THE IRISH ECONOMIC BOOM: FACTS, CAUSES, AND LESSONS

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December 2000

This paper has been prepared for Industry Canada. I am grateful to George Akerlof, Paul Beaudry, Olivier Blanchard, Andrew Sharpe and Brendan Walsh for discussions and advice, and to Serge Nadeau and Renée Saint-Jacques for their unfailing support.

Abstract

Over the past decade, Ireland's real domestic product per head has doubled, and its national unemployment rate has declined from 16% to less than 5%. This has made the Republic one of the ten richest countries in the world. This economic ″miracle″ is the joint outcome of a long-term productivity boom dating back to the 1950s and 1960s, and a sudden short-term output and employment boom that has seen Ireland's job performance recover since 1993 all the ground lost during the previous twenty years.

It turns out that Ireland has been remarkably supportive of long-term productivity growth for several decades, through its openness to free international trade and investment, its business-friendly industrial and tax policies, and its free secondary and low-cost higher education.

The short-term aggregate demand push since 1993 has been fueled by the solid economic recovery in Europe and the United States, continued improvement in Ireland's international cost competitiveness, streamlined public finances, and low (net-of-inflation) interest rates. The aggregate supply response to this expansion in demand has included a sharp increase in women's labour force participation rate, a large flow of new and return immigrants, and massive foreign direct investment, particularly from US multinational corporations. In combination, these developments in labour and capital markets have kept the boom going with no increase in inflation until late 1999. The extended non-inflationary response also owes much to Irish fiscal discipline, consensus-based wage moderation, and participation in the Single European Market and the European Monetary Union.

Ireland's long-term productivity-enhancing policies can be widely imitated or emulated by other countries, including Canada. Policies to promote high employment must take into account country-specific wage-setting institutions and monetary regimes. In general, countries will achieve the lowest sustainable national unemployment rate if they avoid premature monetary tightening, and if they adopt supply-friendly tax, expenditure and regulatory policies that keep unit labour costs low and foster high rates of saving and investment.

1. Introduction

Since 1993, the economic performance of the Irish Republic has been truly exceptional. The Irish standard of living has now outstripped the British level and the European average. This is a moment of history the Irish have been waiting for a thousand years. It is important to understand the nature and origin of the Irish economic boom of the past seven years to see what other countries can learn from it on how to pursue the objectives of rapid economic growth, high employment and low inflation more effectively.

Accordingly, the key facts and patterns that characterize the Irish economic boom will first be reviewed in section 2. Then, a structured interpretation of its causes will be proposed in section 3. Finally, practical lessons for policymaking will be suggested in section 4. The analysis is inspired by the companion paper prepared by Walsh (2000) for this exercise. That paper contains an illuminating description of the historical preconditions and causes of the Irish ″miracle″.

2. Reviewing facts

Before asking what Canada can learn from the Irish economic boom of the 1990s, it is necessary to ascertain its magnitude and components, and contrast it with the concomitant Canadian slowdown and recovery.

A. Overall growth performance

There should be no doubt about the extraordinary performance of the Irish economy over the past decade. As measured by real GDP per head (real GDP divided by total population), the per-capita income generated by the Irish economy increased by 97% between 1989 and 2000, almost doubling in 11 years. Three-quarters of that growth has occurred during the last seven years. Canada's scorecard since 1989 reports a much lower 16%. Table 1 broadens the international perspective to 24 OECD countries. The data stops in 1999, the last year for which it is currently available in most cases. The right-hand column of the Table shows that over 1990-99 Ireland had by far the best performance of all (+83%), followed by emerging Korea (+64%), and Norway a distant third (+31%). Canada's real GDP per head increased by only 12%, which puts the country among the bottom performers in company of Mexico, France, Finland, Sweden, New Zealand and Switzerland. Meanwhile, US real income per head grew cumulatively by 22% - almost twice as much as its Canadian counterpart.

The two left-hand columns of Table 1 show that Ireland's economic boom propelled it from 19th place in 1989 to 7th in 1999. Ireland's domestic real income per capita increased to 74% of the US level in 1999 from 50% ten years earlier. Meanwhile, Canada slipped from 3rd to 4th place. In 1999, its real per capita income had declined to 79% of the US level from 86% in 1989. An important caveat in the case of Ireland is that in recent years a rising portion of the growth in Irish domestic income (earned on Irish territory) has been sent abroad as net payments of interests and dividends to foreigners, and so has not contributed

to raise Irish national income (earned by Irish nationals). In 1999, these net foreign payments represented 12.5% of GDP.

Figure 1 extends the picture back to 1976 by comparing trends in real GDP per working-age adult (real GDP divided by population aged 15-64) in Ireland and Canada relative to the United States. Initially, through ups and downs, Ireland managed to increase its real income per adult from 50% of the leader in 1976 to 60% in 1994. Then, from 1994 onward, its relative performance literally took off. It has risen by 18 points over the past six years, now reaching 78% of the US level. By contrast, the Canadian story has been one of decline from 87% of the US level in 1976 to 77% today. Canada's standard of living has increased in absolute terms, but more slowly than the US standard of living.

B. The productivity-employment split

Real GDP is the total value of goods and services produced within a country's borders each year. It is the most important source of domestic real income. But it still gives too coarse a picture of wealth generation. It is crucial to observe that more income per adult can be created in two basic ways: (1) by increasing real output per employed worker (with better technologies, better education and training, better public infrastructures, more and higher-quality machinery and equipment, better social relations, or more hours worked per employee), and (2) by putting a larger fraction of the adult population to work. The first way, increasing real output per worker, means increasing productivity. The second way, putting more people to work, means increasing the employment rate. The growth rate of real GDP per adult is just the sum of the increase in productivity and the increase in the employment rate. (A third way of getting richer will not be considered in this paper. It amounts to obtaining higher prices for what we sell internationally, paying lower prices for what we buy internationally, or making new natural resources discoveries.)

Figures 2 and 3 break down the trends in real GDP per working-age adult charted in Figure 1 into their productivity and employment-rate components, respectively. In the case of Canada, the decomposition indicates that the relative decline in real GDP per head has come from both a slowdown in productivity and a drop in the employment rate relative to the United States. Figures 2 and 3 show that Canada's relative productivity and employment-rate outcomes have both improved lately, but it is yet unclear whether the catch-up process will extend beyond the normal cyclical recovery.

C. Long-term productivity performance

In the case of Ireland, the decomposition of real GDP per working-age adult into its productivity and employment-rate components brings out a startling fact. The growth in Irish productivity has been very rapid, not just over the past few years, but for the entire period 1976-2000, averaging 3.3% a year. Productivity growth rates of 3% or higher sustained over such an extended period have been a rare occurrence in the postwar period, and particularly so over the last quarter century. In fact, since 1975, only Korea (among OECD member countries) has experienced faster productivity growth than Ireland.

Remarkably, Irish output per employee now exceeds Canadian productivity and is beginning to challenge US productivity.

Two implications follow. First, a fundamental characteristic of the Irish economy over the last 25 years is that it has experienced a long-term productivity boom. Second, the short-term boom of the last seven years is not at all due to some acceleration of productivity. In fact, over the past decade Irish productivity has grown somewhat more slowly (2.9% a year) than over the previous 13-year period 1976-89 (3.6% a year). One possiblity, raised in section 3, is that the slowdown in Irish productivity growth would have been more pronounced in the absence of the recent boom.

It is important at this point to remember that output per worker – which is how we have so far defined productivity – is the product of output per hour worked times the number of hours worked annually by the average worker. Output per hour worked is a more accurate definition of productivity than output per worker. Although the number of hours worked per employee is influenced by market conditions and individual preferences, it also depends on labour regulations determining the lengths of the normal workday, workweek, holidays and vacations. The OECD estimates for the annual number of hours worked per employee are 1780 hours for the average Canadian worker and 1980 hours for the average American worker (OECD 2000). No estimate is provided for Ireland. According to the Irish Labour Force Survey, "usual" weekly hours of work for persons in employment were 38.0 in March 2000. Given that EU members must give 20 working days as vacation time and that most Irish employers give 10 holidays (9 official, plus two half-days on Christmas Eve and Good Friday), annual hours of work per employee in Ireland must be about 1750. These estimates would mean output per worker in Canada and Ireland would be 10% and 12% below output per worker in the United States respectively, simply because the typical employed Canadian and Irish work less hours per year than the typical employed American.

The fact, seen in Figure 2, that Irish output per worker is currently 91% of US output per worker therefore implies that Irish output per hour worked is 103% of US output per hour worked (since 0.91/0.88 = 103%). In other words, it is readily arguable that ″true″ Irish productivity (defined as output per hour worked) already exceeds ″true″ US productivity. Ireland would actually not be the only European country in this case. On an output per hour basis, productivity in France, Germany, Italy, Norway and the Netherlands would also be currently equal to, or greater than, the US level.

One corollary is that the tendency for Irish productivity to decelerate relative to US productivity in the 1990s, which is apparent in Figure 2, should not be too surprising. Productivity usually grows more slowly once convergence to the world technology frontier has been achieved than in the previous catch-up phase. Although no one can pretend to know the future for sure, a further deceleration of Irish productivity toward the rate of growth of US productivity would seem likely in coming years. (This would translate into a progessive flattening of the time path of Ireland's relative productivity in Figure 2.) This kind of slowdown in the growth of productivity is exactly what has already happened to European countries that have already caught up with the level of US output per hour.

In Canada, as Figure 2 indicates, output per worker is currently 83% of the US level. Since the number of annual hours worked by the average Canadian worker is 90% of that observed in the United States, it follows that output per hour in Canada is in fact 92% of the US value (since 0.83/0.90 = 92%). This means that there is, in principle, ample room for future Canadian productivity to accelerate and exceed the rate of increase of US productivity for a while. This would show up as an upward turnaround of the time path of Canada's relative productivity in Figure 2.

