FACTOR MOBILITY, TRADE AND «REGIONAL» ECONOMIC DIFFERENCES IN THE EUROPEAN UNION: WHAT STORY SHOULD WE TELL OUR GRANDCHILDREN? (*)

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Introduction

In orthodox neoclassical theory, regional differences in levels of per capita income and unemployment are narrowed by the processes of factor mobility and trade. Conventional neoclassical growth theory also predicts the long run convergence of per capita incomes across regions and countries, with all economies converging on a common long run steady-state growth of labour augmenting technical progress. Technology is treated as a public good. By contrast, there is a large heterodox body of literature which argues that regional economic differences are not necessarily narrowed by factor mobility and trade; and now neoclassical growth theory is challenged by «new», endogenous growth theory which predicts divergence, or only conditional convergence, by relaxing the (always dubious) assumption of diminishing returns to capital, so that the ratio of saving or investment to GDP also matters for long run growth. Where does the truth lie? What story should we tell our grandchildren? More importantly, what model should policy makers think in terms of when entering into Customs Unions, or common currency areas with other countries, which allow for the greater freedom of trade and the free mobility of factors of production? What story one believes has implications for the predictions of what is likely to happen to «regional» differences within the European Union (EU) with the implementation of full economic and monetary union (EMU) from 1st January 1999.

I will argue that whether a region or country gains relative to others with the general freeing of factor mobility and trade depends first on the nature and strength of factor movements; second, on the structure of production and the demand characteristics of goods, and thirdly on the balance of payments (or monetary) consequences of the freeing of trade.

First of all, however, let us rehearse the neoclassical story. Take two regions (A and B) both at the same level of development, and then assume that one region (say A) suffers an adverse shock which raises unemployment and reduces wages. Labour migrates from A to B in response to differences in opportunities

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(*) This paper is based on a lecture given at the Technical University of Lisbon, 15th January 1999.

which is supposed to lower unemployment and raise wages in A, and to raise unemployment and lower wages in B, leading to equality. Capital, by contrast, is assumed to «migrate» from B to A in response to a higher rate of return on capital where wages are lower, thus reinforcing the equilibrating tendency. It is immediately obvious that all this is very general and static, and a number of qualifications need to be made. First, migration is usually a very selective process which can have serious detrimental effects in the region of origin and confer positive externalities in the regions of destination (see Fagerberg, Verspagen and Caniels, 1992). Secondly, migration not only affects supply, it also affects demand. When labour moves into a region it demands goods and services which adds to labour demand, and when labour leaves a region the demand for output falls. The supply and demand for labour are *interdependent*. Thirdly, and a related point, the (expected) rate of return on capital is affected by demand as well as by the cost of labour. Capital is just as likely to flow to high wage regions to which labour is migrating as to low wage regions where investment opportunities (at least for the provision of local goods and services) are diminishing. In short, factor movements may not be equalising, as Myrdal (1957) and Hirschman (1957) tried to teach us a long time ago. On the contrary, they may be disequilibrating through a process which Myrdal first coined «circular and cumulative causation», which is nothing more than the idea of virtuous and vicious circles based on positive and negative feedback mechanisms ([1]). The proposition applies to both regions within countries and between countries, although there are likely to be differences in the strength of migration and the characteristics of migration in the two sets of economies.

In the static neoclassical equilibrium model, trade is also equilibrating. In the absence of factor mobility, trade acts as a substitute, with poor, low wage regions specialising in relatively labour intensive goods, and rich, high wage regions specialising in relatively capital intensive goods. The returns to factors of production will equalise. All this assumes that labour productivity is the same across regions, and that free trade does not disturb the assumption of full employment. Two major factors could cause unemployment: firstly, a limit to employment in diminishing returns activities, and secondly balance of payments constraints on demand if the balance of payments consequences of trade are not self-rectifying.

Another strand of the neoclassical story which emphasises equilibrium and convergence is neoclassical growth theory, which has recently been challenged by «new», endogenous growth theory, but had already been challenged by economists in the past, most notably by Kaldor (1957, 1961) in his various growth models which introduced a technical progress function to replace the neoclassical

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([1]) Hirschman used the term «polarisation effects».

production function and dropped the assumption of diminishing returns to capital. There are three basic predictions of the conventional (Solow, 1956) neoclassical growth model:

a) First, the steady state *level* of per capita income depends positively on the savings/investment ratio, and negatively on the rate of population growth;

b) Secondly, in the steady state, the long run growth of output is determined by the rate of growth of the labour force in efficiency units (i. e. the rate of growth of the physical labour force plus the rate of labour augmenting technical progress) and is *independent* of the savings-investment ratio because a higher level of saving and investment is offset by a higher capital-output ratio (or a lower productivity of capital) owing to the assumption of diminishing returns to capital; and

c) Thirdly, that given the same tastes and technology across regions, and the assumed inverse relation between the level of capital per head and the productivity of capital, poor regions will grow faster than rich regions, thus leading to the convergence of per capita income across regions (unconditional convergence as it is called in the «new» growth literature).

We see from this brief introduction that orthodox neoclassical theory is obsessed with the notions of equilibrium and convergence; with the presumption that free trade and the free mobility of the factors of production will always benefit poor regions and countries relative to richer regions and countries, and regional economic disparities will narrow. Three issues then arise. First, how does the neoclassical story stand up to empirical scrutiny? Secondly, if it doesn't, what are the forces that may perpetuate divergence? Thirdly, what will be the likely regional consequences of EMU? The remainder of the paper addresses these three issues.

