

**SYMPOSIUM
ON
ECONOMIC GROWTH IN IRELAND:
WHERE HAS IT COME FROM, WHERE IS IT GOING?**

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Reflections on the Process of Irish Economic Growth

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1. INTRODUCTION

The most remarkable feature of the so-called Celtic Tiger has been the extraordinary growth in employment. In a short period, this has transformed the economy from a situation of chronic labour surplus to one with labour scarcity.

Employment Growth

Table 1 shows the growth rates of output volume, population and employment in Ireland over various periods since 1926. I take the last period, 1993-2000, as the *Celtic Tiger* phase. In 1993, total employment was just back to the 1980 level after the large fall in the first half of the 1980s during the worldwide recession following the second oil crisis, and the 1993 level was still 7 percent below that of 1926. It is essentially since 1993 that Ireland has experienced the wholly novel phenomenon of rapid and sustained growth in employment.

When we compare the Celtic Tiger with earlier phases, three things stand out. *First*, there is the amazing acceleration in the growth of output (measured here as the total volume of GDP at constant factor cost on the output basis). *Second*, there is the almost equally great acceleration in the growth of GDP per capita – a crude measure of the rise in living standards. *Third*, there has been **no** acceleration in the growth of overall labour productivity, as measured by GDP per worker ((v) in Table 1). Throughout the postwar period labour productivity growth has been relatively high – in the region of 3½ percent per annum. All of the acceleration in the growth of output, therefore, is accounted for by the acceleration in the growth of employment to an average annual rate of 4¾ percent per annum – an extraordinary rate whether judged in relation to previous Irish history or contemporary international experience. Moreover, practically all of the acceleration in the growth of living standards is

accounted for by the rise in the employment-population ratio. In turn, the rise in the employment-population ratio is fully accounted for by the acceleration in employment growth, since variations in the growth of population have been comparatively small. It is this rapid growth in employment which most distinguishes the Celtic Tiger from all previous phases of Irish economic history.

Table 1: Average Annual Growth Rates of Real GDP, Population and Employment, Various Periods Since 1926 (%)

Period	(i) GDP	(ii) Population	(iii) GDP /Cap	(iv) Employment	(v) GDP /Worker	(vi) Employment- Population ratio
1926-1947	0.9	0.0	0.9	0.0	0.9	0.0
1947-1960	2.3	-0.4	2.7	-1.3	3.6	-0.9
1960-1980	4.1	0.9	3.1	0.5	3.5	-0.4
1980-1993	3.3	0.4	2.9	0.0	3.3	-0.4
1993-2000	8.3	0.8	7.4	4.7	3.5	3.8

Source: National Income and Expenditure, various issues; ESRI Quarterly Economic Commentary, December 2000; data compiled for the ESRI Medium-Term Review 1999-2005; and Kennedy (1971).

The impact of the growth of employment on the unemployment rate is illustrated in Figure 1. In considering its impact on living standards, it is necessary to note the qualification that the rise in GDP per capita overstates the improvement in average living standards, chiefly because of the large and increasing outflow of profits in multinational enterprises, which do not add to domestic living standards. A better measure is GNP per capita, which excludes net international capital flows, and its growth rate is given in Table 2 for the periods since 1960 when differences in the growth rates of GDP and GNP began to become significant. The annual average growth rates of real GNP, and real GNP per capita, in the period 1993-2000 are both about 1.25 percentage points below the corresponding GDP entities.

However, the *acceleration* in growth is nearly as great when measured on a GNP as on a GDP basis. Moreover, since the growth of GNP per worker was slightly lower from 1993-2000 than in the preceding postwar periods, our earlier conclusion - that the acceleration in the rise in living standards during the Celtic Tiger phase is overwhelmingly attributable to the change in the employment-population ratio - is reinforced. The impact on living standards relative to the European Union is clear from Figure 2, which shows that GNP per capita in Ireland, having remained for long at about two-thirds of the EU-15 level, has now caught up with the EU average.