D. Short-term employment performance

If the Irish boom of 1994-2000 has not been due to some acceleration of productivity (more output per worker), it must logically be attributed to the other source of growth in GDP per adult, namely an exceptionally strong increase in the employment rate (a larger fraction of adults put to work). This fact receives confirmation in Figure 3. Like many EU member countries (but in contrast with North America), Ireland suffered a major employment setback between the mid-1970s and the mid-1990s, which largely overshadowed its bright productivity performance. During that period, Ireland was able to close part of its standard-of-living gap with the United States, as we saw in Figure 1, but the process was painfully slow. Since the 1994 turnaround, the burst of employment in Ireland has not only erased previous job losses, but it has pushed the country's employment rate above the European average.

A natural interpretation of the Irish employment boom of recent years is as a return of the employment rate to its "normal" long-term growth path after the long slump of 1976-93. It can be seen in Figure 3 that the Irish employment rate has been 85% of the US employment rate in 2000, and that this is only slightly better than the 84% level observed in 1976. Without the employment slump of 1976-93, but with the same rapid productivity growth performance, the Irish economy would now be at about the same point as it is today – and no one would have noticed!

In sum, the extraordinary income growth performance of Ireland in recent years is due to a dramatic short-term employment turnaround that has finally combined with the country's continuing long-term productivity boom.

The astounding Irish employment boom has had no parallel in postwar Europe. Some European countries have seen their unemployment rates fall appreciably over the past decade. Examples are Austria, Denmark, the Netherlands, Norway, Portugal, and the United Kingdom, whose current unemployment rates are all less than 6%. What is exceptional about Ireland is four special characteristics of the employment surge. First, the Irish unemployment rate has dropped from a much higher initial level than in these other countries (from 16% in 1993 to less than 5% today). Second, the employment rate increase was able to draw on a very large pool of women who had never been in the labour force before. The number of Irish women in the labour force has increased by 65% since 1993. Third, the rate of job creation has absorbed a very large flow of immigrants who were attracted (or attracted back) to Ireland by the boom. And fourth, all these developments have taken place with the speed of lightning.

As Figure 3 indicates, the Irish and Canadian employment rates are currently 85% and 93% of the US employment rate, respectively. They represent even lower percentages of the Norwegian or Swiss employment rates. There is room for further increases in both Ireland and Canada, but particularly for the former. The Irish male employment rate has now caught up with the Canadian male rate, but in proportional terms there are still 20% less women in the labour force in Ireland than in Canada. It is nevertheless likely that the supply of additional labour to the growing Irish economy will come less ″elastically″ in the future than in the past. Severe labour and housing shortages are already developing in Ireland today. They have induced the inflation rate to rise sharply over the past year.

3. Understanding causes

I now turn to interpretations of the Irish productivity-employment boom. Specifically, how can the rapid pace of Irish long-term productivity growth over 1976-2000 and the short-term employment boom of 1994-2000 be explained?

A. Factors behind Ireland's long-term productivity boom

Since 1976, the growth rate of productivity (output per employed worker) has averaged 3.3% a year in Ireland. This is a very fast pace by international standards. An important first influence to note behind this steady increase in productivity has been the continued shift of economic activity and employment from the primary sector to the secondary and tertiary sectors. The Irish primary sector was still employing 40% of Irish workers in 1960; this percentage is down to 9% today. It goes without saying that such a development could not be replicated by Canada, where the transition from the primary sector had been largely completed by the end of the 1950s.

Although a detailed quantitative explanation of productivity growth still eludes the best researchers, there is nevertheless a fairly large consensus on the qualitative factors that can sustain this process. Basically, more output can be produced per hour of work if workers are equipped with (1) better technologies and work organization (knowledge capital), (2) more and better education and training (human capital), (3) more and higher-quality machinery and equipment (physical capital), (4) better public infrastructures (public capital), and (5) greater social cohesion (social capital).

A basic requirement for countries to get rich is a set of national institutions that apply the rule of law, protect property rights, ensure stable and transparent democratic institutions, and promote a free and competitive market economy. Ireland, just as Canada, has had all that for a long time. In particular, it has been free from the political instability and civil strife that have handicapped the economic development of Northern Ireland in the past few decades. It is, however, possible that confusion has persisted to this day in the minds of many foreigners, including foreign investors, between the peaceful Irish Republic in the South and the troubled Northern part of the island. This may have delayed to some extent the movement of foreign direct investment to the South. Beyond this general requirement,

Ireland over the past 40 years has been very active in promoting economic growth. The Irish strategy has had four main components: 1) commercial policy, 2) industrial policy, 3) tax policy, and 4) education policy.

First, from the 1950s onward Irish commercial policy became an ardent and consistent promoter of free trade and monetary integration. Ireland is on a small island, and its current population (3.8 million) is slightly larger than that of Greater Montreal. It understood early that the only way for its small and very open economy to expand and prosper was to get a wide access to external markets and to make its domestic economy competitive by exposing it to import competition. This early abandonment of protectionist policies led Ireland into the European Union in 1973, the European Monetary System in 1979, the Single European Market in 1993, and the European Monetary Union in 1999. Nowadays, Ireland's export-to-GDP ratio exceeds 85%, the corresponding number for Canada being half as large.

The early and determined outward orientation of Ireland stands in contrast with the greater reluctance of the British to join European institutions and the hesitations Canadians had until the late 1980s concerning free trade with the United States. The importance of the outward attitude of the Irish is underlined by the international evidence showing that openness to trade and foreign investment has a catalytic effect on technological diffusion and innovation, which is mostly where long-run productivity growth comes from (see Coe and Helpman 1995).

Second, Irish industrial policy has been an early supporter of the free movement of international investment. Beginning with the repeal of the Control of Manufactures Act in 1958, Ireland switched gradually from a protectionist industrial policy to a very liberal regime toward foreign direct investment by the early 1970s. This evolution included a very welcoming attitude toward foreign investment, greater administrative efficiency to respond to the queries and needs of multinational corporations, a generous system of capital grants, various tax-related incentives, the end of restrictions on multinational corporations to remit profits abroad, the relaxation of incentives to locate in peripheral regions, improvements in international transport and communications infrastructures, and general reliance on stable and transparent legal and administrative rules. As Walsh (2000) puts it, ″by the early 1970s few other countries exercised as liberal a regime towards foreign direct investment.″ Natural factors have also operated to make Ireland particularly attractive to US multinational corporations as a place to invest, such as the compatibility of the Irish legal and regulatory framework, and strong linguistic and cultural ties.

Third, Irish tax policy has been strongly supportive of business investment for several decades. The 1950s saw the introduction of a preferential rate of corporate taxation on profits from exports and manufacturing activity. Following pressure from the European Union, this was replaced in the 1980s by the current 10% corporate tax rate on profits from manufacturing and internationally traded services, and from activities located in the International Financial Services Centre in Dublin. Again following European pressure, Ireland is now set to apply a single corporate profits tax of 12.5% to the entire corporate sector by 2003.

Just as in the case of industrial policy, support for business investment by Irish tax policy is not recent, but has been strong, reliable, transparent and consistent over many decades. It is a major mistake to attribute the spurt of foreign direct investment flows to Ireland in the second half of the 1990s to some recent reorientation of Irish industrial or corporate tax policies. The support to foreign direct investment from tax policy is real and important, but it has been there since the 1950s. By itself, it cannot explain the timing of the recent foreign investment boom.

Fourth and finally, from the 1960s onward Irish education policy has been to encourage free secondary and low-cost higher education. Interacting with a late baby boom, this policy has made available a plentiful supply of well-educated young workers. The performance of Irish pupils in international comparisons of proficiency in mathematics and science is respectable and close to that of Canadian pupils. A recent United Nations survey of literacy and numeracy indicates young Irish score significantly above average. Irish education generally supports shorter, more applied courses than Continental education. These developments have been very instrumental in making Irish domestic firms more productive and attracting multinational corporations to Ireland. In the more depressed period before the 1990s, one negative consequence of rising levels of education was emigration of highly-skilled young Irish. But as soon as employment prospects brightened, the investment in secondary and post-secondary education provided solid support for continued productivity growth.

Ireland's long-term productivity boom raises questions about how to interpret the relative deceleration of Canadian productivity since the mid-1980s (see Figure 2). Complementary interpretations of the Canadian slowdown relative to US productivity have recently been offered. Among others, Trefler (1999) has pointed out that Canadian manufacturing productivity has been lagging behind US productivity essentially in sectors where product (as opposed to process) innovation dominates, such as electrical and electronic machinery, and commercial and industrial machinery. Trajtenberg (2000) has found a series of weaknesses in Canadian innovative performance as revealed by patenting activity. For my part (Fortin 1999), I have emphasized the relative underinvestment of Canadian firms in tangible machinery and equipment.

The problem with these various interpretations is that Ireland's performance has not been more impressive than Canada's in product innovation, R&D spending (despite generous tax and grant incentives as in Canada), patent activity, and investment in machinery and equipment. Figure 4 underlines the fact that Ireland's fixed investment has not been more dynamic than Canada's on average over the last three decades. Yet Irish productivity has managed to offset those weaknesses by being stronger elsewhere and eventually to do very well in the aggregate. One possible lesson is that one should perhaps not care too much about performance in every specific sector or dimension, but should focus instead on the general policies emphasized above, namely trade, industrial, tax and education policies, and allow market forces to do the rest. In particular, given the right short-term conditions to be discussed below, such policies have made it very attractive for highly-productive multinational corporations to set foot in Ireland and allow average productivity for the Irish economy as a whole to keep rising very rapidly over the last decade.

