

CENTRE FOR ECONOMIC RESEARCH

WORKING PAPER SERIES

2002

Is the Celtic Tiger a Paper Tiger?

Cormac Ó Gráda, University College Dublin

WP02/02

January 2002

**DEPARTMENT OF ECONOMICS
UNIVERSITY COLLEGE DUBLIN
BELFIELD DUBLIN 4**

IS THE CELTIC TIGER A PAPER TIGER?

by

Cormac Ó Gráda
Department of Economics
University College
Dublin 4
cormac.ograda@ucd.ie

Paper presented at the Money, Macro, and Finance Group 2001 Conference, Queen's University, Belfast, 5-7 September 2001. My thanks to Frank Barry, Joe Durkan, John Sheehan, and Kevin O'Rourke for comments and advice.

IS THE CELTIC TIGER A PAPER TIGER?

Cormac Ó Gráda

Last year Ireland's GDP grew faster than anywhere else in the world. In 2001 Ireland remains at the top of the OECD growth league (Economist Intelligence Unit, 2001: 10-11; OECD, 2001: vi). Nonetheless, though the Irish economy continues to attract the headlines, gone is the euphoric tone of even a year or two ago. Now attention focuses more on plant closures by (mainly U.S.) multinationals and the downward revision of growth forecasts. Economists debate the prospects of a 'soft landing' and the sustainability of growth rates half or less those experienced in the 1990s. Nonetheless the achievements of the last decade or so have been indeed notable. For reasons noted below, they are better captured by GNP per head than by GDP per head. Not only has GNP per head in the Republic moved far ahead of Northern Ireland's in the 1990s, but it has reached that of the UK as a whole. Living standards have risen too, if not quite in tandem. Who would have believed all this possible even a decade ago?

Just as there was no hint that a Celtic Tiger was about to roar in the economic commentary of the early 1990s, there was little sense that the experience might prove temporary in the commentary of the late 1990s (e.g. Gray, 1997; Sweeney, 1998; Tansey, 1999; Barry, 1999). Accounts of the Irish economic miracle tended to be very present-centred. Reading them just a few years later, they seemed to imply that Ireland had switched definitively to a new, higher, steady state growth regime. So much so that for a few years policy makers from far and near sought the key to achieving rapid sustained economic growth from Ireland.¹ It became the turn of IDA personnel and Irish economists to travel abroad offering rather seeking advice.

A longer-term, more historical perspective suggests a less dramatic spin. Measuring the performance of the Irish economy against that of the OECD convergence club (shorthand for the pattern reflected in Figures 1(a) and 1(b) below) between mid-century and the mid-1980s implies serious under-achievement. In this period only the 1960s offered a ray of hope. The 1950s were a 'lost decade' of virtual stagnation and mass emigration, while between 1973 and the mid-1980s the record was one of initial growth fuelled by reckless fiscal deficits and a bloated public sector, followed by a painful fiscal correction. However, applying the same simple convergence framework to the 1950-1998 period as a unit suggests that Ireland was

‘on track’, in the sense that it grew as fast as an economy with its 1950 income level might be expected to grow (Ó Gráda and O’Rourke, 1996; 2000). The difference is clear from Figures 1(a) and 1(b). This, and signs that the economy is now returning to more modest growth rates, suggest that the Celtic Tiger’s main achievement was catching up with the rest. Seen from this perspective, the signs that growth is slackening are nothing to be concerned about. Press commentary evokes a sense of disappointment, however, and public policy, with its focus on the need for yet more and more imported capital and imported labour seems hell-bent on the pursuit of continued rapid growth.