Convergence or divergence across countries and regions?

Countries

First of all, if we think of regions as countries, what does the international evidence suggest? Neoclassical growth theory predicts unconditional convergence, but it was clear long before the advent of «new» growth theory that there had been no narrowing of the international distribution of income, at least in the post-war years. The growth of income per head has been as high (if not higher) in

23

rich countries as in poor countries, leaving the Gini ratio for the world distribution of income virtually unchanged. The assumptions of neoclassical growth theory, however, were always so unrealistic that there could never be the presumption of *unconditional* convergence. It is simply not true that preferences and technology are the same across countries, giving the same ratios of saving and investment to GDP and the same production function. On the latter point, it was always foolish to assume, as Kaldor pointed out in several different contexts, that the productivity of capital would be lower in capital-rich countries than in capital-poor countries, therefore giving a lower rate of growth in rich countries for the same ratio of output invested. Outside of the neoclassical paradigm, the amount of investment always mattered for long run growth long before the invention of endogenous growth theory. Two quotes from Kaldor will illustrate:

> As regards the process of economic change and development in capitalist societies, I suggest the following «stylised facts» as a starting point for the construction of theoretical models [...](4) steady capital-output ratios over long periods; at least there are no clear long-term trends, either rising or falling if differences in the degree of capital utilisation are allowed for. This implies, or reflects, the near identity in the percentage rate of growth of production and of the capital stock — i. e. that for the economy as a whole, and over long periods, income and capital tend to grow at the same rate [Kaldor, 1961].

and:

> A lower capital-labour ratio does not necessarily imply a lower capital-output ratio — indeed, the reverse is often the case. The countries with the most highly mechanised industries, such as the United States, do not require a higher ratio of capital to output. The capital-output ratio in the United States has been falling over the past 50 years whilst the capital-labour ratio has been steadily rising; *and it is lower in the United States today than in the manufacturing industries of many underdeveloped countries* [emphasis added]. Technological progress in the present century led to a vast increase in the productivity of labour, but this was not accompanied by any associated reduction in the productivity of capital investment [Kaldor, 1972].

Kaldor is the true progenitor of «new» endogenous growth theory (see, also, Palley, 1996). Given that the capital-output ratio (K/O) may be expressed as the ratio of the capital-labour ratio (K/L) and the productivity of labour (O/L), *anything* which increases the productivity of labour in the same proportion as the capital-labour ratio as countries get richer will keep the productivity of capital unchanged.

24

«New», endogenous growth theory has chosen to concentrate on externalities to R&D expenditure (Romer, 1986) and education (Lucas, 1988), but there are several other mechanisms that will raise labour productivity in the course of growth and capital deepening, including learning by doing, embodied technical progress, micro and macro increasing returns — all mechanisms that have been discussed in the growth and development literature for centuries, going back at least to Adam Smith in 1776 [see also, Young (1928) and Verdoorn (1949)].

In the tradition of «new» growth theory, the test of the neoclassical growth model and unconditional convergence is to take a cross section of countries and to regress the growth of per capita incomes over a given period on the initial level of per capita income. A negative sign indicates poor countries growing faster than rich countries [or beta (β) convergence] (²). Taking large samples of rich and poor countries shows no evidence of β convergence, although there is some evidence of (unconditional) convergence clubs for certain (homogenous) groups of countries over certain time periods. One of the first studies in this field was by Barro (1991) who took 98 countries over the period 1960 to 1985. There is no significant negative relation between the growth of per capita income and the initial level of per capita income, but the model is then augmented to allow for differences in human capital formation proxied by school enrollment rates. With this additional variable in the equation, the sign on the initial per capita income variable turns significantly negative. For Barro, this rehabilitates the neoclassical model i. e. there *would be* convergence *if only* countries had the same level of human capital formation (³). It should be pointed out at this stage, however, (because the interpretation of other studies is also affected) that a negative sign on the per capita income variable indicating conditional convergence is not necessarily support for the neoclassical assumption of diminishing returns to capital. The negative sign could be picking up the effects of «catch-up», or the effect of resource shifts from low productivity agriculture to higher productivity industry in poor countries, and both phenomena are conceptually distinct from the shape of the production function (⁴). Further large sample studies by Mankiw, Romer and Weil (1992); Knight, Loayza and Villanueva (1993), and Barro and Wha-Lee (1993) also show no evidence of unconditional convergence, but evidence of conditional convergence when other factors affecting the growth of output per head are allowed for such as political

(²) It should be noted that beta convergence does not necessarily imply a narrowing of the dispersion of per capita incomes because dispersion can be affected by the behaviour of outlying observations (i. e. beta convergence does not imply sigma convergence).

(³) It should mentioned that the Barro study excludes key variables such as the investment ratio and population growth which might have altered thes results.

(⁴) I have to say on this in Thirlwall and Sanna (1996).

instability; government activity; market distortions, and trade variables (for a survey of evidence, see Thirlwall and Sanna, 1996). Levine and Renelt (1992) and Levine and Zervos (1993) show, however, that in all these cross section equations estimated, only four variables are really robust in the sense that their significance is not affected when other variables are added to the equations; they are: initial per capita income, the investment ratio, education and population growth. All other variables are «fragile». The most recent study I have seen which illustrates well the points made above is shown in table 1 below.

