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SOURCES OF REGIONAL DIVERGENCE IN THE CELTIC TIGER: POLICY RESPONSES[*]

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Abstract: This paper presents new evidence on the sources of living standards divergence among Irish regional authority areas during the "Celtic Tiger" boom period of the 1990s, which has been associated with unbalanced regional development. The paper shows that strong regional living standards divergence during this period was driven both by the emergence of the "demographic dividend" and by productivity. Productivity divergence was, in turn, driven by the manufacturing sector. Although structural change had a convergent effect on productivity in previous decades, this effect was negligible during the "Celtic Tiger" boom. The discussion then considers the appropriate response to Ireland's regional policy dilemma, namely how to address the problem of regional imbalance without compromising national growth and competitiveness. At the beginning of the new millennium, regional policy is back on the agenda with the inclusion of balanced regional development as a key objective in the National Development Plan: 2000-06. However, delays in the formulation of the National Spatial Strategy gives rise to concern. Based on the results of the paper, it is argued that future growth in regional and therefore national living standards hinges on continued productivity growth in internationally competitive industries based in Irish regions, as demographic factors and structural change are unlikely to continue playing prominent roles. It recommends that policy be targeted at improving regional growth and competitiveness in regional authority areas, rather than aiming for balanced regional development.

Keywords: convergence; living standards; productivity; regional policy.
JEL Classifications: I31, 040, D31, R11, R12.

1. INTRODUCTION

This paper presents new evidence on the sources of living standards convergence (divergence) among the Irish regional authority areas[1] since 1960 and especially during the "Celtic Tiger" boom of the 1990s. This later period has been associated

[*] Thanks to various members of the Central Statistics Office for providing data under special request. All errors are my own

with unbalanced regional development or regional divergence. The recent publication by the Central Statistics Office (CSO) of regional GVA estimates for 1999 facilitates more comprehensive analysis of the 1990s. The paper follows Kennedy (2000/01), who argued that the "Celtic Tiger" boom should be dated from 1993, when national employment was back at its 1980 level. Accordingly, analysis is conducted for the period 1993 to 1999, and compared to the earlier periods of 1979 to 1993[2] and 1960 to 1979. Recent research has shown strong living standards convergence among Irish regions between 1960 and 1979 being replaced by weak divergence between 1979 and 1996 (O'Leary 2001a and 2001b). This paper therefore presents new evidence for the period 1993 to 1999, which is compared to the previous periods. It also investigates the sources of convergence (divergence) over the whole period.

It begins by outlining data and measurement issues. It then proceeds to investigate the roles played by labour productivity and demographic factors in explaining the degree of convergence (divergence) in the official measure of living standards. Next, it considers alternative living standards measures, including regional "GNP", following O'Leary (1999), and regional household incomes, data for which were recently published by the CSO. It goes on to decompose aggregate productivity into three sectors: agriculture, manufacturing and services[3] and the contribution from structural change. Finally, the paper turns to an analysis of the current policy dilemma facing the government.

2. DATA AND MEASUREMENT ISSUES

The data for 1960 and 1979 were constructed from Attwood and Geary (1963) and Henry (1997) respectively. The methods used are described in O'Leary (2001a and 2001b). This data set provides GVA at constant factor cost[4] as well as employment and population levels for the existing regional authority areas. These data are available for the three broad sectors of activity. The recent publication of official regional GVA estimates for 1999 provides a timely opportunity for analysis of the "Celtic Tiger" period (CSO, 2002a). Although the same construction methods were used to extend the data set to include 1993 and 1999, a number of measurement problems arise.[5]

The first concerns the comparison of 1999 GVA estimates with those for 1993. This concerns a change to the ESA 95 standard from the ESA 79 standard used for 1993. The ESA 95 standard treats royalty payments for the use of technology as a purchase, which has to be deducted in arriving at GVA. Formerly, these were treated as factor income outflows and therefore not part of GVA. In addition, under the new standard all profits of foreign owned enterprises are considered as part of factor income outflows, as distinct from remitted profit, which was previously attributed to outflows. These differences make a significant difference to the estimates for the manufacturing sector and overall. Under special request, the CSO kindly provided the 1993 GVA estimates in accordance with both the ESA 95 and 79 standards.[6]

This facilitated comparisons between 1979 and 1993 on the ESA 79 basis and between 1993 and 1999 on the ESA 95 basis.

A second problem arises in relation to demographic data for 1993. The CSO Regional Accounts for that year provide data for total employment and population for the regional authority areas (CSO, 1997). Data for the population between the ages of 15 and 64, total labour force and sectoral employment are available from the 1993 Labour Force Survey (CSO, 1994). However, these differ from the Regional Accounts data due to the Labour Force Survey using the old planning regions, which included Roscommon in the Midlands rather than the West. In order to facilitate detailed analysis of demographic trends, a complete data set was constructed with adjustments made for Roscommon. A comparable data set for the second quarter of 1999 was constructed from the Quarterly National Household Inquiry. The majority of these data are available online (CSO, 2002b). However, estimates of population between the ages of 15 and 64 were kindly provided by the CSO under special request.

The chief measure of convergence employed in this paper is the widely used σ convergence measure, equal to the coefficient of variation of living standards (productivity) levels. The rate of convergence over time is calculated as the average percentage change in the coefficient of variation between two points in time. A negative (positive) value indicates convergence (divergence). This measure refers to the degree to which the distribution is narrowing (widening).[7]

3. DECOMPOSING LIVING STANDARDS: PRODUCTIVITY AND DEMOGRAPHY.

Growth in living standards, defined as regional "GVA" or output per capita, may be decomposed into the growth in productivity, or GVA per worker, the employment rate, the participation rate and the age-dependency inverse as follows (see for example, Boyle G, McCarthy T and Walsh J. 1998/9):

$$\text{Growth}\left(\frac{O}{N}\right) = \text{Growth}\left(\frac{O}{L}\right) + \text{Growth}\left(\frac{L}{LF}\right) + \text{Growth}\left(\frac{LF}{N1564}\right) + \text{Growth}\left(\frac{N1564}{N}\right) \qquad (1)$$

where, for each region: *O* denotes GVA;
N denotes population;
L denotes employment;
LF denotes labour force;
*N*1564 denotes population between 15 and 64.

Table 1 presents the decomposition of living standards growth for the period 1960 to 1979. For the state as a whole, productivity growth was 0.6 per cent per annum. greater than living standards growth. Reductions in the participation rate accounted

for the majority of this difference. It is clear that the poorer regions fared better than the rich regions. Dublin/Mid-East, the most prosperous region, exhibited relatively low growth in living standards, mainly due to low growth in labour productivity. Similarly, the poorest region, the West, registered higher growth in living standards, mainly due to faster productivity growth. Table 1 also presents the rate of convergence for the period. Strong convergence is evident, at a rate of 3.5 per cent per annum. Strong convergence was driven by labour productivity with the participation rate exerting a weak divergent effect.[8] Thus, it appears as if there was a vibrant convergence process underway during the 1960s and 70s, with poorer regions catching up mainly due to relative productivity improvements.