B. Factors behind Ireland's short-term employment boom

I now turn to the set of factors explaining the Irish short-term employment boom of 1994-2000, which has led to employment rates now exceeding the levels of the mid-1970s. In this most recent episode, Ireland has been blessed by an extraordinarily favourable set of circumstances in terms of both aggregate demand and aggregate supply. On the demand side, several mutually reinforcing influences have propelled spending to unprecedented heights: fast-growing foreign trade partners, stable fiscal policy, low real interest rates, and rising international competitiveness. On the supply side, plenty of new resources have accommodated the expansion in demand without generating inflation prematurely. In labour markets, these have been the previously-unemployed, women and immigrants; in real capital markets, inbound foreign direct investment has come in spades.

The first demand-side influence has been the solid economic recovery of Ireland's trade partners since 1993. The United States, the United Kingdom and the rest of the European Union have all been experiencing strong output and income growth. Since Ireland's export-to-GDP ratio was already 70% in 1994, the country immediately benefited from this foreign expansion. In the first two years of the boom, the annual growth rate of Irish real exports shot up to 20%.

The second demand-side influence has been the extraordinary improvement in Irish international cost competitiveness since the mid-1980s. Figure 5 illustrates the evolution of Ireland's manufacturing unit labour costs relative to its main trading partners. On a 1995 = 100 basis, this relative cost index dropped from 160 in 1986 to 80 in 1999. This means that during this period Irish unit labour costs (measured in US dollars) increased by only half as much as unit labour costs among competitors (also measured in US dollars).

The international cost competitiveness of a country can be improved by slower wage growth and faster productivity growth than elsewhere, or by depreciation of the domestic currency. It is mainly the first two factors, Irish wage moderation and sustained rapid productivity growth, that initially formed the basis for the country's rising competitiveness. Concerning the exchange rate, the Irish punt first appreciated (with ups and downs) by 9% relative to currencies of trading partners from 1986 to 1992. Since then, a two-step depreciation of the effective exchange rate, 5% in 1993 and 8% in 1999-2000, has contributed to increased international competitiveness. The exchange rate of the Irish punt is now fixed relative to the currencies of its euro partners, but remains flexible relative to other currencies such as the British pound and the US dollar.

Ireland's sharply rising international competitiveness has had three effects. First, it has boosted its share of international export markets much beyond what was warranted by the general expansion of foreign economies. Between 1993 and 1999, real exports increased more than twice as much as real GDP. Second, the market position of Irish firms against import competition within the domestic economy has been reinforced. Third, the country has become an extremely profitable place to do business relative to other industrialized countries. This goes a long way explaining the extraordinary movement of foreign direct investment to Ireland.

The third demand-side influence has been Ireland's newly-recovered fiscal stability. During the second half of the 1980s, Irish fiscal policy had to fight ballooning debt and deficits and was sharply restrictive. But once the fiscal consolidation job was done at the turn of the 1990s, fiscal waters became much calmer.

During the 1970s and the first half of the 1980s, Ireland's public finances fell into a "black hole" of debt and deficits. As Figure 6 indicates, until the mid-1980s the Irish fiscal deficit was around 10% of GDP. The public sector debt amounted to 110% of a year's GDP. Just as Canada later did in 1995, Ireland then went through severe fiscal restraint that brought government spending down from 49% of GDP in the mid-1980s to 39% in the early 1990s. Figure 6 shows that, at the beginning of the new expansion in 1994, the fiscal deficit had melted down to 2% of GDP. The debt-to-GDP ratio was declining rapidly. The worst of fiscal consolidation was finally behind. Since then, public spending has continued to fall as a fraction of GDP, but so has the overall tax burden. This has produced a moderate fiscal surplus, which can be seen in Figure 6, and only a small net effect on aggregate demand. The much-discussed equalization payments in the form of "structural funds" received from the European Union helped Ireland balance its fiscal budget in the first half of the 1990s. Those transfers were useful as short-term stabilizers and as a source of funds for investment in infrastructures, but they did not play a major role in the 1994-2000 boom.

The fourth demand-side influence has been the advent of very low real interest rates in Ireland. (Real interest rates are defined as the difference between market interest rates and the ongoing inflation rate.) Figure 7 shows that real interest rates remained in the 7-to-8% range throughout the 1986-93 period, but then came down and stayed in the 2-to-3% range. In the past year, they have even turned negative as inflation has come to exceed 6%.

The dramatic fall in Irish real interest rates resulted from two major developments. First, until it had become clear Ireland had dealt decisively with its fiscal debt and deficit problems at the turn of the 1990s, markets were imposing a risk premium on Irish medium- to long-term bond issues. Following the fiscal consolidation, the premium all but disappeared. Second, the Maastricht Agreement, eventually confirmed by the entry of Ireland in the European Monetary Union, put an end to exchange risk for the Irish punt relative to the German mark. This naturally brought Irish interest rates to converge to low German levels.

From 1994 onward, low Irish real interest rates triggered an investment boom. Fixed investment has since increased twice as much as GDP, as Figure 4 indicates. It is also important to recall that membership in the Monetary Union means that nominal interest rates are now set in Frankfurt, not in Dublin. Interest rates will therefore remain low in Ireland even if inflation increases significantly for as long as the European Cental Bank determines that interest rate hikes are not required in the euro area as a whole. Macroeconomic adjustment to country-specific disturbances in a monetary union does not come from interest rate management by the local central bank (which no longer exists), but from active fiscal policy and the loss of competitiveness generated by the increase in domestic inflation relative to the rest of the currency area.

Between 1993 and 2000, all these aggregate demand factors have sustained exceptionally strong increases of 83% in Irish real GDP and 44% in Irish employment. Even more startling has been the response of aggregate supply in labour and real capital markets. This response has allowed the national unemployment rate to fall from 16% in 1993 to 5% at the end of 1999 before inflationary pressures began to appear.

How can this prolonged non-inflationary response on the supply side be explained? Mainly by two major developments. The first supply-side development has occurred in labour markets. From 1986 onward, Ireland experienced an unexpected degree of continued wage moderation, accompanied by peaceful industrial relations. Over the last 15 years or so, the purchasing power of the average wage has increased more slowly than productivity, so that the share of wages in gross domestic income has declined sharply, and the share of capital incomes has risen to an unprecedented level. This evolution is clear from Figure 8, which shows that the share of labour came down to 42% of GDP in 1998 from 52% in 1986, after rising on trend from 1970 to 1986. The dramatic moderation of Irish wages has boosted business profitability and created a powerful incentive for domestic and foreign firms to locate, do business and create jobs in Ireland. A similar phenomenon of long-term wage moderation has also been observed in the Netherlands since the tripartite agreement of 1982, with similar effects on profitability and employment (see Blanchard 2000).

Wage moderation in Ireland has been the result of periodic consensus-based National Wage Agreements that have been negotiated centrally since 1987. Moderate wage growth has often been encouraged as a quid pro quo for personal tax cuts granted by the Irish government. The Agreements have allowed the growing supply of labour from the previouly-unemployed, the new labour force participants (mainly women), and the large flow of immigrants to Ireland from the United Kingdom and elsewhere to fully exert its moderating pressure on the pace of Irish wage growth. There is no question that a limit must be reached on the extent of feasible decline in the share of labour in gross domestic income. The most recent National Wage Agreement, reached in early 2000, projects wage growth at the rate of 5.5% a year over the next two years, but it is already clear that rising inflation and fierce competition among firms for increasingly scarce labour will produce average wage growth in excess of this baseline rate of increase.

The second supply-side development has occurred in real capital markets. The rate of fixed capital formation has been boosted by massive flows of inbound foreign direct investment, particularly from the United States. As explained above in the review of causes of the Irish long-term productivity boom, many policies had previously set the appropriate long-run context, or preconditions, for an expansion of foreign direct investment in Ireland. Commercial, industrial, tax and education policies all worked together to support inbound foreign direct investment. It needs to be repeated that the low corporate tax rate in Ireland (10% in manufacturing and international financial services) had been in place since the 1950s. Although the low tax rate has clearly helped, it cannot be the cause of the sudden explosion of foreign direct investment in Ireland after 1993.

It is the timing and magnitude of the response of multinational corporations in the 1990s that needs to be explained. The fragmentary data available (OECD 1999) indicates that the flows of net foreign direct investment in Ireland averaged about US$100 million a year over 1986-90, but ten times more (US$1.1 billion a year) over 1991-97. The stock of US

direct investment installed in Ireland, which accounts for two-thirds of the total, increased by US$1 billion in 1995, US$2 billion in 1996 and US$4 billion in 1997. Further, these official figures likely understate reality by a significant amount because they omit investment projects financed by the retained earnings of multinational corporations. The foreign direct investment inflow is known to have accelerated further since. The largest share of that investment has gone to the chemicals (including pharmaceuticals), electronics and financial services sectors. Foreign companies in Ireland now account for approximately 25% of GDP, 50% of manufacturing employment, 75% of manufacturing output, and 85% of merchandise exports.

A particularly favourable set of short-term factors have combined with the long-run factors to produce the foreign direct investment boom of the 1990s. First, as prospects for the Single European Market brightened in the early 1990s, Euro-optimism began to replace the Euro-pessimism of the seconf half of the 1980s. This led multinational corporations to look for bases from which to penetrate the new European Market. Second, the US boom of 1993-2000 came just in time to supply very large flows of new foreign direct investment to Europe. Third, many of the demand- and supply-side influences specific to Ireland that have already been mentioned, namely recovered fiscal discipline, low local real interest rates, firming international cost competitiveness, and persistent wage moderation gave an extraordinary boost to business expectations and profitability in Irish locations. Walsh (2000) reports that in recent years the return on capital from US direct investment in Ireland has been in excess of 30%, compared to around 10% in the rest of Europe. Given all the favourable long-term preconditions and the short-term advantages of investing in Ireland, over the last seven years the country has caught the lion's share (20%) of rising US direct capital flows to Europe.

Naturally, to appreciate the impact of foreign direct investment on the Irish economy, it is important to bear in mind the small size of Ireland relative to the rest of the industrialized world. The US economy, in particular, is 70 times the size of the Irish economy. So, even if only a very small piece of the very large US pool of funds shifts to Ireland from elsewhere, it can have a very large impact on the very small Irish economic space.