TABLE 1

Explaining growth of per capita GDP, 1960-88

	Unconditional divergence	Conditional divergence	The richer accumulate faster	
	Average growth of GDP per capita	Average growth of GDP per capita	Investment level	Primary school enrollment
Effect of:				
Initial level of GDP per capita relative to leader	0.40	− 0.32	4.43	4.57
Average level of investment.............	−	0.07	−	−
Average enrollment in primary school	−	0.03	−	−

Source: Lant Prichett, «Divergence, Big Time», unpublished, World Bank, 1995.

The study takes 117 countries over the period 1960-88. Column 1 shows no evidence of unconditional convergence because the coefficient of 0.40 is positive. Column 2 shows the coefficient turns negative once differences in the level of investment and schooling are allowed for. Columns 3 and 4 show how investment and schooling are positively correlated with the level of per capita income.

Regions

Now let us consider the evidence across regions within countries (including the European Union as a single economy). There are examples where free trade and factor mobility do seem to be associated with a narrowing of regional differences in economic welfare. The most spectacular case seems to be the

United States where Barro and Sala-i-Martin (1992) show that there has been a process of regional per capita income convergence going on over the last hundred years. Taking personal income data, they find an inverse relation across US regions between the average growth of per capita income over the period 1880-1988 and the initial (1880) level of per capital income, with a correlation coefficient of − 0.93. Only two sub-periods, 1920-30 and 1980-88, show evidence of divergence. Using Gross State Product over the period 1963-86 shows a similar inverse relation across 48 States, although the correlation coefficient is smaller and there is more instability between the various sub-periods. This disappears, however, when the sectoral composition of State output is allowed for. Both income and product data suggest convergence at the rate of approximately 2 percent per annum.

In Europe, the evidence is more mixed. Across the regions of Europe, there is evidence of per capita income convergence over the long period 1950 to 1990, but the process may have stopped in the 1980s. On the other hand, regional productivity levels continued to converge in the 1980s, but at the expense of unemployment. Regional unemployment rate differences both within Europe as a whole, and within individual countries, have remained remarkably stubborn over a long period. Barro and Sala-i-Martin (1991) take 73 EU regions over the period 1950-85, and find convergence of regional per capita incomes at the rate of 2 percent per annum. The study has been criticised by Armstrong (1995a), however, on the grounds that the GDP data are expressed in current prices and exchange rates, and only regions in the seven most prosperous EU countries are considered [5]. Armstrong expands the data set to include seven Spanish regions, three Greek regions and the countries of Ireland, Portugal and Luxembourg as separate «regions», and converts the GDP statistics into constant (1985) prices and exchange rates. Also extending the time period to 1990, he finds the rate of convergence to be considerably slower than 2 percent per annum, and virtually non-existent in the 1980s. Convergence is confirmed, although proceeding at different rates, taking the coefficient of variation of GDP per capita across 85 regions of the EU for selected years (Armstrong 1995b) — see table 2. This is a measure of what is called sigma-convergence (σ), and β convergence is a necessary (although not a sufficient) condition for σ convergence. The data shows substantial narrowing of per capita incomes between 1950 and 1970; slower convergence between 1970 and 1990, and not much change at all between 1975 and 1992 measured by gross value added at market prices.

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[5] Armstrong also points out that the 73 regions do not·coincide with any of the standard definitions of regions used by Eurostat — but, of course, any definition of a «region» is arbitrary.

27

TABLE 2

Coefficients of variation of GDP per capita: 85 EU Regions 1950-1992

	Coefficients of variation
a) Gross Value Added at factor cost:	
1950	0.4568
1960	0.4212
1970	0.3671
b) Gross domestic product at market prices:	
1970	0.3701
1980	0.3509
1990	0.3097
c) Gross value added at market prices:	
1975	0.3181
1980	0.3231
1985	0.3233
1990	0.2991
1992	0.3005

Source: Armstrong (1995b).

Paci (1997) takes per capita income and labour productivity across 109 regions in 12 EU countries over the period 1980-1990, also distinguishing between the three sectors of agriculture, industry and services. He finds no evidence for β or σ convergence of per capita income, but strong evidence for *b* and *s* convergence of productivity levels. Sigma convergence is shown in figure 1. The difference in results is accounted for by differences in the rate of unemployment and participation rates between regions which affects the level of per capita income, but not productivity. Part of the convergence in productivity is the result of the shift from agricultural to industrial and service activities, because in the former there is no evidence of convergence while in the latter two sectors there is.
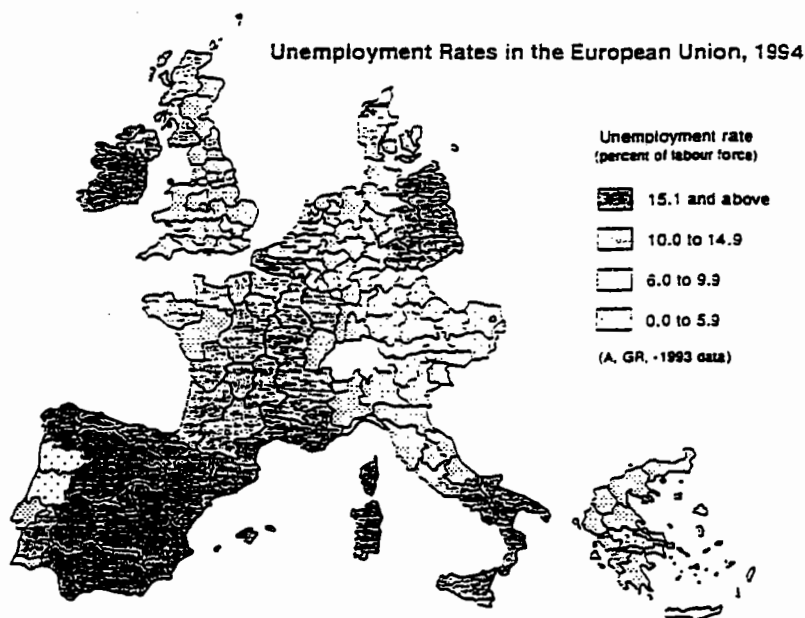
FIGURE 1