Figure 1: Unemployment Rate 1993-2000

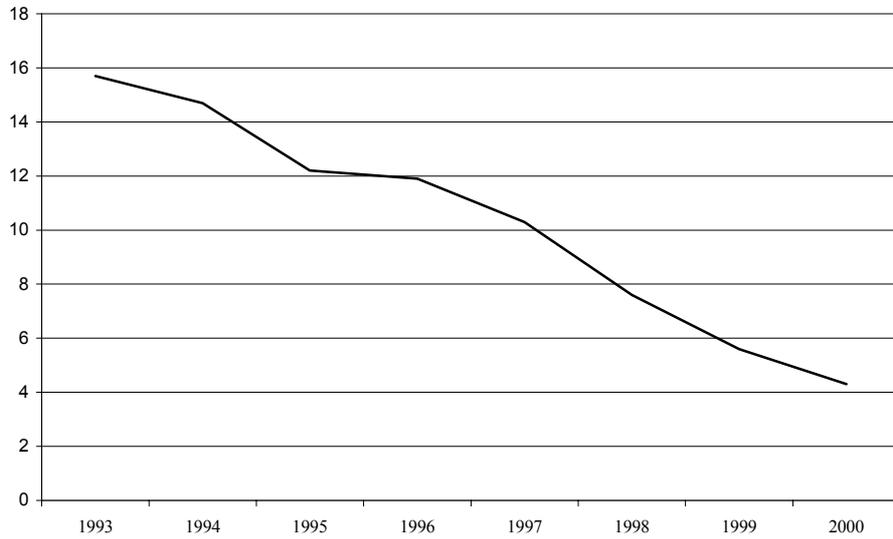
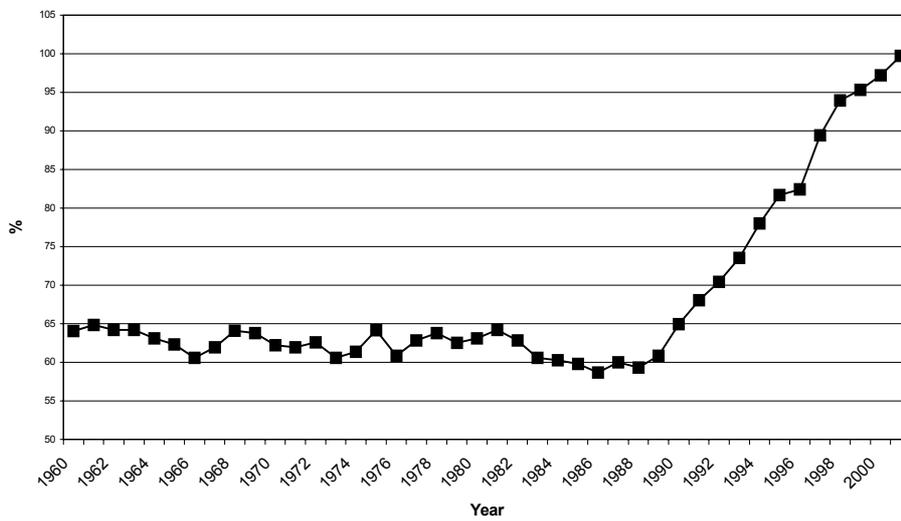


Figure 2: GNP per Head of Population 1960-2001, EU 15=100



**Table 2: Average Annual Growth Rates of Real GNP,
Various periods since 1960 (%)**

	GNP	GNP per Cap	GNP per worker
1960-1980	3.9	2.9	3.3
1980-1993	2.5	2.1	2.5
1993-2000	7.1	6.2	2.3

Source: As in Table 1.

It is worth taking a closer look at the changes in the employment-population ratio (E/P). As is well known, this ratio encompasses three familiar entities: the unemployment rate (measured here as E/L, which is 1 minus the unemployment rate), the labour force participation rate (L/Pa), and the age dependency rate (measured here as Pa/P, which is 1 minus the share of the dependent age groups in the total population) – where E is total employment, L is the total labour force, Pa is the population in the active (i.e. non-dependent) age groups, and P is the total population.² Table 3 gives the average annual rates of change in these entities for each of the periods in Table 1.

