical work, which still needs to be done. But the data on asset swaps seem to suggest that financial markets in the Euro area do respond to news on fiscal policy – though probably not enough to exercise sufficient fiscal discipline and thus be a substitute for fiscal rules.

APPENDIX

Table 1A:
The structure of financing of non-financial companies (2000, ECB data)

	UK	Euro area average
As % of GDP		
<i>Equity finance</i>	162	168
<i>Loans</i>	72	73
<i>Other finance</i>	38	39
<i>Total liabilities</i>	272	280
As % of total liabilities of non-financial companies		
<i>Equity finance</i>	60	55
<i>Loans</i>	26	31
<i>Other</i>	14	14

Individual country data:

per cent of GDP

	Shares	Other Sec.	Loans	Other Liab.	Trade Cred.	Tot. Liab.
Average 9-Euro	168,4	8,4	72,7	7,7	22,7	279,9
Austria	24,7	8,1	80,3	0,9	2,0	115,9
Belgium	221,6	7,9	63,4	7,5	0,0	300,4
Germany	81,9	2,6	63,3	20,7	0,0	168,5
Spain	155,8	3,5	61,1	5,4	59,8	285,6
Finland	379,5	11,6	95,1	6,1	17,0	509,4
France	278,5	17,6	50,9	3,8	34,7	385,5
Italy	103,3	2,0	56,3	7,6	20,4	189,7
Netherlands	162,7	12,1	98,5	0,0	34,0	307,3
Portugal	107,7	10,4	85,0	16,9	36,7	256,7
UK ¹	162,1	23,9	71,7	-	14,1	271,8

per cent of total liabilities

	Shares	Other Sec.	Loans	Other Liab.	Trade Cred.	Tot. Liab.
Average 9-Euro	54,9	3,1	30,7	3,4	7,9	100,0
Austria	21,3	7,0	69,3	0,8	1,7	100,0
Belgium	73,8	2,6	21,1	2,5	0,0	100,0
Germany	48,6	1,5	37,6	12,3	0,0	100,0
Spain	54,6	1,2	21,4	1,9	20,9	100,0
Finland	74,5	2,3	18,7	1,2	3,3	100,0
France	72,2	4,6	13,2	1,0	9,0	100,0
Italy	54,5	1,1	29,7	4,0	10,8	100,0
Netherlands	52,9	3,9	32,1	0,0	11,1	100,0
Portugal	42,0	4,1	33,1	6,6	14,3	100,0
UK ¹	59,7	8,8	26,4	-	5,2	100,0

Euro area averages for 9 countries in ECB study: Austria, Belgium, Germany, Spain, Finland, France, Italy, Netherlands, Portugal.¹

¹Data for the UK are for 2001 Source: ECB for Euro area countries, National Statistics Office of the UK for UK.

Table 1B:
The structure of financing of non-financial companies.
Bank borrowing as a per cent of total liabilities.
Data relative to 274 multinationals

	1990	1997	2001
Germany	73.7	58.9	32.1
Italy	74.8	70.9	53.1
France	37.3	31.4	31.2
Belgium, Luxembourg and Netherlands	48.7	47.3	23.5
Denmark, Sweden, Finland, Norway	43.5	46.4	36.0
Switzerland	44.3	42.0	26.5
Great Britain	42.4	29.6	27.3
United States	10.0	9.3	9.4
Japan	44.7	50.2	56.0

Table 2:
The structure of household financing, Dec 2000 (% of GDP)

	Total Liabilities	Of which : From banks	of which :		
			Consumer loans	Housing loans	Other
UK	82	56	-	43	-
Euro Area-9	56	44	6	31	7
Austria	40	29	12	13	4
Belgium	44	34	4	23	7
Germany	74	70	10	43	17
Spain	58	46	8	29	9
Finland	34	28	2	20	6
France	53	37	8	22	7
Italy	31	21	-	-	-
Netherlands	92	67	3	58	6
Portugal	83	60	7	44	9

Table 3:
Debt Maturity

	Loans from Domestic Financial Institutions				Bonds, % tot. liab.	
	% tot.liab.	% tot.loans	of which (in %)		Short Term	Long Term
			<1y	>1y		
Average 9-Euro	19,9	61,0	36,4	63,6	0,5	2,4
Austria	58,8	84,81	30,5	69,5	0,1	6,9
Belgium	11,9	56,15	43,8	56,2	0,7	2,0
Germany	22,9	60,98	29,0	71,0	0,4	1,1
Spain	15,1	70,54	35,0	65,0	0,2	1,0
Finland	4,7	25,34	14,9	85,1	0,3	1,9
France	9,3	70,53	30,6	69,4	1,2	2,1
Italy	21,9	73,89	57,9	42,1	0,1	0,8
Netherlands	14,2	44,26	32,1	67,9	0,0	3,9
Portugal	20,7	62,59	53,4	46,6	1,8	2,2
UK ¹	18,4	69,68	-	-	-	-

Household Loans from resident MFIs

	% tot.liab.	% tot.loans	of which (in %)	
			<1y	>1y
Average 9-Euro	76,8	87,7	8,2	91,8
Austria	71,6	71,8	12,9	87,1
Belgium	75,9	84,7	9,2	90,8
Germany	94,3	95,2	8,0	92,0
Spain	78,6	96,6	7,2	92,8
Finland	83,7	84,7	1,8	98,2
France	70,4	81,6	-	-
Italy	68,5	92,1	-	-
Netherlands	72,9	71,7	-	-
Portugal	75,1	93,3	10,9	89,1
UK ¹	67,6	72,9	-	-

¹Data for UK are for 2001. Source: ECB for Euro area countries, National Statistics Office of the UK for UK.

Table 4:
Asset swap spreads

	September 2000	April 2002	November 2002	Change: 11/02 - 04/02
Germany	65	25	15	- 10
France	50	15	10	- 5
Italy	40	0	0	0
Belgium	30	10	10	0
Spain	35	10	10	0
Finland	45	10	15	+ 5
UK	120	40	15	- 35

Source: Datastream

Figure 1:

Taylor Rule: Bundesbank parameters, Euro area output gap, consensus HICP expectations

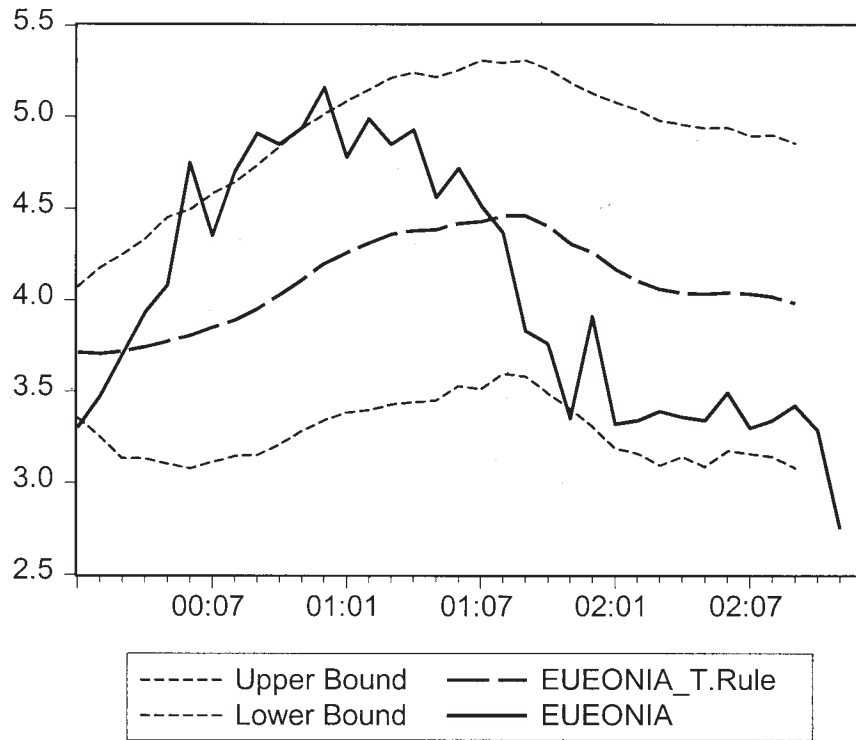


Figure 2:

Taylor Rule: Bundesbank parameters, German output gap, German CPI consensus expectations

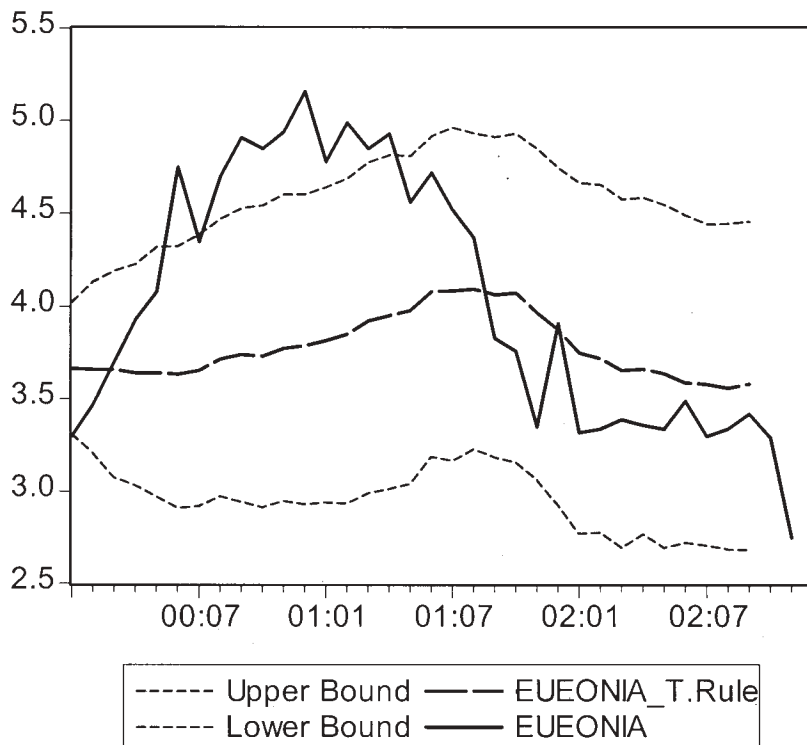


Figure 3:
Taylor Rule: Fed parameters, Euro area output gap, consensus HICP expectations

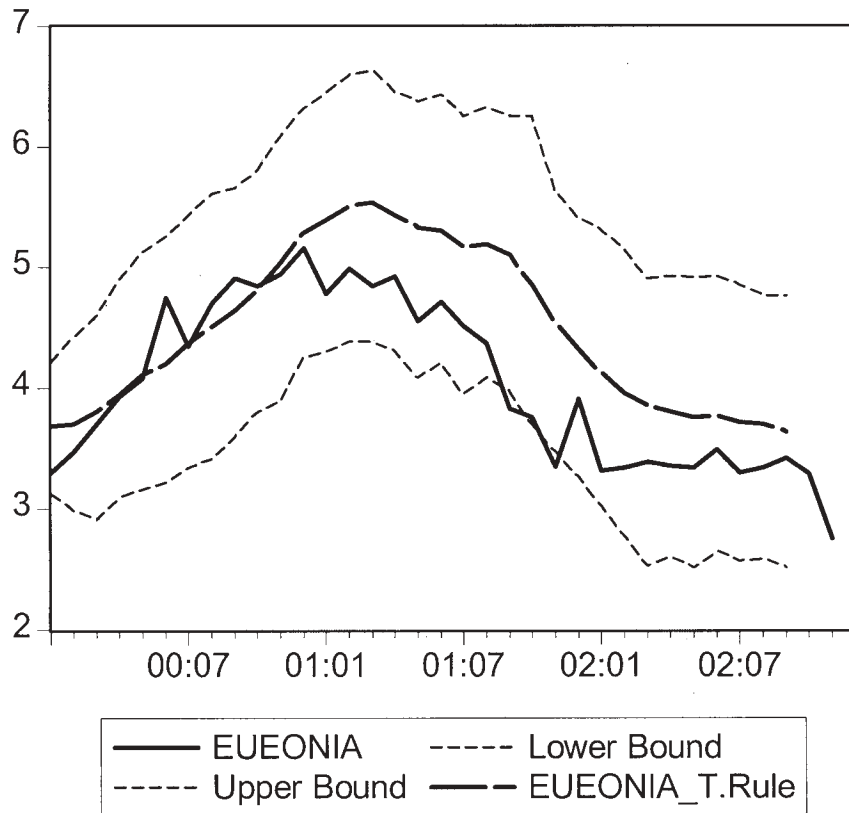


Figure 4:

BBB Corporate spreads in the Euro zone and UK

(The maturity of the BBB corporate bonds used to construct spreads is between 7 and 10 years. Government bonds are 10-year benchmark bonds)

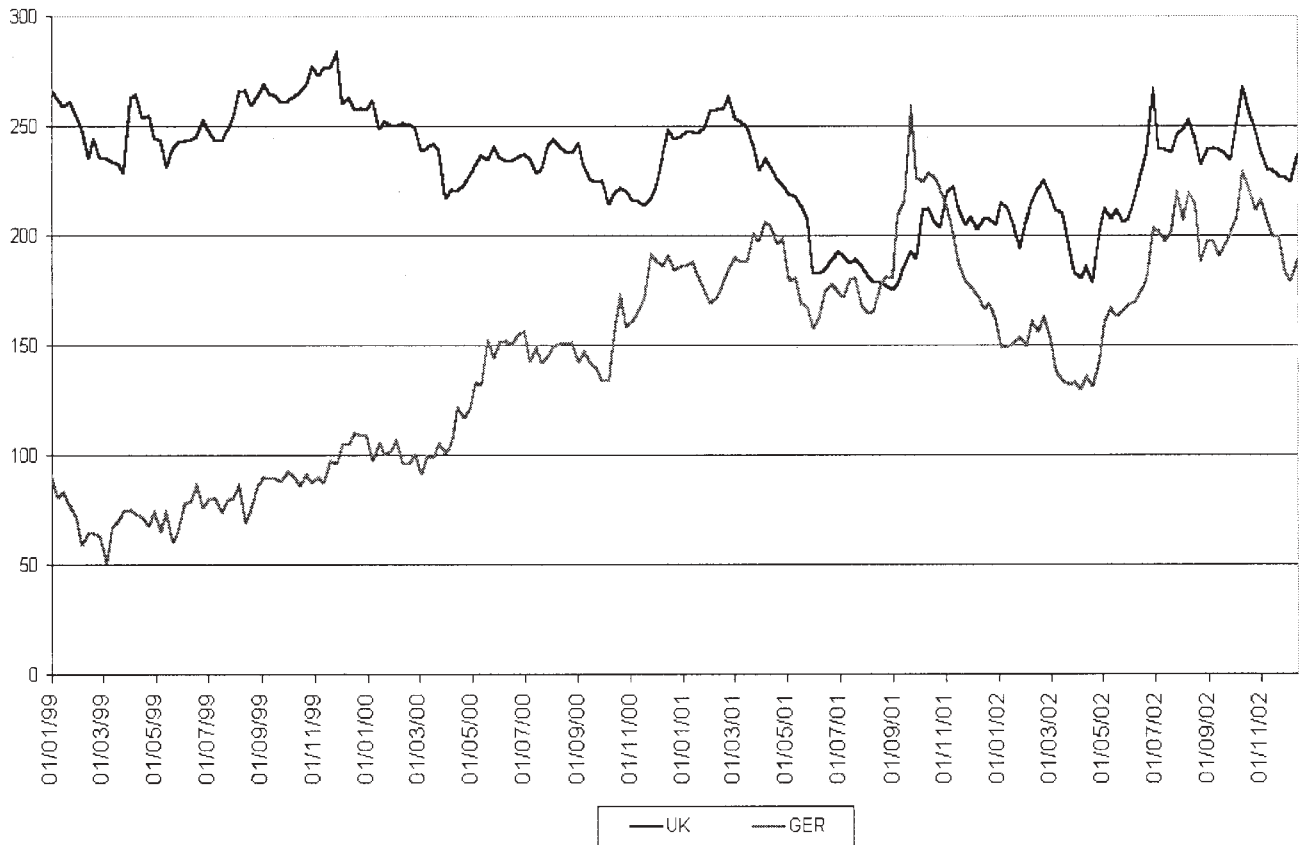


Figure 5:
 Government Bond Spreads
 (10-year Benchmark Bonds versus Bunds)

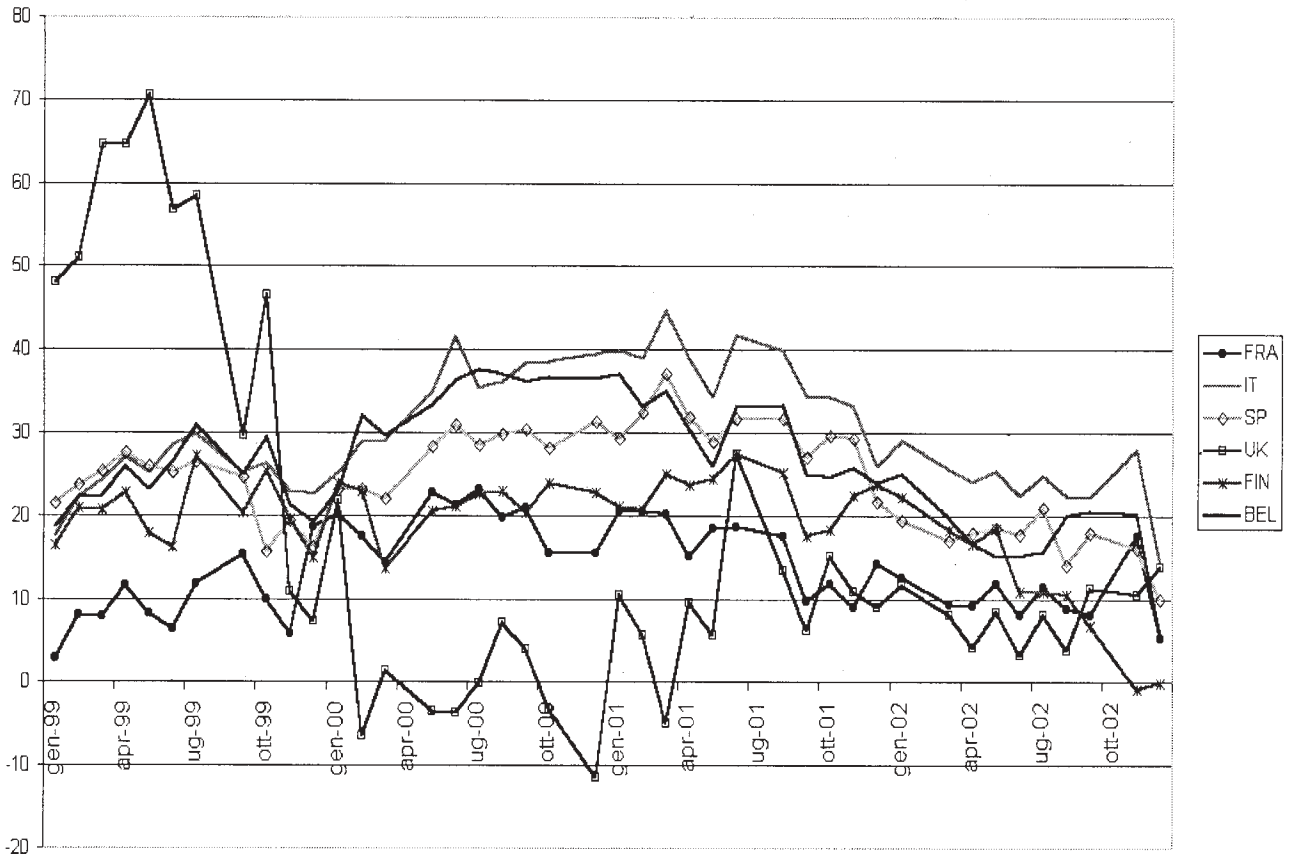
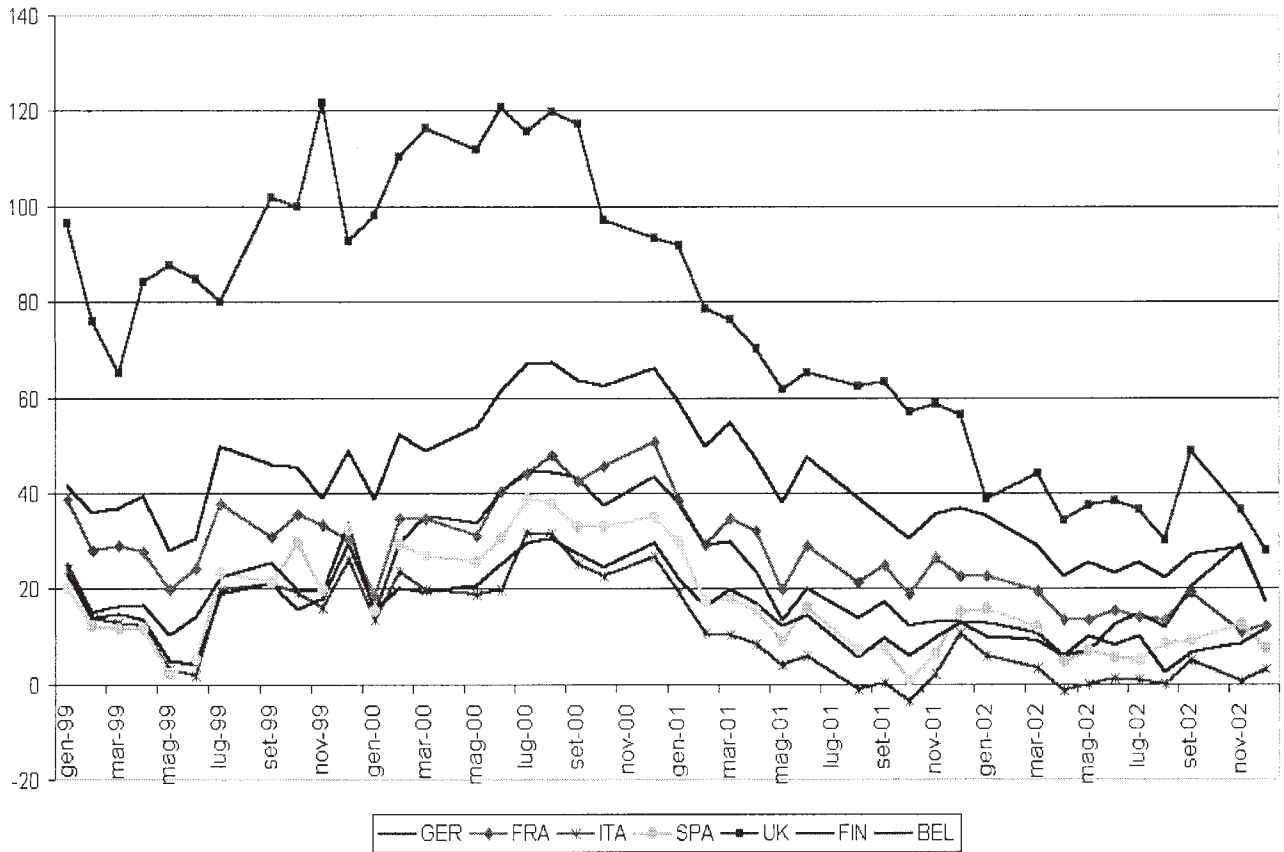


Figure 6:

Asset Swap Spreads

(yield on a 10-year swap contract minus the yield on the 10-year government bond benchmark)



DANIEL GROS¹: AN APPLICATION OF THE OPTIMUM CURRENCY AREA APPROACH – REGIONAL VERSUS INTERNATIONAL LABOUR MOBILITY IN THE E(M)U

December 2002

HM Treasury invited Daniel Gros to revisit his 1996 paper 'A Reconsideration of the Optimum Currency Area Approach: The Role of External Shocks and Labour Mobility'² with particular reference to the quotation: "International labour movements in the EU (especially immigration from third countries) have now increased to a point where they are of a comparable order of magnitude as inter-regional migration within member countries. EMU should thus not be more difficult to manage than existing Monetary Unions in Europe that member states represent." (p. 29).