Sigma convergence across European regions
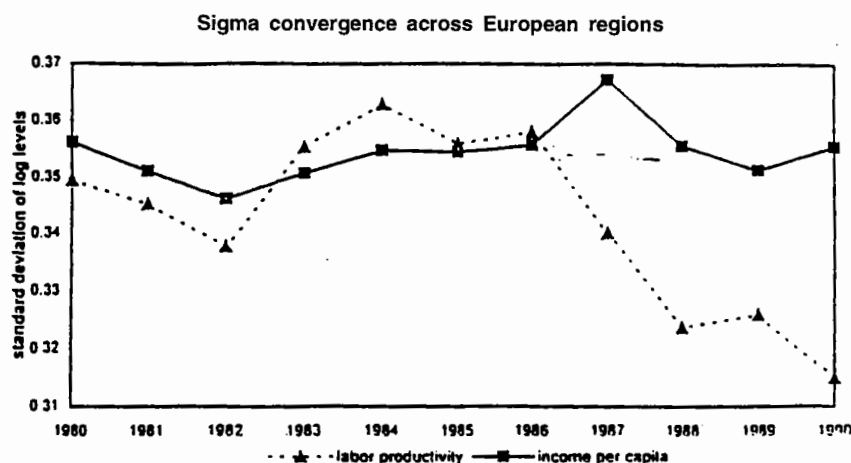
Source: Paci (1997)

Fagerberg and Verspagen (1996) reach similar conclusions regarding per capita income, at least for the 1980s. They take 70 regions in six EU countries and show convergence up to 1980, but not thereafter. For the period 1957-70, the rate of catch-up is estimated at 4.3 percent per annum; for the period 1970-90, 2.4 percent per annum, but for the period 1980-90 there was no significant catch-up. The authors argue that the scope for convergence is not exhausted, but other factors pushed towards divergence, particularly differences in unemployment and in research and development (R&D) effort between industrial and agricultural regions. Indeed, it appears to be the case from a further study by Fagerberg, Verspagen and Caniels (1996) that regional differences in per capita income are systematically related to differences in unemployment rates. They take 64 regions in Germany, France, Italy and Spain over the period 1980-90, and find that growth in poor regions is hampered by unfavourable industrial structure and weak R&D effort. Employment in poor regions grew faster, but so did labour supply, preventing a reduction in the rate of unemployment. There is evidence of conditional convergence, but only after allowing for differences in industrial structure, R&D effort, population density and migration. Interestingly, labour migration is found to have a strong positive impact on per capita income growth, indicating that migration was disequilibrating during this period. The policy implications are that the predominance of agriculture is a barrier to growth in poor regions, mainly because the scope for scale economies and R&D is less than in industry. Faster growth requires structural change in favour of industrial activities, but this requires, in turn, the appropriate physical infrastructure and the provision of human capital — the factors now stressed by «new» growth theory.

Turning to regional unemployment rates across Europe, the pattern is shown in figure 2.

29

FIGURE 2

Regional unemployment across the European Union, 1994

Unemployment Rates in the European Union, 1994

Unemployment rate
(percent of labour force)

15.1 and above

10.0 to 14.9
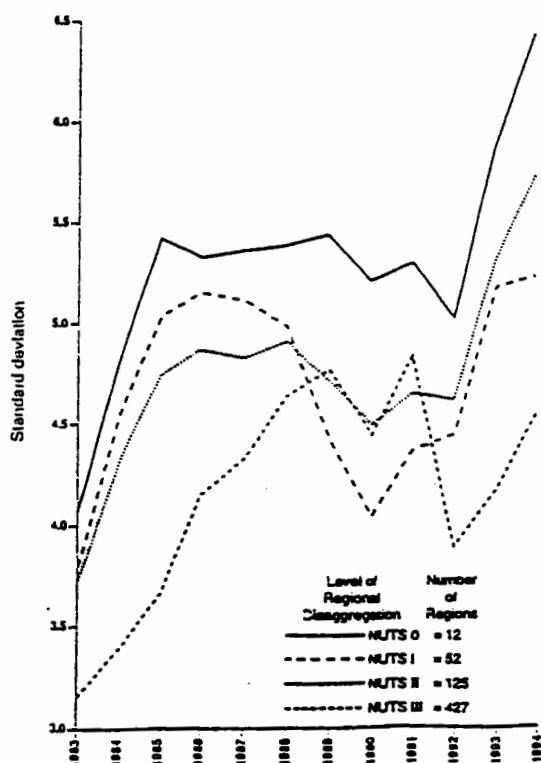
6.0 to 9.9

0.0 to 5.9

(A, GR, -1993 data)

There is no evidence of «global» convergence over the last twenty years. A study by Baddeley, Martin and Tyler (1996) shows that the absolute dispersion of ratios tends to follow a pro-cyclical pattern, rising in the recession of the early 1980s, falling in the boom 1986-90, and rising again post-1990 [6]. Underlying these cyclical movements, the trend of dispersion has been upwards. The degree of dispersion for different levels of regional disaggregation is shown in figure 3. Taking 427 regions in the UK, Germany, France, Spain, Belgium and Italy, the standard deviation of unemployment rates rose from 3.2 in 1983 to 4.5 in 1994. Within the six countries themselves, regional unemployment rate differences have either persisted or widened, except in the UK. The authors argue that the persistence should not be interpreted as a prolonged disequilibrium in regional labour markets, but as an equilibrium phenomenon associated with differences in industrial structure and the numbers of long term unemployed.