Table 2 presents the decomposition from 1979 to 1993. For Ireland as a whole, productivity again dominated living standards growth. Demographic factors exerted a weaker negative effect on living standards, with a significant deterioration in the employment rate and decreases emerging in age-dependency. At a regional level, the South-West grew faster in terms of living standards than any other region, with the West growing the slowest. Significantly, these regions occupied the same positions for productivity growth. As regards demographic factors, the Midlands was most affected by the deterioration. Table 2 reveals that living standards exhibited weak divergence. This was driven by the turnaround in the role played by productivity compared to the earlier period. Productivity by now exerted a weak divergent effect on living standards. The demographic factors also contributed to divergent living standards.

Table 3, which presents the analysis for the "Celtic Tiger" boom period of 1993 to 1999, shows a radically different picture. For the state as a whole, living standards growth increased to 7.7 per cent per annum, with demographic factors now exerting a strong positive effect on living standards. This was mostly due to very large growth in both the employment rate and the labour force participation rate over the period and is consistent with the findings of recent issues of the ESRI's *Medium-Term Review* (see, for example, Duffy, FitzGerald, Hore, Kearney and MacCoille, 2001, p. 8). Significantly, these results show, similar to Kennedy (2000/01), that an improvement in the rate of productivity growth was not responsible for the "Celtic Tiger" boom.[9]

The South-West and Dublin/Mid-East were the fastest growing regions in terms of living standards during the "Celtic Tiger" boom, with the Midlands and notably the South-East growing slowest. In terms of productivity, the performance of the South-West stands out, while that of the South-East and the Midlands was very sluggish. With regard to demographic factors, Dublin/Mid-East benefited the most from the improvement, with the South-East benefiting the least. Table 3 also reveals that overall regional living standards diverged in the "Celtic Tiger" boom by 4.4 per cent per annum.[10] Divergence was driven by productivity, employment and participation rates, while age-dependency had a weak convergent effect on living standards.

It is clear from the foregoing that regional living standards diverged strongly during the "Celtic Tiger" boom. This compares to weak divergence during the 1980s and early 1990s and strong convergence during the 1960s and 1970s. This confirms the existence at the end of the 1990s of a regional policy dilemma, whereby a strong national convergence problem has coincided with the emergence of unbalanced regional development, mostly due to very strong growth in Dublin/Mid-East and the South-West. Regional divergence was driven during the "Celtic Tiger" boom by productivity and the "demographic dividend", with employment and participation rates being mostly responsible. However, the acceleration in the growth of regional living standards compared to the previous period was driven by demographic factors and not by productivity.

Further analysis of these productivity trends is presented in section five. First, however, the next section turns to an investigation of alternative measures of regional living standards.

4. ALTERNATIVE ESTIMATES OF REGIONAL LIVING STANDARDS

It is widely known that Irish GDP is overstated due to the unusually large net factor outflows from the country, mostly attributable to profit outflows by foreign owned enterprises. This prompts the widespread use of GNP when commenting on Irish living standards (see for example, Duffy, Fitzgerald, Hore, Kearney and MacCoille, 2001 and Kennedy, 2000/01). O'Leary (1999) suggested a method of adjusting regional GVA for net factor outflows. For profit outflows, which is the dominant component, this involves distributing the national profit outflow estimate using each region's share of foreign owned manufacturing profit, defined as the remainder of net output of manufacturing establishments. The resulting regional "GNP" estimate gives an approximate estimate of regional income.

Table 4 shows that for the period 1979 to 1993, if regional living standards are measured using "GNP" per capita, both national and regional growth slow down compared to GVA per capita, while the rate of divergence increases to 1.5 per cent per annum. This is due to the fact that the shares attributed to the Border, West and South-West are large in relation to the size of these regional economies. For the "Celtic Tiger" period, although growth rates also slowed down, surprisingly the rate of divergence declined from 4.4 per cent per annum to 1.0 per cent per annum. This decline may be explained both by the increased absolute size of the outflow and by the increasing regional concentration of foreign-owned manufacturing profit.

Table 5 presents how the estimates are constructed for both years. It is noticeable that in 1999 net profit outflows represented 27 per cent of GDP compared to 10 per cent in 1993, an increase of 27 per cent per annum in real terms. This increase is disguised by an increase in overall outflows by 16 per cent per annum; other outflows were overtaken by inflows during the period, mostly due to reductions in the size of foreign debt. For Dublin/Mid-East and the South-West, the share of the

remainder of net output of foreign owned establishments also increased by 41 per cent and 34 per cent respectively between 1993 and 1999. This resulted in the level of profit outflow attributable to these regions increasing by 35 per cent and 34 per cent per annum in real terms respectively. The share declined for all other regions, but especially the West (-70 per cent) and the Midlands (-73 per cent).[11]

The result is that growth in Dublin/Mid-East and to a greater extent, the South-West, declines markedly by this measure, while the poorer regions emerge with the highest growth in "GNP" per capita for the period. These results should be treated with caution as, given the growing scale of the outflow, the method of regional distribution may be too crude, being constrained by data availability.[12] The method also assumes that all outflows are from manufacturing establishments. However, account should be taken of the large multinational presence in internationally traded services located in Dublin in the Financial Services Centre, as well as in other sectors located in a number of regions. Clearly, given the size of the outflow in the 1990s, further work needs to be done in this area.

The recent publication by the CSO of regional household income estimates provides alternative measures of regional income for the period 1993 to 1999. These relate to primary income, total income and disposable income in the household sector (CSO, 1999 and 2002a).[13] Ross also provides estimates of total household income at four or five yearly intervals in the period 1960 to 1977 for the old planning regions (see for example Ross, 1977). Analysis of these data generally confirms the pattern evident in Table 1, with living standards convergence being present, albeit at a reduced rate of 1.2 per cent per annum. It should be noted that, by this measure, convergence was strongest between 1969 and 1973.[14]

Table 6 presents growth of the different official measures of regional household income for the "Celtic Tiger" boom compared to regional GVA per capita. The household income measures display more muted growth rates but slightly stronger rates of divergence. Overall, these measures provide further evidence of regional living standards divergence between 1993 and 1999.

For the state as a whole, primary income grew by 2.8 per cent per annum less than GVA in capita terms. This signals a growing share in GVA of undistributed company profits, part but not all of which is repatriated. At a regional level, the comparison between the two measures is more complex, due to a workforce producing GVA in a particular region but residing in neighbouring regions. All other things being equal, as residency patterns of workforces became more disperse over the period, with, for example, workers in the Dublin/Mid-East region increasingly residing in adjoining regions, one might expect to see the rate of divergence of primary income per capita being less than the rate for GVA per capita. That the opposite is observed is probably explained by the greater concentration of the regional distribution of undistributed profits, the effect of which dominates. Further work is required to test this hypothesis.