The resulting acceleration in business fixed investment, particularly by foreign companies, has combined with wage moderation in labour markets to extend the non-inflationary phase of the employment boom until the end of 1999. A more rapid pace of fixed investment works against inflation by increasing labour productivity, and hence the ratio of wages to prices, faster than would otherwise have occurred. This has contributed to keep price inflation low for an extended period in Ireland even if nominal wages were picking up speed. A similar development has been observed in the wake of the 1996-2000 acceleration of US productivity. Here too, price inflation has remained low despite accelerating nominal wages. In Ireland, inflationary pressures did not show up before the national unemployment rate had declined to around 5%. In the United States, there is as yet little evidence of any fundamental increase in inflation even if the national unemployment rate has been under 4.5% for almost three years.

4. Drawing lessons

In this section, I will first summarize the nature and origin of the Irish economic boom of 1994-2000 as presented in the previous two sections. From this summary I will then speculate on what Canada (and other countries) can learn from Irish actions to enhance long-term productivity and promote high employment.

A. The Irish economic boom: A summary

The Irish economic boom is definitely not a figment of the mind. It has been very real. Real domestic income (GDP) per head in Ireland has doubled in the 1989-2000 period. The major part of the increase has taken place since 1993. In Canada, real domestic income per head has risen by only 16% in the same period. To see what Canada can learn from the Irish experience on effective means of promoting economic growth, high employment and low inflation, I have analyzed the nature and origin of the Irish boom.

What are the conclusions?

As a way of thinking about the Irish boom, I have suggested to decompose real GDP per adult into the product of productivity (real GDP per worker) and the employment rate (the fraction of the adult population who is at work). Irish productivity growth has been very rapid, in excess of 3% a year, over the past quarter century. It has actually decelerated a bit over the last decade. The employment rate, by contrast, suffered a major setback in the 1970s and remained depressed until 1994. It has since recovered in only seven years all the ground lost during the previous twenty years. The sudden turaround of the Irish job performance in 1994 is exactly what is behind the economic boom. Huge numbers of unemployed, women and immigrants have been put (or put back) to work.

So, the Irish economic ″miracle″ is actually a combination of two broad features: a continuing long-term productivity boom, and a short-term employment boom that has produced a remarkable job recovery following two sclerotic decades. Depending on definition, Ireland's productivity is currently challenging or exceeding US productivity. The Irish employment rate is still 15% below the US level. There is room for futher growth, at a more moderate speed.

Canada, on the other hand, has not kept up with the United States in terms of either employment rate or productivity. First, the relative deterioration of the Canadian employment situation is the outcome of the long and protracted slump of 1990-96, and of the remarkable job creation performance of the US economy since 1992. Fortunately, a solid employment recovery has begun to turn the Canadian job situation around in the past four years. Currently, Canada's employment rate is about 93% of the US employment rate. Second, the relative deceleration of Canadian productivity started during the 1980s. In this case, recovery is more uncertain. In terms of output per hour worked, Canadian productivity currently lags US productivity by 8%. There is room for Canada to improve its relative performance along both the employment and the productivity dimensions.

B. Policies to enhance long-term productivity

Why has Irish productivity grown so rapidly in the past quarter century? Ireland clearly satisfies the prerequisite of having a national infrastructure based on a decentralized market economy, democratic parliamentary institutions, property rights and the rule of law. A specific factor has been that Ireland has completed its economic transition from lower-productivity agriculture to higher-productivity manufacturing and services only in the 1980s, that is, much later than most other industrialized countries.

Beyond that, Irish public policy has been actively, consistently and, one should say, remarkably supportive of productivity growth for several decades. I have emphasized four types of policies: commercial, industrial, tax and education policies. Ireland understood very early that to expand and prosper its small open economy needed to secure its free access to wider international markets and to subject its own firms to international competition. Irish commercial policy began to back free trade in the late 1950s. Since then, Ireland has adhered to all institutions of the European Union, from the old Common Market to the new European Monetary Union. Further, for thirty years or more, every aspect of Ireland's industrial policy has been geared to welcoming and attracting foreign direct investment with favourable, reliable and transparent legal and administrative rules. More generally, for several decades, Irish corporate tax and grant policy has been strongly supportive of domestic and foreign investment. Ireland's very low corporate income tax rate for manufacturing and internationally traded services (to be soon uniformly spread to all sectors) may be controversial, but it is definitely not the result of a recent conversion of the country to business tax incentives. It began in the 1950s and has been consistent ever since. Finally, for three decades, Irish education policy has been based on free secondary and low-cost post-secondary education. In interaction with the Irish baby boom, this has made a large and continuing flow of highly-skilled young workers available to support business activity.

What is there for Canada, or any other country, to learn? Three lessons, I would think: (1) support free international trade and investment, (2) develop business-friendly industrial and tax policies, and (3) stick to free secondary and low-cost post-secondary education. There is also a fourth lesson: be determined, consistent, and patient. The horizon over which the appopriate policies give results exceeds the four- or five-year length of a single electoral mandate.

The first lesson is that small open countries such as Canada must be active and consistent supporters of free international trade and investment. Contemporary research has established beyond doubt that a determined outward orientation accelerates technological innovation and diffusion in the domestic economy, allows specialization to take place by procuring the relevant economies of scale, guarantees access to international markets, and strenghtens the competitiveness of domestic firms by subjecting them to stimulating international competition. Examples of steps Canada could take are to promote freer trade with Latin America and Asia, adopt a more welcoming attitude toward incoming foreign direct investment, and work with other countries to find definitive, internationally-acceptable ground rules for foreign direct investment.

How likely is this to happen? Canadians hesitated until the late 1980s to embrace the Free Trade Agreement with the United States, but it is arguable that attitudes have now

changed following the extraordinary growth of Canadian exports over the last eight years. Openness to foreign direct investment is a more delicate issue, given Canadian sensitivities to the dominant position of US multinational corporations. But foreign direct investment by Canadian firms in other countries has increased rapidly in recent years. This could bring a shift in perceptions by making it clearer to Canadians that international investment is not a one-way street anymore, but has become a multilateral game in which Canadian interests have a stake and would be best served by reliable and transparent international ground rules.

The second lesson is that business activity works better in a rules-based, transparent and friendly environment that makes it more profitable than in a discretionary, arbitrary and inimical environment that makes it less profitable. For over forty years Irish industrial and tax policies have been a learning-by-doing experience of the first type of approach. They have included a generally positive attitude toward business, administrative efficiency to respond to queries and needs, a low corporate income tax rate (initially for exporters and manufacturers, and now for all sectors), a generous system of capital grants, the early removal of restrictions on choice of business locations and disposal of profits, the provision of adequate international transport and communications infrastructures, and stable and transparent rules.

Business-leaning industrial and tax policies inevitably generate some tension between efficiency and equity objectives. More business activity and higher employment is seen to be obtained at the cost of making the rich richer. Irish-type industrial and tax policies are likely to raise political objections. (Many Irish have actually raised them.) The antidote to such feelings of inequity lies in the demonstration that business taxes are among the most harmful to growth. They lower all forms of income (including wages) more than other types of taxes such as goods and services taxes or payroll taxes (see Kesselman 1997 for a review of the relevant literature).

The reason this is so is that corporate income taxes (and other business taxes such as capital taxes and sales taxes on capital inputs) are taxes on business investment spending, which is the carrier of productivity growth, and hence of income growth. If business investment is taxed more heavily, there will be less of it because this form of spending will be switched externally to lower-tax countries, and internally to lower-tax forms of spending, such as residential construction, which are not directly connected to productivity growth. If business investment declines, then productivity and the capacity to pay good wages will be lower, and the standard of living will drop in every income class. There are alternative ways for government to raise revenue that are less detrimental to growth and can preserve the existing degree of tax progressivity and equity among income classes.

The negative effect of business taxation on business investment, productivity and the standard of living is now better recognized by all levels of government in Canada. Corporate tax cuts and incentives have been announced earlier this year by many jurisdictions. However, even after taking these into account, both the statutory corporate income tax rate and the effective tax rate on business investment in Canada will continue to be among the highest in industrialized countries, as Table 2 reports. From a taxation prespective, Canada is very far from being an interesting place where a Canadian or foreign multinational corporation would like to locate its North American or world operations. A major challenge for Canadian federal and provincial tax authorities is to acknowledge the key importance of

rising international tax competition, recognize that lower business taxes are growth-enhancing and not necessarily regressive, and follow the 40-year-old lead of Ireland on this matter. Canada should cut its business taxes more and faster.

The third lesson to be learned from Irish growth-promoting policies pertains to the central role played by investment in secondary and post-secondary education. As pictured in Figure 9, until recently there was a large Canada-US gap in school enrollment. The gap reached a maximum in 1979, with 48% of the young population attending school in the United States and only 42% in Canada. Then, throughout the 1980s, the aggregate enrollment rate rose sharply in Canada, but increased much more slowly in the United States, so that the gap was entirely closed by 1991. The enrollment rates in the two countries were both 62% in 1997. There is now solid evidence on the favourable impact of the level of education on labour quality and productivity, and on both individual and aggregate wages (see, for example, Acemoglu and Angrist 2000). Skilled workers play a key role in the development and implementation of new technologies. Education could also constitute a weapon against rising inequality in the knowledge-intensive economy (see Murphy, Riddell and Romer 1998).

So far, Canada has done at least as well as Ireland in raising its school enrollment rate. In fact, it is mainly its high education level that explains why Canada ranks first on a world scale according to the United Nations' Human Development Index. Still, Canada ought not to forget the main lesson from the Irish experience of the last thirty years. It is that broad, equal-opportunity access to a college education based on individual preferences and abilities is the best guarantor of continued society-wide increases in employment and the standard of living, as opposed to a system largely based on ability to pay. It is, in particular, doubtful that significant increases in current real levels of university tuition fees in Canada would be the proper approach to fight the dropout rate, attract more students, and foster economic growth.