ABSTRACT

1. According to the bible on the optimum currency area approach (Mundell (1961)), the case for flexible exchange rates based on *national* currencies is only as strong as the *difference* between inter-regional and inter-national labour mobility. For the US the difference between inter-regional and inter-national labour mobility is very large, making a strong case for the US dollar. However, for most EU countries this difference is much smaller, implying that the case for national currencies is much weaker in Europe. The UK seems to occupy an intermediate position between the average EU and the US. There is some evidence that international migration within the EU-15 responds to national labour market conditions, but the effect is quantitatively negligible.

1. INTRODUCTION

2. Discussions of the economic costs and benefits of EMU usually take as their basis the optimum currency area (OCA) approach. This approach starts from the premise that when an external shock hits the economy, it is easier to adjust the exchange rate than domestic prices or wages. In the words of Mundell (1961):

A system of flexible exchange rates is usually presented, by its proponents, as a device whereby depreciation can take the place of unemployment when the external balance is in deficit, and appreciation can replace inflation when it is in surplus (p. 657).

3. Most economists accept the general idea behind this approach, namely that nominal wages are usually sticky in the short run and that it is therefore easier to adjust to external shocks and obtain changes in the real exchange rate, or the terms of trade, through a movement in the exchange rate. When the exchange rate is fixed and wages are still slow to adjust, negative external shocks will lead to unemployment. The only channel for market adjustment that remains at this point is migration.

¹ Many thanks for Anna Türmann for dedicated research assistance.

² Gros, D. (1996) 'A Reconsideration of the Optimum Currency Area Approach: The Role of External Shocks and Labour Mobility', Centre for European Policy Studies (CEPS) Working Document No. 101.

4. One key question to ask in evaluating the economic case against EMU thus concerns the potential role of labour mobility. To cite again the classic in this area, Mundell (1961):

The argument for flexible exchange rates based on national currencies is only as valid as the Ricardian assumption about factor mobility (p. 661).

According to Mundell, the latter has two aspects: “that factors of production are mobile internally, but immobile internationally” (Ibid.).

5. The emphasis on the difference between inter-regional and inter-national labour mobility in Mundell is often overlooked in discussions about EMU. If one were to find that labour mobility is as low within member countries as it is between them, one would have to conclude (yet again!) with Mundell that “the optimum currency area is the region” (Ibid., p. 660).

6. To paraphrase, the case for flexible exchange rates based on *national* currencies is only as strong as the *difference* between inter-regional and inter-national labour mobility. This key point is almost invariably overlooked in the literature on EMU which considers only one aspect, namely the low degree of inter-national labour mobility within Europe, without checking whether it is much different from inter-regional mobility within countries.

7. But even if one abstracts from this argument, larger questions remain: How important is labour mobility in theory and in practice? Is the general impression that labour mobility is extremely low in Europe justified? Is more labour mobility desirable for EMU (because it facilitates adjustment)? Or is it undesirable (because it favours concentration), hence increasing the potential for more asymmetric shocks in the future?

8. This note is organised as follows: Section II presents some basic data on inter-national and inter-regional labour mobility. Section III provides some evidence on the degree to which existing labour mobility in Europe actually contributes to regional adjustment. Section IV reviews briefly previous studies on migration in the US that do not confirm the conventional wisdom. Section V discusses some limitations to the view that more labour mobility is always better. Section VI offers conclusions.

II. INTER-NATIONAL VERSUS INTER-REGIONAL MOBILITY

9. It is a commonly accepted proposition that labour mobility in Europe is very low in absolute terms and in comparison with the US. A corollary is that the potential costs of EMU should be high. This corollary is not warranted, however, because, as argued above, the key consideration for the OCA is the difference between inter-regional labour mobility within countries and labour mobility across countries. Neither factor has so far been documented systematically because of the absence of reliable statistical material. A key problem is that national population registries often apply totally different methods to classify inter-national migrants and have little incentive to follow people who leave the country. Regarding immigration the official statistics obviously fail to capture the large numbers of illegal immigrants. Illegal migration might also contribute to economic adjustment, but this is impossible to document in the absence of reliable data.

10. The US seems to conform best to the ‘Ricardian’ assumption about labour mobility: In the US about 3% of the population moves across state boundaries every year versus only about 0.6% who enter the US from abroad. Inter-regional migration is thus definitely much larger than inter-national migration. Moreover, it seems that for the US intra-national migration responds much more to local labour market developments than inter-national migration, because the latter seem to be influenced much more by longer-term considerations, such as the difference between the level of wages abroad and in the US.

II. The key question is thus: Does this Ricardian assumption also describe the reality for the EU (or rather its member countries)?

12. The first point in this respect is that regional migration within countries of the EU-15 is much lower than regional migration within the US. Mobility within EU nation states amounted to 4 million people in 1999 (around 1.2% of the population), whereas in the US, migration across states and within the country amounted to 8.4 million people (3% of population). Moreover, the regions within member states are on average smaller than US states (there are close to 100 regions by the Eurostat classification with an average population of around 3.5 million, against 50 states for the US, with an average population of around 5.5 million). Taking the difference in unit size into account one could thus argue that the effective rates of intra-national migration are about one third smaller in the EU than in the US.

13. But what about the second part of the story, inter-national migration? It is not widely appreciated that over the last few years international migration flows to the EU have been of a similar order of magnitude as those of the US, which is often used as a reference point. In 2000 about 2 million people entered the EU-15 across international borders, representing about one half of one per cent of the population. In the US, international inflows amounted to about 1.75 million in 1999 which represents 0.6% of the population.³

Table 1: Inter-national and intra-national factor mobility compared

	Gross flows as % of population		
	Inter-national Migration	Inter-regional Migration	Ratio: Inter-regional /International
US	0.6 %	3.0 %	4.8
UK	0.6 %	1.7 %	2.8
EU	0.5 %	1.1 %	2.0
E	1.1 %	1.2 %	1.1D

1999 and 2000 data. Source: Eurostat and US Census Bureau

14. If one compares the EU (or rather its member states) to the US the following picture emerges: for the US intra-national migration is almost an order of magnitude higher than inter-national migration, but this is not the case for the EU, where intra-national migration is much lower. The last column of Table 1 shows the appropriate comparisons: for the EU intra-national migration is 'only' two times larger than inter-national migration, compared to a ratio of almost 5 for the US. It is interesting that for Germany inter-regional and inter-national migration are of approximately the same size.

³ Data taken from US Census Bureau, Population Division.

15. The raw data on (gross) migration flows thus suggest the following result: the Ricardian assumption that there is a qualitative difference between labour mobility across regions within countries and across international borders seems to apply to the US, much less so to the EU-15 average and not at all to Germany. The UK seems to occupy an intermediate position between the EU average and the US. Migration of EU citizens across EU borders is, however, only a fraction of overall international migration. Only about 25% of cross-border migrants in the EU come from other EU countries. (See Table 2.)

16. The figures discussed so far refer to one specific year, but it seems that these flows do not change greatly over time. Regarding inter-regional migration the data are not always available regularly (e.g. on an annual basis). For those countries for which it is available, it seems that there has been little change over the last decade. Inter-national migration seems to be more variable as it can be influenced strongly by policy changes. The most important change in this respect seems to have taken place in Germany, where immigration fell strongly between the early and late 1990s, mainly as a result of tightening policy. By contrast, immigration seems to have increased for a number of other EU member countries. Looking at the EU average it appears that between the early 1990s and now, there has been a slight reduction in inter-national migration. This implies that the finding of Gros (1996), as based on data from the early 1990s, has to be somewhat modified in the sense that the difference between inter-regional and inter-national migration flows has somewhat widened (basically inter-regional flows were 'only' 60% larger in the early 1990s, but are 100% larger today).

Table 2: Migration in Europe, 1999

(in thousands)			
	Immigration total	Immigration from other EU countries	Within country, inter-regional
BE	68.5	26.6	131.1
DK	51.4	17.1	181.2
DE	874.0	169.3	1000.4
GR	12.6	3.0	
ES	127.4	41.8	257.1
FR	57.8		617.5
IE	47.5	31.6	
IT	162.9	23.2	296.1
LU	12.8	3.7	
NL	119.2	34.9	266.7
AT	86.7	20.1	75.6
PT	14.5	8.2	32.6
FI	14.7	6.0	0.2
SE	49.8	14.6	158.5
UK	354.1	90.5	1001.5
Total	2053.9	490.6	4018.5

Note: For countries for which 1999 data were not available, older data (1998, 1997) were used. For France, annual data on immigration from EU countries were missing as were regional data for Greece, Ireland and Luxembourg. For France, average regional migration data were taken for the years 1982-89.

III. DO OBSERVED LABOUR MOVEMENTS CONTRIBUTE TO ADJUSTMENT?

17. This is what the basic data on population movements can tell us. In order to evaluate if labour mobility functions as an adjustment mechanism for labour market disequilibria in Euroland, the decisive point, however, is not the total of migration flows (between European countries and/or regions) but rather, whether flows of people (and hence also workers)⁴ react to the state of local labour markets. It is more difficult to arrive at definite conclusion. The only certainty seems to be that there are large differences between member states in this respect.

18. To illustrate these differences we provide some simple regression results for three countries with potentially different sensitivity of inter-regional migration to economic differentials: Germany, Spain and the UK. For all three countries we investigated the impact of unemployment and wage levels on inter-regional net-migration flows (within the respective countries, scaled by population). Depending on data availability, we used 2001, 1999 and 2000 data, respectively. The purpose of briefly presenting these results is simply to illustrate some stylised facts. For a comprehensive survey of this issue, see Puhani (2001) and Ederveen and Bardsley (2002).

19. In the case of Germany⁵ our simple regression analysis delivers a significant correlation coefficient and a strong impact of unemployment (after the outlier Niedersachsen was eliminated). Although the number of observations is small, the results are still statistically highly significant. The slope coefficient of about -1 (with a t-statistics of over 4, see Table 3) suggests that the unemployment rate of a “Land” has a clear negative impact on the rate of regional in-migration.

20. However, the flows across German Länders are still small if compared to the existing unemployment differences. The regression result implies that a one percentage point difference in the unemployment rate leads to a higher rate of out-migration of 0.1 per cent. Under the assumption that all emigrants are unemployed and immediately find a job outside their original region, it would thus take ten years to eliminate a ceteris paribus 1% rise in unemployment through migration. The wage-effect is insignificant.

21. The data on regional migration for the (NUTS-2 regions) in Spain⁶ provide a totally different picture. In this case there seems to be no link at all between the economic variables and regional migration flows (This is not only a result of this specification. The unemployment variable did not have a statistically significant impact on regional migration flows in whatever specification used.) The order of magnitude of the rates of migration is different. For Germany it is about 0.6 to 0.8% (of resident population) whereas in Spain it is only 0.4% (see Graphs A1 and A2). Yet the differences in unemployment rates for Spain are higher on average. The differences alone suggest that migration flows in Spain are less sensitive to unemployment differentials than in Germany. This result corresponds to one of the findings of Ederveen and Bardsley (2002), who present a meta-analysis of 22 empirical studies on labour mobility within and across the EU. The study shows that migration flows in southern European countries are less sensitive to wage and unemployment differentials than in other countries, in particular in Germany and the UK.

⁴ Leuvensteijn and Parikh (2001) show that the discrepancy between normalised population and labour migration data is not significant and that the results are similar.

⁵ Puhani (2001) also examines net migration for German regions but considers a longer time period.

