DIVERGENT INFLATION RATES BETWEEN MEMBERS OF THE EURO AREA: CAUSES, IMPLICATIONS AND SUSTAINABILITY

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With monetary policy in the hands of ECB, one might expect to observe similar inflation rates among the EU member states. However, it is clearly not the case. This essay by Mark Metze identifies and explores the causes of inflation divergences within the EU, concluding that convergence of inflation rates is unlikely in the nearest future.

Introduction

Inflation[1] differentials within the Eurozone are an omnipresent phenomenon, one that has attracted widespread attention amongst European business and the general public. Above average inflation can lead to the reallocation of investment, bubbles in the property market as currently in Ireland, or a lasting nationwide consumption strike (as seen in Germany) raising unemployment and leaving the country at the verge of deflation in late 2002.

All of the above are short-run developments, which have occurred since the introduction of the Euro in 1999 and are likely to be dampened by the activation of automatic adjustment mechanisms such as lost competitiveness, an appreciation of real effective exchange rates, and drops in aggregate demand (Mortimer-Lee, 1998). Resulting in negative 'equity' situations, reductions/restraints in wage growth or even current account deficits inducing falls in government spending and wages, these developments then correct for national differentials.

The aforementioned short-run implications do, however, leave us alert to the fact that the European type of monetary union spans very differently developed

[1] Inflation is defined as "the persistent rise in the general level the of money prices" while price stability may exist at inflation rates in the range of 0-2 per cent. The Causes of this are composition (choice of items in basket), quality (qualitative improvement of items in basket) and substitution (consumers' purchase of cheaper substitutes than items in basket) biases in the CPI (McAleese, 1997) .

and regulated economies. The operation of almost entirely decentralised[2] fiscal policies and the extremely slow nature of effect characteristic of the above mechanisms of adjustment may bear significant hazards for the future of the currency system and its economies.

In the course of this essay we will take a look at the extent of inflation differentials across the European Monetary Union (EMU), discuss the most common causes of inflation differentials in a monetary union and compare our findings to the European Central Bank's (ECB) analyses of the problem in 1999 and 2003.

Part I: Preliminaries

Empirical Evidence

As pointed out numerously, and somewhat visible from Figure 1 below, the two decades preceding the establishment of the EMU were marked by a significant convergence of inflation rates across the later union states[3] starting from a ten percentage points difference between the highest and lowest national HICP[4] increase in 1980 and arriving at half a percentage point difference in 1997 subsequently increasing back to a two point difference in 1999 (ECB, 1999).

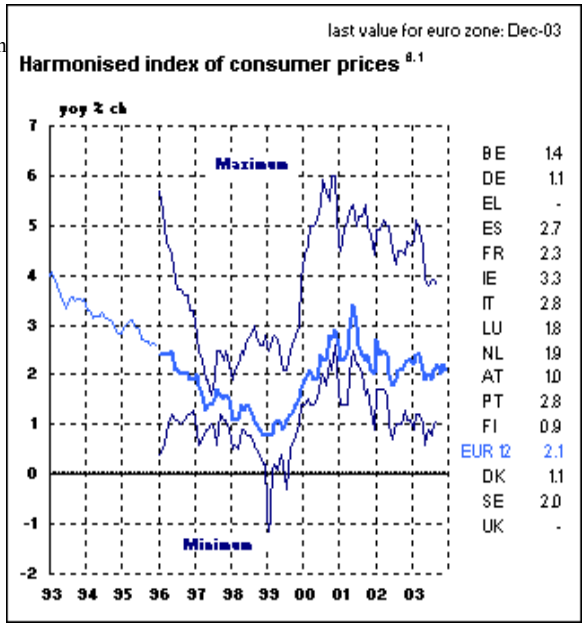
It is, however, also evident from Figure 1 that this convergence did not last and seems to have developed into a significant divergence of up to four percent in the aftermath of Stage Three of Economic and Monetary Union.

[2] The EU's purely re-distributive fiscal strength currently lies at a cap of 1.27% of EU GDP, 1.03% of which were used in the Budget of 2003 and six countries currently opting for a cap of 1% over the next budgetary cycle post 2007.