It may be seen from Table 3 that the period 1993-2000 emerges as highly exceptional, not simply because of the huge rise in the employment-population ratio, but also because all three components of the ratio improved – in contrast with previous history when all three components were usually static or deteriorating.

**Table 3: Average Annual Rates of Change in the Employment-Population
Ratio and Its Components (%)**

	E/P	E/L	L/Pa	Pa/P
1926-1947	0.0	0.1	0.0	0.0
1947-1960	-0.9	-0.2	-0.3	-0.4
1960-1980	-0.4	0.0	-0.4	0.1
1980-1993	-0.4	-0.8	-0.1	0.5
1993-2000	3.8	1.7	1.2	0.9

Source: As in Table 1.

The only significant exception to the latter is that the age dependency ratio ceased to deteriorate from the mid 1960s, though it is only since the end of the 1980s that a significant improvement took place. However, the improvement in the age dependency ratio from 1993-2000, though substantial, was the smallest of the three elements in the rise in the employment-population ratio. The dominant factor was the greater utilisation of the actual and potential labour force available, as shown by the fall in unemployment and the rise in labour force participation.

It is reasonable to conclude that improvement in the employment-population ratio at the rate experienced from 1993-2000 is a once-off phenomenon, and cannot be sustained much longer. The economy is now near full employment, the labour force participation rate of females is approaching the EU average,³ and age dependency is set to rise again in the second half of the present decade.⁴

Growth of Labour Productivity

The only conceivable way, therefore, that the rate of growth in output and in average living standards experienced during the Celtic Tiger phase could be maintained would be through an acceleration in the growth of labour productivity. We saw already that no such acceleration took place during the Celtic Tiger as far as overall labour productivity is concerned. Does the same hold true for the major sectors? Table 4 gives the growth rates of volume of output, employment, and output per worker in each of the three main sectors – agriculture, industry and services – for the same periods as Table 1. In terms of employment, the services sector was the largest contributor to the overall employment increase from 1993-2000 – because it has by far the largest number of jobs. As far as relative growth is concerned, however, industry was the leader in terms of both output and employment. The growth rate of industrial employment from 1993-2000, at about 6 percent per annum, is very remarkable at a time when industrial employment has been static or declining in most developed economies. Moreover, the *acceleration* in the growth of output and employment compared with the preceding postwar phases was also greatest in industry. Though much has been made of the growth of services, there can be little doubt about the critical importance of industry in driving the Celtic Tiger economy.

In regard to labour productivity, essentially there has been no acceleration in the growth rate of productivity in the sectors during the Celtic Tiger. True, productivity growth in industry in that phase was higher than in the rest of the period since World War 2, but the acceleration had already taken place over the period 1980-93, which actually recorded a higher rate of productivity growth than from 1993-2000. Admittedly, the data for services are problematic because of the difficulties of measuring real output growth in that sector, and it is conceivable that during the Celtic Tiger productivity growth there was higher than recorded. If that were so, however, then the growth rate of output would also be higher in services and in the economy as a whole.

Table 4: Sectoral Growth Rates (% p.a.)

	GDP	Employment	GDP/Worker
<i>Agriculture</i>			
1926-1947	-0.3	-0.8	0.5
1947-1960	2.0	-3.1	5.3
1960-1980	1.6	-2.8	4.5
1980-1993	2.8	-2.8	5.7
1993-2000	0.3	-2.1	2.5
<i>Industry</i>			
1926-1947	2.4	1.9	0.5
1947-1960	5.2	0.5	4.6
1960-1980	5.5	1.8	3.7
1980-1993	4.7	-1.3	6.1
1993-2000	11.9	5.9	5.6
<i>Services</i>			
1926-1947	1.1	0.3	0.7
1947-1960	0.9	-0.4	1.3
1960-1980	4.0	1.7	2.2
1980-1993	2.3	1.5	0.8
1993-2000	6.9	5.3	1.6

Source: As in Table 1.