⁶ NUTS is an abbreviation standing for ‘nomenclature des unités territoriales statistiques’ and refers to the decomposition of the EU into smaller administrative units. NUTS-1 comprises for instance the 16 German Länder. Spain has a similar number of units at the NUTS-2 level.

22. In the case of the UK the labour market seems to be much more responsive to local economic conditions: migration flows across NUTS-1 regions are strongly affected both by the unemployment rates and by local wage rates. The impact of unemployment on migration flows is 50% larger than for Germany. But this still implies that it would take 6-7 years if a regional unemployment problem were to be solved only through migration. The surprising result is that the coefficient on wages does not show the expected sign. It is highly significant, but its sign is negative, implying that higher wages lead to less inward migration. This result seems to be driven by the data for London, which recorded large population outflows despite having the highest level of wages. It is possible that this reflects the movement of commuters just outside the Greater London area.

Table 3: Estimation results for net inter-regional migration

Variable	Germany		Spain		UK		EU-15	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
Unemployment rate (%)	-0.96	-4.20	-0.16	-1.26	-1.445	-5.442	-0.10	-3.34
GDP/employed (in euro)	0.00	0.75	-0.2	-1.2	-0.001	-6.267	0.01	3.09
Dummy*	-10.55	2.24	13.48	4.62			4.13	16.39
Adjusted R ²	0.83		0.61		0.822		0.97	
Observations	16		18		12		11	
Average absolute migration rate (in %)	0.4		0.3		1.4		0.07	

*Note: We introduced a dummy in Germany for Niedersachsen, in Spain for the Balears and in the EU-15 for Ireland.

23. On the European level, choosing a place to stay seems to be weakly correlated with unemployment and wage differentials of the EU-15 countries (see the last column in Table 3). Both coefficients have the expected sign and are significant. Yet one should bear in mind that the number of observations is low (data for BE, GR, ES, FR are missing) and since the unemployment coefficient is so small (-0.1), migration flows across European countries seem to react much less to unemployment differentials than flows within countries (the coefficients for inter-regional migration in Germany and the UK are 10-15 times larger). The root cause of this result is of course that migration across borders is very low in the EU in absolute terms (again see Table 3 above). The shock absorber function of labour mobility on the inter-state level therefore seems negligible in quantitative terms.

IV. THE CONTRIBUTION OF LABOUR MOBILITY TO ADJUSTMENT TO REGIONAL SHOCKS IN THE US

24. It is documented above that people move much more often in the US than in Europe. What matters in the context of discussions about EMU, however, is the extent to which net movements react to local unemployment. The previous section documented that in this respect member countries differ considerably. The general perception of the US is that migration is a key equilibrating factor. However, it is surprising to note that this perception has a very narrow base. The most widely cited study is Eichengreen (1993), who compares the

reaction of inter-regional migration to local unemployment and wages in the US, UK and Italy. He finds that net immigration to any of the 9 census regions reacts indeed to unemployment in the previous period, but the effect is rather imprecisely estimated since the t-statistic is only 1.92. The point estimate (-0.37) implies that net immigration would fall only by 0.0825 (percentage points) if the average unemployment for the US is 8% and if it increases in any region from this level to 10%. If migrants have the same family composition and activity rates as the local population, the change in migration would thus be equivalent to 1/25th of the increase in unemployment.

25. Blanchard and Katz (1992), henceforth BK, report a much stronger reaction of migration to unemployment. They estimate that a negative shock to employment in any “average” US state is offset within one period by about 60% through migration. The problem with their approach, however, is that they do not use any data on migration; instead they calculate implicit migration effects from their data on employment, unemployment and participation rates.

26. BK argue that migration must account for most of the adjustment to shocks to employment in the US since they find that a 1% shock to employment in a given state is followed typically by a 0.3% increase in unemployment and a very small (0.05) decrease in labour force participation. According to BK, migration must account for the difference, i.e. 0.65% of the total adjustment. This interpretation implies that if General Motors fires 100 workers, 65 of those who do not find a job the same year will have left the region within the same period. This is difficult to believe even for the US.

27. The BK finding is also difficult to accept because it runs counter to many other studies on the US labour market, which generally find, as reported in Greenwood (1975 and 1985) that unemployment is not an important factor in explaining migration flows. This discrepancy might be due to the fact that BK do not use any direct data on migration, but calculate migration as a residual on data on the labour force, employment and unemployment. Since these data come from different sources it is likely that some of their coefficients pick up the inconsistencies in the data (i.e. a measurement error) that is strongly correlated with the other variables. Since migration is really the residual, the estimated effects of an unemployment shock are not based only on the migration that actually takes place but also on the inconsistencies in the data.

V. CAN LABOUR MOBILITY BE A SUBSTITUTE FOR REAL WAGE ADJUSTMENTS?

28. The Introduction referred to the important place accorded to labour mobility in the OCA approach. The usual line of reasoning is quite simple. In EMU, unemployment will rise if an external shock hits a given country or region because nominal wages usually do not adjust quickly enough to re-establish equilibrium in the labour market. It is then argued that if all the unemployed left (and go to the country/regions that experience the mirror image, or positive side of the same shock), there would be no problem. This argument is too simple however, since it neglects the fact that those who leave also reduce the demand for domestic products. Emigration of the unemployed shifts the demand for labour again downwards, which implies that at the (by assumption) fixed nominal wage there will be a second round of unemployment.

An aside: Is more labour mobility necessarily better for EMU?

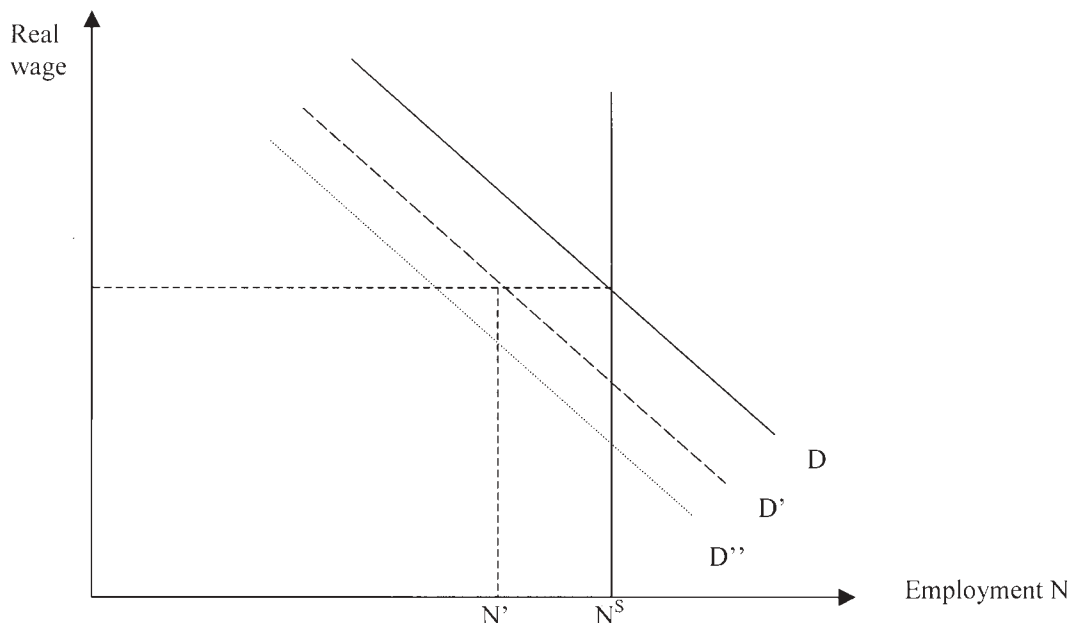
The OCA view of labour mobility as an adjustment mechanism looks only at labour flows as a short-term adjustment mechanism, however, and does not take into account that concentration of industry and hence pronounced core periphery patterns are more likely to emerge when labour mobility is high. But since most studies concur that labour mobility is low in Europe compared to the US (not only across countries, but also across regions within countries (Decressin and Fatàs, 1995), there should be less concentration in Europe than in the US.

Some authors have used this line of thought to arrive at a sort of “catch-22”: as long as labour mobility is low in Europe, EMU is costly because labour mobility is needed to offset asymmetric shocks. As the argument goes, however, if labour mobility were to increase (possibly because EMU comes anyway), concentration would increase and hence the likelihood of asymmetric shocks would also increase, again making EMU costly. In the flip of a coin, the choices are: “heads”, EMU is impossible, or “tails”, it is not desirable. The proper conclusion would seem to be that labour mobility is perhaps less crucial for EMU than previously thought. Although labour mobility allows for a quicker adjustment to shocks, it also favours concentration of industry and hence increases the potential for asymmetric shocks.

Since labour mobility is usually assumed to be important however, it is still useful to take a look at the data which does not always yield the results that are commonly expected.

29. A simple graph can illustrate this idea quite easily. Chart 1 represents the usual model of the labour market: labour supply is fixed at N^s (e.g. a constant share of the total population) and labour demand, D , is the usual function of the real wage (on the vertical axis). Initially equilibrium is attained at the full employment level N^s . An external demand shock is assumed to shift the labour demand schedule to the left, say to D' . If real wages cannot adjust, labour demand drops to N' and there is unemployment equal to $N^s - N'$.

Chart 1: Labour market



30. Apparently the unemployment problem could be solved if the unemployed emigrated until N^s drops to N' . This reasoning, however, neglects the fact that the labour demand curve depends not only on the real wage rate, but also on the level of overall demand. Since the unemployed receive in reality unemployment benefits which allow them to maintain their

spending close to that of the employed, they also contribute to domestic demand as long as they stay at home. If they emigrate, the domestic demand curve for labour will again shift to the left, say to D'' , thus aggravating the fall in employment that occurred in the first round. At the given wage rate, this leads to more unemployment and hence more emigration.

31. While it is difficult to determine *a priori* where this cycle will stop, it is clear that labour mobility can magnify the impact of demand shocks on regional output.

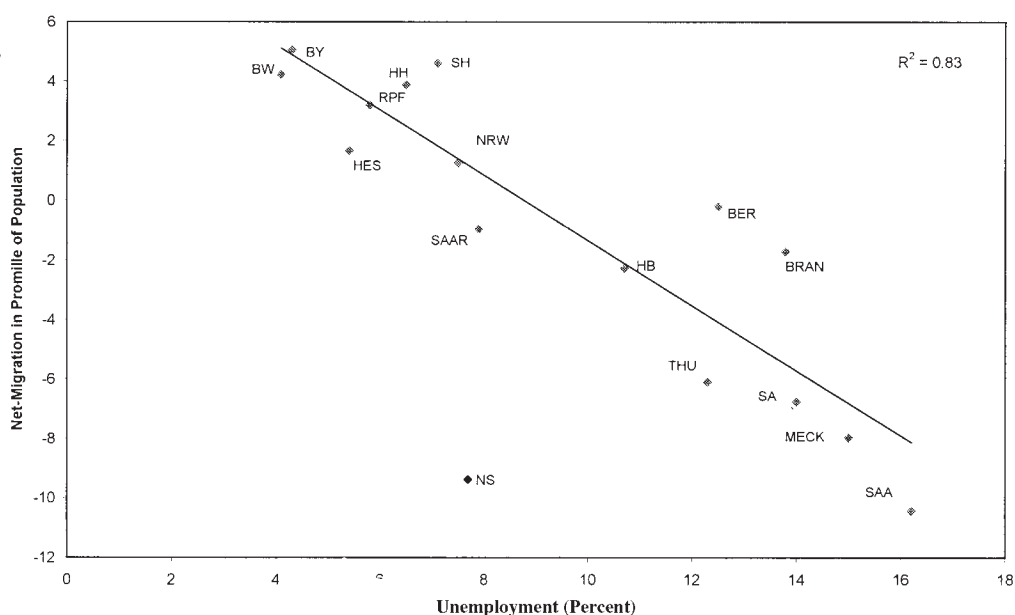
VI. CONCLUSIONS

32. The main argument of this paper is that within the debate about EMU one should not look only at inter-national labour mobility, but also at the difference between inter-national and inter-regional labour mobility. The main empirical finding of this paper in this context is that this difference is much larger for the US than for most EU member countries. Inter-national migration into the EU (especially immigration from third countries) has somewhat declined compared to the early 1990s, so that it now runs at about half the rate of inter-regional migration within member countries, i.e. inter-national migration is definitely smaller, but not of a totally different order of magnitude than inter-regional migration.