Total income increased by 0.9 per cent per annum less than primary income per capita. This may be caused by a relative decline in transfers over the period, partly due to substantial reductions in unemployment during the "Celtic Tiger" boom, as evidenced in Table 3. This decline was concentrated in the Border, Dublin/Mid-East and the West, with the result that the rate of divergence increased marginally, compared to the rate of divergence for primary income per capita. Disposable income grew at a slightly greater rate than total income per capita, mostly due to reductions in income tax rates over the period. The benefits of these reductions were concentrated in the South-West and the South-East, with the result that the rate of divergence increased to 7.4 per cent per annum. Interestingly, the combined impact of the taxation and welfare system, which can be seen by comparing the trends for primary and disposable income per capita, was to lower growth by 0.7 per cent per annum and increase the rate of divergence by 1.9 per cent per annum. This is due to the dominant effect of reduced welfare payments over reductions in tax rates, with regions such as the Border, Dublin/Mid-East and the West being most affected.[15]

Overall, these results provide convincing evidence for the existence of strong living standards divergence during the "Celtic Tiger" boom. The previous section documented the divergent effect emanating from demographic factors. The next section addresses the issue of productivity divergence in more detail.

5. DECOMPOSING AGGREGATE PRODUCTIVITY: SECTORAL PRODUCTIVITY AND STRUCTURAL CHANGE.

The level of aggregate labour productivity, or GVA per worker, in a particular year, may be defined as:

$$\frac{O}{L} = \left[S_a * \left(\frac{O}{L} \right)_a \right] + \left[S_m * \left(\frac{O}{L} \right)_m \right] + \left[S_s * \left(\frac{O}{L} \right)_s \right] \qquad (2)$$

where: S denotes sectoral employment shares;
the subscripts a, m and s denote agriculture, manufacturing and services respectively.

Thus, the growth in aggregate productivity consists of two components. The first is productivity growth in the particular sectors. The second refers to the effect on aggregate productivity of shifting sectoral employment shares due to structural change over time. These components are now analysed in turn.

5.1 Sectoral productivity growth

Table 7 presents the aggregate and sectoral growth and convergence rates for the period 1960 to 1979. Overall, manufacturing exhibited marginally the fastest productivity growth, with services being the slowest growing sector. However,

overall convergence of 3.9 per cent per annum is clearly driven by converging services, with both agriculture and manufacturing exhibiting very weak convergence. Essentially, in services, the fastest (slowest) growing regions were those with the lowest (highest) productivity levels in 1960. Thus, Dublin/Mid-East, the clear productivity leader in services in 1960, grew at 1.6 per cent per annum subsequently, compared to approximately double this rate in the South-East and the Border. This strong convergence process was not present in the other sectors. For example, in manufacturing the productivity leader, Dublin/Mid-East, grew faster than the Border.

It is worth noting that there is a high degree of homogeneity of overall manufacturing productivity in Irish regions over the period, since the coefficient of variation was very low at 8-9 per cent. Given the limited scope for it to occur, it is surprising that weak convergence had emerged in manufacturing by 1979; the industrialisation of regions outside Dublin/Mid-East that was underway might have resulted in regions specialising in different manufacturing industries and, consequently, growing at different rates. The hypothesis that the policy of regional dispersal pursued by the IDA played a role (Breathnach 1982; O'Leary 2001b) is worth testing.

It is conceivable that the process of industrialisation may have had the additional effect of increasing personal incomes and, therefore, the demand for services in the regions outside Dublin/Mid-East. This, in turn, may have lead to growth opportunities for the services sectors, which were largely sheltered from international trade at the time. These opportunities were realised, as evidenced by the significant growth in productivity levels there, relative to their counterparts in Dublin/Mid-East. Thus, although the policy of regional dispersal had very little effect on the degree of convergence in manufacturing, it may still have had a role to play in the strong convergence among services. This hypothesis warrants further study.

Table 8 presents the results for the period 1979 to 1993. Overall, manufacturing was the fastest growing sector, nearly doubling its productivity growth rate compared to the previous period. On the other hand, productivity growth in services more than halved. Overall, weak productivity divergence of 0.6 per cent per annum emerged during this period. This was driven by both manufacturing and services. In manufacturing, the strongest growth performers were the South-West and Dublin/Mid-East, with the Midlands and the West falling behind. A similar pattern emerged in services, with the most prosperous regions, most notably Dublin/Mid-East, being the strongest performers.

The shift of emphasis by the IDA from an explicit regional focus to a targeted industry approach may have played a role in the emergence of strong divergence in manufacturing during the period. The largely homogenous manufacturing base that was present in 1979 had disappeared by 1993; concentrations of successful foreign-owned multinational companies were emerging by this time in the high-technology

computer, electronics and pharmaceutical sectors, located in the South-West and Dublin/Mid-East (Bradley and Morgenroth 1999; Meyler and Strobl 2000 and O'Leary, 2001a).

Manufacturing divergence may have lead to service sector divergence, especially in the sheltered sectors. Thus, concentrations of high-technology manufacturing industry resulted in strong relative growth of incomes and, therefore, increased demand for services there. This is demonstrated in regions where manufacturing sectors prospered, especially Dublin/Mid-East, for the service sectors in such regions increased in relative terms. Similarly, the opposite process seems to have been underway in regions like the West, where diminishing relative manufacturing and service productivity coincided. However, it may also be that strong tourism growth in the early 1990s and the emergence of internationally traded financial services centered in Dublin/Mid-East contributed to the strong service sector divergence that emerged. Further disaggregation is required to test this hypothesis.

Table 9 presents the results for the period 1993 to 1999. Manufacturing remained the fastest growing sector, with both agriculture and services exhibiting lower productivity growth. Overall, the rate of aggregate productivity divergence strengthened significantly to 3.6 per cent per annum, driven predominantly by manufacturing, with the other sectors converging weakly. Services became increasingly heterogeneous, containing both private and public activities as well as traded and non-traded sub-sectors; the absence of disaggregated data inhibits a better understanding of underlying patterns.

Dublin/Mid-East overtook the South-West as the region with the fastest productivity growth in manufacturing, with productivity collapsing in the Border and the South-East, compared to the previous period.[16] This confirms that one of the chief factors explaining productivity divergence during the "Celtic Tiger" boom was productivity growth in the internationally competitive, mostly foreign-owned multinational companies in the high-technology computer, electronics and pharmaceutical sectors, concentrated in Dublin/Mid-East and the South-West.

It has been widely documented that since the mid-1980s, manufacturing – and therefore aggregate – GVA estimates may be distorted, due to transfer pricing by foreign owned companies. In the present context, this calls for adjustments to 1993 and 1999. In order to arrive at an approximation of the effect of transfer pricing, it is necessary to judge the extent to which profit outflows are attributable to this covert phenomenon. Birnie and Hitchens (1998) argue that manufacturing GVA should be adjusted by the full amount of profit outflows, which are assumed to be generated completely by transfer pricing. O'Leary (1997) adjusts manufacturing GVA by 50 per cent of profit outflows. This approach provides an average estimate of the degree of transfer pricing, as it lies between the two extremes provided by Birnie and Hitchens' (1998) upper estimate and the lower estimate of zero transfer pricing assumed in Tables 8 and 9.