[3] For example Mortimer-Lee, 1998; ECB, 1999

[4] Using the Harmonised Index of Consumer Prices as a comparison of inflation rates, one should be aware of the fact that weights used in the construction of national HICP components differ taking account of dissimilar patterns of consumption. This could mechanically generate measured differentials across countries even if inflation rates for individual goods were equal (ECB, 37).

Figure 1: Harmon



General Causes of Inflation

Unspecific to monetary unions, a core of classic and strong explanations of inflation prevails. In assessing the causes of inflation differentials, we shall begin by emphasising a simple but very significant distinction: The causes of inflation - amongst which we also find structural factors - should not be confused with structural variables which cause differences in the transmission of the common monetary policy.[5]

Excessive growth of the money supply is clearly the most obvious cause of inflation. Money supply growth will result in inflation whenever it persistently exceeds the growth in real output, *ceteris paribus* (McAleese, 1997). While in a monetary union one may be tempted to expect money supply growth to be a symmetrical phenomenon, given the application of the same discount rate to all

[5] The latter only intensify or weaken inflationary or counter-inflationary impulses rather than cause these. While the former will only be significant and direct causes of inflation 'differentials' if they occur asymmetrically throughout union states, the catalyst mechanisms cause nothing but differentials.

banks throughout the union, we will later see how financial intermediaries[6] and different national propensities to use organised markets[7] cause differences in money supply growth throughout the Union.

Other common causes of inflation are demand and supply-side shocks to the economy, on the other hand, demand-side shocks can originate from bullish business and/or consumer confidence in the future of the private sector, monetary and fiscal impulses or changes in export demand due to increased competitiveness or booming trading-partner economies (Mortimer-Lee, 1998). On the other hand, inflation can originate from a 'demand-pull' process that describes the (almost) inevitable monetary expansion following from excessive government deficits (McAleese, 1997). The fate of the Stability and Growth Pact will determine whether such shocks might possibly cause inflation differentials in the future. Currently, however, the minimal French and German breeches cannot be attributed to having induced such effects.

Supply-side shocks occur if key materials, resources or labour become short. Such conditions tend to persistently raise costs ahead of the level of productivity, thereby resulting in what has been termed cost-push inflation (McAleese, 1997).

Finally, of course, rises in productivity will lead to wage increases over time, thereby raising prices and causing inflation. Inflation will also be created where wage increases are negotiated by strong labour unions that are successful in raising wages by more than productivity justifies.[8]

Part II: Causes of Divergent Inflation Rates in the EMU

Cyclical Factors

Different Stages of the Economic Cycle

Commenting on inflation differentials of only 2%, the ECB in 1999 interpreted that evidence suggested some dispersion of cross-country cyclical

[6] Financial intermediaries - banks and building societies that provide a channel for the transmission of funds between borrowers and lenders. The liabilities so created are non-marketable (Howell and Bain, 2000).

[7] Organised markets, such as stock exchanges, provide the legal and practical framework for the sale and purchase of tradable liabilities (Howell and Bain, 2000).

[8] See McAleese 1997 Such mechanisms are also amplified by the fact that economies consist of sectors which see little if any productivity increases (e.g. schools) and other sectors, which drive economic growth. Wage increases, however, are necessary in both sectors or employment would successively fall in the former and rise in the latter.

positions within EMU generating inflation differentials in the short term. It explained the bulk of such effects would come via impacts on non-traded goods that, in the short-run, depend on domestic rather than external demand (ECB, 1999).

To explain these findings briefly: Different cyclical positions in the monetary union refer most of all to demand-shocks that some countries experience relative to others. Given that some countries experience booms while others experience downturns or even recessions, there are two theoretical possibilities: the shocks are offsetting and thus perfectly asymmetrical, or less than offsetting and thus imperfectly asymmetrical. If shocks were perfectly symmetrical, stabilisation policy of the ECB[9] could be perfectly fair. But to the extent that shocks are asymmetric, the ECB stabilises too little from the respective points of view of the individual member states.[10]

Optimum Currency Area Theory (Mundell, 1961) posits that due to the impossibility of devaluing their currency in a monetary union, single fast-growing economies must pursue deflationary policies that in turn constrain their growth processes (De Grauwe, 2000). This view, however, has come under criticism and it has been pointed out by Krugman (1989) that due to the nature of income elasticities, characteristic of and faced by fast growing countries relative to slow growing countries,[11] the former can continue to grow faster without incurring trade balance problems. Should, however, current account deficits occur, then the higher productivity of capital in faster growing economies attracting investment flows from slow growers makes it possible to finance these (De Grauwe, 2000).