Figure 1(a). Initial income and subsequent growth: OECD 1950-87

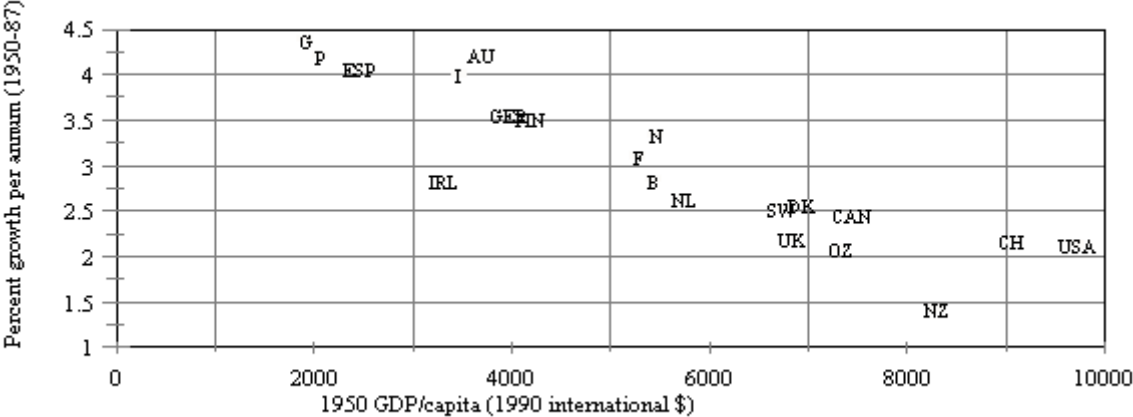
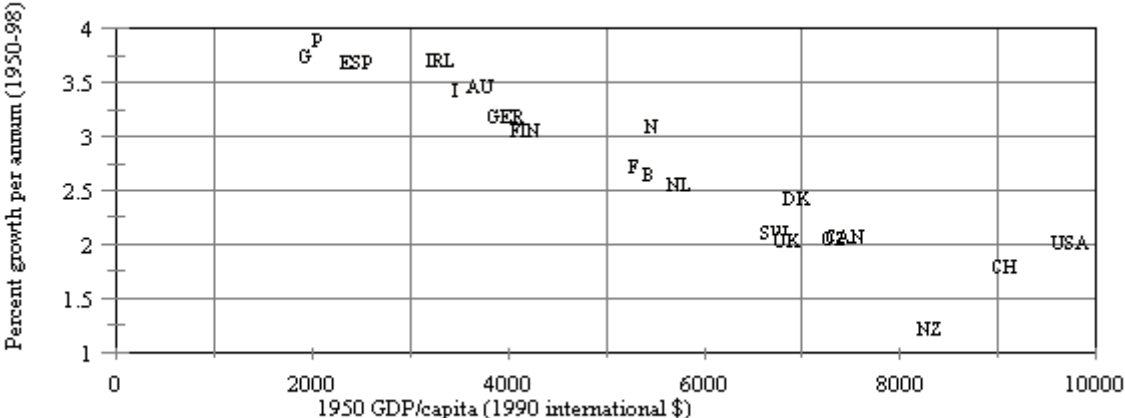


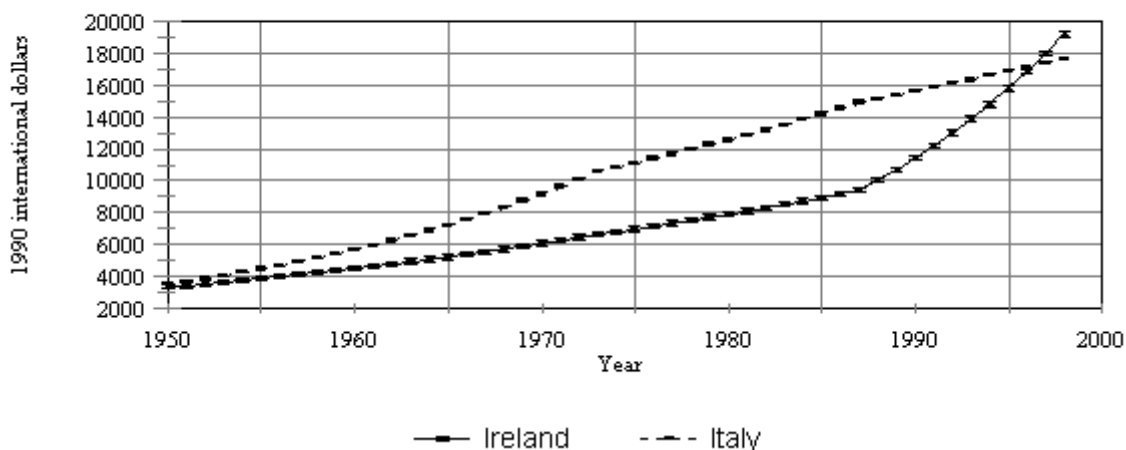
Figure 1(b). Initial income and subsequent growth: OECD 1950-98