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[6] In an early study of the cyclical sensitivity of unemployment, I found this behaviour for the regions of the UK (Thirlwall, 1966).

FIGURE 3

Absolute dispersion of regional unemployment in the EU, 1983-1994

Level of Regional Disaggregation	Number of Regions
NUTS 0	= 12
NUTS I	= 52
NUTS II	= 125
NUTS III	= 427

Source: Baddeley *et al.* (1996).

I shall argue below that differences in regional growth rates should also be interpreted as an equilibrium phenomenon associated with differences in industrial composition and in the income elasticity of demand for regional exports and imports.

Growth inequality

Let us now address the question in more depth of what are the major factors that account for the growth inequalities between regions and countries which may prevent the convergence of per capita income and unemployment. Some have been mentioned already such as investment, education and R&D expenditure, but many of these factors are themselves endogenous. I suggest here a rather different perspective. One of the significant facts to remember in discussing regions within countries is that they are very open economies, in many cases exporting and importing 90 percent or more of their regional product. If this is the case, it is impossible to understand the growth performance of regions

31

without reference to the strength of the external demand for their products. When factors of production are freely mobile, growth can never be supply constrained in the neoclassical sense (except for land based activities). Countries are also becoming increasingly open, and one of the major criticisms of «new» growth theory is that with a few exceptions most of the modelling is done as if economies are closed. There is no recognition of the importance of external demand in driving the growth process, or constraints on demand imposed, for example, by the balance of payments. Where trade is modelled, the measure of trade is the share of exports and/or imports in GDP. This may pick up the static gains from trade, and technological spillovers from trading contacts, but not the dynamic gains from trade or the growth effects of trade that come from the expansion of demand, or from the supply side through the greater ability to import (⁷).

It is a fundamental proposition in Keynesian growth economics (Hicks, 1950, Kaldor, 1970) that the rate of growth of output is determined by the dominant component of autonomous demand, to which other components of demand will adapt. In an open economy, the major component of autonomous demand is likely to be export demand. Below, I develop a model of export-led growth which has some interesting properties and can be used to explain growth rate differences between regions or countries either as a cumulative disequilibrium process or as a persistent equilibrium process associated with the demand characteristics of the goods exported and imported.

Let
$$y_t = \gamma(x_t) \tag{1}$$

where y is the growth of output, x is the growth of exports and t is a time subscript. γ is the constant elasticity of output growth with respect to export growth.

Now assume a constant elasticity export demand function which makes exports a function of relative prices (competitiveness) and income outside the «region», so that:

$$x_t = \eta(p_{dt} - p_{ft}) + \varepsilon(z_t) \tag{2}$$

where $(p_{dt} - p_{ft})$ is the difference in the rate of growth of domestic and foreign prices (measured in a common currency); z_t is the growth of income outside the «region»; η (< 0) is the price elasticity of demand for exports, and $\varepsilon(> 0)$ is the income elasticity of demand for exports.

(⁷) When export growth is included as an independent variable in a «macro-determinants of growth» equation of the Barro-type, it is highly significant (see Thirlwall and Sanna 1996).

Assume that export prices are determined by a percentage mark-up on unit labour costs, so that the growth of domestic prices is given by:

$$p_{dt} = w_t - r_t + t_t \tag{3}$$

where w_t is the rate of growth of wages; r_t is the rate of growth of labour productivity, and t_t is the growth of 1 + % markup.

Finally, let the rate of growth of labour productivity be partly induced by the growth of output itself (Verdoorn's Law) owing to the existence of static and dynamic returns to scale (particularly in the tradeable goods sector):

$$r_t = r_a + \lambda y_t \tag{4}$$

where r_a is autonomous productivity growth, and λ is the Verdoorn coefficient.

Combining equations **(1)** to **(4)** gives an expression for the equilibrium growth rate of:

$$y_t = \frac{\gamma[\eta(w_t - r_a + \tau_t - p_{ft}) + \varepsilon z_t]}{1 + \gamma\eta\lambda} \tag{5}$$

Remembering that $\eta < 0$, the growth rate is shown to vary positively with r_a, z, ε, p_f and λ, and negatively with w and τ. The model is circular since fast export growth leads to fast output growth; fast output growth leads to fast productivity growth; fast productivity growth leads to improved competitiveness, and a faster rate of growth of exports. The interesting question then naturally arises, if the equilibrium is disturbed does the growth rate cumulatively diverge or return to equilibrium? This has a bearing on how regional differences in growth rates should be interpreted, and the precise meaning of Myrdal's model of «circular and cumulative causation».