In deriving these conclusions, Krugman's criticism points at the possibility that the automatic adjustment mechanisms, lose their functions in constraining fast-growers due to their characteristic advantages in production and capital attraction. Given the fact that since the start of Stage Three of EMU, asymmetric shocks can no longer be corrected by changes in monetary policy or the exchange rate, such conditions would thus lead to persistent differentials in national inflation rates and

[9] Note that the only function the ECB is willing to accept is the maintenance of price stability 0-2% inflation. It can thus be described as a 'hard-nosed' monetary authority, indifferent about the levels of unemployment.

[10] This theoretical framework is an extension of optimal currency area theory by De Grauwe (2000), one that would evidently suggest countries with significant differences in cyclical positions to refrain from joining a monetary union.

[11] Economic growth implies amelioration of existing products and the development of new products leading to higher income elasticities of exports from fast growing countries relative to income elasticities of slow growing partners. Faster growing countries also tend to have greater income elasticities of exports relative to their income elasticities of imports (De Grauwe, 2000).

possibly to inflationary spirals in those countries for which current interest rates are already too low today.[12]

We should, however, note the ECB's conviction that cyclical movements in the Euro area have become more synchronised over time (ECB, 1999) and, while undoubtedly relevant, do not seem sufficient to explain the observed levels of differentials (ECB, 2003).

The Balassa-Samuelson Effect and the convergence of living standards

As we will see in later parts of this essay (sector structure) there are a number of reasons for which member economies might experience asymmetrical shocks. Clearly, one factor that stands in close conjunction with the hikes of the business cycle, is productivity growth. Growth in productivity, however, can also be the product of a catch-up phase of less-developed countries in a monetary union and thus occur in a longer-lasting and more consistent fashion than commonly resulting from the economic cycle.

The Balassa-Samuelson effect relates inflation differentials between countries in a monetary union to differentials in their productivity growth and can therefore be applied to explain inflation differentials stemming from both cyclical differences as well as catch-up phases. Distinguishing between traded and non-traded (assumed to be wage costs only) goods, the model postulates that competition between monetary union countries assures that price changes of tradable goods as opposed to non-traded goods are equalised. Since differentials in wage changes reflect differences in productivity growth[13] the latter must cause inflationary differentials, if it differs across the union (De Grauwe, 2000).

[12] Mundell emphasises the importance of either relative price and wage flexibility or sufficient mobility of labour in combination with a sufficiently centralised budget considering the reduced efficacy of monetary and exchange rate policy due to monetary union (De Grauwe, 2000). If we accept Krugman's criticism, we are prompted by the realisation that for some fast growers in the EMU neither of these conditions for an optimal currency may apply.

[13] A rise in productivity in the traded goods sector will tend to drive up wages in this sector, but since this increase in wages is matched by increased productivity, it will not give rise to higher traded goods prices. But since labour is assumed to be mobile across sectors, firms in the non-traded goods sector will have no option but to offer higher wages in order to retain their workers. In the non-traded goods sector the increase in wages will not be matched by a productivity increase, thereby raising costs. This increase in costs will lead to an increase in prices in the non-traded sector. (ECB, 1999)

Table 1. Implied inflation differentials to the euro area average due to the BS effect compared with actual HICP inflation differentials between 1995 and 2002

	DE	FR	NL	AT	FI	ES	IT	BE	PT	IE	GR
Estimated BS inflation differential	-0.6	0.1	0.1	0.2	0.5	0.5	0.5	0.6	0.7	1.3	1.6
Actual HICP inflation differential 1995-2002	-0.7	-0.4	0.6	-0.4	-0.3	1.1	0.9	-0.2	1.1	1.2	1.9