Labour productivity growth can in principle be separated into two components: the part taking place within sectors (or firms), and the part due to structural change arising from a growing employment share of sectors (or firms) with high *levels* of productivity. The work of Keating (2000) and others shows that the latter component (the intersectoral effect) is quite small when measured at the level of the three main sectors – so that most productivity growth takes place within these broad sectors (the intrasectoral effect). But, of course, structural change also takes place within each of the three sectors, with some tendency for high productivity activities to increase their share of employment, and for low productivity firms to go out of business.

Keating's (2000) results suggest that if we could disaggregate sufficiently, the intersectoral effect could become quite sizeable. This may account for the fact that the period of most rapid productivity growth in industry was during the 1980s when industrial employment fell sharply. Most of the job losses took place in indigenous industry due to closures in firms that probably had low levels of productivity

compared with the new high-tech foreign firms which fared better during this period.

We pointed out above that labour supply is likely to constrain the future growth of the Irish economy unless labour productivity growth was to rise. On the basis of past trends, a rise in the growth rate of labour productivity is improbable: indeed, it would be a considerable feat to even maintain the high rate experienced throughout the post-war period. Much of the post-war growth in labour productivity was no doubt due to realising the potential for catching-up which exists for all developing economies. As an economy approaches nearer to the frontier of best-practice technology, however, the scope for catching-up is attenuated. Moreover, the potential for productivity growth due to structural change is now more limited in Ireland than in the past, since many activities and firms with relatively low productivity have ceased to exist.

Growth of Capital and Total Factor Productivity

If the growth of labour productivity did not increase during the Celtic Tiger, what about capital productivity? Table 5 shows the average annual growth rates of (physical) capital and output per unit of capital for the periods since 1960 for the economy as a whole and for the three main sectors. Taking the economy as a whole first, there has been a substantial acceleration in the growth of the productivity of capital since 1993. When we look at the sectors, however, the improvement is essentially confined to industry, and is probably associated with structural change towards activities like electronics which have comparatively low physical capital requirements relative to their output.

Given that the overall rate of growth of capital productivity rose from 1993-2000, while the growth rate of labour productivity was unchanged, it follows that the overall growth of Total Factor Productivity (TFP, or output per unit of combined labour and physical capital input) was higher during the Celtic Tiger than previously – as may be seen from Table 6. A sectoral breakdown shows that this acceleration in the growth of TFP was confined to industry.

Growth of Human Capital

So far I have said nothing about the presumed rise in the quality of labour as a result of increased education. The available figures show, however, that in a growth accounting framework, the rise in human capital per worker cannot account for *any* of the *acceleration* in the growth of output (or tfp). The reason is that these figures indicate that human capital per worker was rising more slowly from 1993-2000 than in the preceding period! The figures in Table 7, drawn from FitzGerald and Kearney (2000) and based on the data in Durkan, FitzGerald and Harmon (1999), show the average annual rise in education per worker and its (weighted) contribution to the growth of output (and productivity) for each five-year period since 1980.

**Table 5: Growth Rates of Physical Capital Stock and Capital Productivity
(% pa)**

	GDP	Capital*	GDP/Capital
<i>Agriculture</i>			
1960-80	1.6	6.5	-4.6
1980-93	2.8	1.1	1.6
1993-2000	0.3	2.0	-1.7
<i>Industry</i>			
1960-80	5.5	7.0	-1.4
1980-93	4.7	2.4	2.3
1993-2000	11.9	4.3	7.2
<i>Services</i>			
1960-80	4.0	1.6	2.4
1980-93	2.3	2.8	-0.5
1993-2000	6.9	4.5	2.3
<i>Total Economy</i>			
1960-80	4.1	4.0	0.0
1980-93	3.3	2.5	0.7
1993-2000	8.3	4.3	3.8

*The growth rates for capital refer to 1993-99, since the 2000 figure is not available. Housing capital stock is included for the whole economy but not for the sectors.