In a two region (or country) model, a necessary condition for the divergence of growth rates is that the growth rate of one of the regions diverges from its own equilibrium rate. Whether divergence will take place is essentially an empirical issue depending on the stability conditions of the model in disequilibrium. If for simplicity we confine ourselves to a first-order system, it is clear from the circular nature of the model that a one period lag in any of the equations gives the same stability conditions, namely that convergence to, or divergence from, the equilibrium growth rate depends on whether $\gamma\eta\lambda$ 1. If we assume a one period lag in the export demand function, we get the first order difference equation:

$$y_t = \gamma[\eta(w_{t-1} - r_a + \tau_{t-1} - p_{ft-1}) + \varepsilon(z_{t-1})] - \gamma\eta\lambda y_{t-1} \tag{6}$$

the general solution to which is:

$$y_t = A(-\gamma\eta\lambda)^t + \frac{\gamma[\eta(w_{t-1} - r_a + \tau_{t-1} - p_{ft-1}) + \varepsilon(z_{t-1})]}{1 + \gamma\eta\lambda} \tag{7}$$

where A is the initial condition.

3

33

The behaviour of y depends on the value of $\gamma\eta\lambda$. Since $\gamma > 0, \lambda > 0$ and $\eta < 0, (-\gamma\eta\lambda) > 0$. The condition for cumulative divergence from equilibrium is that $(-\gamma\eta\lambda) > 1$. This is possible but unlikely since $0 < \gamma < 1$ if exports grow faster than output; λ (the Verdoorn coefficient) rarely exceeds 0.5, and the price elasticity of demand for exports (η) rarely exceeds 2. In short, observed growth rate differences are likely to reflect differences in equilibrium growth rates rather than a process of divergence (we don't observe the «world» exploding!). Differences in equilibrium growth rates, in turn, are likely to reflect structural differences between economies captured in differences in the income elasticities of demand for exports (ε). There are big differences in the income elasticities of demand of different types of commodities: between primary products and industrial goods, and between different types of industrial goods. The opening up of trade which forces countries into different patterns of specialisation may produce large disparities in equilibrium growth rates associated with the demand characteristics of goods.

Balance of payments constrained growth

The export-led, «cumulative-causation» growth model outlined above lacks a balance of payments constraint. The equilibrium growth of output given by equation **(5)** or **(7)** could give a rate of growth of imports which exceeds the growth of exports, leading to an unsustainable balance of payments position. In the long run, no country or region can grow faster than that rate consistent with balance of payments equilibrium on current account unless it can finance ever-growing deficits which, in general, it cannot. For most countries, the maximum long run sustainable deficit to GDP ratio seems to be of the order of 1-2 percent. Through the largesse of governments, regions within countries can probably sustain larger deficits, but the general proposition remains that regional problems are balance of payments problems (Thirlwall, 1980).

It is easy to impose a balance of payments constraint into the model and to derive the sustainable growth rate consistent with payments equilibrium. Let the initial balance of payments equilibrium be defined as:

$$P_d X = P_f M E \qquad (8)$$

where P_d is export prices; X is the volume of exports; P_f is import prices in foreign currency; M is the volume of imports, and E is the exchange rate measured as the domestic price of foreign currency (which converts the value of imports in foreign currency into domestic currency).

The condition for a moving equilibrium through time is:

$$p_d + x = p_f + m + e \qquad (9)$$

where lower case letters represent rates of growth of the variables.

The growth of exports containing the idea of a virtuous circle [combining equations **(2)**, **(3)** and **(4)**] gives:

$$x = \eta(w - r_a - \lambda y + \tau - p_f - e) + \varepsilon(z) \qquad (10)$$

The growth of imports may be written as:

$$m = \psi (p_f - p_d + e) + \pi(y) \qquad (11)$$

where ψ (< 0) is the price elasticity of demand for imports, and π (> 0) is the income elasticity of demand for imports. Substituting **(10)** and **(11)** into **(9)**, and solving for the growth of income consistent with balance of payments equilibrium (y_B) gives:

$$y_B = \frac{(1 + \eta + \psi)\,[w - r_a + \tau - p_f - e] + \varepsilon(z)}{\pi + \lambda(1 + \eta + \psi)} \qquad (12)$$

If we were to assume either that relative prices measured in a common currency do not change very much and there is no Verdoorn effect, or that the Marshall-Lerner condition is just satisfied so that $\eta + \psi = -1$, then equation **(12)** reduces to:

$$y_B = \frac{\varepsilon(z)}{\pi} \qquad (13)$$

or:

$$\frac{Y_B}{Z} = \frac{\varepsilon}{\pi} \qquad (14)$$

i. e. a region's or country's long run growth rate can be approximated by the ratio of the income elasticities of demand for exports to the income elasticity of demand for imports. This is now known in the literature as the dynamic Harrod trade multiplier result (where $\varepsilon z = x$) [8]. Equation **(14)** is the basis of the classic centre-periphery models of Prebisch (1950) and Seers (1962) where growth rate differences between regions are dependent on the income elasticities of demand for exports and imports reflecting the structural characteristics of regions in production and trade.

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[8] See McCombie and Thirlwall (1994, 1997). For a recent survey, see also the mini-Symposium on Thirlwall's Law in *Journal of Post Keynesian Economics*, Spring 1997.

What will happen to regional differences with EMU?

One interesting finding in the work on regional growth performance is that when national dummy variables are included in the regional growth equations (Armstrong, 1995b; Paci, 1997), the explanatory power of the equations increases dramatically and the estimated rate of (regional) convergence (or catch-up) falls considerably. This suggests that movements in convergence/divergence have much more to do with what is happening to growth performance *between* countries than to what is happening to regional performance *within* countries.