The current slow-down suggests the following interpretation of the half century. Before the late 1980s decades of protectionism followed by wrong-headed fiscal policy widened the gap between Ireland and almost every other economy in western Europe except Britain. At the same time the Republic had developed some of the prerequisites for faster economic growth: an underemployed labour force; a stock of emigrants willing to return, given better job prospects; ample energy supplies; an underutilised transport network; a competent and honest public service. An attractive tax package for U.S. multinationals attracted by the prospect of the single European market, and the conviction that Irish policymakers had learned from the mistakes of the late 1970s and early 1980s, did the rest. There followed the hectic Celtic Tiger interlude, and by the end of the 1990s Ireland had made up the ground it had lost.

This record is summarised by the fact that Ireland, where GDP per head was the same as in Italy in 1950, fell far behind in the following three decades or so, and then more than made up all the lost ground from the mid-1980s on (in 1998 Ireland's GDP per head was eight per cent higher than Italy's). So is the bottom line that Ireland had caught up and that its new growth trajectory would sweep it pass not just Italy but everybody else? Not so. The present value of Irish GDP per head, discounted back to 1950, would have been 28.9 per cent higher had it experienced Italian growth rates over the period as a whole, with the slightly lower Italian average growth over the period, but concentrated at the beginning rather than at the end (Ó Gráda and O'Rourke, 1997; 2000; see Figure 2). Moreover, the spectacular output growth rates of recent years tend to make us forget that productivity performance was not so spectacular relative to the record before 1987. The growth in output per worker between 1971 and 1987 was almost as fast as that in the decade that followed. Whence Brendan Walsh's comment that 'if attention had been focused on output per worker rather than total output the phrase 'Celtic Tiger' would never have become popular' (Walsh, 1999: 3).

Figure 2. Irish & Italian GDP/capita
1950-1998



So what produced the Tiger? One of Ireland’s leading macroeconomists has argued that several factors played a role, and that ‘we cannot establish the relative importance of each’ (Walsh, 2000: 671). Still, it is hardly surprising that a recent acclaimed account by an ex-politician and an ex-head of the Industrial Development Authority would give pride of place to politicians ‘who took a long-term strategic view on a number of specific issues’, and the ‘rifle-shot, rather than the scatter-gun, approach’ to seeking out multinationals adopted by the IDA since the 1980s (McSharry and White, 2000: 363-4, 368, and *passim*). Other factors often highlighted in the literature include fiscal restraint, generous tax incentives to multinationals, EU largesse, plentiful human capital, a pliable labour force, and social partnership. It is the contention of this paper that some elements in this package of factors have been oversold, and that others were geared to delivering catch-up, but not limitless growth at the rates achieved in the 1990s.

Human Capital:

Government spokesmen and the IDA frequently stress the part played by Ireland’s human capital. The argument has been overdone, for two reasons. The first hinges on the distinction between the social and the private return on education, too often neglected in this context. Indeed in the 1970s and 1980s analysis focused on the gap between the two, due the emigration of so many of those with third-level qualifications (e.g. NESC, 1991). In the circumstances, investing more instead in infrastructure such as roads and telecommunications might have yielded a better return. The claim that schooling has boosted growth tends to rest

on a growth accounting approach to human capital's contribution, which in effect assumes that it had no opportunity cost (Durkan, Harmon, and Fitzgerald, 1999; Tansey, 1998: 250). Ireland's investment in education is now undoubtedly producing high private and social returns, quite apart from 'new growth theory' gains, but who is to say that less investment in schooling at times in the past would have been the more sensible option?