Source: GDP as in Table 1. Capital stock kindly supplied by John FitzGerald.

**Table 6: Growth Rates of Total Factor Productivity,
Total Economy (% pa)**

1960-80	2.0
1980-93	2.3
1993-2000	3.6

Source: As in Table 5.

It emerges that the rise in the education input, and its contribution to the growth of output (and productivity) was highest from 1980-85 and was progressively less in

each subsequent quinquennium. In fact, the rise in human capital per worker during the Celtic Tiger was dwarfed by the rise in labour input (unadjusted for quality) – so that the outstanding feature of the Celtic Tiger was the increased utilisation of labour rather than the increase in its quality. Accordingly, while the rise in education can account for a (small) part of the growth of output (and productivity) during the Celtic Tiger, it cannot account for any of the acceleration in growth in this period – *unless* human capital affects growth in ways that are not captured by a growth accounting framework. This proviso may be an important one, and I will return to it later.⁵

Table 7: Growth Rates of Education per Worker, and its Contribution to Growth of Output and Productivity (% pa)

	<u>Education per worker</u>	<u>Contribution to growth</u>
1980-85	1.51	0.96
1985-90	1.00	0.59
1990-95	0.94	0.54
1995-2000	0.81	0.43

Source: FitzGerald and Kearney (2000)

2. POSSIBLE CAUSES OF THE CELTIC TIGER

I believe we are still a long way from a full understanding of the causes and timing of the Celtic Tiger. There is no great difficulty in compiling a list of plausible factors, but insufficient research has yet been done to enable us to specify with confidence the necessary and sufficient conditions of Ireland’s remarkable expansion, and to quantify their relative contribution. There is also need for scepticism arising from the fact that many of the factors commonly advanced to explain the Celtic Tiger (such as the growth of human capital, or the restoration of order in the public finances) were already in place in 1993 – yet no one predicted that they would bear fruit so soon and on such a massive scale. What I can most usefully do here is to highlight some factors which I believe would repay further research.

One factor which I myself had envisaged (Kennedy 1993) as a necessary, though not a sufficient condition, of a rapid acceleration in Irish economic growth, was a return in our main trading partners to the “Golden Age” growth rates experienced before the first oil crisis in 1973. This did in fact materialise in the United States, but not in the area receiving two-thirds of our exports, the European Union (see Table 8). What I did not foresee, however, was that despite continued low growth of European GDP, the growth of the volume of goods imports in the EU, and in the OECD as a

whole, was restored to the rapid rates prevailing before the first oil crisis (Table 8). I do not think this factor has received as much attention as it deserves in accounting for Ireland's performance since 1993. In formal terms, it means that the import elasticity of demand with respect to GDP in the EU was substantially higher in this period than in the preceding thirty years. That immediately raises the question "Why?". I would speculate that the Single European Market is a key factor. If so, this raises a wider question as to why other EU countries, apart from Ireland, did not derive more benefit in terms of higher GDP growth.

The rapid growth in the US was undoubtedly a major contributor to Ireland's success, though without the resurgence in EU trade the Irish growth rate would have been constrained. The massive growth of US imports from 1993-2000 can be attributed to high GDP growth, and the US import elasticity was no higher than in the 1980s. However, the buoyancy of the US economy helped Ireland on both the supply side and on the demand side. On the supply side, as is widely recognised, the flow of US foreign direct investment, from which Ireland drew, was critical in enabling Ireland to realise the potential offered by the Single European Market. On the demand side the strong growth in US imports underpinned the buoyancy of world trade, as well as providing a rapidly expanding market for Irish goods. The last mentioned point has attracted little notice, though at first sight the impact seems dramatic.