Source: ECB

The ECB in both 1999 and 2003 emphasised the importance of the Balassa-Samuelson effect in explaining inflation rate differentials but attaches greater weight to the catch-up nature of productivity, income and price level convergence as opposed to purely cyclical causes in its 2003 report (ECB, 2003). With regard to the implications of catching-up trends, the ECB emphasises its concern to avoid inflation synergies between such 'convergers' and normal performers. From the comparison of Balassa-Samuelson estimates of differentials with actual differentials between 1995 and 2002, it emerges that the effect is most significant for the EMU's formerly least developed countries and interestingly, Germany. We may, however, question whether Ireland's contribution to HICP inflation differentials can any longer be accounted for as the result of convergence. Entirely different to Spain, Portugal and Greece the country's price level currently stands at 12 percentage points above the EU average (ECB, , 2003), i.e. it may still be catching up in terms of productivity (B-S effect) and standard of living, but this process seems at last to have decoupled from convergence in the general price level. If Ireland continues to experience inflationary differentials above the EMU average, Krugman's criticism of Optimal Currency Area Theory and its implications would be a particularly good explanation of this unparalleled performance.

Institutional and Sector Asymmetries

Sector Structure

As one may expect from the principle of comparative advantage, different regions and different countries engage in the production of very different goods and services. If this is the case, asymmetric (country-specific) shocks are more likely to

occur and symmetric shocks across the union are more likely to have asymmetric effects.[14]

There exists, however, no agreement as to whether or not trade integration under the Single European act and furthered by EMU will lead to a converging structure in production resulting in the convergence of sector patterns, increased intra-industry trade[15] and shocks being predominantly symmetric resulting in symmetric effects. While these consequences of trade integration are predicted by, amongst others, the EU Commission, a more 'pessimistic view' is proposed by Krugman (1991). Contrary to the Commissions view, his analysis emphasised that trade integration will lead to the concentration of production (so as to allow for the reaping of advantages from economies of scale) resulting in sector-specific shocks becoming country-specific (De Grauwe, 2000). While this agglomeration effect is blind to national borders[16] and studies like that by Freudenberg et al (1995) have presented evidence of substantial increases in intra-industry trade in the EU between 1980 and 1994, both views are likely to remain significant.[17]

This is also proposed by Dornbusch et al (1998). They examine the transmission of a tightening in interest rates across the union countries. They find that those countries with a large share of Gross Domestic Product (GDP) in construction, capital goods and consumer durables will be more exposed to changes in the interest rate, *ceteris paribus*. These findings designate the countries Luxembourg (cluster of financial services) and Germany (producer of capital goods *par excellence*) as the extremes of an otherwise less country specific effect.

Degrees of Openness and the Transmission of Demand and Supply Shocks

More than sector structure *per se* the degree of openness plays a significant role in the transmission of demand and supply shocks. Generally, the more open an economy (i.e. the greater the value of its exports and imports over GDP) the greater the probability that it will diverge from a monetary union's average inflation. This phenomenon derives from three distinct mechanisms at work in open economies:

[14] See De Grauwe (2000) and Begg et al (1998). Mortimer-Lee finds that economies in monetary unions may react very differently to demand shocks in the way they translate demand impulses into growth and inflation (inflation-growth divide). Using correlation analysis, it is derived that the similarity between Germany and most other EU countries in their reaction to demand shock is much less than for supply shocks (1998).

[15] Intra-industry trade: the exchange of broadly similar goods.

[16] A good example of which being the regional business cluster around the production line of the Smart car at the French-German border.

[17] See European Economics lecture 30/01/2004

Firstly, small open economies (SOEs) - the most open type of economy - given their lack of sufficient economies of scale in crucial industries[18] are above average importers of inflation with the degree of the latter mechanism hinging crucially on the exchange rate *vis à vis* their trading partners[19] (McAleese, 1997).

We shall account for this importance of the exchange rate for open economies in general as the second mechanism driving inflation differentials. If, for example, the ECB tightens interest rates, then relatively more open union countries will experience more of a loss in competitiveness and more of a terms-of-trade[20] improvement (Dornbusch et al, 1998). This is due to the more pronounced effects of exchange rate changes on demand, supply and the price level in open economies.[21]

The reverse mechanism, interest rate reductions, as pursued by the ECB in the past years, will therefore leave more open economies at relatively higher prices and less open economies with lower price hikes. Given the fact that interest rate exposure[22] and exchange rate exposure coincide to greater or lesser degrees for the different union economies, the effects of a change in the interest rate vary throughout EMU.[23]

Thirdly, more open economies are often both more exposed to extra-union Foreign Direct Investment (FDI) and extra-union export demand, a relationship that can contribute to inflation differentials between countries in a monetary union.