The second reason why the case for investment in human capital has been oversold is that, for all the hype about Ireland's highly educated workforce, recent international comparisons show it in a less than stellar light. Ireland passes muster when measured by the Third International Mathematics and Science Study (TIMMS), which tested samples of schoolchildren in their early teens in 39 countries in 1995: in these tests Irish schoolchildren came fourth out of the thirteen EU countries included. However, the much-cited International Adult Literacy Test (IALS), which focuses on those old enough to be in the labour force, is more relevant. IALS, which measured adult literacy skills across OECD member-states in 1995, returns a less impressive verdict. By this measure Ireland came ahead of only Portugal of the ten EU economies included (see Table 1).

Table 1: HUMAN CAPITAL LEAGUE TABLES

COUNTRY	TIMMS/ maths	TIMMS/ science	IALS/ prose	IALS/ documents	IALS/ quantitative
Austria		2	1		
Belgium	3	11	7	7	7
Denmark	9	12	6	3	2
Finland			2	4	6
France	5	9			
Germany	6	3	5	6	4
Greece	12	10			
IRELAND	4	4	9	9	9
Netherlands	1	2	4	5	5
Norway	10	7	3	2	3
Portugal	13	13	10	10	10
Spain	11	8			
Sweden	7	6	1	1	1
UK	8	5	8	8	8

Note: for a full explanation of scores see Barro and Lee (2001).

True, Irish educational standards have improved significantly in recent decades, especially due to the introduction of free second-level education in 1967, but correcting for cohort effects does not make much difference (Barro and Lee, 2001; Steedman and McIntosh, 2001). This suggests that commentary in the 1990s exaggerated the quality of the Irish labour force. Perhaps fluent English meant more to U.S. multinationals than high IALS scores. That, however, is hardly a function of policy, nor specific to the 1980s or 1990s.

Fiscal Policy:

Ireland's efforts at setting its public finances right in the 1980s attracted a good deal of attention abroad. In 1989 Rudiger Dornbusch scorned at a 'failed stabilization', which a few years later would spawn the concept of an expansionary fiscal contraction (EFC). An EFC occurs when the deflationary effects of budgetary surpluses on aggregate demand are outweighed by their positive impacts on private expectations, investment and consumption. For a time the role of EFC in jump-starting Irish recovery was the subject of much debate. The latest consensus is against it. Of course, this does not rule out a role for stabilisation policy. McSharry and White deem fiscal stabilisation 'the main precondition for a sustained economic recovery', and the case is more formally stated by Patrick Honohan (1999). Unquestionably without the dramatic, unequally-borne fiscal corrections of the 1982-7 period, DFI would have gone elsewhere and the Tiger would not have roared. However, had the economy not almost self-destructed from the late 1970s the corrections would have not been necessary in the first place. In other words fiscal stabilization was about making up lost ground, not achieving a new steady state.

The transfer of about IR£9 billion at 1994 prices to the Irish exchequer between 1989 and 1999 through the EU's Community Support Frameworks (Delors I and Delors II) arguably eased the challenge of fiscal stabilization, as Marshall Aid did for other European economies in an earlier generation. But macroeconomic simulations suggest that in accounting for the Celtic Tiger the transfer was an 'also ran'.² Frank Barry, John Bradley, and Aoife Hannan (1999; see too Honohan, 1997) found that without it GDP would have been 3 to 4 percentage points less in the late 1990s. This must be set against the doubling of real GDP between 1990 and 2001.

Since 1987, when the Tiger was born, and today the ratio of government revenue to GDP has dropped from 40.3 to 33.2 per cent, and the ratio of public expenditure to GDP from

48.5 to 27.7 per cent. The Irish public sector is now the smallest in the EU in relative terms. Over the same period the ratio of national debt to GDP has fallen from over 100 per cent in 1987 to 38 per cent by the end of 2000. The timing suggests that Ireland's current status as a low tax, low public debt economy is a product of the Celtic Tiger, however, not its cause.