C. Policies to promote high employment

A sharp employment turaround has been the main driving force behind the Irish economic boom of 1994-2000. During those seven years, employment has increased by 44% following an 83% rise in real GDP. Demand- and supply-side developments have both contributed to this extraordinary growth in employment and output.

The aggregate-demand push in Ireland has been very traditional in nature, but exceptional in strength. It has been driven by four basic influences: a solid recovery of Ireland's foreign trade partners, continued improvement in Ireland's international cost competitiveness, streamlined public finances, and low (net-of-inflation) interest rates. Similar factors have been sustaining the Canadian recovery of 1997-2000, but in Ireland they have been stronger by an order of magnitude.

Even more startling, supply-side developments have allowed the output and employment boom to keep going with no increase in inflation until the unemployment rate fell to around 5% toward the end of 1999 from 16% in 1993. (Inflation has now risen into the 6% range.) First, labour markets have absorbed very large numbers of workers from

three sources: the previously-unemployed, new Irish labour force participants (mainly women), and immigrants from the United Kingdom and elsewhere. Their movement into employment has been characterized by an unexpected degree of continued wage moderation under the umbrella of periodic consensus-based National Wage Agreements since 1987. The latter have allowed the growing supply of labour from all three sources to fully exert its moderating pressure on the pace of Irish wage growth.

Second, the supply of real capital has been sharply expanded by massive flows of inbound foreign direct investment, particularly from the United States. Irish commercial, industrial, tax and education policies had obviously set the appropriate welcoming context. But the timing and magnitude of the explosion of foreign direct investment from 1994 onward was further stimulated by three factors: the inception of the Single European Market, the plentiful supply of funds made available by the US boom, and the extraodinary boost to business expectations and profits given by recovered fiscal discipline, firming international cost competitiveness and persistent wage moderation. A relative-size effect has also been at work: for a very small country like Ireland (about the size of Greater Montreal), getting only a small additional piece of the very large US pool of funds can have a very large macroeconomic impact. The acceleration of business fixed investment, particularly by foreign companies, has generated faster growth than would otherwise have occurred in labour productivity and real wages. It has helped price inflation to remain low for an extended period, even after nominal wage growth finally began to pick up speed.

What can Canada learn from Ireland's employment boom of 1994-2000? The central characteristic of the Irish boom is that it has allowed the national unemployment rate to decline from 16% in 1993 to 5% by late 1999 while keeping inflation in the 2% range throughout that period. There is an obvious parallel with the concomitant US expansion, which has seen the national unemployment rate fall below 4.5% with no obvious inflationary pressures in sight yet. In this respect, the United States has done as well as Ireland. (It must of course be remembered that the United States started at a much lower unemployment level than Ireland and has not absorbed large flows of immigrants and new labour force entrants, which is why job expansion in Ireland has been so enormous). By contrast, in the ongoing Canadian recovery the national unemployment rate has declined to slightly below 7% by late 2000 from 10% at the end of 1996, with no fundamental increase in inflation. So, the practical question to ask is whether and how Canada could lower its national unemployment rate even more, and sustain this lower level without rising inflation.

The Irish economic boom of 1994-2000 confirms that two requirements must be met for a non-inflationary expansion of output and employment to take place. First, aggregate demand for goods and services must be propped up through some mechanism. Second, the additional productive labour and capital needed to sustain the growth in output must be supplied without generating higher inflation.

In small open economies, the growth of aggregate demand often results from international influences that largely escape control by domestic economic policy. In the Irish case since 1993, these external influences have been the simultaneous economic expansions in the United States, the United Kingdom and the rest of Europe, and the depreciation of the punt and the euro since 1996. In the Canadian case since 1996, the international influences have been the US expansion and the previous depreciation of the Canadian dollar.

A mitigating factor has been the ups and downs of world prices for Canada's natural resource exports.

But various components of Irish domestic policy, not only international influences, have been supportive of both the demand expansion and the non-inflationary labour and capital supply response. The three most important, singled out above, are fiscal discipline, consensus-based wage moderation, and participation in the Single European Market and the European Monetary Union. Can Canada emulate Ireland along these lines? The answer is clearly yes in the case of fiscal discipline and free trade. Fiscal responsibility has returned to Canada after the federal and provincial fiscal consolidation programs of 1995-98. Further, Canada has enjoyed free trade with the United States since 1989, and with Mexico since 1993. In these cases, the lessons have already been learned.

However, other components of Irish policy, such as centralized national wage agreements and participation in a continental monetary union, cannot be easily transplanted to the Canadian context. Canadian wage-setting institutions are very different from their Irish counterparts. Private-sector wage bargaining is fully decentralized, even for the 20% of private-sector employees who are union members. Because history, tradition and culture play an important role in wage bargaining, Canadian institutions could not easily be shifted toward the kind of consensus-based corporatist structure that Ireland has adopted. This does not mean wage growth cannot be moderate in Canada. In fact, this has clearly been the case in recent years. The share of wages in Canada's gross domestic income has hovered around 56% since 1995, which is down from the 60% level of the mid-1970s and early 1990s. Similarly, Canada's international competitiveness since 1995 has been stronger than at any time in the last thirty years – except in 1986.

The economic merits of Canada's participation in an eventual North American or Pan-American Monetary Union with the United States, and perhaps Mexico and other Latin American countries, are hotly debated (see Courchene and Harris 1999; Murray 2000). Among benefits would be the elimination of business risk arising from exchange rate volatility and longer-lasting currency misalignment, and assured convergence of Canadian interest rates to US levels. Among costs would be the loss of monetary independence to deal with macroeconomic disturbances specific to Canada. There is a wide consensus that, for a very small country like Ireland, monetary integration into a wider currency area is the best course to follow. The end of foreign exchange risk and the convergence of Irish interest rates to German levels have been important factors behind the Irish economic success of the 1990s. I share with many others the view that this is also the optimal economic solution for intermediate-size countries like Canada, but that a North American Monetary Union is not politically feasible for now, because of lack of interest in the the United States and lack of political legitimacy in Canada (Buiter 1999; Mundell 2000; Fortin 2000).

What more can Canada do to minimize unemployment without allowing inflation to get out of control? The current recovery has seen the national unemployment rate fall below 7% without raising inflation for the first time in 25 years. Given differences with the United States in labour force measurement and in economic structure, it may be difficult for Canada to reduce its unemployment rate permanently below 5.5% (although we will never know if we do not try). But maybe this 5.5% permanent level at least is achievable given the choice

of the right policies. Remember that reducing Canada's unemployment rate by ″just″ one percentage point would generate around 250,000 more jobs and $20 billion worth of additional output and income.

The recent expansions in the United States and Ireland suggest two directions for Canada. First, as the ultimate regulator of aggregate demand through its control of short-term interest rates, the Bank of Canada should allow the current recovery to run its course, and therefore the national unemployment rate to continue to decline, until there is tangible evidence that a wage-price acceleration is about to occur. (An economic slowdown in the United States would of course make this harder to achieve.) The Bank should avoid raising interest rates prematurely on the basis of theoretical speculation that inflation is ″just around the corner″. Pre-emptive attacks run the danger of fighting an enemy that is simply not there – yet – and of missing the opportunity for further non-inflationary reductions in unemployment. There are signs that the Bank of Canada has begun to follow the lead of the US Federal Reserve and is more ready now that it was only a few years ago to adopt a more pragmatic attitude. It should be encouraged to continue in this direction.

Perhaps also, the Bank should be invited to allow inflation to drift into the 2-to-3% range, as the Federal Reserve has done, instead of keeping it between 1% and 2% as it has done since 1991. This would be a prudent move, given the emerging evidence in the recent macroeconomic literature (see, for example, Akerlof, Dickens and Perry 2000) that, when the inflation rate is already very low, the slightest half-percentage-point variation in inflation could have important consequences for the level of non-inflationary unemployment a country can achieve.

Second, the Irish experience indicates that reducing the non-inflationary unemployment rate could be made easier by supply-friendly tax, expenditure and regulatory policies. Personal income tax cuts in Ireland seem to have encouraged moderate wage growth and low inflation. This could be widened to all kinds of policies (regulatory or other) that would retard the growth of unit labour costs. Canadian tax and expenditure policies must also turn resolutely toward means of fostering higher rates of saving and investment – an aspect of tax reform that has perhaps not received enough attention in recent Canadian discussions. This could be achieved by accelerating infrastructure investment, by paying down the public debt, by increasing the income-tax deductibility of personal savings, and by reducing the statutory and effective tax rates on business investment.

5. Conclusion

Between 1989 and 2000, real domestic income per head in Ireland has doubled, with most of the increase taking place in the last seven years. This compares with an increase of only 16% in Canada.

The Irish economic boom of recent years has two dimensions: (1) a continuing rapid long-term increase in productivity (output per worker) at the average annual rate of nearly 3% a year; and (2) a short-term employment boom that has seen the number of jobs expand by 44% since 1993, the employment rate of the working-age population return to, and then

exceed, its level of the mid-1970s, and the unemployment rate decline from double digits to less than 5%.

Irish commercial, industrial, tax and education policies have been very supportive of the rapid pace of long-term productivity growth. This strong and consistent support is not recent, but began to develop in the 1950s and matured in the 1970s. There is much for other countries to learn and emulate in these areas, in terms of both content and perseverance.

The short-term employment boom has followed developments in both aggregate demand and aggregate supply. The aggregate-demand push has been spurred by a solid recovery, and the aggregate-supply response has kept inflation in check until the end of 1999, thanks to persistent wage moderation in labour markets and massive flows of inbound foreign direct investment in real capital markets. Policywise, fiscal discipline, centralized wage bargaining, and Ireland's participation in the Single European Market and the European Monetary Union have been key factors contributing to the growth of aggregate demand and to the non-inflationary aggregate-supply response.