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[18] Let us take as an example Ireland and the absence of an auto-industry from the island economy.

[19] The ECB in 2003 also finds that "different levels of exposure to external shocks, such as the marked fluctuations of energy prices and exchange rates over the last four years, also appear to have contributed to the existence of inflation differentials across euro area countries. Due to national differences in the degree of openness concerning extra euro area trade and oil dependency, import prices and inflation have been affected differently across countries. The resulting impact on inflation dispersion should, however, be temporary." (ECB, 2003) .

[20] The terms of trade are the ratio of export to import prices.

[21] For an effective appreciation of its currency, profit margins of exported goods fall as foreign exchange buys less domestic currency, aggregate demand falls and output falls. But since imports prices fall and reduce the price of production, supply shifts outwards leaving the economy at previous output levels but lower prices. Less open economies also experience the re-equilibration to previous output levels through shifts of AD and AS, however, these movements are less pronounced resulting in relatively less marked changes in price levels. (See De Grauwe, 2000)

[22] sensitivity to credit, as described under 'Sector Structure' (III.2.1)

[23] See Dornbusch et al. 1998.

Differences in Financial Systems and the Transmission of Interest Rate Shocks

As we could observe in the context of sector differences and exchange rate exposure, the monetary mechanism[24] may differ significantly between the EMU members.

Dornbusch et al (1998) emphasise, however, that in Europe, differences in the monetary mechanism essentially derive from the role of financial markets and banks. The credit channel, they find, is relevant in the EMU because, especially in continental Europe, banks provide the bulk of firms' credit. So while the Anglo-Saxon financial systems experience large wealth effects as consequence of a rise in interest rates, the continental type may suffer from banks' credit rationing. Affecting national inflation through both real factors and relative money supply growth the systems may produce significant differentials in the former.[25]

Amongst the continental EMU countries that are broadly similar in their use of bank as opposed to capital market credit, significant disparities also lead to differences in monetary policy transmission. Since banks aim at cultivating long-term relationships with customers they are prepared to absorb, at least temporarily, some effects of an interest rate hike (Ibid).

Table 2: Differences in the response of bank lending rates (in basis points) to a 100 basis point rise in central bank interest rates

After:	One Month	One Quarter	Two Quarters	One Year
DE	0	36	53	74
NL	71	95	102	103
BE	63	95	93	93
FR	51	53	55	58
ES	0	100	104	105
IT	19	72	97	106
UK	100	100	100	100

Source: BIS (1995)/Dornbusch et al., 1998.

[24] The monetary (transmission) mechanism refers to the ways in which a change in the interest rates affects an economy. It works along the lines of three channels: The 'monetary channel'/'textbook channel' concerns the transmission of interest rates across financial markets by arbitrage along the yield curve and across financial products affecting the market value of wealth. Secondly, the 'bank lending channel'/'credit channel' operates through the supply of bank loans to borrowers without direct access to financial markets and the third, the "balance sheet channel"/"broad credit channel" operates through the effect of monetary policy on the value of collateral, and thus the availability of credit to those requiring collateral to obtain funds (see Dornbusch et al 1998).

[25] Ireland, once more, appears to be an outlier due to firms' greater use of capital markets as source of credit.

Since the degree of absorption depends crucially on the competitiveness prevalent in the national banking sectors, differences are still significant, but consolidation is ahead. So while bank responses to a rise in interest rates varied markedly in 1995 and Germany remains the EMU country with the greatest bank competition per square kilometre (The Economist, 2003) developments point at consolidation. While the G10 *Report on Consolidation in the Financial Sector* (2001) finds that, "the euro has accelerated the speed of financial market integration in Europe," joint ventures and takeovers currently seem imminent in European banking. According to the report and in line with current events, consolidation is likely to reduce competition across the union and lead to a fall in the disparities in the response of bank lending rates and inflation differentials.

A third cause of inflation differentials rooted in the structure of the financial systems stems from differences in legal frameworks. By granting a greater degree of protection to banks extending mortgages, some European legal systems make lending easier by reducing the percentage of collateral required for borrowing, leading to the very different transmission of shocks throughout the union and thus differentials in inflation records (De Grauwe, 2000; Dornbusch et al, 1998).