33. Some simple sample results on recent data for inter-regional migration within larger member countries show large differences. However, even for the countries in which inter-regional migration responds strongest to regional labour market conditions the strength of the reaction is not so large that one could expect migration alone to have a strong impact on unemployment differences in the short to medium run. Moreover, in some member countries inter-regional migration does not seem to be connected with regional labour markets and hence contributes little to the adjustment to shocks. EMU should thus not be much more difficult to manage than the existing monetary unions in Europe that member states represented up to 1999.

APPENDIX

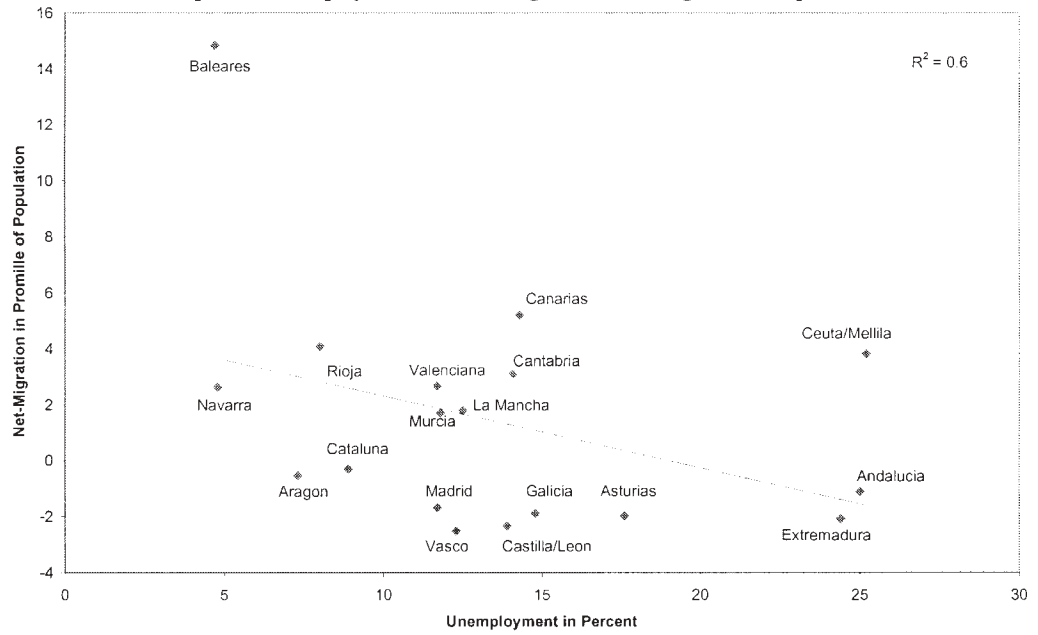
Graph A1: Unemployment and interregional net-immigration in Germany, 2001



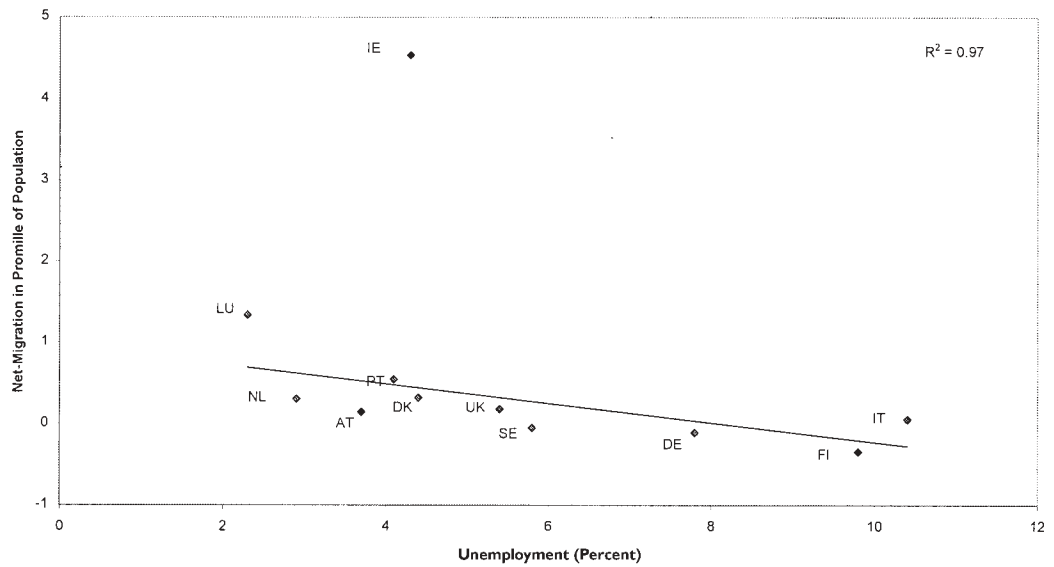
Note: The excessive regional outflow for Niedersachsen can be explained by the refugee camp in Friedland. Inflows are registered as international immigration whereas outflows to other regions within Germany are registered as regional migration. The trend line does not include Niedersachsen.

Source: Statistisches Bundesamt.

Graph A2: Unemployment and interregional net-immigration in Spain, 1999



Graph A3: Unemployment and interstate net-migration in the EU-15, 1999



Source: Eurostat.

Note: The trendline does not include Ireland. Due to missing emigration data the graph does not show BE, GR, ES, FR.

REFERENCES

- Blanchard, O. and L. Katz (1992): "Regional Evolutions", *Brookings Papers on Economic Activity* I, pp. 1-75.
- Decressin, J. and A. Fatàs (1994): "Regional Labour Market Dynamics in Europe", CEPR Discussion Paper No. 1085.
- Ederveen, S. and Bardsley, N. (2002): "The influence of wage and unemployment differentials on labour mobility in the EU: A meta-analysis", CPB, The Hague.
- Eichengreen, B. (1993): "Labour Markets and European Monetary Unification", in: Masson, P.R. and M.P. Taylor (eds.), *Policy Issues in the Operation of Currency Unions*, Cambridge: Cambridge University Press.
- Faini, R. (1994): "Unions, Fiscal Policy and Regional Development", *The Location of Economic Activity: New Theories and Evidence*, CEPR Conference Report (Vigo, 17/19 December 1993), pp. 179-202
- Greenwood, M.J. (1975): "Research on Internal Migration in the United States: A Survey", *Journal of Economic Literature*, Vol. 13, pp. 397-444.
- Greenwood, M.J. (1985): "Human Migration: Theory, Models and Empirical Studies", *Journal of Regional Science*, Vol. 25, pp. 521-44.
- Gros, D. (1996): "A Reconsideration of the Optimum Currency Area Approach: The Role of External Shocks and Labour Mobility", Centre for European Policy Studies, (CEPS) Working Document No. 101.
- Leuvensteijn, M. and A. Parikh (2001): "How Different are Determinants of Population versus Labour Migration in Germany?", *Applied Economics*, No. 9, pp. 699-703.
- Leuvensteijn, M. and A. Parikh (2002): "Internal Migration in Regions of Germany: A Panel Data Analysis", ENEPRI Working Paper No. 12.
- Mundell, R. (1961): "A Theory of Optimum Currency Areas", *American Economic Review*, Vol. 51, September, pp. 657-664.
- Puhani, A.P. (2001): "Labour Mobility: An Adjustment Mechanism in Euroland? Empirical Evidence for Western Germany, France and Italy", *German Economic Review*, Vol.2, No.2, pp. 127-140.

ANDREW HUGHES HALLETT: ASYMMETRIES AND ASYMMETRIC POLICY TRANSMISSIONS IN THE EUROZONE

December 2002

HM Treasury invited Andrew Hughes Hallett to revisit his 1999 paper ‘EMU in Reality: the Effect of a Common Monetary Policy on Economies with Different Transmission Mechanisms’¹ co-authored with Laura Piscitelli, with particular reference to the quotation: “...monetary transmission and asset effect asymmetries ... have the effect of destabilizing the natural (European-wide) business cycle, and of putting the country-specific cycles out of phase with one another ... Comparatively simple asymmetries in transmission mechanisms are condemned to slow down, if not delay convergence”.

1. Optimal Currency Area theory teaches us that, to join a single currency union, an economy needs to satisfy four separate criteria – or to have the independent policy capacity to absorb the disequilibria caused if they are not satisfied. These four criteria are:²

- (a) The partner economies should trade predominantly and freely among themselves.
- (b) There should be a very high degree of factor (labour and capital) mobility between member countries and regions. Recognising that labour mobility has its own costs and limitations, this condition may only be available as a long-term solution to persistent disequilibria in labour markets. If so, labour mobility must be supplemented by sufficient relative wage flexibility in the short term.
- (c) Industrial production should be well diversified within each economy or region. That would imply a high degree of intra-industry trade – as opposed to industrial specialisation and concentration.
- (d) The member economies should not be subject to country-specific shocks; or to institutional, behavioural, or transmission asymmetries. If they do have asymmetric structures or transmission mechanisms, even symmetric shocks will have asymmetric impacts. This condition implies that each economy needs to be, and to remain, broadly “in-cycle” with its partners.

STRUCTURAL ASYMMETRIES AND THE PATTERN OF INTEGRATION

2. Of these four criteria, the European partners satisfy the first: with Britain conducting 49% of her trade within the Euro-zone – and the others more (up to 75% for Belgium or the Netherlands). However if investment income is taken into account, Britain derives only about 41% of her foreign exchange earnings from the Euro-zone (ONS, 2000). That is lower than her partners.

¹ Hughes Hallett, A. and Piscitelli, L. (1999) ‘EMU in Reality: the Effect of a Common Monetary Policy on Economies with Different Transmission Mechanisms’ *Empirica* 26, pp. 337-58.

² See Mundell (1961), McKinnon (1963), and Kenen (1969).

3. A more interesting asymmetry comes from Mundell's emphasis on capital links (Mundell 1973a,b). Capital links may be as important as trade links: a) because they enable international investment to be undertaken where it is most efficient; and b) because they allow countries to pool their short-term financing risks (Asdrubali *et al.*, 1996). Thus, even if there were sufficient factor mobility and structural similarities, trade integration is only a necessary condition for convergence. It is not sufficient because, if your investment partners are a different set of countries, then the financial links may imply a different pattern of shocks and spillovers from those coming from one's trade partners. That would lead to a pattern of incompletely converged cycles. This, arguably, was the root cause of the downfall of the Dollar link in Argentina: the capital/money link being with the US, the trade links being with Brazil and Europe, where the two sets of partners showed divergent cyclical and cost positions.

4. And so it is for Britain, albeit to a lesser extent. She may trade as much with her European partners as with anyone else, but her investment income is 75% from non-EU sources. Moreover foreign investment is roughly one-third of total UK investment. Consequently if the two sets of trading partners move apart, as the US and Europe have done, then a currency link to either party will imply extra costs. Ultimately one has to decide which set of costs will be smaller: a Euro link or a dollar link. Alternatively, a policy of steering a course between the two currencies, might bring lower costs and greater stability in the *trade-weighted* exchange rate.

STRUCTURAL ASYMMETRIES IN THE LABOUR MARKET

5. With respect to the factors of production, capital mobility is certainly available under the single market arrangements. However, the rigidities in Europe's labour markets – reducing both mobility and wage/price flexibility – are legendary. Eichengreen (1992) estimates that intercountry and interregional migration is at least three times lower than in comparable monetary unions such as the USA. More recent estimates (MacLennan *et al.*, 2000; Obstfeld and Peri, 1998) confirm those figures. The UK may have more flexible labour markets than her European partners, but they are less flexible than those in the US.³

6. We have less direct evidence on wage and price flexibility in the European economies. However, Decressin and Fatas (1995) demonstrate that the lack of interregional immigration has meant that country or region-specific shocks have had to be absorbed by labour participation rates. As a result, unemployment has in practice played little role in regulating the European labour markets. That implies wage and price flexibility has largely been absent – an observation consistent with the later work of Blanchard and Wolfers (2000), Ball (1999), Phelps (1994) or Nickell (1997) for example. As a result, unemployment has persisted and wages have failed to adjust to clear the markets.