In 1992, the US was only the fourth most important market for Irish exports, much the same as exports to France, about two-thirds of exports to Germany, and only one-third of Irish exports to Great Britain. In the latest figures available, covering the first ten months of 2000, Irish exports to the US were more than twice those going to France, 50 percent more than to Germany, and were on the way to taking over leadership from Great Britain as Ireland's most important export market. More detailed examination of the figures, however, indicates a less dramatic impact than the above data would suggest. Much, though by no means all, of the growth in Irish exports to the US is concentrated in one category, organic chemicals (SITC Division No 51), which by the year 2000 accounted for nearly half of all Irish exports to the US. Even apart from considerations of transfer pricing, this category has very high value-added relative to its employment – so that the impact on the Irish economy is comparatively small. According to the 1998 *Census of Industrial Enterprises*, while "other organic basic chemicals" (NACE Code 2414) accounted for over one-quarter of the total gross value added in Irish manufacturing, it employed less than 2 percent of persons engaged in manufacturing.⁶

The buoyancy of the demand for Irish exports during the Celtic Tiger phase, and the extent to which Ireland took advantage of this, is shown in Table 9. The volume of Irish goods exports grew at the phenomenal rate of 16½ percent per annum from 1993-2000 - a rate that would lead to a doubling of exports every 4½ years, and almost twice the average rate achieved in the preceding 30 years. Of the increase over the previous period, only about two-fifths can be attributed to Ireland increasing its share of export markets, so that the larger part can be accounted for by

the growth of the markets themselves. While the Irish performance in gaining market share is impressive, this would not have accomplished nearly as much as it did without the major acceleration that took place in market growth.

Table 8: International Growth Rates of GDP and Goods Imports (% pa)

	1960-1973	1973-1980	1980-1993	1993-2000
GDP Growth (volume)				
United States	4.0	2.2	2.3	4.1
EU-15	4.7	2.3	1.9	2.5
Germany	4.3	2.2	2.0	1.8
United Kingdom	3.1	1.1	2.0	3.0
Total OECD	5.0	2.5	2.4	3.2
Growth of Goods Imports (volume)				
United States	9.1	2.7	6.7	12.1
EU-15	8.7	3.1	3.7	8.1
Germany	10.6	4.7	3.7	7.8
United Kingdom	5.9	1.5	4.4	7.8
Total OECD	9.2	2.8	4.5	9.4
Implied Import Elasticities				
United States	2.3	1.2	2.9	3.0
EU-15	1.9	1.3	1.9	3.2
Germany	2.5	2.1	1.9	4.3
United Kingdom	1.9	1.4	2.2	2.6
Total OECD	1.8	1.1	1.9	2.9

Source: OECD *Economic Outlook*, December 2000 and earlier issues; OECD *National Accounts of OECD Countries, Main Aggregates*; and OECD, *Historical Statistics*, various issues.

Nevertheless, Ireland during the Celtic Tiger managed not only to hold its share of rapidly growing world markets, but also to increase that share substantially. In fact the figures in Table 9 show that Ireland has been increasing its market share since the 1960s, but it did so at a much more rapid rate during the Celtic Tiger. Critical to this achievement was the sustained flow of US foreign direct investment to Europe, and that Ireland won an increased share of this flow. The question then arises as to why Ireland was such a favoured location for US investment compared with other areas of Europe. Plausible reasons can be advanced, such as the generous industrial incentives (and particularly the favourable tax treatment of profits), the plentiful supply of young well educated labour at competitive wages, the improvements in human capital and physical infrastructure funded by EU Structural Funds, sound public finances and sensible economic policies, the fact that Ireland is an English-

speaking country, and the far-sightedness and dynamism of the Industrial Development Authority in marketing Ireland's advantages.

Table 9: Irish Export Performance Growth Rates (% pa)

	Volume	Market	Performance
1963-1980	7.7	3.2	4.4
1980-1993	9.2	4.1	4.9
1993-2000	16.5	8.0	7.8

Note: Export performance is measured as the difference between the growth of a country's exports and the growth of its markets. The export market facing each country is calculated on the basis of a weighted average of import volumes in each exporting country's markets, where the weights correspond to trade flows in a designated year.

Source: *OECD Economic Outlook*, various issues.