Procedures for Pay Negotiations and Productivity Differences

As introduced previously, strong labour unions can raise wages by more than productivity increases. Hence, if union degrees of centralisation and strengths differ between euro zone countries, inflation differentials are likely to result. According to De Grauwe (2000), countries with regional labour unions contribute more to inflation[26] while perfectly centralised and perfectly decentralised unions are less likely to do so.[27] Equally important, a correlation of growth in real wages between 1987 and 1997 and trade union membership by Mortimer-Lee (1998) produces a clear and positive relationship between both variables. It emerges that the Eurozone countries with the lowest average real wage growth are the Netherlands and France (0.5 and 0.9% per annum), while Finland is most unionised and experienced annual real wage increases of 2.4%. Contrary to such findings, the Solow-McDonald model, predicts a convergence of labour unions' wage demands and unemployment tolerance in a monetary union due to the introduction of a centralised monetary policy (De Grauwe, 2000). Theory here, however, is not (yet) verified by actual developments. The ECB in its 2003 report highlights that "the

[26] If unions bargain locally there exists a free-rider problem and thus unions do not exercise wage restraint.

[27] If unions are perfectly centralised, they will take into account the inflationary effect of wage increases. Perfectly decentralized unions (unions at the firm level) will exercise restraint since wages have direct impact on the employment situation of their members by affecting the competitiveness of the firm.

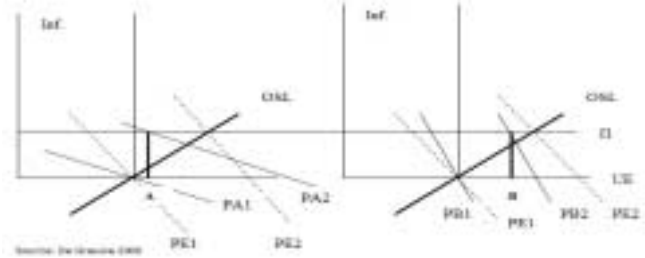
observed diversity in inflation rates since 1999 is mirrored by a considerable diversity in profit margin changes and unit labour cost (ULC) developments." It finds profit margins to be the dominant explanation for inflation differentials for Belgium, Spain, Greece, France, Ireland and Italy while ULCs are important for Portugal, Luxembourg, the Netherlands, Austria and Germany.[28]

Should the Solow-McDonald model be verified at later stages and inflation differentials continue, the outcome would be non-optimal, leaving countries with lower productivity growth and/or above average inflation without yet another instrument available for the correction competitive disadvantages (De Grauwe, 2000).

Labour Market Rigidities

Labour markets across Europe are differently regulated while labour mobility between EMU members is still very low. Where two union countries differ in their labour markets' degree of rigidity, the ECB's reaction (monetary policy to achieve optimal euro area inflation (Π) at the intersection of the optimal stabilisation line (OSL), with the post shock EMU-Phillips curve, PE2) to a symmetric shock (equal shifts in national Phillips curves PA and PB) will initially produce equal inflation rates but different national unemployment trade-offs (De Grauwe, 2000). Since unemployment reactions differ (A, B) this will cause asymmetrical changes in other real factors between the countries and ultimately translates into inflation differentials.[29]

Figure 2: Labour Market Rigidities



[28] We should note the fact, that this pattern does not mirror the characteristic influence of labour unions as described by De Grauwe (2000) and as found by Mortimer-Lee (1998).

[29] Slopes of 'National' Phillips curves (PA and PB) differ according to the degree of labour market rigidity: The more rigid a country's labour market the steeper its (short-run) Phillips curve since employers are relatively less capable to react to inflationary surprises by firing employees.

Policy

Fiscal Policies

Since under EMU, one monetary policy must now fit all, fiscal policy, from both Keynesian[30] and Monetarist[31] perspectives, has increased in importance. The fact that under EMU the crowding out effects - be they partial or complete - will be spread throughout the entire euro zone as opposed to only those countries pursuing expansionary policy alone may rise the efficacy of fiscal activism (Mortimer-Lee, 1998). If applied in accordance with the national economic cycles only, fiscal policy could in this way reduce inflation differentials and thereby contribute to more convergence.