In order to operationalise such approaches at a regional level, it is first necessary to distribute net profit outflows to the regions for both years. In the absence of a more exact method, it may again be assumed, as in Table 5, that net profit outflows are proportional to profit earned by foreign establishments. It should be noted once again that Table 5 shows a very large increase in the absolute size of the outflow and increasing regional concentration of foreign owned manufacturing profit over these years. Against this background, the suggested approaches have very large effects, some of which give spurious results. For example, if Birnie and Hitchens (1998) approach is adopted, the South-West registers negative productivity levels in 1999. If O'Leary's average approach is used, with 50 per cent of outflows attributed to transfer pricing, the results are counter-intuitive as the rates of manufacturing and aggregate productivity growth halve and strong divergence is replaced by strong convergence for both measures.[17] Clearly, further work should be done at a detailed sectoral level, perhaps using benchmark productivity levels from other countries, in order to arrive at a definitive assessment of the degree of adjustment warranted.

5.2 Structural change

Turning to the second component of aggregate productivity growth, namely structural change, Table 10 presents the evolution of the sectoral employment shares over the full period. The Dublin/Mid-East region is clearly at a more advanced stage of development, with the services employment share increasing to 74 per cent in 1999, a declining share in manufacturing since 1960 and a very small share in agriculture. The other regions are in the earlier stages of industrialisation, with scope for further declines in agriculture, shares in manufacturing remaining roughly constant in the last twenty years and shares in services rising to approximately 55 per cent in 1999.

Changing employment shares may contribute to aggregate productivity growth over time if the shift is from low productivity sectors, like agriculture, to high productivity sectors, like manufacturing. It has therefore been hypothesised that structural change may have had a convergent effect on aggregate productivity; regions with relatively low productivity levels may catch up on productivity leaders, as their greater pool of relatively unproductive agricultural workers are reallocated to higher productivity sectors (Abramovitz 1986 and Doyle and O'Leary, 1999). It may be expected that this effect may lesson over time as the pool of agricultural workers in regions declines.

Table 11 shows the effect of structural change on aggregate productivity performance between 1960 and 1979. Overall, sectors contributed 2.8 per cent or 80 per cent of aggregate productivity growth with structural change contributed the remaining 20 per cent.[18] As a result of the strong industrialisation underway in this period, the poorer regions benefited most from this effect, with the West standing out with a 36 per cent contribution. On the other hand, Dublin/Mid-East, which had limited scope to benefit from decreasing agricultural employment shares, only had a 13 per cent contribution from structural change. The result is that structural change

had a convergent effect on the degree of aggregate convergence, with -2.0 per cent per annum or over 50 per cent of the overall rate of convergence being attributed to this effect.[19]

Table 12 displays the same decomposition for the period 1979 to 1993. Overall, the beneficial effect on aggregate growth of sectoral employment shifts has disappeared, with only the West, the Midlands and the Mid-West benefiting. In each of the other regions, its effect was slightly negative, indicating that sectoral employment shares changed to the detriment of aggregate productivity growth. However, the fact that the poorer regions benefited from structural change resulted in structural change continuing to have a strong convergent effect, equal to 1.3 per cent per annum, on the degree of aggregate divergence. In other words, divergence would have been stronger, at 1.9 per cent per annum, only for the convergent effect of structural change.

During the "Celtic Tiger" boom, the effect of structural change on aggregate productivity growth remained very small, with the poorer regions benefiting the most. Although the convergent effect of structural change remained, it declined in magnitude to only 0.3 per cent per annum during this period. Thus, over the whole period, as the share of workers in agriculture declined, so did the convergent effect of structural change on the degree of aggregate productivity convergence. It should be noted that this effect refers to shifts between the broad sectors. As Keating (2000/01) has shown, if the analysis is conducted for a greater degree of disaggregation, then the effect on aggregate growth is larger. However, a more detailed sectoral breakdown is as yet unavailable at a regional level.

5.3 Conclusion

The foregoing has identified the factors that were important in driving the productivity convergence (divergence) performance in the regions since 1960. In the 1960 and 70s, overall strong convergence was driven by convergence in services and by the convergent effects of structural change. The emergence of weak productivity divergence in the 1980s and early 1990s was driven by strong divergence in both manufacturing and services. Divergence would have been stronger only for the continuing convergent effect exerted by structural change. In the period 1993 to 1999, strong productivity divergence was driven mainly by manufacturing, with the other sectors exhibiting weak convergence and the convergent effect of structural change lessening significantly. These trends provide the context for analysing regional policy. Accordingly, the next section investigates the existing regional policy dilemma.

6. THE REGIONAL POLICY DILEMMA.

A detailed investigation of the sources of the convergence (divergence) performance of Irish regions since 1960 has shown that strong regional living standards divergence during the "Celtic Tiger" boom, which resulted in impressive national catch-up with other EU countries, was driven both by the emergence of the "demographic dividend" and by productivity. Productivity divergence was in turn driven by the manufacturing sector. Although structural change had a convergent effect on productivity over the whole period, the size of this effect has diminished over time, with the result that it has been negligible during the "Celtic Tiger" boom. This picture differs markedly from the previous three decades; strong regional convergence in the 1960s and 1970s were replaced by weak divergence in the 1980s and the early 1990s. However, both of these periods coincided with the failure of the country to catch up on other EU countries.

At the beginning of the new millennium, increased regional divergence has put regional issues on the policy agenda, with the inclusion for the first time of balanced regional development as a key objective in the *National Development Plan 2000-06*. The dilemma facing policymakers is how to bring about regional balance without compromising national performance. There is widespread consensus that over the next twenty years, the chief determinant of national growth and competitiveness will be the rate of productivity growth of internationally competitive industry in both the manufacturing and service sectors (see for example Forfas, 2000 and Gallagher, Doyle and O'Leary, 2002).

According to the results of this paper, the productivity performance of these industries will also determine the degree of regional balance or convergence. This is due to the influence of other factors, which have been identified as important in explaining the degree of regional divergence to date, lessening over the next two decades. Thus, the "demographic dividend", which had a divergent effect on living standards during the 1990s, was a once off phenomenon. Recent predictions suggest that the combined effect on growth of the employment, participation and age-dependency rates will decline to roughly 1 per cent per annum to 2010 (Duffy, Fitzgerald, Hore, Kearney and MacCoille, 2001, p. 42). Similarly, the convergence effect of structural change has progressively weakened over the past forty years, with the result that it cannot be expected to exert much of an influence at the broad sectoral level.

Thus, similar to other industrialised countries, regional and national performance in Ireland will be driven in the next twenty years by productivity in the key traded sectors. Speculation on future trends should be based on recent experience. This paper has shown that during the "Celtic Tiger" boom, productivity growth in manufacturing industries in Dublin/Mid-East, the Mid-West, the South-West and the West were more than twice the rates in the Border, Midlands and South-East.[20] Regional convergence of living standards over the next two decades, therefore, depends on higher productivity growth in sectors such as manufacturing for

relatively low productivity regions, such as the Border, the Midlands, the West and the South-East. The likelihood of this occurring depends on the factors shaping productivity in these regions and their more prosperous neighbours.