7. Several papers have set out to analyse how monetary union might affect wage bargaining and market flexibility: Cukierman and Lippi (2001), Sibert and Sutherland (2000) or Soskice and Iverson (1998) for example. But in each case the market structures have been kept fixed, so the question of what incentives actually exist for market reform and whether structural asymmetries would gradually disappear, has largely been ignored.⁴ Against that, many have argued (e.g. Frankel and Rose, 1998) that cyclical convergence will come about because

³ MacLennan *et al.* (2000) estimate annual US labour mobility at 2.8% of the population, but 1.6% in the UK, and 1.23%, 1.07% and 0.5% in Germany, France and Italy respectively. Obstfeld and Peri have even lower figures for Europe, and claim that labour market flexibility is now declining instead of rising.

⁴ It has long been argued that structural reform is a prerequisite for a successful EMU (Delors Committee, 1989). But that argument has largely been based on the empirical and analytic evidence of a negative relationship between (real) wage rigidities and economic performance: Bruno and Sachs (1985), Nickell (1997). The point that matters for this review is whether those rigidities are likely to be removed; or whether the existing structural asymmetries are more likely to get preserved or extended. Paragraphs 8 and 9 show the latter is more likely to happen. For recent evaluations which support that point of view, see Van Bergeijk *et al.* (1999) or Krueger (2000).

economic structures are endogenous. There is more to say about that below. But there is preliminary evidence that EMU has changed wage bargaining and induced some convergence – albeit on a very small scale.⁵

8. On the other hand, the strategic arguments point in the opposite direction. Calmfors (1998, 2001) argues that although money wages may become more flexible in a single currency zone, further labour market reforms are *less* likely if they had been linked to a time inconsistency problem, especially when (as in Europe) the monetary union has been designed specifically to eliminate that kind of problem. There will be less need for such reforms once inside the union – and less desire for them among governments who, with the loss of monetary policy and with the restrictions of the Stability Pact, are more limited in the instruments they can use to stabilise the domestic economy. Most governments would wish to retain rigidities in their labour markets so that they still have some effective instruments (pay roll taxes, employment protection, incomes policies, minimum wage laws, etc.) with which to stabilize their economies.

9. It is still possible to argue that asymmetric shocks would increase the incentive to develop new measures to counter those shocks (Sibert, 1999). But it is hard to see that governments would not use those measures to create asymmetric practices to counter such shocks. And when we test propositions of this kind (see Hughes Hallett and Viegi, 2000), that is exactly what we find. To do away with such practices would mean a higher degree of uncertainty about incomes and employment, and less social welfare provision since payroll taxes and other “social” provisions would have to be cut to provide flexibility in unit labour costs. That would not be acceptable in a Euro-zone that wishes to provide a degree of social insurance. In fact closer integration has typically generated the opposite reaction, as governments and labour organisations have sought to provide employment insurance in an increasingly uncertain world where governments are no longer able to control many of the policy levers that used to stabilise output, employment and growth at home (Agell, 1999).

10. Finally it is *not* correct to say that, because Britain has relatively flexible markets, she could join a less flexible Euro-zone without much cost to herself (indeed might even profit from doing so). In a series of papers⁶ examining the incentives to join a currency union, and the incentives to reform in such a union, we have shown that there are always costs, to *both* sides, to forming a currency union under imperfect market flexibility. Put simply, rigidities in one place spill over to constrain the performance of others. Hence asymmetries in the capacity of labour markets to adjust, asymmetric shocks, or asymmetric transmissions, all cause spill over which damage others (unless price flexibility is perfect). The flexible country would have to do more adjusting than previously since it now has to absorb the problems transmitted by others, as well as its own disturbances. The inflexible economy, meanwhile, will welcome the fact that it can transfer part of its burden of adjustment onto others. That leads to a kind of Groucho Marx theorem. Countries will only want to join a Union with markets more flexible than their own; but they have no incentive to join a Union with markets that are less flexible. Consequently, once in the union the incentives to maintain flexible markets would weaken towards the level of the least flexible.⁷

⁵ Andersen *et al.* (2000)

⁶ See Hughes Hallett and Jensen (2001, 2002).

⁷ This argument is also made by Burda (1998), while Riboud *et al.* (2002) point out that most countries have in fact adopted the least flexible labour market practices in the EU upon joining.

SOURCES OF ASYMMETRIC TRANSMISSIONS

11. I now turn to the asymmetric transmission of certain events or disturbances. Structural and transmission asymmetries are likely to be more important than any asymmetries in shocks: *first* because they imply asymmetric impacts from symmetric shocks. And *second* because, even if the incidence of asymmetric shocks diminishes with convergence to the union average, asymmetric transmissions will still be in place.

12. Surprisingly little work has been done in assessing the likely impact of structural or transmission asymmetries in a currency union such as Europe. Most of the literature is concerned with trying to explain what asymmetries exist between the European economies, and why they exist. The results have been inconclusive in that most studies agree that asymmetric transmissions exist, and that the degree of asymmetry varies over countries. But they disagree over exactly where those asymmetries lie, and how large they are.⁸ In my own work I have used a model which does not assume any particular form of asymmetric transmissions in its baseline, but allows me to impose asymmetry in a few specified places to gauge what the consequences would be for economic performance or cyclical convergence. The particular econometric model used (the IMF's standard multi-country econometric model *Multimod*), therefore offers a vision of what would happen if there were no asymmetries. Then, by varying specific transmission parameters between countries, we can pin-point which asymmetries matter for the transmission of a common monetary policy, and which do not.

13. Why might asymmetric transmissions exist in Europe? First, institutional considerations suggest that differences in pensions, asset ownership and housing, corporate finance, and in the scale of government debt, will generate differences in asset-to-income ratios and the ability of assets to affect expenditure and credit. It is a common observation that the output sensitivity to variations in nominal interest rates is higher in the UK, due to the extent of home ownership and to the availability of consumer credit (MacLennan *et al.*, 2000). In addition, transaction costs are low and housing is an effective collateral, and asset ownership widespread. These differences are on the *demand* side.

14. By contrast, many European economies have fixed-rate financing, especially in the corporate bond market. Their interest rate sensitivity is therefore on the supply side. The UK's output would be relatively insensitive on the *supply* side due to the popularity of equity financing and the lower proportion of bond financing. Most European countries also have 'universal' banking, where banks both finance and hold equity stakes in their client firm. Under such a regime, variations in monetary conditions, asset values and public debt may have somewhat smaller effects on output. Hence the transmission of monetary policy will vary with the industrial structure in each economy (Kashyap and Stein, 1997; Carlino and DeFina, 1998).

15. In addition Cecchetti (1999) argues that, in view of differences in financial structures (i.e. size, concentration and health of the banking system, and the availability of alternative sources of finance), the impact of monetary policy will be lower in the UK than it is in France, Germany or Italy (see Table 2). Thus different legal systems, differences in shareholders' rights, ease of collateralisation and enforcement, and differences in regulation, all lead to the same conclusion – even with a common money (Engel and Rogers, 1996).

⁸ See for example BIS (1995), Dale and Haldane (1995), Britton and Whitley (1997), Ramaswamy and Sloek (1998), Gerlach and Smets (1995), Smets (1995), Kieler and Saarenheimo (1998), Suardi (2001).

THE CONSEQUENCES OF ASYMMETRIC POLICY TRANSMISSIONS

16. By varying the transmission parameters across countries in Multimod, Hughes Hallett and Piscitelli (1999, 2002a) find that asymmetric impacts of a common monetary policy can easily destabilise an economy's business cycle, even where there had been synchronised cycles before. Moreover those new cycles are likely to be diverging, putting the European economies further out of phase with each other. Within that general framework, we find:

- (a) The main asymmetries were caused by differing income elasticities of the demand for money, and by differing asset effects on consumption and aggregate expenditures. Those asymmetries generated persistent "out of cycle" effects because they altered the model's steady state solution. Variations in the interest elasticity of the demand for money also produced divergent cycles; but these cyclical differences tend to die away.
- (b) These country-specific cycles tended to produce a weak core vs. periphery (i.e. France and Germany vs. the UK and Italy) divergence in cycles and performance – confirming the cluster effects of Artis and Zhang (2002).
- (c) Nominal rigidities (wage contracting) do not matter too much if they are broadly similar, but could be disastrous if their incidence differs widely across countries (consistent with the theoretical results in Hughes Hallett and Jensen 2002). However structural rigidities, such as in the Phillips curve, matter a great deal. But asymmetric transmissions will emerge here only in the short run if the long run Phillips curves are vertical (Turner *et al.* 2001). The reason is that, with Phillips curves vertical in the long run, and with each economy returning to that curve with the same (EMU) inflation rate, asymmetric transmissions can only affect the short run variations around the long run Phillips curve. That is comparatively minor. But if structural reforms can affect the long run position of the Phillips curve, then the story is quite different.

17. We then examined whether domestic policy instruments could be used to damp down the domestic business cycles, and bring them back into phase (Hughes Hallett and Piscitelli, 2002a). We found:

- (a) That fiscal policy was no help in this regard since fiscal policy has very little impact when budget constraints are anticipated and effective. That means the automatic stabilisers are not effective in damping down or synchronising cycles.
- (b) If fiscal policy is ineffective, policy makers are likely to turn to wage policies and greater market regulation to stabilize their economies – as we argued above. But two caveats are in order here. Structural reforms could reduce the need for greater regulation in the labour markets by strengthening the effectiveness of an economy's automatic stabilisers. Second, the capacity for regional stabilisation would be enhanced if a system of fiscal transfers could be introduced at the European level.
- (c) Market responses, in the form of small economy-wide risk premia, can help counteract this destabilisation and cyclical divergence. Persistent asymmetries and cyclical divergence may therefore lead to an endogenous weakening of the common monetary policy and regional risk premia - as happened in the US 60 years ago.

18. How do we know these results are right? Do they correspond with what has actually happened since the single currency came into existence?

19. On a simple examination of the numbers, it does appear that the Euro-zone members have been subject to larger, destabilising, and partly divergent fluctuations compared to their pre-euro days. Table 1 gives a quick sketch of the evidence. It is clear that the cycles in the Euro-zone are expanding, both relative to past experience and relative to the UK as an outside comparator. This is most marked in growth rates, but it also appears in unemployment and in the fluctuations in inflation. It is also clear that there is now *divergence* within the euro area: contrast the “core” (France, Germany and Italy), and a better performing “periphery” (Spain, Finland, the Netherlands and Ireland), which are increasingly out of phase with each other. We also see divergence between the UK and the euro area, in that the UK is not subject to the same degree of cyclical fluctuations as her EU partners.

ARE EUROPE’S ASYMMETRIC TRANSMISSIONS CAUSED BY STRUCTURAL DIFFERENCES OR POLICY FAILURES?

20. De Grauwe (2000) has also examined the case of asymmetries in transmission caused by differences in the parameters that transmit the effects of monetary policy onto the real side of the economy. He shows that as those differences increase, then the effectiveness of monetary policy for stabilising output and employment decreases. As a result, the stabilisation efforts made by the ECB will automatically decrease – the central bank will just concentrate on doing what it can do. De Grauwe points out that the ECB could have overcome this difficulty by using more national information in the setting of its policies. But the statutes and declared strategy of the ECB explicitly rules out that prescription. So we can hardly expect it to be followed.

21. Structural reform (greater wage and price flexibility), and more powerful automatic stabilisers, could help restore the stabilising power of monetary policy and hence overcome this difficulty.