Canada already enjoys free trade with the United States and Mexico. It has returned to fiscal discipline in recent years. However, Canadian wage-setting institutions are very decentralized and cannot imitate Ireland's periodic National Wage Agreements. Further, political obstacles currently prevent Canada from forming a monetary union with the rest of North America. To minimize unemployment without allowing inflation to get out of control, the Bank of Canada should let the current recovery run its course without increasing interest rates pre-emptively and prematurely. Canadian tax, expenditure and regulatory policies should avoid putting undue burden on unit labour costs, and should be made to encourage the expansion of saving and investment by every feasible means.

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Table 1

Real GDP per head in 24 OECD member countries:
Level indices for the years 1989 and 1999, and
cumulative growth rates over the period 1989-1999

	Year 1989		Year 1999		Period 1989-1999	
Rank	Country	Level index (U.S. = 100)	Country	Level index (U.S. = 100)	Country	Cumulative growth rate (%)
1	United States	100	United States	100	Ireland	83
2	Switzerland	99	Norway	83	Korea	64
3	Canada	86	Switzerland	83	Norway	31
4	Denmark	80	Canada	79	Portugal	29
5	Japan	77	Denmark	77	Spain	25
6	Norway	77	Netherlands	75	Netherlands	25
7	Austria	76	Ireland	74	Australia	24
8	Sweden	76	Australia	74	United States	22
9	Belgium	75	Austria	74	Turkey	20
10	Finland	74	Belgium	73	Denmark	18
11	Netherlands	73	Japan	72	Belgium	18
12	Germany	73	Germany	70	Austria	18
13	Australia	73	Sweden	68	Germany	17
14	France	70	Finland	68	United Kingdom	17
15	Italy	70	United Kingdom	66	Greece	15
16	United Kingdom	69	Italy	66	Italy	15
17	New Zealand	61	France	65	Japan	15
18	Spain	52	New Zealand	54	Mexico	13
19	Ireland	50	Spain	54	France	13
20	Greece	46	Portugal	48	Canada	12
21	Portugal	46	Korea	48	Finland	12
22	Korea	36	Greece	44	Sweden	10
23	Mexico	27	Mexico	25	New Zealand	8
24	Turkey	19	Turkey	19	Switzerland	2

Source: Authors' calculations based on OCDE data. Five member countries are omitted: two very small (Iceland and Luxembourg), and three East European (Czech Republic, Hungary and Poland), for which pre-1991 data is lacking. Level indices for 1999 are per capita volume indices for GDP adjusted for purchasing power parities. They are taken from the OECD's *Main Economic Indicators* (November 2000, p. 263), and converted to a U.S. = 100 basis. The 1989-1999 cumulative growth rates for real GDP per capita are calculated from individual countries' national accounts and total population data found in OECD *National Accounts* and *Labour Force Statistics* publications. Deflating the 1999 level indices by the 1989-1999 growth factors and rebasing to U.S. = 100 yields the 1989 level indices.

Table 2

Statutory corporate income tax rates, and effective tax rates on capital investment[a] in the manufacturing and services sectors of nine industrialized countries, declared intentions[b] (percentages)

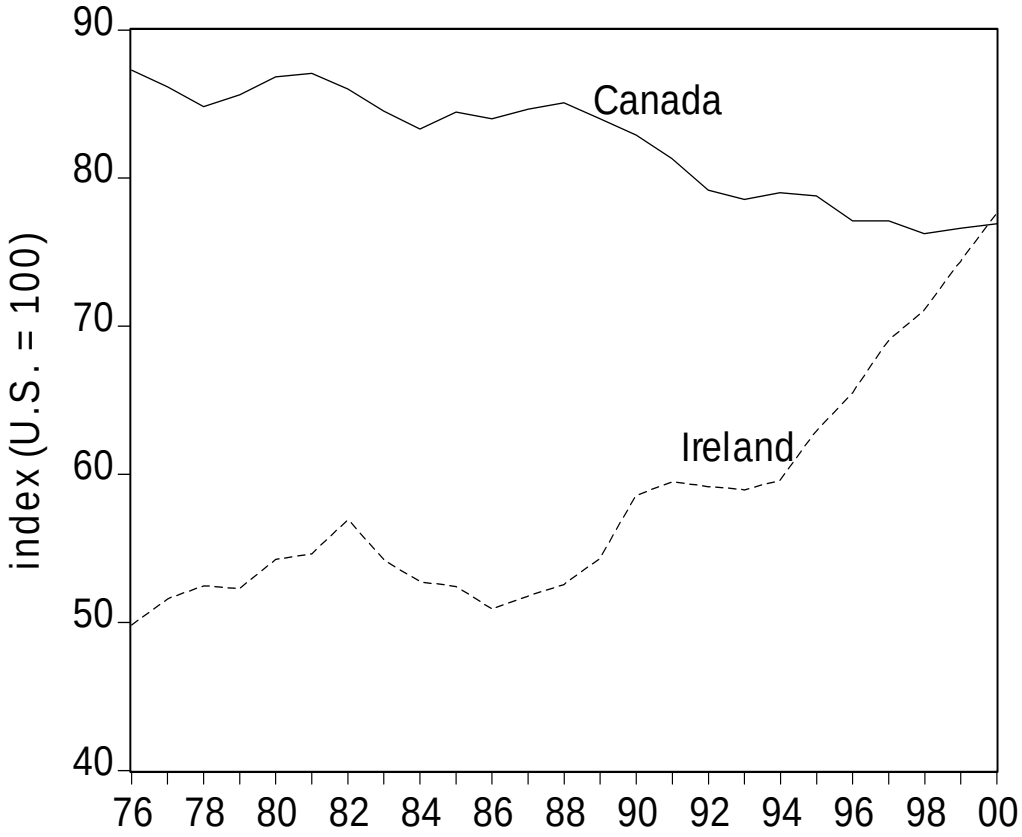
	Statutory corporate income tax rate		Effective tax rate on capital investment			
			Manufacturing		Services	
Rank	Country	Rate	Country	Rate	Country	Rate
1	Japan	41.0	United States	23.6	France	25.8
2	United States	39.2	France	23.2	United States	24.8
3	France	37.8	Canada	22.8	Canada	24.6
4	Canada	36.4	Japan	22.6	Japan	24.0
5	Germany	35.0	Germany	21.1	Italy	21.4
6	Italy	31.3	Italy	18.1	Germany	20.8
7	United Kingdom	30.0	United Kingdom	17.2	United Kingdom	17.2
8	Sweden	28.0	Sweden	14.4	Sweden	14.2
9	Ireland	12.5	Ireland	5.3	Ireland	5.3

[a] In addition to the statutory corporate tax rate, the effective tax rate on capital investment takes into account the most important corporate tax provisions (such as depreciation allowances and various tax credits), capital taxes, and sales taxes on capital inputs.

[b] The declared intentions are for the years 2000 or 2001, except in the cases of Canada (2004) and Ireland (2003).

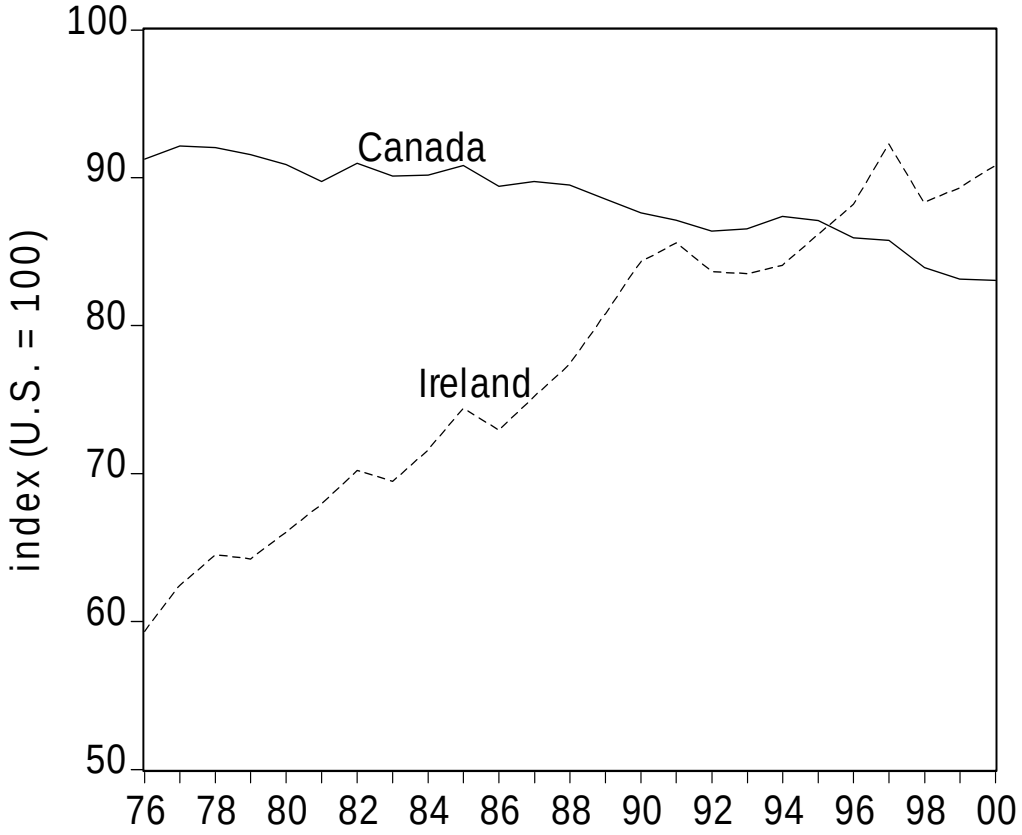
Source: Mintz and Wilson (2000).