The issues involved may be considered for two scenarios. The first might be referred to as the convergence scenario. It involves the emergence over the next number of decades of urban diseconomies in the form of congestion and higher factor costs in Dublin and to a lesser extent in Cork, Limerick and Galway. If these inhibit growth in the more prosperous regions, and if the less prosperous regions are able to exploit their catch-up potential, then regional convergence may result. In this scenario, a tendency towards balanced regional development would be the outcome. A second scenario might involve regional divergence. This would result if agglomeration economies in urban centres strengthen and outweigh emerging diseconomies and if poorer regions fail to exploit their catch-up potential.

There are a number of theories in the literature that may be invoked. Neoclassical growth theory, for example, predicts regional convergence. The Williamson hypothesis (1965) suggests that countries' catch-up regional disparities may initially increase, due to the emergence of growth poles, but may subsequently lessen as urban diseconomies emerge. On the other hand, new growth theory, which has been the subject of a considerable research effort since the mid-1980s, generally predicts divergence. Unfortunately, the absence of empirical economic research on these competing hypotheses in the Irish case, which is partly explained by lack of data, severely inhibits our capability to assess these or other scenarios at this time.

If it is assumed that maximising national growth and competitiveness is the overriding national objective, then the role of regional policy should be to foster an environment in which productivity growth in traded industries located in the regions are as high as possible. Clearly, depending on which of the above scenarios transpires, this might result in either balanced or unbalanced regional development. If the latter were to occur, it is interesting to consider whether it would be so unpalatable as to result in regional policy being employed in such as way as to compromise national growth, so as to deliver balanced regional development. While it may seem unlikely that policy would deliberately be targeted in this way, it is possible that in attempting to achieve both balanced development and improved national performance, policymakers might err on the wrong side by, for example, designing an inappropriate mix of programmes or by adopting unsuitable institutional arrangements.

There is evidence to suggest that this outcome is a possibility. O'Leary (2002) has argued that there is a distributional bias in the formulation of regional policy. Historically, policy has treated regional balance as involving the distribution of gains from improvements in national growth and competitiveness. The demise of Buchanan's growth centre strategy proposed in the 1960s provides an example of the bias. This proposal was overturned due to political expediency, with the result that a policy of dispersal was followed.[21]

This bias continues to prevail in the current National Development Plan, which fails to make the trade-offs necessary for a growth strategy. For example, in referring to "major gateways", "regional gateways", "development hubs" and even "small towns and villages" (*National Development Plan 2000-2006*, pp. 43-4) as forming part of a development strategy, the plan clearly shirks the task of prioritising. The expectation that the National Spatial Strategy would deliver a blueprint for development has been severely dented. The delay by the government in publishing the strategy has been due to short-term political expediency. The result is that the country is nearly halfway into the lifetime of the plan, without an explicit spatial strategy. In addition, the prospects of delivering on the plan during the next three or four years are already in doubt, owing to cutbacks in public expenditure.

Meanwhile, the same institutional arrangements, which were characterised by "system failure" in evaluations of previous EU Community Support Frameworks (Fitzpatrick and Associates, 1997), have again been adopted. Government departments direct national operational programmes, with little involvement from the regional authorities or the new regional assemblies, which oversee the unwieldy BMW and South & East regions. Not that regional and local government have shown much appetite for make the necessary trade-offs in the selection of growth centres. They are more concerned with their locality getting a "fair share". The problem is that such shortsightedness from national, regional and local policymakers may lead to disappointing results. By failing to provide an environment in which internationally competitive industry may be embedded in Ireland's regional economies, Irish policymakers are jeopardising long-term growth prospects regionally and nationally.

It is clear from the results presented in this paper that future national and regional living standards growth will hinge on continued productivity growth in internationally competitive industries based in Irish regions. The objective of balanced regional development provides a distraction from this objective. Accordingly, following O'Leary (2002), this paper recommends that the objective of balanced regional development be replaced by improved regional growth and competitiveness.[22] This could involve strengthening the existing Regional Authorities, who would be required to build a close partnership with industry, and be given responsibility for formulating strategies and proposing policy initiatives for their regions. Regional Authorities would supersede local authorities as the primary sub-national authority for economic planning. This would involve reorganising government departments and agencies to work through the regions and initiating local government reform. If necessary, distributional objectives could be pursued by central government using separate policy measures.

Endnotes

1. See Appendix I Table A1 for definitions of the regions.
2. This also coincides fairly closely with the sub-period 1980-93 chosen by Kennedy (2001/02).
3. See Appendix Table A2 for definition of sectors.
4. At 1990 prices. national sectoral deflators are used as no regional deflators exist.
5. The complete data set is available from the author.
6. These data also included revisions for 1993, which proved to be significant.
7. This measure is a sufficient but not a necessary condition for β convergence, which relates to the degree of catch-up convergence. To circumvent this problem, Boyle and McCarthy (1997) propose Kendall's rank concordance measure, known as γ convergence, as a supplement to σ convergence. This measure tracks the degree of intra-distributional mobility or leap-frogging. Thus, if σ divergence occurs in the presence of γ convergence, this indicates β convergence. Both σ and γ convergence are employed for Irish regions between 1960 and 1996 by O'Leary (2000), who finds that little evidence of γ convergence. The absence of leap-frogging is principally due to Dublin/Mid-East and the South-West persistently occupying the first and second ranks over the period.
8. See Appendix III for an outline of the method.
9. Based on national accounting data, Kennedy showed that aggregate productivity increased from 3.3 per cent per annum between 1980 and 1993 to 3.5 per cent per annum in the period 1993 and 2000 (2000/01, p. 124). This compares to a reduction from 3.8 per cent per annum between 1979 and 1993 to 3.3 per cent per annum in the period 1993 to 1999 in this paper. Apart from difference in time periods, such a discrepancy may be explained by the emphasis here being on the collection of consistent regional estimates. The main differences include (i) the compilation of regional output at constant factor cost, using sector specific deflators and in accordance with both the ESA 79 and 95 standard (see Section 2); (ii) the use of historic sources from Henry (1997) for 1979 and Attwood and Geary (1963) for 1960; and (iii) various adjustments made to demographic data.
10. It should be remembered that if regional price deflators were available, the rate of divergence might be less, assuming that prices in Dublin/Mid-East and the South-West grew at a faster rate than the other regions.
11. These data are from the Census of Industrial Production (establishment results) for 1993 and 1999. They were kindly made available by the CSO on special request.
12. See O'Leary (1999) for a full discussion.
13. Primary income is defined as the sum of income from the self-employed, compensation of employees, rent of dwellings and net interest and dividends. Total income is defined as primary income plus social benefits plus other current transfers. Disposable income is defined as total income minus income taxes minus social insurance contributions (see CSO, 2002a).