I would have to admit, however, that we still lack a convincing analysis of the relative importance of the factors involved. It is possible, for instance, that human capital has played a greater role than emerged earlier in the growth accounting framework, which essentially measures only its supply side contribution. Human capital may also have had a profound influence on the demand for labour in that it proved an attraction to foreign enterprise which in its absence might have chosen another location. The possibility that there may be lags and/or threshold effects in the impact of human capital, further complicates the identification and quantification of the causal mechanisms.

The foregoing factors can be summed up in one measure, familiar to economists, namely that Ireland must have been a highly profitable environment in which to locate production in the nineteen-nineties. That is indeed borne out by many statistics. I give one set in Table 10 – the share of profits and professional earnings in non-agricultural net domestic product at factor cost (excluding rents). Looking first at the figures for total non-agriculture, it will be seen that the profit share rose substantially in the period 1993-2000. However, it was rising rapidly also well before 1993!

Again, it is reasonable to allow for lags in the response to changes in the profit share, but such lags would need to be established. When we look at the two sectors comprising non-agriculture, industry and services, we see that the rise in the profit share prior to 1993 was essentially due to what was happening in industry. In services, there were ups and downs in the profit share over the period 1960-93, but the share was little different in 1993 from what it was in 1960, and it has risen much less than the industry share since 1993.

Table 10: Share of Profits in Non-agricultural Net Domestic Product at Current Factor Cost, Various Years (%)

Year	Industry	Services	Total Non-Agr
1960	25.7	22.5	23.7
1980	25.8	11.7	15.9
1985	37.7	12.1	24.1
(1990)†	(42.4)	(23.0)	(31.8)
1990†	43.1	29.3	35.2
1993	46.7	25.5	33.5
2000	*57.8	*29.2	44.0

*Figures relate to 1999.

†Two sets of figures are given for 1990, because of changes in concepts and methods. The set in parentheses is roughly consistent with the years prior to 1990, while the second set is wholly consistent with the years after 1990.

Source: As for Table 1. Rents are excluded from NDP.

The huge rise in the profit share is not something that should be overlooked in considering the causes of the Celtic Tiger. Ultimately the growth of an economy is constrained by the willingness of society to accept the costs of growth, such as a fall in the wage share of national income. That Ireland has been willing to accept such a large fall in the wage share for a comparatively long period, has almost certainly been important in sustaining the high growth rates of the Celtic Tiger phase. Although many of my economic colleagues are sceptical of the part played in this by the successive national partnership agreements, I believe that it is unlikely that such a prolonged shift to profits would have been tolerated without the partnership mechanisms. Whether it will be possible to sustain partnership much longer is of course a different matter. Indeed I do not think we understand fully why it has been sustained so long. One might speculate that the savage job losses of the first half of the 1980s so burned itself in the minds of the trade unions and the general public, that they were willing to accept prolonged pay restraint once it was seen to be translating into more jobs – an example, perhaps, of Olsonian social learning leading to a regime change in response to a shock (Olson, 1996).

It may be argued that the rise in the profit share in industry is somewhat spurious, and as much a consequence as a cause of the way Ireland has developed – in that transfer pricing encourages foreign firms to locate a disproportionate share of their global profits in Ireland in order to take advantage of the favourable tax regime. Nevertheless, although profits in Ireland are artificially inflated, this does not detract from the value of the incentive in attracting foreign investment, since the facility

enables foreign firms, through investing in Ireland, to legally raise the after-tax rate of return on their global investment. A recent study of foreign investment by over 500 US multinationals (Grubert and Mutti, 2000), shows that tax rates have a significant and substantial effect on the choice of location and the amount invested there. They found that a lower tax rate that increases the after-tax rate of return to capital by one percent is associated with about 3 percent more capital investment where the country has an open trade regime.

The provision of well researched answers to the kind of questions I am raising is not simply an esoteric academic quest: it has profound practical importance. For example, how much is the flow of US direct investment likely to be hit by recession in the US, and what would be the consequences for Ireland? How badly would Ireland be affected by a tightening of restrictions on the use of transfer pricing in US tax law? Many similar questions can be posed of a severely practical nature to which we need better academic answers.