Figure 1
Real GDP per working-age adult,
Canada and Ireland compared to the United States, 1976-2000



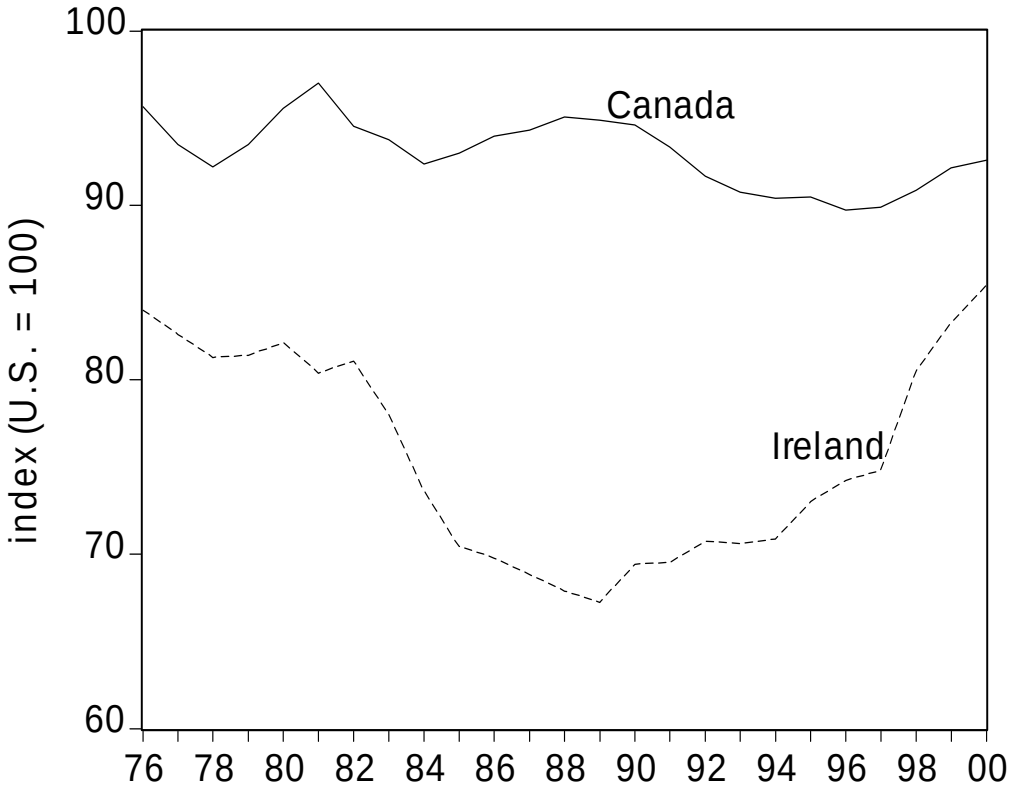
Source: OECD.

Figure 2
Productivity: Real GDP per employed person,
Canada and Ireland compared to the United States, 1976-2000



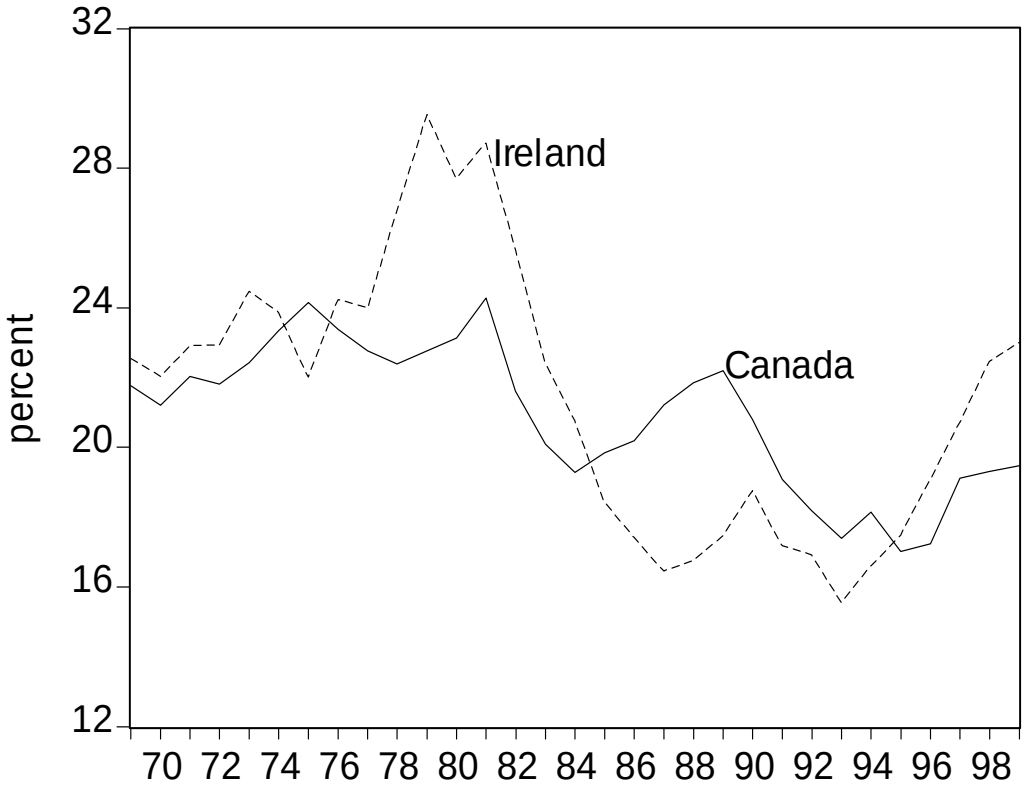
Source: OECD.

Figure 3
Employment rate:
Employment as percentage of working-age population,
Canada and Ireland compared to the United States, 1976-2000



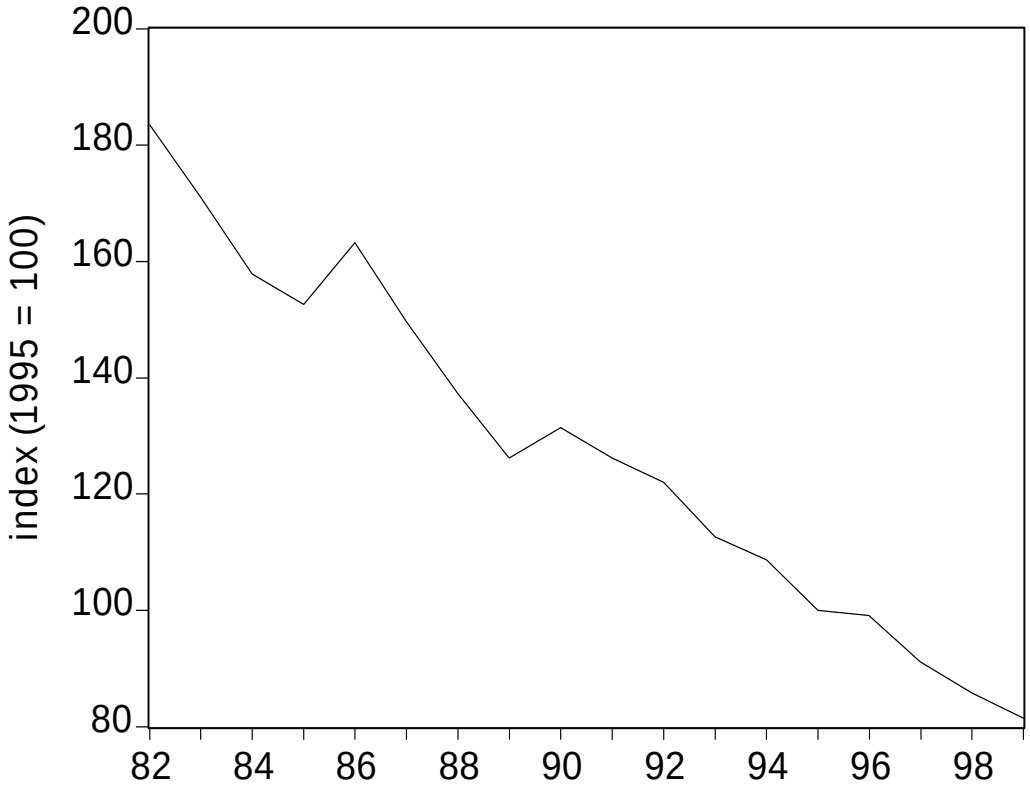
Source: OECD.

Figure 4
Public and private investment:
Gross fixed capital formation as percentage of GDP,
Canada and Ireland, 1969-1999



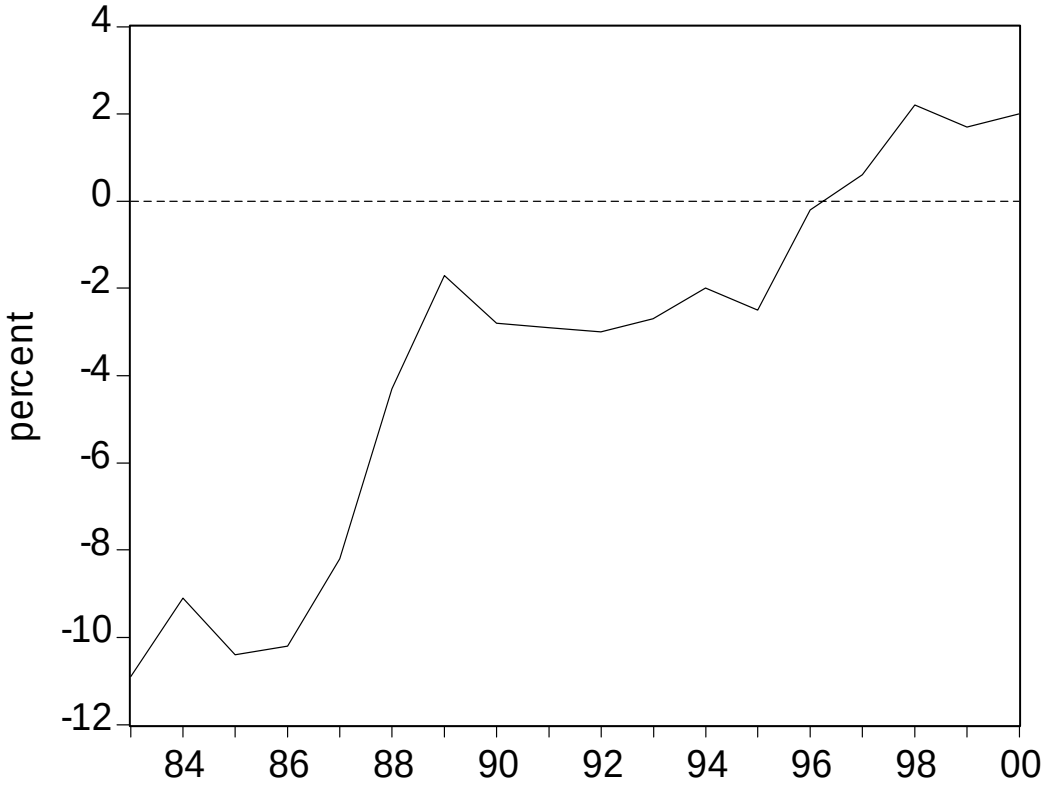
Source: OECD.