14. Ross' data, which are converted to 1990 prices by O'Connor (1999), are not strictly comparable with Table 1, owing to the different time periods and the different number and slightly different definition of region used. The old planning regions are similar to the existing regional authority areas, except that (i) Roscommon is included in the Midlands rather than the West and (ii) the Border is divided into regions, the North-East, consisting of Louth, Monaghan and Cavan and the North-West and Donegal, consisting of Sligo, Leitrim and Donegal. The following table reveals the convergence pattern for these data.

Table A3: Growth and Convergence of Total Household Income† in Irish Regions: Various Years: 1960-77 (per cent per annum)

	1960-77	**1960-65**	**1965-69**	**1969-73**	**1973-77**
North-East	+4.2	+4.1	+5.4	+6.6	+0.9
North-West	+4.1	+3.3	+4.9	+7.5	+1.0
Midlands	+3.7	+2.4	+5.1	+7.3	+0.5
West	+4.6	+3.1	+5.2	+8.4	+2.4
East	+3.6	+3.8	+5.0	+5.0	+0.6
Mid-West	+4.1	+4.0	+4.7	+7.2	+0.7
South-East	+4.1	+3.4	+4.5	+7.6	+1.2
South-West	+4.2	+3.8	+4.7	+7.0	+1.3
State	+4.0	+3.8	+5.1	+6.4	+1.0
Rate of Convergence	-1.2	+1.7	-0.3	-5.6	-1.3

†*Note:* At constant 1990 prices.

15. It should be noted that these trends relate to the rate of divergence over time and not the level of the coefficient of variation at a point in time. Similar to Boyle, McCarthy and Walsh (1998/99, p. 166) who source income data from the Household Budget Survey, the value of the coefficient of variation, which measures the level of dispersion, is higher for GVA per capita than the income measures in both 1993 and 1999, with primary income per capita having the highest and disposable income the lowest level of dispersion in both years. However, unlike Boyle, McCarthy and Walsh (1998/99,166), there are relatively few changes in ranking between the different measures, with the only major change being the West increasing from rank 6th in terms of GVA per capita to fourth for the income measures, and the South-East correspondingly losing two places in 1999.
16. Indeed, the very poor performance of the South-East and the improved performance in the West explains why the rate of manufacturing divergence declined over the two periods.

17. It should be noted that O'Leary (2000), in adopting the average estimate of the degree of transfer-pricing for 1996, did not report counter-intuitive results. This is due to the size and regional concentration of the profit outflow increasing markedly between 1996 and 1999.
18. These contributions are measured using the intrasectoral component of aggregate productivity growth and the intersectoral and residual components respectively. See Appendix IV for outline of the method.
19. See Appendix IV.
20. The poor performance of the South-East is especially noteworthy in that, for manufacturing, it occupied joint first position in terms of productivity, with 105 per cent of the national average in 1979. By 1993, it had slipped to 100 per cent and ranked third, but by 1999 it collapsed to 82 per cent of the national average and ranked fourth. In addition, this region benefited least from the demographic dividend. The net effect in terms of official living standards was that in 1999 it was 81 per cent of the national average, which was below its relative position in 1960 of 83 per cent.
21. It would be interesting to investigate the extent to which this policy compromised national growth and convergence in the 1960s and 1970s.
22. O'Leary (2002) also argues the new functional economic areas should be urgently formulated as part of developing a spatial strategy. The availability of population levels and commuting flows from the recent census of population will provide an opportunity for up-to-date research to inform this decision. Given the size of the country, it is probably only feasible to think of perhaps seven regions, which could be loosely based on existing regional authority boundaries.

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APPENDIX I:
DEFINITIONS OF REGIONS AND SECTORS

Definition of Regional Authority Areas

Regions	Counties
Border:	Cavan, Donegal, Leitrim, Louth, Monaghan and Sligo.
Dublin/Mid-East:	Dublin, Kildare, Meath and Wicklow.
Midlands:	Laois, Longford, Offaly and Westmeath.
Mid-West:	Limerick, Clare and Tipperary North Riding.
South-East:	Waterford, Carlow, Kilkenny, Wexford and Tipperary South Riding.
South-West:	Cork and Kerry.
West:	Galway, Mayo and Roscommon.

Sector Classification

Sectors	Definition
Agriculture:	Agriculture, Forestry and Fishing.
Manufacturing:	Manufacturing and Building.
Services:	Retail and Wholesale Distribution; Transport and Communication Services; Market Services; Other Non-Market Services (including Public Administration, Defence, Education and Health); Rent of Dwellings.

APPENDIX II:
OUTLINE OF COUNTERFACTUALS USED ON RATE OF LIVING STANDARDS CONVERGENCE

The counterfactuals presented in Tables 1 to 3 are conducted are order to investigate the effects of each of the components in equation (1) on the rate of living standards convergence (divergence) over the period. In order to examine the effect of differences in, for example, productivity on the rate of living standards convergence (divergence) for the years 1960 to 1979, the coefficient of variation of living standards levels is re-computed for each year after removing regional differences in labour productivity. If the resultant rate of convergence (divergence) increases compared to the observed rate, then it can be concluded that productivity has a divergent (convergent) effect. If the resultant rate decreases, then it has a convergent (divergent) effect. The size of the convergent (divergent) effect may then be calculated as the difference between the rate of σ convergence (divergence) and the rate of σ convergence (divergence) that results after differences in productivity have been removed. For example, suppose that the observed rate of σ convergence changes from -2.0 per cent per annum between 1960 and 1979 to -4.0 per cent per annum, after differences in productivity have been removed. This leads to the conclusion that these differences have a divergent effect on living standards equal to -2.0 – (-4.0) = +2.0 per cent per annum

The use of counterfactual experiments in this way is indicative of the proximate causes of the degree of living standards convergence (divergence) observed. Isolation of the effect on the overall degree of living standards convergence (divergence) of regional differences in each of the components of equation (1), which is an accounting identity, provides only an approximation of the nature and importance of effects. Underlying causal mechanisms are not uncovered by this method. However, the method does have the potential of indicating avenues for future research into the ultimate causes of the living standards convergence (divergence) performance of Irish regions (see O'Leary, 2001b for a full discussion).

APPENDIX III:
METHOD OF DECOMPOSING AGGREGATE PRODUCTIVITY GROWTH AND OUTLINE OF COUNTERFACTUALS

The method, which is widely used (see for example Broadberry, 1998, Boyle, McCarthy and Walsh, 1999/2000 and Doyle and O'Leary, 1999), involves decomposing aggregate productivity growth into intersectoral, intrasectoral and residual component as follows:

$$\text{Intersectoral Growth} = \frac{\left(\sum P_{i,j,t} * S_{i,j,t+T}\right)}{\left(\sum P_{i,j,t} * S_{i,j,t}\right)}$$

$$\text{Intrasectoral Growth} = \frac{\left(\sum P_{i,j,t+T} * S_{i,j,t}\right)}{\left(\sum P_{i,j,t} * S_{i,j,t}\right)}$$

$$\text{Residual Growth} = \left(\frac{\Sigma\left(P_{i,j,t+T} - P_{i,j,t}\right)\left(S_{i,j,t+T} - S_{i,j,t}\right)}{\left(\Sigma P_{i,j,t} * S_{i,j,t}\right)}\right)$$

where: P denotes labour productivity, defined as regional GVA per worker;
i denotes sectors;
j denotes regions;
t denotes time.