A second point to note is that testing for β convergence and finding that the test is significant is not a confirmation that the growth process is necessarily described by a neoclassical model with diminishing returns to capital. The growth process may be more accurately described by a cumulative causation model based on increasing returns, as outlined above, and yet nonetheless convegence be observed because of other countervailing forces. As suggested earlier, convergence may be the result of «catch-up», or faster structural change in poor countries or regions. Also, convergence could be the result of the implementation of regional policies. Most EU countries have pursued active regional policies for at least the last three decades, and the EU itself pursues regional and structural policies to promote growth in deprived regions.·

In considering, therefore, what is likely to happen to regional disparities with the implementation of monetary union, the basic questions to consider are firstly is there likely to be real convergence between the countries of Europe that form the single currency area, and secondly will regional (and structural) policies be strong enough to offset divergent tendencies if countries adversely affected by shocks find difficulty in adjusting because they have lost sovereignty over monetary and exchange rate policy?

This raises the question, in turn, of whether the countries that have decided to adopt a single currency constitute an optimum currency area. In other words, do they comprise a sufficiently homogenous economic entity in which it is sensible to have just one currency instead of multiple currencies, and to operate a single economic policy as opposed to countries operating their own independent economic policies? This clearly depends on the benefits and costs of a single currency, and whether the benefits outweigh the costs, where the benefits and costs are measured in terms of output gains and losses within the area as a whole. The costs of a single currency relate to: the loss of the exchange rate as an instrument of policy to maintain a country's competitiveness; the loss of the interest rate as an instrument of economic policy, and loss of fiscal discretion. These are all powerful weapons of economic policy that countries entering a single currency area surrender; weapons that are traditionally used for managing economies to prevent recession and to control inflation. This is a considerable loss of sovereignty. The benefits of a single currency relate largely to the promotion of trade and the greater mobility of factors of production — labour

and capital — leading to a more efficient allocation of resources. The question then is: under what economic circumstances are the costs likely to be minimised and the benefits maximised, so that one can be sure that the currency area is an optimum? Four conditions are normally specified.

The first condition to minimise costs is that economies should be roughly similar and synchronised so that shocks are symmetrical in the sense that if a shock to the system takes place (e. g. a world recession or an oil price increase etc.), all the countries are affected in the same way so that countries do not require specific individual policies applied to them. This, of course, is the reason why so much attention in the run-up to monetary union focussed on countries reaching certain convergence criteria. Note, however, that all the convergence criteria were *monetary* in nature, relating to inflation, interest rates, budget deficits and the size of the national debt. But monetary convergence is no guarantee of real convergence, nor any guarantee that future shocks will be symmetrical. The more countries and regions are specialised, the less symmetrical shocks are likely to be. Indeed, given the diverse nature of the economies of the EU, and differences in institutional arrangements, it is likely that any future shocks will be asymmetrical. Real convergence will require monetary *divergence* which will be precluded by the single currency.

If costs are incurred in particular countries or regions, in terms of lost output and unemployment, a second condition to minimise costs in an optimum currency area is that there should be sufficient labour market flexibility and capital mobility to mitigate the costs. The presumption is that if wages are sufficiently flexible, and labour and capital are freely mobile, the underutilisation of resources in depressed regions can be eliminated. There are two responses to this argument. Firstly, wages may not be flexible downwards, and even if they were Keynesian theory teaches that wage flexibility may not be an efficient adjustment mechanism in the case of demand shocks. Abraham and Van Rompuy (1995) have tested for regional wage flexibility in Europe by regressing wage growth against the growth of regional unemployment, national unemployment, productivity growth and other variables using combined time series and regional cross section data (334 observations) and cast doubt on the role of wage flexibility in regional labour markets. Changes in national variables seem to have a stronger impact than regional conditions on regional wages. Secondly, labour and capital mobility may not be equilibrating, as argued earlier. There is no guarantee that capital will move to depressed regions to take advantage of surplus labour, and there is no guarantee that net emigration will necessarily alleviate the unemployment problem of depressed regions if it sets up cumulative forces which further depress the region. Even if neoclassical adjustment mechanisms are allowed to work, they may turn out to work perversely.

A third condition to minimise costs is that fiscal transfer mechanisms exist which automatically come into operation if countries within the single currency

37

area become depressed and unemployment rises — as, for example, in an individual country where government expenditure on unemployment and social security automatically rises as unemployment rises which cushions consumption in a region. At present, these mechanisms between the countries of EMU simply do not exist.

Finally, a fourth condition for an optimum currency area is that multiple currencies are seriously impeding trade and the efficient allocation of resources. Under these circumstances, moving to a single currency would maximise benefits. No one disputes that trade is an important engine of growth, and of mutual benefit to countries, provided it leads to the *balanced* growth of exports and imports, but I think the argument here is exaggerated for two reasons. Firstly, there is no firm empirical evidence that multiple currencies and fluctuating exchange rates discourage trade. But this is not surprising, since big traders hedge against currency fluctuations. Secondly, trade has grown and flourished in Europe for the last fifty years with multiple currencies (and would continue to do so without a single currency). Indeed, now that barriers to trade have virtually been eliminated, the major determinant of trade is the buoyancy of markets. There is a real danger that trade may be discouraged by the single currency if the euro-area becomes a deflationary zone because the European Central Bank (ECB) sets interest rates to achieve monetary stability at the expense of growth, and to keep the euro strong in relation to the US dollar. In the last decade, the EU has been one of the most deflationary regions of the world economy in the attempt by countries to meet the Maastricht convergence criteria.