The breach of the European Stability and Growth Pact by France and Germany should, nonetheless, have caused mixed feelings with Monetarists (seeing an increasing likelihood of monetary union failure ahead) and Keynesians (expecting some moderation of these dangers). Enthusiasm about fiscal policy is also dampened by its extremely slow nature of effect. The common two-year period it takes to affect the economy is also a strong indication as to why current inflation differentials cannot yet stem from the recent breaches.

Conclusion

In the course of this essay we have taken a look at cyclical, structural and policy-triggered causes of inflation differentials in a monetary union and have linked the first two of these three broad categories to the divergence in the Eurozone. We have seen that - depending on conditions - a variety of direct and catalyst factors can be the cause of such developments, an understanding that acknowledges the peculiar role of the ECB as a policy maker squeezed between its 'hard-nose' Bundesbank legacy and the apparent divergence of its members.

We found that the Balassa-Samuelson effect of normal and catch-up growth is a key source of inflation divergence, specifically in the case of the strongest

[30] Depicting the LM curve as positively sloped, J.M. Keynes suggested government spending as adequate reaction to demand deficiency and the resultant output gaps (difference between potential and actual GNP resulting in unemployment). By increasing expenditure, government would shift the IS schedule to the right and thus increase output and interest rates. For a detailed discussion see Blanchard 19 chapter 6 and SMG chapter 11

[31] Based on the assumption of a vertical LM curve, Monetarism depicts fiscal expansion under independent central banks, i.e. in the absence of accommodating monetary policy, as ineffective tool, raising interest rates rather than output. Fiscal restraint, however, is regarded as highly efficient as it reduces interest rates and thus stimulates consumption and investment. For a detailed discussion see Blanchard (2000).

outliers. Its explanatory power does, however, vary markedly across the Eurozone with 'cost chain' patterns being equally inconsistent.

Finally, we must conclude that as long as dissimilarities in the labour market regulations, labour power and financial systems persist, inflation rates are unlikely to converge given the significantly different structures and orientations of the EMU economies.

Bibliography

Blanchard, O. (2000), *Macroeconomics.* 2nd ed. Upper Saddle River, NJ: Prentice Hall.

Center for Economic Policy Research (2004), "Industrial Location, The Labour Cost–Product Quality Nexus." [Online]. *Centre for Economic Policy and Research*. Available from: <http://www.cepr.org/pubs/bulletin/meets/2273.htm>

De Grauwe, P. (2000), *Economics of Monetary Union*. 4th ed. Oxford: Oxford University Press.

Dornbusch, R. et al. (1998), "Immediate challenges for the European Central Bank" In: *EMU: Prospects and Challenges for the Euro*, Begg, D. et al. (eds.), Oxford: Blackwell Publishers.

European Central Bank (1999), *Monthly Bulletin: October 1999*. Frankfurt: ECB. Available from: <http://www.ecb.int>

European Central Bank (2003), *Inflation Differentials in the euro area: potential causes and policy implications*. Frankfurt: ECB. Available from: <http://www.ecb.int>

European Commission (2004), *European Economy.* Available from: <http://europa.eu.int>

Freudenberg, M. et al. (1995) "Intra-Industry Trade and the Single Market: Quality Matters." *Economic Policy Research.* Discussion Paper 1959.

Group of Ten (2001), *Report on the Consolidation of the Financial Sector: January 2001*. Paris: OECD. Available at <http://www.oecd.org>

Howells, P. and Bain, K. (1992), *The Economics of Money, Banking and Finance.* Addison: Wesley Longman.

Krugman, P. (1989), "Differences in Income Elasticities and Trends in Real Exchange Markets." *NBER Working Paper*, (2459).

Krugman, P. (1991), *Geography and Trade*. Cambridge:MIT Press.

McAleese, D. (1997), *Economics for Business*, London: Prentice Hall.

Mortimer-Lee, P. (1998), "Can Euroland work with one interest rate?' Mimeo.

Mundell, R. (1961), "A Theory of Optimal Currency Areas." *American Economic Review*, Vol. 51.

Temperton, P. (ed.) *The Euro.* Chichester: John Wiley and Sons.

Shaw, G. et al. (1997), *Macroeconomics: Theory and Practice in the UK.* 3rd ed. Oxford: Blackwell Publishers.