Social Partnership:

A similar argument can be made about social partnership, introduced in 1987. Irish economists were initially very sceptical of it (e.g. Durkan, 1992), but the scepticism soon gave way to a conviction that social partnership was a distinctively Irish contribution to economic success. Some now even argue for social partnership as a recipe for long-run growth in a full employment context. Here too history has something to say. This 'Irish solution to an Irish problem' bears a close resemblance to the tripartite contract between labour, capital and the state developed in many other European economies in the early 1950s. In those cases organised labour made a commitment to wage moderation in return for a capitalist commitment to re-invest profits and the state's commitment to the welfare state. The particularly Irish feature of social partnership in the 1980s and 1990s, in an era when the welfare state was under threat in any case, was the state's undertaking to reduce personal taxation instead.

Social partnership worked well in the mess left behind by governments in the late 1970s and early 1980s. The commitment to wage moderation made sense when unemployment was high, and contributed to the share of wages and salaries in GDP plunging from 57.5 percent in 1987 to 46.3 per cent twelve years later. Wage moderation in the heavily unionised public sector was a boon to the public finances. Social partnership also kept down the number of industrial disputes and workdays lost. The system has persisted, its most recent embodiment being the Programme for Competitiveness and Fairness. However, in an economy like Ireland's in 2001, where unemployment is three per cent, the scope for social partnership 1980s and 1990s-style is less compelling. Wage moderation simply leads to excess demand for labour and loss of credibility for the trade union movement. Ironically, key features of social partnership – centralised bargaining, wage moderation, low wage dispersion – were identified by some labour economists as reasons for the poor performance of some European economies in the 1980s (e.g. Calmfors and Driffil, 1988; Freeman, 1989). For social partnership to continue working it needs to re-invent itself.

'Free Trade':

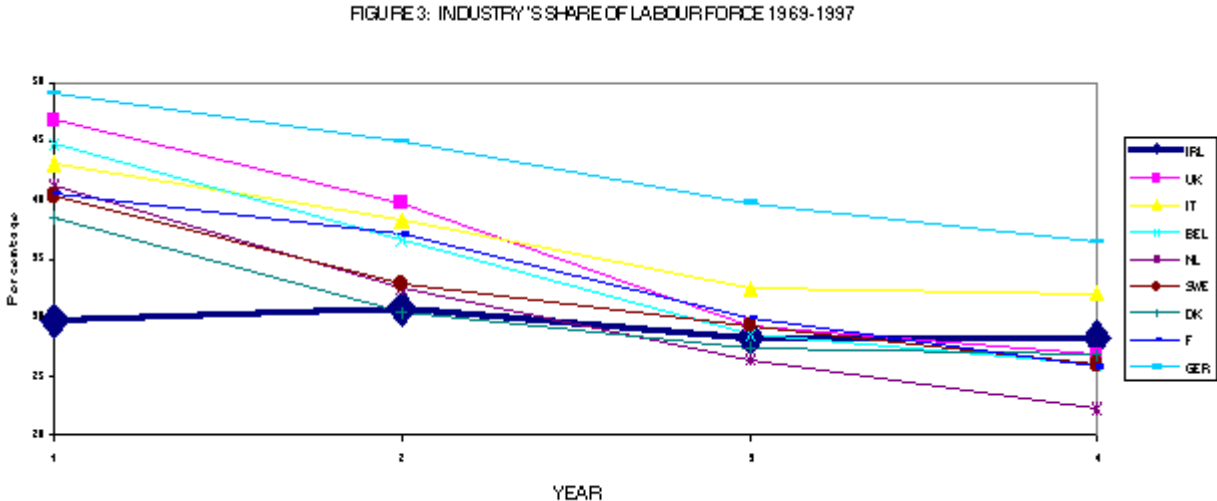
In the 1960s Ireland scrapped much of the protectionist apparatus built up since the 1930s. Tariffs were reduced unilaterally, and the Industrial Development Authority, originally an arm of protectionist policy, was transformed into an agency to attract foreign capital. But what emerged was hardly free trade. Instead Ireland shifted from one form of trade distortion to another: export-subsidizing industrialization (ESI) replaced import-substituting industrialisation (ISI). A trade sector bloated by DFI replaced one shrunk by ISI. However, while ISI resulted in small and mainly indigenous factories, short production runs, and high costs, ESI relied on foreign capital and a global (though mainly European) market, and so was more likely to involve firms and industries subject to increasing returns to scale; it was also more likely to generate productivity enhancing agglomeration effects. There is some evidence to support this (Barry *et al.* 2001).