Intersectoral growth measures aggregate productivity growth arising from shifts in sectoral employment shares due to structural change. Intrasectoral growth measures aggregate growth due to sectoral productivity growth. The residual or interaction component represents the joint effect of changes in both sectoral employment shares and productivity growth. This effect, which is usually small, is here attributed to structural change.

Intersectoral and intrasectoral productivity levels are the numerators in their respective equations. The effect of structural change on the rate of convergence (divergence) of aggregate productivity is then analysed using counterfactual experiments. The counterfactual rate is calculated for intrasectoral productivity levels, as this excludes the effects of structural change. If the resulting rate of convergence (divergence) increases relative to the observed rate, then structural change may be taken as having a divergent (convergent) effect. If the resultant rate decreases, then it has a convergent (divergent) effect. The size of the convergent (divergent) effect may be calculated as the difference between the two rates. The use

of counterfactual experiments in this way is indicative of the proximate causes of the degree of aggregate convergence (divergence) observed (see O'Leary, 2000 for a full discussion).

APPENDIX IV:
TABLES

Table 1:Decomposition of living standards growth[1] in Irish regions: 1960-79 (per cent per annum)

	O/N	O/L	L/LF	LF/N_{1564}	N_{1564}/N
Border	+3.7	+4.5	-0.2	-0.6	0.0
Midlands	+3.0	+3.7	0.0	-0.8	+0.1
West	+4.0	+4.7	-0.1	-0.6	+0.1
Dublin/Mid-East	+1.8	+2.3	-0.1	-0.4	+0.1
Mid-West	+3.7	+4.1	0.0	-0.5	+0.1
South-East	+3.6	+4.2	-0.1	-0.5	0.0
South-West	+3.3	+3.7	0.0	-0.3	0.0
State	+2.9	+3.5	-0.1	-0.5	+0.1
Rate of Convergence	-3.5	Counterfactuals[2]			
		-3.8	-0.1	+0.7	0.0

Notes: 1. At constant 1990 factor cost.
2: See Appendix III for an outline of the method.

Table 2: Decomposition of living standards growth[1] in Irish regions: 1979-93 (per cent per annum)

	O/N	O/L	L/LF	LF/N_{1564}	N_{1564}/N
Border	+3.6	+4.1	-0.5	-0.2	+0.3
Midlands	+3.2	+3.8	-0.7	-0.1	+0.3
West	+3.1	+3.4	-0.6	-0.1	+0.4
Dublin/Mid-East	+3.3	+3.5	-0.7	-0.1	+0.6
Mid-West	+3.4	+3.7	-0.4	-0.3	+0.4
South-East	+3.5	+3.5	-0.5	+0.1	+0.4
South-West	+4.7	+5.0	-0.5	-0.2	+0.4
State	+3.6	+3.8	-0.6	-0.1	+0.5
Rate of Convergence	+0.9	Counterfactuals[2]			
		+0.4	+0.2	+0.2	+0.6

Notes: 1. At constant 1990 factor cost.
2. See Appendix III for an outline of the method.

Table 3: Decomposition of living standards growth[1] in Irish regions: 1993-99 (per cent per annum)

	O/N	O/L	L/LF	LF/N_{1564}	N_{1564}/N
Border	+6.6	+3.1	+1.3	+0.8	+1.3
Midlands	+6.2	+2.1	+1.2	+1.6	+1.1
West	+7.3	+3.2	+1.4	+1.2	+1.3
Dublin/Mid-East	+8.3	+3.1	+2.1	+2.2	+0.7
Mid-West	+7.3	+2.8	+1.3	+1.8	+1.2
South-East	+5.3	+2.0	+1.0	+1.0	+1.2
South-West	+8.5	+4.7	+1.2	+1.2	+1.2
State	+7.7	+3.3	+1.6	+1.6	+1.0
Rate of Convergence	+4.4	Counterfactuals[2]			
		+2.4	+1.0	+1.3	-0.8

Notes: 1. At constant 1990 factor cost.
2. See Appendix III for an outline of the method.

Table 4: Comparisons of regional GVA and "GNP" per capita[1]: 1979-93 and 1993-99 (per cent per annum)

	1979-93		1993-99	
	GVA per capita	GNP per capita	GVA per capita	"GNP" per capita
Border	+3.6	+2.2	+6.6	+6.4
Midlands	+3.2	+3.0	+6.2	+8.3
West	+3.1	+2.0	+7.3	+10.0
Dublin/Mid-East	+3.3	+2.9	+8.3	+7.5
Mid-West	+3.4	+2.9	+7.3	+7.0
South-East	+3.5	+2.7	+5.3	+5.1
South-West	+4.7	+3.4	+8.5	+1.1
State	+3.6	+2.9	+7.7	+6.6
Rate of Convergence	+0.9	+1.5	+4.4	+1.0

Notes: 1. At constant 1990 factor cost.
2. From Table 2.
3. From Table 3.

Table 5: Derivation of regional "GNP" estimates for 1993 and 1999 (€m)[1]

	1993					1999				
	(1) Regional GVA	(2) Net Profit Outflows	(3) Other Net Outflows	(4)= (2)+(3) Total Net Outflows	(1) – (4) Regional "GNP"	(1) Regional GVA	(2) Net Profit Outflows	(3) Other Net Outflows	(4)= (2)+(3) Total Net Outflows	(1) – (4) Regional "GNP"
Border	3629	648 (15.9)	36	684	2945	6553	1941 (9.3)	-645	1296	5257
Midlands	1680	88 (2.2)	15	103	1577	3071	125 (0.6)	-303	-178	3,250
West	2861	423 (10.4)	26	448	2413	5649	654 (3.1)	-557	97	5552
Dublin /Mid-East	17529	1109(27.3)	180	1289	16239	37674	8062 (38.5)	-3688	4375	33300
Mid-West	3212	285 (7.0)	33	318	2894	6223	1304 (6.2)	-610	694	5529
South-East	2898	455 (11.2)	41	496	3402	6741	1573 (7.5)	-662	911	5830
South-West	6391	1060(26.1)	71	1131	5260	13031	7297 (34.8)	-1273	6024	7008
State	39199	1069 (100)	402	4470	34727	78943	20957(100)	-7739	13218	65725

Notes: 1:At current prices and in accordance with the ESA 95 standard.
2:Estimates for the State derived as debit minus credit entries for Dividends, Distributed Branch Profits, Income on Equity and Reinvested Earnings from Balance of Payments Current Account for 1999 (CSO, 2002c). Figures in brackets are per cent regional shares.
3. Estimates for the State derived as debit minus credit entries for Compensation of Employees, Income on Debt and Other Investment Income from Balance of Payments Current Account for 1999 (CSO, 2002c).