All that can really be said with any certainty on the benefit side is that there will be a saving in transaction costs, estimated at about $30 billion a year. This is a big saving absolutely, but very small in relation to the combined GDP of EU countries, and set against the potential costs of monetary union. The potential costs of the single currency are enormous relating to the loss of sovereignty over monetary policy, fiscal policy and the exchange rate.

On monetary policy, it cannot make economic sense to have one interest rate for all countries regardless of individual country circumstances. Firstly, there is no reason to suppose that the economic cycles of countries will be sufficiently synchronised that all countries require the same interest rate at the same time in order to regulate the level of economic activity. Secondly, the impact of interest rate changes on economic activity will differ between countries according to differences in the sensitivity of investment and consumption, and particularly in the demand for housing. The interest rate decided by the ECB will be some compromise rate which suits no one country in particular, designed to target a European-wide inflation rate (and when the trade-off between inflation and unemployment also differs between countries). This is going to pose serious problems of economic management for countries. Booms will be more difficult to control, and depressed economies will be unable to reduce interest rates to

38

stimulate activity. The latter poses an even greater problem because members of the single currency are bound by fiscal rules and cannot easily boost public expenditure and reduce taxes.

On fiscal policy, a Stability Pact was agreed at the Dublin Summit in 1996 that countries should not run deficits of more than 3 percent of GDP without incurring a fine of 0.2 percent of GDP and another 0.1 percent of GDP for every one percentage point of deficit over the 3 percent limit. In conditions of depression, this makes no economic sense. If the deficit itself results from a recessionary shock, the Stability Pact will compound the deflation, and the fine in such circumstances would make the deficit even worse. At the very least, cyclical deficits need to be separated from structural deficits, as the OECD already does for countries.

On exchange rate policy, the exchange rate as an instrument of economic policy for members of the single currency completely disappeared on 1st January 1999 when exchange rates became irrevocably locked prior to the abandonment of national currencies in 2002. It is sometimes naively said that if exchange rates disappear, the balance of payments problems of countries also disappear because there is no longer an exchange rate to defend. Whoever heard of Scotland, Sicily or the regions of Portugal having a balance of payments problem? Exchange rates disappearing, however, do not mean that imbalances between exports and imports disappear. What it means is that when plans to import exceed plans to export, the exchange rate is no longer there to take the strain, and balance of payments problems will manifest themselves, not in the form of a depreciating currency which encourages exports and discourages imports, but as falling output and higher unemployment. Regional problems of slow growth and high unemployment *within countries* are essentially balance of payments problems which, by definition, cannot be alleviated by exchange rate movements because regions within a country are already part of a single currency area (Thirlwall, 1980). Likewise, a single European currency will *de facto* turn the countries of Europe into regions as defenceless as regions within countries; with the added disadvantage, however, that the Europe-wide budget to cope with pockets of deprivation and unemployment is far smaller in relation to the size of the areas likely to be affected than the size of national budgets in relation to the regional problems of countries. There is no built-in mechanism for the automatic transfer and redistribution of resources between countries, as there is, for example, between States in the USA. I would concede that the exchange rate is of limited use in permanently raising the growth rate of a country, unless it can engineer a continuing depreciation in the *real* exchange rate, but it remains an invaluable weapon to combat internal and external shocks, or gradually deteriorating competitiveness. Who knows where the shocks to countries will come from in the future, and how they will affect countries differently, as they surely will? The consequences of a single currency in the face of a deterioration in competitiveness could be serious damage to the real economy, which means a loss of output and jobs.

39

Conclusion

The great challenge in Europe at this present time is to boost growth and to create jobs. I see nothing in the single currency itself that is going to produce a more dynamic European economy. In fact, by the «rules of the game», the introduction of the euro could be deflationary for at least three reasons. Firstly, the task of the independent ECB is quite clear and that is to control inflation. Interest rates will not be set to promote growth and to reduce unemployment but to keep a lid on the price level, despite the fact that there is no scientific evidence from time series or cross section data that suggests that price stability is a precondition for faster growth. On the contrary, inflation and growth appear to be positively correlated within the range 0-8 percent inflation [9]. Secondly, the ECB will want to promote a strong euro to compete with the US dollar. It certainly has the potential to do so with the euro area accounting for a slightly higher share of world trade than the US and with a larger volume of foreign exchange reserves. The ECB will need to keep interest rates relatively high to keep the euro strong. Thirdly, there is nothing in the pacts and conditions governing monetary union that provide safeguards against deflation, such as governments running budgetary surpluses or other policies which lead to falling prices or rising unemployment. The rules of the game are asymmetric, biased against inflation, as indeed they are at the international level whereby the IMF penalises countries in balance of payments deficit but not those in surplus, which therefore imparts deflationary bias in the world economy. At the European level, the Stability Pact will lead to deflationary bias, and the loss of the exchange rate to combat a loss of competitiveness will work in the same direction.

From what I have said, it should be clear that I do not believe that monetary union will lead to the real convergence of member countries. If anything, increased divergence is more likely. This being so, greater regional divergence is also likely given that regional disparities are more closely related to regional disparities between countries than to regional disparities within countries. All this, of course, is quite independent of the accession of new states to the EU which is another story.

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[9] For an up-to-date survey, see Thirlwall (1999).