Perhaps it is too soon to ask whether this new, more sophisticated form of protectionism has produced any grown-up infants. Can subsidies to export-oriented multinationals generate dynamic gains that ISI-oriented protection cannot deliver? The first generation of multinationals, those introduced in the 1960s and 1970s, certainly failed to deliver on this score. Some researchers, like NUI Galway's Roy Green, are more optimistic about the current generation: according to Green, the policy of concentrating on high technology sectors and forging linkages with the local economy 'has proved to be a winning formula in the development and sustainability of Ireland's extraordinary economic metamorphosis' (Green, 2000).

It bears noting, however, that public policy has led to Ireland being one of the only countries in the OECD in which manufacturing's share in output has continued to rise. The rest of western Europe has been experiencing de-industrialization since the 1970s. While manufacturing's share in the Republic's GDP has risen from barely one-fifth in the 1950s to 35.4 per cent in 1970 and 38.4 per cent today (1999), its share in the UK has plummeted from 35 per cent in 1979 to 23.9 per cent in 1999.³ Some of the rise in the Republic is the product of DFI-induced transfer pricing, but employment data corroborate Irish distinctiveness in this respect. The proportion of total civilian employment accounted for by industry has fallen throughout Europe in recent decades, but in Ireland it has held its own (Figure 3). It is striking that the shift in Ireland's occupational structure is so different to that of the rest of northwestern Europe. Is it because Ireland has bucked the European de-industrialization trend

that it has done so well? Is this a reflection of Ireland’s true comparative advantage, or is it merely a distortion produced by the corporate tax regime? One argument on the side of optimism might be that the ‘rust-belt’ de-industrialisation responsible for the decline in the industrial labour force elsewhere (as in Northern Ireland) is the product of an earlier industrial phase that largely passed the Republic by.

Figure 3



Corporation Tax:

For a long time Ireland paid a high price for how it exercised its economic sovereignty. Today it is reaping the benefits of independence. While the gaps between poor and wealthy regions of the United Kingdom are slow to narrow, and in some cases are widening, Ireland has overtaken the UK in terms of output, if not quite in living standards.⁴ The main economic benefit of sovereignty has been control of fiscal policy. Ireland can get away with its low corporate tax regime because it is a small economy, producing about one percent of EU GDP, and because it was the first to offer foreign investors such tax concessions. Size matters: if Germany or France decided unilaterally to reduce its corporate taxation level to the 12.5 per cent across the board rate being introduced by Ireland in 2003, it would risk breaking up the EU. Being first matters: Ireland’s position in this near-to-zero sum game depends on others

– or too many others – not following suit. Whether aspirant EU member states from Eastern Europe are likely to compete on this front remains to be seen. That certainly would not be in Ireland's interest.

It has been argued that the taxation argument has been oversold, since in recent years Ireland's share of US DFI in Europe has risen despite some narrowing in tax differentials. The findings of a recent paper by Rosanne Altshuler, Harry Grubert, and Scott Newton (1998) are interesting in this context. Altshuler and her colleagues have produced evidence of an increasing sensitivity of US DFI to tax rates, finding that the elasticity of real capital to after-tax rates of return doubled from 1.5 in 1984 to almost three in 1992. They attribute the rise to the increasing mobility of capital and globalization. Has the elasticity risen further since the early 1990s? If so, this could explain why Ireland has managed to increase its share, but also how vulnerable it would be to tax harmonisation (Altshuler *et al.*, 1998; Grubert and Mutti, 2001). The issue is worth urgent attention. In a similar vein Reint Gropp and Kristina Kostial have simulated the effect tax harmonisation would have had on European economies in the 1990s. They find that it would have cost the Republic FDI worth over 1.3 per cent of GDP annually between 1990 and 1997 (Gropp and Kostial, 2001).