22. In the light of the previous paragraph, it is important to be clear whether Europe's transmission asymmetries are due to structural asymmetries, or to asymmetric shocks and policy failures. Demertzis and Hughes Hallett (1998) decompose inflation and unemployment fluctuations in the EU area into their constituent parts: i) policy errors plus asymmetric shocks, ii) structural differences of each economy from the European average, and iii) interactions between those terms. Using a wide range of estimates for the natural rate of unemployment in each economy, we found structural differences to dominate in every case – and by a wide margin. Consequently:

- (a) Europe's problem has been a matter of structural differences – not poor macroeconomic management.
- (b) Asymmetric transmissions are far more damaging than asymmetric shocks.
- (c) Improved macroeconomic management is unlikely to bring many gains. What would make a difference however is structural convergence. That poses a different sort of policy problem; and implies the need for structural reform and flexible markets.

DO TRANSMISSION ASYMMETRIES IMPLY LARGE WELFARE LOSSES?

23. If there are few analyses of the likely impact of asymmetries in transmission, there are even fewer that assess how important the losses in performance might be. I know of three: Nolan (2002), Hughes Hallett and Weymark (2001), and De Grauwe and Piskorski (2001). As the optimal currency area theory and Nolan point out, the first best solution is to form a

currency union of countries that have similar structures and similar shocks – and hence similar transmissions. However, once the first best conditions are broken, it is no longer obvious that you necessarily want to form a union with those most similar to yourself. Consequently, the only way to analyse the potential costs of asymmetric transmissions is to compare the outcomes in a currency union, to the outcomes and average performance levels in the same union when policies are designed for the characteristics of your particular economy. That contrasts what you are actually going to get on average, with what you would have got under your ideal monetary union.

24. Nolan's analysis is based on a Barro-Gordon model with no fiscal policy. Monetary policy may follow either a strictly cooperative framework (this is not what the ECB does); or a policy where the ECB simply targets EU-wide aggregates (the actual EMU). This brings out the "second best" nature of EMU, the cooperative framework being strictly Pareto Optimal. But the differences are relatively small: the losses are equivalent to about 1.1% of GDP, with a range of 0.6% of GDP to 2.1% of GDP. Nevertheless, since the estimates offered by the European Commission (EU, 1990) for the benefits of joining the single currency are also in the range of 1%-1.5% of GDP, this means transmission asymmetries could be expected to wipe out anything between 60% to twice the gains from joining the Euro itself.

25. The Hughes Hallett-Weymark paper covers the possibility of using national fiscal policies to help satisfy the objectives of income stabilisation, redistribution and the provision of public services. But the results are almost exactly the same. In this case, designing a monetary policy with a fully independent ECB with an optimal degree of conservatism born out of the experience of the 1990s, implies losses which also range from 0.5% of GDP to 2.5% of GDP for those countries whose transmission and preference parameters vary from those incorporated into the monetary policy rules of the ECB. Transmission asymmetries again cost between half to twice all the potential gains from the single currency. Britain lies right in the middle of the pack here, liable to lose all of her potential EMU gains because of transmission asymmetries.

26. An important implication of these results, is that national fiscal policies are really of very little help in stabilising the extra volatility caused by transmission asymmetries. The reason is that once you have an effective budget constraint (with or without a Stability Pact), fiscal policy is effectively tied down. The automatic stabilisers are then too weak to provide much protection, so that boom-bust cycles will emerge from the asymmetric transmissions.

27. De Grauwe and Piskorski (2001) conduct a similar exercise with a model of the EU-11 countries, but no fiscal policies. The UK is not represented. The analysis is dynamic, and allows the welfare costs caused by asymmetric transmissions to be cumulated over time. Welfare losses are again measured as the differences between a strictly cooperative (national data) solution, and a common policy (aggregate data) solution. But the results are still very similar. The second best nature of a common policy solution "costs" the average European economy between 2% and 6% in welfare units (roughly 1.5% to 2.5% of GDP). However those costs vary widely over different countries – from gains of 2%-5% in Italy, Germany and Spain, to losses of 5% – 20% for Belgium, France and the Netherlands.

HOW WELL ARE THE EU AND THE UK'S CYCLES CORRELATED?

28. Measuring symmetry in the form of correlations between the cycles of the European economies has proved popular, although only a few studies have included Britain in their analysis. It is also important to remember that high cyclical (or shock) correlations are only a necessary condition for the optimal currency area conditions to apply. Sufficiency requires similar variances as well.⁹

⁹ Hughes Hallett and Jensen (2001).

29. Most analyses take the correlations between the output cycles as their measure of cyclical convergence. Table 3 provides some typical results. These show how the cyclical convergence between the UK and Germany, which was virtually negligible over the pre-EMU period, has been *falling* from a correlation of 0.5 in the 1980s to a negative correlation of -0.32 by 1996. The UK's correlations with the US, meanwhile, have risen from 0.49 to 0.81.

30. Results such as these do not take into account the differences between the real and nominal parts of the cycle, or the differences between demand and supply shocks. For that, the classic references are Bayoumi and Eichengreen (1993, 1997). But their results do not include the UK. A more recent study (Demertzis *et al.* 1998) does include the UK, and finds some correlation between the UK and the periphery group (Greece, Ireland, Italy, Spain, Portugal, Finland and Sweden) on the demand side. But there are no significant correlations with the core countries, or with the supply or monetary shocks of any country. These results are summarised in Table 4.

31. There is an alternative literature which attempts to establish if there is an emerging European business cycle in the EU (Artis and Zhang, 1997; Forni and Reichlin, 2001). These studies also show that there is some evidence of a common cycle in the core countries, but that does not include the UK whose cycle remains out of phase with the Euro-zone (Rubin and Thygesen, 1996; Kontolemis and Samiei, 2000). In fact the UK's cycle may even be diverging from her Euro-zone partners (Barrios *et al.*, 2001).

WOULD THE UK AND EUROPEAN BUSINESS CYCLES BECOME MORE CLOSELY CORRELATED IN EMU?

32. Frankel (1999) and Frankel and Rose (1998) have argued that the optimal currency area properties evolve over time, and that membership of a free trade zone or a currency union will induce a greater degree of convergence between the transmission of shocks. This work is based on an empirical relationship between business cycle correlations and the degree of trade intensity between countries. Using a gravity model, Frankel and Rose find a significant (if small) increase in the correlations between national business cycles as trade intensity increases – the correlation coefficients rise from 0.2 to 0.3 on a sample of data from the OECD countries over the 1970s, 1980s and 1990s. This suggests that the optimal currency area conditions might be achieved endogenously.¹⁰

33. There are three interesting things about these results:

- (a) The correlation increases are rather small.
- (b) These results appear to hold just as well for periods where exchange rates are fluctuating as they do when they are fixed. Hence if there are increasing correlations between cycles, it must be for some secular reason and have little to do with the monetary regime in place.
- (c) They hold for all OECD countries, most of which are not in the Euro-zone. So these results do not appear to have anything in particular to do with Europe or its single market.

34. Another concern is that these results have no theoretical underpinning. So should we expect this kind of result more generally? The answer, using a real business cycle model (see Hughes Hallett and Piscitelli, 2002b), is yes – but only up to a point. In the theoretical analysis, cyclical convergence follows trade integration if:

¹⁰ Frankel and Rose (2002) have extended that idea to suggest that the single currency itself might lead to large gains in national incomes. However, closer examination reveals that that will only hold for small economies with high savings and high taxation (Hughes Hallett, 2002).

- (a) The home economy is small and stable;
- (b) The industrial structures of the home economy and the rest of the zone are similar, and the rest of the zone is open with high value added; and
- (c) Relatively little integration has already taken place.

35. But *divergence* would follow if

- (a) The output shocks were of different sizes, if the home economy is relatively large or volatile compared to the rest of the zone; or
- (b) There are marked differences in industrial structures and if the home economy trades less with the rest of the zone than its partners do; or
- (c) A lot of integration and mutual trade dependence is already in place.

36. As things stand, the UK is more likely to satisfy the last three conditions – which may explain why her economy has performed differently since EMU started. The general implication is that, as a country joins a single currency and single market, it is likely to experience some cyclical convergence to start with (unless it is large, with a different structure or is well integrated already). But as integration proceeds and countries become more specialised, then their business cycles are likely to go out of phase again.

CONCLUSION

37. The message is that asymmetric transmissions are important and may cause more damage than asymmetric shocks. There are institutional and theoretical reasons why such asymmetries would emerge naturally and be sustained (not least by the policy makers in their own interest). There is also empirical evidence to suggest that these asymmetries would lead to welfare losses as large as the gains from the single currency itself.

38. Where the literature has been less successful, is in suggesting ways in which these asymmetries may be overcome. It appears that they will not vanish “endogenously” as integration proceeds. In fact the opposite might happen. Similarly, with the Stability Pact and pressures for a social market economy constraining labour market flexibility, national policies may not be able to help.

39. In such an environment, one possible resolution would be to create a set of independent but coordinated fiscal policies directed at social equality and public services. That would allow a fully independent monetary policy to be retained. But the coordination process would allow it to be combined with fiscal policies in such a way as to minimise (if not eliminate) the country-specific effects. In this way the ECB could retain full instrument independence and shared target independence (full coordination and Pareto optimality do not allow any player to have full target independence anyway). This set up is valuable because, if fiscal policy is slow and uncertain in its impacts, then it pays to set the fiscal framework first and then allow monetary policy to act as a stabilising mechanism.¹¹ This avoids the possibility that the ECB will try to control everything with one instrument (which it cannot do), and then leave fiscal policy to pick up the pieces with short-run stabilisation measures to which it is ill-suited.

¹¹ That is, very much as the Bank of England does now. The advantages of this kind of fiscal “leadership” are analysed in Hughes Hallett and Weymark (2002) and Taylor (2000).

Table 1: Cyclical Developments since the Arrival of the Euro

	Growth (%):				Unemployment (%):			
	1998	2001q1	2002q1	2002q4	1998	2001q1	2002q1	2002q4
Germany	2.2	2.8	-0.4	0.2	9.4	9.2	8.1	10.4
France	3.2	2.9	1.9	1.6	11.8	9.2	8.7	9.1
Italy	1.5	2.5	0.8	2.3	11.9	10.5	9.5	9.1
Spain	4.1	3.9	1.2	2.3	18.8	13.6	10.6	11.3
Finland	5.1	4.9	4.6	2.5	11.4	10.2	9.2	8.5
Neth/lands	3.7	3.3	-1.6	1.2	4.1	2.6	2.2	2.3
Ireland	8.9	7.8	3.1	3.2	7.6	5.6	4.1	4.3
UK	2.6	3.1	0.5	2.2	6.3	5.3	5.2	5.2

	Inflation (% p.a.)			
Germany	0.9	2.6	1.5	1.2
France	0.8	2.2	1.3	1.6
Italy	2.1	2.9	2.3	2.2
Spain	1.8	4.1	2.8	3.1
Finland	1.4	3.4	2.1	1.5
Neth/lands	1.9	2.9	4.8	3.1
Ireland	2.4	6.7	3.4	4.7
UK	3.4	1.1	0.8	1.5

Source: National Statistics, Eurostat

Table 2: Elasticities of Output with Respect to a Permanent Change in Interest Rates (Exchange Rates Fixed)

	Impact Effect	Effect after two years
Germany	0.54	1.41
France	0.46	1.54
Italy	1.11	2.14
Spain	0.35	1.54
UK	0.47	0.91
Sweden	0.95	2.36

Source: Dornbusch et al (1998)

Table 3: GDP Correlations Between the UK, Germany and the US since 1987

	UK	US
1979-86		
Germany	0.51	0.69
US	0.49	
1987-96		
Germany	-0.32	-0.43
US	0.81	
1979-96		
Germany	0.01	0.16
US	0.56	

Source: CEPR(1996)

Table 4: The Correlations between the UK and European Business Cycles 1980-89 /1990-95