Table 6: Growth comparisons for regional GVA, primary income, total income and disposable income per capita[1]: 1993-99 (per cent per annum)

	GVA per capita[2]	Primary Income[3] per capita	Total Income[4] per capita	Disposable Income[5] per capita
Border	+6.6	+4.4	+3.5	+3.6
Midlands	+6.2	+2.9	+2.5	+2.7
West	+7.3	+5.0	+3.9	+4.0
Dublin/Mid-East	+8.3	+5.6	+4.7	+4.8
Mid-West	+7.3	+5.1	+4.3	+4.3
South-East	+5.3	+3.6	+3.0	+3.3
South-West	+8.5	+3.8	+3.1	+3.5
State	+7.7	+4.9	+4.0	+4.2
Rate of Convergence	+4.4	+5.5	+6.0	+7.4

Notes: 1. At constant 1990 prices.
2. From Table 3.

Table 7: Sectoral productivity growth[1] in Irish regions: 1960-79 (per cent per annum)

	Aggregate	Agriculture	Manufacturing	Services
Border	+4.5	+4.9	+3.3	+3.0
Midlands	+3.7	+2.3	+4.2	+2.8
West	+4.7	+3.3	+4.2	+2.6
Dublin/Mid-East	+2.3	+2.0	+3.5	+1.4
Mid-West	+4.1	+3.5	+4.3	+2.8
South-East	+4.2	+4.3	+4.1	+3.3
South-West	+3.7	+3.5	+4.0	+2.8
State	+3.5	+3.6	+3.7	+2.2
Rate of Convergence	-3.9	-0.2	-0.8	-8.8

Note: 1. At constant 1990 factor cost.

Table 8: Sectoral productivity growth[1] in Irish regions: 1979-93 (per cent per annum)

	Aggregate	Agriculture	Manufacturing	Services
Border	+4.1	+7.7	+7.2	+0.1
Midlands	+3.8	+7.5	+5.0	+0.6
West	+3.4	+7.8	+5.0	0.0
Dublin/Mid-East	+3.5	+6.5	+7.1	+1.8
Mid-West	+3.7	+6.6	+5.4	+1.1
South-East	+3.5	+4.7	+7.0	0.0
South-West	+5.0	+6.6	+9.8	+0.6
State	+3.8	+6.8	+7.1	+1.1
Rate of Convergence	+0.6	-4.2	+9.2	+11.4

Note: 1. At constant 1990 factor cost.

Table 9: Sectoral productivity growth[1] in Irish regions: 1993-99 (per cent per annum)

	Aggregate	Agriculture	Manufacturing	Services
Border	+3.1	+2.9	+3.1	+2.2
Midlands	+2.1	+3.7	+3.5	-0.9
West	+3.2	+2.4	+5.8	+0.5
Dublin/Mid-East	+3.1	-2.2	+9.0	+0.1
Mid-West	+2.8	+0.5	+7.7	-1.2
South-East	+2.0	+1.2	+3.4	+0.3
South-West	+4.7	+2.7	+6.7	+0.8
State	+3.3	+1.5	+6.8	+0.3
Rate of Convergence	+3.6	-1.0	+4.5	-1.4

Note: 1. At constant 1990 factor cost.

Table 10: Sectoral employment shares in Irish regions: 1960, 1979, 1993 and 1999 (per cent)

	Agriculture				*Manufacturing*				*Services*			
	60	79	93	99	60	79	93	99	60	79	93	99
Border	52	29	18	13	19	34	30	35	29	37	52	52
Midlands	49	33	22	14	22	34	28	35	30	33	50	51
West	65	39	23	18	11	24	25	29	24	38	53	53
Dublin/Mid-East	9	4	3	3	36	34	24	23	54	62	73	74
Mid-West	48	26	16	11	18	32	34	32	34	42	50	57
South-East	44	24	19	13	20	34	31	32	35	42	50	55
South-West	40	25	18	11	24	31	27	31	37	44	55	58
State	36	19	13	9	25	32	27	28	39	49	60	63

Table 11: Decomposing regional productivity growth, 1960-79 (per cent per annum)

	Aggregate Productivity Growth	Contributions from:	
		Sectors[1]	Structural Change[1]
Border	+4.5	+3.5	+1.0
Midlands	+3.7	+3.0	+0.7
West	+4.7	+3.0	+1.7
Dublin/Mid-East	+2.3	+2.0	+0.2
Mid-West	+4.1	+3.3	+0.8
South-East	+4.2	+3.8	+0.4
South-West	+3.7	+3.2	+0.5
State	+3.5	+2.8	+0.7
Rate of Convergence	-3.9	-1.9	-2.0

Note: 1. See Appendix IV for outline of counterfactuals.

Table 12: Decomposing Regional Productivity Growth, 1979-93 (per cent per annum)

	Aggregate Productivity Growth	Contributions from:	
		Sectors[1]	Structural Change[1]
Border	+4.1	+4.2	-0.1
Midlands	+3.8	+3.6	+0.2
West	+3.4	+3.0	+0.5
Dublin/Mid-East	+3.5	+3.7	-0.3
Mid-West	+3.7	+3.5	+0.2
South-East	+3.5	+3.7	-0.2
South-West	+5.0	+5.2	-0.2
State	+3.8	+3.9	-0.1
Rate of Convergence	+0.6	+1.9	-1.3

Note: 1. See Appendix IV for outline of counterfactuals.

Table 13: Decomposing Regional Productivity Growth, 1993-99 (per cent per annum)

	Aggregate Productivity Growth	Contributions from:	
		Sectors[1]	Structural Change[1]
Border	+3.1	+2.6	+0.4
Midlands	+2.1	+1.4	+0.7
West	+3.2	+2.5	+0.6
Dublin/Mid-East	+3.1	+3.2	-0.1
Mid-West	+2.8	+3.0	-0.2
South-East	+2.0	+1.9	+0.1
South-West	+4.7	+3.9	+0.8
State	+3.3	+3.0	+0.3
Rate of Convergence	+3.6	+3.9	-0.3

Note: 1. See Appendix IV for outline of counterfactuals.

DISCUSSION

Mr. Bill Keating: From the CSO's perspective, I very much welcome the use the author has made of the regional accounts and household income data that the CSO has developed over recent years. However, I do want to take issue with references to "living standards" when GVA is mentioned. GVA is a measure of output and is not the same as household income for a number of reasons, especially the impact of commuting, state transfers and the profits of foreign direct investment enterprises. It was to overcome interpretation problems of this nature that CSO developed the household income series as a complement to the regional accounts.

I think endnote ten makes an important point. There could be different deflation effects in different regions, especially in industry where the breakdown by sector could differ between regions. Given the relatively small differences between regions, this could be important. The author's attempt to estimate GNP at regional level is undoubtedly worthwhile, although some of the results clearly illustrate the difficulties. It does, however, appear reasonable that the rate of divergence in the 1990s should decline if using GNP rather than GVA. The point made regarding the International Financial Services Centre is important and this aspect undoubtedly needs further work.