Some sense of the impact of the tax regime on industrial structure may be obtained from Table 2. There we first compare the share of wages and salaries to net output in a range of sectors in both Ireland the UK in the late 1990s. In Ireland most of the enterprises in the first four sectors are indigenous, whereas the second four are dominated by US multinationals. The UK data operate as rough controls. The most striking feature is the small share of net output going on wages and salaries in Ireland's multinational sectors. Labour's small share in Ireland's NACE 21-22 is explained by the presence of a subsidiary of Microsoft in that sector. These differences, and the concentration of US multinationals in these sectors, underline the importance of transfer pricing for US DFI in Ireland (and the distortions in both Irish GDP and industrial production data). The same goes for much of Ireland's internationally traded services sector, since 1987 also beneficiaries of low corporation profits tax. More systematic comparisons of sectoral data, embracing all NACE categories and perhaps a few more economies, might help reveal the 'real' size of Ireland's industrial sector. Be that as it may, so far Ireland has not been a loser by its distorted, though perhaps also somewhat vulnerable, foreign trade regime.

Finally, referring back to our earlier remarks about infant firms growing up, Table 2 also compares the percentages of employees described as ‘operatives’ (Ireland) or ‘industrial workers’ (UK) in the same sectors. The high-tech sectors dominated by DFI are of particular interest, given the prevailing belief in Ireland that they attract highly skilled and highly educated workers. The strength of white collar occupations in these sectors in both countries is confirmed. Also worth noting, though, is how Ireland lags behind the UK in this respect in all cases (though US FDI also bulks large in the UK).

TABLE 2: LABOUR SHARE AND RATIO OF OPERATIVES TO OTHER WORKERS IN SELECTED INDUSTRIES, IRELAND (1998) AND THE UNITED KINGDOM (1997)

Sector	NACE	(W + S)/NO (%)		Operatives/All Employees (%)	
		<u>IRL</u>	<u>UK</u>	<u>IRL</u>	<u>UK</u>
Wood and Wood Products	20 1)	40.8	46.4	77.6	70.9
Paper, Publishing, Printing	21-22	11.6	39.8	55.3	51.3
Textiles	17	49.9	48.8	80.7	77.5
Food Products	15-16	17.4	30	74.7	78.1
Chemicals	241-243	2.7	30.5	56.4	49.8
Pharmaceuticals	244	10.6	27.3	60.5	42.5
Elect/Optical	30-33	21.1	42.9	65.5	56.8
Computers	30	12.4	32	56.7	46.8

Source: Derived from *Census of Industrial Production 1998* (Dublin, 2000); *Manufacturing Summary Volume, Data for 1997* (London, 1999).

Conclusion:

In the mid-1980s, with massive reserves of unemployed labour and more to draw on abroad, a grave fiscal situation recently brought under control, a generous corporation tax regime, and the prospects of wage moderation, industrial peace, and a single European market, the conditions for an economic recovery in Ireland were right. The Tiger's achievement was to capitalise on this situation. The Irish economy — now healthy, rich, and relatively well run — is no Paper Tiger.

Yet this is no time for smugness. Small open economies, no matter how successful, get buffeted by exogenous shocks. Ireland now faces the double threat of the US recession in short run and of competition from Eastern Europe diverting FDI in the longer run. It may grow faster than the OECD norm for a few more years, but to think that it can do so in the long run is wishful thinking. Most likely, soon the Tiger years will be remembered as the interlude when Ireland made up all the ground it had lost and became a 'normal' European economy.

REFERENCES:

- Altshuler, Roseanne, Harry Grubert, and T. Scott Newlon (1998). 'Has U.S. investment abroad become more sensitive to tax rates?', NBER Working Paper No. 6383, January.
- Barro, Robert J. and Jong-Wha Lee (2001). 'International data on educational attainment: updates and implications', *Oxford Economic Papers*, 541-563.
- Barry, Frank (1999). *Understanding Irelands Economic Growth*, London: Macmillan.
- , John Bradley, and Aoife Hannan (1999). 'The European dimension: the single market and the structural funds', in Barry (1999), pp. 99-118.
- , Hölger Jörg, and Eric Strobl (2001). 'Foreign direct investment, agglomerations, and demonstration effects: an empirical investigation', available at <http://www.ucd.ie/~economic/workingpapers/2001.htm>.
- Calmfors, Lars, and John Driffil (1988). 'Bargaining structure, corporatism and macroeconomic performance', *Economic Policy*, 6: 16-41.
- Durkan, Joseph (1992). 'Social consensus and incomes policy', *Economic and Social Review*, 23(3), 347-63.
- , Doireann FitzGerald, and Colm Harmon (1999). 'Education and growth in the Irish economy', in Barry (1999), pp. 99-118.
- Economist Intelligence Unit (2001). *Country Reports: Ireland*, August.
- Freeman, Richard B. (1989). 'Labour market institutions and economic performance', *Economic Policy*, 6.
- Gray, Alan W. (ed.) (1997). *International Perspectives on the Irish Economy*, Dublin: Indecon.
- Green, Roy (2001). Cited in 'Celtic Tiger Alive and Well', <http://www.highereducationireland.com/newsdesk/tiger.html/>
- Gropp, Heint and Kristina Kostial (2001). 'FDI and corporate tax revenue: tax harmonization or competition?', *Finance & Development*, 38(2), 10-17.
- Grubert, Harry and John Mutti (2001). 'Do taxes influence where U.S. corporations invest?', *National Tax Journal*, LIII(4), Part 1, 825-839.
- Honohan, Patrick (1997). *EU Structural Funds in Ireland: A Mid-term Evaluation of the CSF 1994-1999*, Dublin: ESRI.

— (1999). 'Fiscal Adjustment and disinflation in Ireland: setting the macro basis of economic recovery and expansion', in Barry (1999), pp. 75-98.

MacSharry, Ray and Padraic White (2000). *The Making of the Celtic Tiger: the Inside Story of Ireland's Boom Economy*, Cork Mercier Press.

OECD (2001). *Main Economic Indicators*, Paris: OECD.

Ó Gráda, Cormac (1997). *A Rocky Road: the Irish Economy since the 1920s*, Manchester: Manchester University Press.

— (2000). 'From frugal comfort to ten thousand a year: trade and growth in the Irish economy', in Ray Ryan (ed.), *Writing in the Irish Republic: Literature, Culture, Politics 1949-1999*, London: Routledge, pp. 263-282

— and K.H. O'Rourke (1997). 'Irish economic growth, 1945-1988', in N.F.R. Crafts and G. Toniolo (eds.), *Economic Growth in Europe since 1945*, Cambridge: Cambridge University Press, pp. 388-426.

— and — (2000). 'Living standards and growth', in John O'Hagan (ed.), *The Economy of Ireland: Policy and Performance of a European Region*, London: Macmillan, pp. 178-204.

Steedman, Hilary and Steven McIntosh (2001). 'Measuring low skills in Europe: how useful is the ISCED framework?', *Oxford Economic Papers*, 564-581.

Sweeney, Paul (1998). *The Celtic Tiger: Ireland's Economic Miracle Explained*, Dublin: Oak Tree Press.

Tansey, Paul (1998). *Ireland at Work: Economic Growth and the Labour Market, 1987-1997*, Dublin: Oak Tree Press.

Walsh, B.M. (1999), 'What's in store for the Celtic Tiger?', *Irish Banking Review*, Spring, 3-10.

— (2000). 'The role of tax policy in Ireland's economic renaissance', *Canadian Tax Journal*, 48(3), 658-673.

ENDNOTES:

1. The seminar held in conjunction with the launch of Frank Barry's *Understanding Ireland's Economic Growth* in May 1999 attracted embassy officials from three continents (including those of Poland, Hungary, Denmark, Estonia, Israel, Mexico, and Finland). Even Silvio Berlusconi took a fleeting interest in *il tigre irlandese* (*Irish Times*, 24 October 1996; c. 3-6 June 2000).
2. The transfer was also tiny compared to that from Whitehall to Northern Ireland, estimated at about one quarter of personal expenditure in the 1990s. See Ó Gráda, 2000: 278, 282.
3. For comparability construction has been added to industry in the UK. Compare Ó Gráda, 1997: 122-124.
4. For example, since the 1960s Welsh domestic product per head has fallen behind that of the UK as a whole. In 1968 it was 86.1 per cent; in 1990 83.2 per cent, in 1998 it was just short of four-fifths.