I will conclude this section with two more general points. *First*, the Irish experience suggests that the notion of jobless growth may be something of a myth. Rather it suggests that if high enough growth can be maintained, jobs are bound to be created. *Second*, the Irish experience may be of limited applicability to the search for a general means of securing economic growth. Certainly it is doubtful if the path followed by Ireland could be successfully pursued by a large country. In the case of foreign investment, for example, the global pool is simply not big enough to enable a large country, like Britain or France, to secure the same proportionate impact as in Ireland.

3. FUTURE CHALLENGES

For those of us who worked on Irish economic issues over the past forty years, uppermost in our minds was the problem of labour surplus, which constituted the dominant development challenge in Ireland for much of the past 200 years or so. The problem manifested itself in diverse ways: most notably in massive emigration, high unemployment, low labour force participation and a large amount of underemployment, especially in agriculture. It is quite a major transformation, therefore, to reorient our minds to cope with a situation of labour scarcity.

Clearly Ireland's economic success during the past decade means that the development challenge for the future differs greatly from the past. Three key issues immediately present themselves:

- 1) How do we maintain the progress achieved during the Celtic Tiger, and at what rate?
- 2) How do we cope with the adverse side effects? and
- 3) How do we best use the fruits of our success?

In regard to (1) I argued above that there is no possibility of maintaining much longer the kind of growth rates achieved during the Celtic Tiger – even if that were desirable. On the other hand we would wish to avoid a crash. Accordingly, there is a broad consensus that the desirable goal would be a so-called “soft landing” – in which GDP growth would taper down to the sustainable long term rate, i.e. the rate consistent with the secular growth of labour productivity and the natural increase in the labour force (the latter perhaps supplemented by moderate net immigration). The chief threats to the achievement of this goal lie, domestically, in the explosion of expectations in regard to pay and, internationally, in a recession in the US economy and/or a cyclical downswing in the industries in which Ireland has become heavily specialised, such as electronics.

In regard to (2), the chief adverse side effects that have revealed themselves are price inflation (and, most notably, soaring house prices), and congestion (especially in traffic, but also in other services). The distribution of the fruits of the Celtic Tiger (question (3)) is obviously a matter of social choice, and depends on how far we want to go to become an inclusive and caring society and on how much we value quality of life in preference to more material goods and services. Key concerns that arise are poverty strategy, provision of affordable housing, reduction of hospital waiting lists, childcare, care of the elderly, school drop-outs, literacy deficiencies, and the protection of the physical environment.

While the three questions can be posed separately, the answers to them are interrelated, since the desired objectives for each can conflict with one another, and trade offs are inevitable. The issues that arise constitute a formidable list of challenges for the next generation of economists!

Endnotes

1. I am deeply indebted to my ESRI colleague, John FitzGerald, who greatly facilitated the writing of this paper by making available to me the basic data underlying his joint paper, FitzGerald and Kearney (2000). I would also like to thank the following for helpful comments on an earlier draft: John FitzGerald, Finola Kennedy, Danny McCoy, and Eoin O'Malley.

2. This follows from the identity

$$E/P \equiv E/L * L/Pa * Pa/P$$

When converted to growth rates as in Table 3, the equality between the two sides of the equation is approximate since there are interrelations components, but the latter may be presumed to be small.

3. See, for example, *Employment in Europe 2000*, Luxembourg, Office for Official Publications of the European Communities, 2000.
4. Central Statistics Office, *Population and Labour Force Projections, 2001-2031*, Dublin: Stationery Office, July 1999.
5. The matter is also examined in detail in FitzGerald and Kearney (2000).
6. It is interesting to note that a similar, though less extreme, situation existed in Irish manufacturing in 1926, when brewing, then the dominant industry, accounted for over 30 percent of the value of net output in Transportable Goods industry, but only 7½ percent of employment – so that its labour productivity was four times the average. The implied labour productivity level in “other organic basic chemicals” in 1998 was about 13 times the average!

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