Figure 5
International cost competitiveness:
Manufacturing unit labour costs in Ireland
relative to its major trading partners, 1982-1999



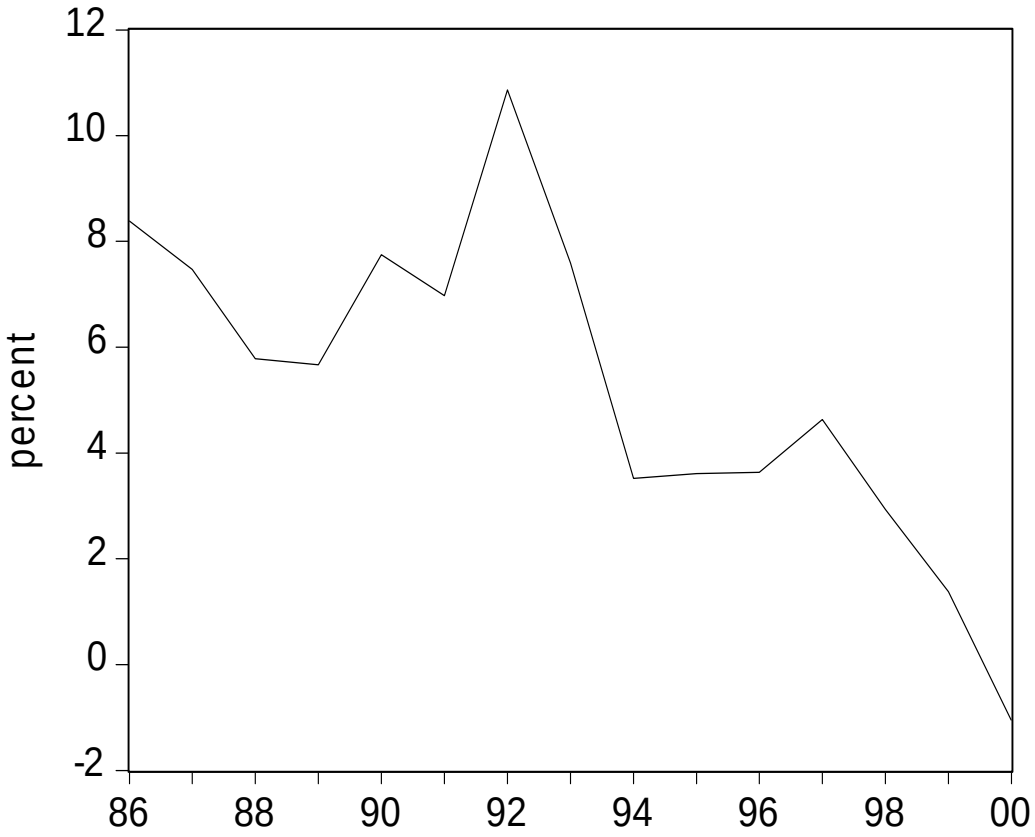
Source: OECD.

Figure 6
Public sector fiscal balance
as a percentage of GDP,
Ireland, 1983-2000



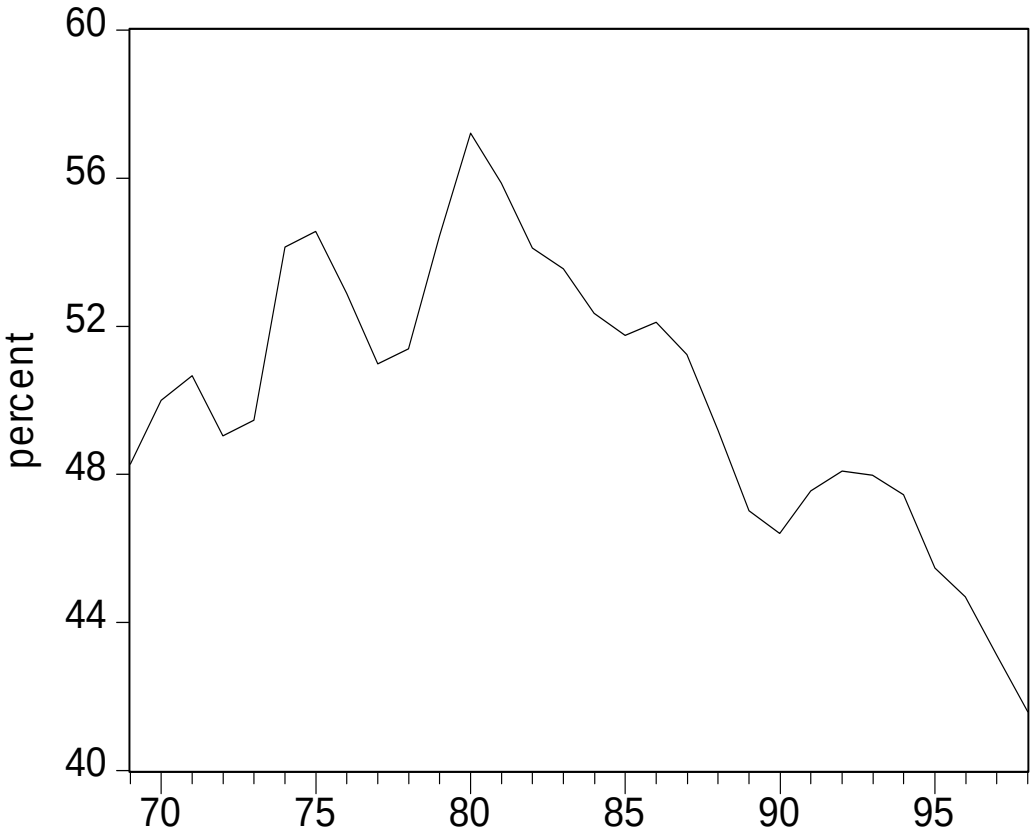
Source: OECD.

Figure 7
Real short-term interest rate,
Ireland, 1986-2000



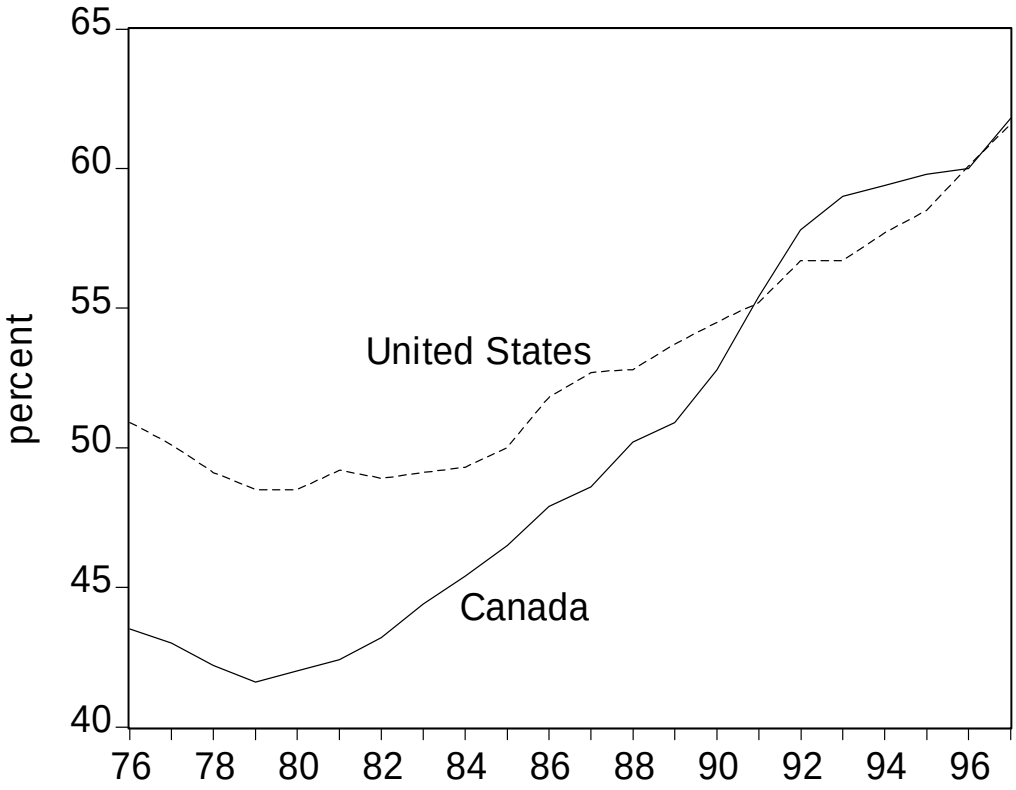
Source: OECD.

Figure 8
Share of wages in gross domestic income,
Ireland, 1969-1998



Source: OECD.

Figure 9
School Enrollment Rates:
Percentage of 15-24 Population Who Attend School,
Canada and the United States, 1976-97



Sources: Statistics Canada; US Bureau of Labor Statistics.