Shocks:	Demand	Supply	Monetary
UK with EU-core	0.32/-0.12	0.13/-0.04	- 0.27/0.05
UK with EU-periphery	0.32/-0.13	0.11/0.29	- 0.55/0.09

Source: Demertzis et al (1998)

BIBLIOGRAPHY

- Agell J (1999) "On the Benefits from Rigid Labour Markets: Norms, Market Failures, and Social Insurance" *Economic Journal*, 109, F143-64.
- Andersen T, N Haldrup and J R Sorensen (2000) "Labour Market Implications of EU Product Market Integration" *Economic Policy*, 30, 107-33.
- Artis M and W Zhang (1997) "International Business Cycles and the ERM: Is there a European Business Cycle?", *International Journal of Finance and Economics*, 2, 1-16.
- Artis M and W Zhang (2002) "Membership of EMU: a fuzzy clustering analysis of alternative criteria" *Journal of Economic Integration*, 17, 54-79.
- Asdrubali, P., B. Sørensen and O. Yasha (1996) "Channels of Interstate Risksharing: United States 1963-1990", *Quarterly Journal of Economics*, 111, pp.1081-1110.
- Ball L (1999) "Aggregate Demand and Long Run Unemployment", *Brookings Papers on Economic Activity*, 2 (1999), 189-251.
- Barrios S, M Brulhart, R Elliott and M Sensier (2001) "A Tale of Two Cycles; Cofluctuations between UK Regions and the Eurozone" Discussion Paper 2001/02, Leverhulme Centre for Research on Globalisation and Economic Policy, University of Nottingham.
- Bayoumi T and B Eichengreen (1993) "Shocking Aspects of European Monetary Union" in F Torres and F Giavazzi (eds) "Adjustment and Growth in the European Monetary Union" Cambridge University Press, Cambridge and New York.
- Bayoumi T and B Eichengreen (1997) "Ever Closer to Heaven? An Optimal Currency Area Index for European Countries" *European Economic Review*, 41, 761-70.
- BIS (1995) "Financial Structures and the Monetary Policy Transmission Mechanism", Bank for International Settlements, Basel.
- Blanchard O and J Wolfers (2000) "The Role of Shocks and Institutions in the Rise of European Unemployment: the Aggregate Evidence" *Economic Journal*, 110, C1-33.
- Britton, E. and J. Whitely (1997) "Comparing the Monetary Transmission Mechanism in France, Germany and the United Kingdom: some issues and results", Bank of England Quarterly Bulletin, May 1997, Vol. 37, No. 2.
- Bruno M and J Sachs (1985) "The Economics of World Wide Stagflation" Basil Blackwell and Co., Oxford.
- Burda M (1998) "The Consequences of EU Enlargement for Central and East European Labour Markets" *European Investment Bank Papers*, 3, 65-82.
- Calmfors L (1998) "Macroeconomic Policy, Wage Setting and Employment: What Difference Does the EMU make?" *Oxford Review of Economic Policy*, 14, 125-51.
- Calmfors L (2001) "Unemployment, Labour Market Reform and Monetary Union" *Journal of Labour Economics*, 19, 265-89.
- Carlino G and R DeFina (1998) "The Differential Regional Effects of Monetary Policy: Evidence from the US States" *Journal of Regional Science*, 39, 339-58.
- Cecchetti S (1999) "Legal Structure, Financial Structure and the Monetary Transition Mechanism", *Economic Policy Review*, Federal Reserve Bank of New York, 5, 9-28.

- CEPR (1996) "The Ostrich and the EMU", Centre for Economic Policy Research, London.
- Cuckierman A and F Lippi (2001) "Labour Markets and Monetary Union – a strategic analysis" *Economic Journal*, 111, 541-65.
- Dale S and G Haldane (1995) "Interest Rates and the Channels of Monetary Transmission: some sectoral estimates" *European Economic Review*, 39, 1611-26.
- Decressin J and A Fatas (1995) "Regional Labour Market Dynamics in Europe" *European Economic Review*, 39, 627-56.
- De Grauwe P (2000) "Monetary Policies in the Presence of Asymmetries", *Journal of Market Common Studies*, 38,593-612.
- De Grauwe P and T Piskorski (2001) "Union Wide Aggregates vs. National Data Base Monetary Policies: does it matter for the Eurosystem?" Discussion Paper 3036, Centre for Economic Policy Research, London.
- Delors Committee (1989) "Report on Economic and Monetary Union in the European Community" Office of the Publications of the European Communities, Luxembourg.
- Demertzis M and A Hughes Hallett (1998) "Asymmetric Transmission Mechanisms and the Rise in European Unemployment" *Journal of Economic Dynamics and Control*, 22, 869-86.
- Demertzis M, A Hughes Hallett and O Rummel (1998) "Is a 2-Speed System in Europe the Answer to the Conflict between the German and the Anglo-Saxon Models of Monetary Control?" in S Black and M Moersch (eds) "Competition and Convergence in Financial Markets – the German and Anglo-Saxon Models" Elsevier North-Holland, New York.
- Dornbusch R, C Favero and F Giavazzi (1998) "Immediate Challenges for the European Central Bank" in D Begg and others (eds) "EMU: Prospects and Challenges for the Euro" Basil Blackwell and Co, Oxford.
- Eichengreen B (1992) "Is Europe an Optimal Currency Area?" in H Borner and H Grubel (eds) "The European Community after 1992: The View from Outside" MacMillan and Co, London.
- Engel C and J H Rogers (1996) "How Wide is the Border?" *American Economic Review*, 86.
- EU (1990) "One Market, One Money", *European Economy*, 44, EU Official Publications, Luxembourg.
- Forni M and L Reichlin (2001) "Federal Policies and Local Economies: Europe and the US" *European Economic Review*, 45, 109-134.
- Frankel J (1999) "No Single Currency Regime is Right for All Countries at All Times" *Essays in International Finance*, Princeton University, Princeton, NJ.
- Frankel J and A Rose (1998) "The Endogeneity of the Optimal Currency Area Criteria" *Economic Journal*, 108, 1009-25.
- Frankel J and A Rose (2002) "An Estimate of the Effect of Common Currencies on Trade and Growth" *Quarterly Journal of Economics*, 117, 437-66.
- Gerlach S and F Smets (1995) in BIS (1995).
- Hughes Hallett A (2002) "When Does A Common Currency Increase National Income?" Department of Economics, Vanderbilt University, Nashville, TN.

- Hughes Hallett A and SEH Jensen (2001) "Currency Unions and the Incentive to Reform: Are Market Mechanisms Enough?" *North American Journal of Economics and Finance*, 12, 139-55.
- Hughes Hallett A and SEH Jensen (2002) "On the Enlargement of Currency Unions: Incentives to Join and Incentives to Reform" in R Beetsma and others (eds) "Fiscal Policies, Monetary Policies and Labour Markets: Key Aspects of European Macroeconomic Policies after Monetary Unification" Cambridge University Press, Cambridge.
- Hughes Hallett A and L Piscitelli (1999) "EMU in Reality: the Effect of a Common Monetary Policy on Economies with Different Transmission Mechanisms" *Empirica* 26, 337-58.
- Hughes Hallett A and L Piscitelli (2002a) "Does One Size Fit All? A Currency Union with Asymmetric Transmissions and a Stability Pact" *International Review of Applied Economics*, 16, 71-96.
- Hughes Hallett A and L Piscitelli (2002b) "Does Trade Integration Cause Convergence?" *Economics Letters*, 75, 165-70.
- Hughes Hallett A and N Viegi (2000) "Labour Market Institutions and Monetary Policy in EMU: Do Asymmetries Matter?" Discussion Paper 2979, Centre for Economic Policy Research, London.
- Hughes Hallett A and D Weymark (2001) "The Cost of Heterogeneity in a Monetary Union" Discussion Paper 3223, Centre for Economic Policy Research, London.
- Hughes Hallett A and D Weymark (2002) "Government Leadership and Central Bank Design" Discussion Paper 3395, Centre for Economic Policy Research, London.
- Kashyap A and J Stein (1997) "The Role of Banks in Monetary Policy: a Survey with Implications for EMU" *Economic Perspectives*, Federal Reserve Bank of Chicago, 21, 2-18.
- Kenen P (1969) "The Theory of Optimum Currency Areas: an Eclectic View" in R Mundell and A Swoboda (eds) "Monetary Problems of the International Economy", University of Chicago Press, Chicago, Ill.
- Kieler M and T Saarenheimo (1998) "Differences in Monetary Policy Transmission? A Case not Closed" *European Commission Economic Review*, 81, 819-40.
- Kontolemis Z and H Samiei (2000) "The UK Business Cycle, Monetary Policy and EMU Entry" WP/00/210, International Monetary Fund, Washington DC.
- Krueger A (2000) "From Bismark to Maastricht: the March to European Union and the Labour Compact" NBER Working Paper 7456, Cambridge MA (forthcoming in *Labour Economics*).
- MacLennan D, J Muellbauer and M Stephens (2000) "Asymmetries in Housing and Financial Market Institutions and EMU" in T Jenkinson (ed) "Readings in Macroeconomics" Oxford University Press, Oxford.
- McKinnon R (1963) "Optimum Currency Areas" *American Economic Review*, 53, 717-25.
- Mundell R (1961) "A Theory of Optimal Currency Areas" *American Economic Review*, 51.
- Mundell R (1973a) "Uncommon Arguments for Common Currencies" in HG Johnson and A Swoboda (eds) "The Economics of Common Currencies" Allan and Unwin, London.
- Mundell R (1973b) "A Plan for a European Currency" in H G Johnson and A Swoboda, op. cit.
- Nickell S (1997) "Unemployment and Labour Market Rigidities: Europe vs North America" *Journal of Economic Perspectives*, 11, 55-74.

Nolan C (2002) "Monetary Stabilisation Policy in a Monetary Union: Some Simple Analysis" *Scottish Journal of Political Economy*, 49, 190-210.

Obstfeld M and G Peri (1998) "Regional Nonadjustment and Fiscal Policy" in D Begg, J von Hagen, C Wyploz and K Zimmermann (eds) "EMU: Prospects and Challenges for the Euro", Blackwell and Co, Oxford.

ONS: Office for National Statistics, London (various publications).

Phelps E (1994) "Structural Slumps" Harvard University Press, Cambridge, MA.

Ramaswamy R and T Sloek (1998) "The Real Effects of Monetary Policy in the European Union: the evidence from pooled time series" *IMF Staff Papers*, 45.

Riboud M, C Sanches-Paramo and S Silva-Jauregui (2002) "Does Euroscelerosis Matter? Institutional Reform and Labour Market Performance in Central and Eastern Europe in the 1990s" Social Protection WP 0202, The World Bank, Washington DC.

Rubin J and N Thygesen (1996) "Monetary Union and the Outsiders; a cointegration-codpendence analysis of business cycles in Europe", *Economie Appliquee*, 44, 123-71.

Sibert A (1999) "Monetary Integration and Economic Reform" *The Economic Journal*, 109, 78-92.

Sibert A and A Sutherland (2000) "Monetary Regimes and Labour Market Reform" *Journal of International Economics*, 51, 421-35.

Smets F (1995) in BIS (1995).

Soskice D and F Iverson (1998) "Multiple Wage Bargaining Systems and the Simple European Currency Area" *Oxford Review of Economic Policy*, 14, 110-24.

Suardi M (2001) "EMU and Asymmetries in the Monetary Policy Transmission" Economic Paper 157, DGII, European Commission, Brussels.

Taylor JB (2000) "Reassessing Discretionary Fiscal Policy" *Journal of Economic Perspectives*, 14, 21-36.

Turner D, L Boone, C Giorno, D Meacci, D Rae and P Richardson (2001) "Estimating the Structural Rate of Unemployment for the OECD Countries" *OECD Economic Studies*, 33, 172-216.

Van Bergeijk P, J van Sinderen and B Vollaard (1999) "Structural Reform: the issues" in P van Bergeijk, J van Sinderen and B Vollaard (eds) "Structural Reform in Open Economies: a road to success?" Edward Elgar, London.