

## V. STRUCTURAL POLICIES AND GROWTH

### Introduction

***Recent growth trends have brought structural policies back to the forefront***

Throughout the 1960s and 1970s, countries with lower GDP *per capita* were generally growing relatively faster than richer ones, leading to a gradual convergence in income levels. This convergence process appears to have reversed during the 1990s, at least among the largest OECD economies, as growth in the United States rose above that observed in Japan and in the major European Union countries. The US growth revival and the related reversal in the convergence process have led to a renewed interest in analysing the relative contribution of institutions, structural policies and other fundamental factors to the growth performance over time and across countries. During the past few years, the OECD has completed a major programme of analysis and empirical research on the sources of economic growth, leading to a broad set of policy recommendations and priority areas for reforms contained in the recent OECD publication, *The Sources of Growth in OECD Countries*.<sup>1</sup> Building on this as well as on previous in-depth analysis conducted in the context of the *OECD Jobs Strategy*, this Chapter provides an overview of the links between structural policies and labour and product market performance. More specifically, the Chapter reviews the main factors thought to have contributed to differences across countries in the degree of labour resource utilisation, in the intensity of physical and human capital use as well as in the pace of technological progress. In doing so, it provides a number of performance and policy indicators which can be used to assess progress achieved in structural reform.<sup>2</sup>

### Diverging growth trends

***Growth rates in GDP per capita have diverged between the largest economies...***

During the 1960s and 1970s, the pattern of growth across countries was broadly consistent with the conventional view according to which countries lagging in terms of labour productivity and GDP *per capita* gradually close the gap *vis-à-vis* the leading country (the United States). After stalling during the 1980s, the convergence process appears to have reversed during the 1990s, at least among the largest OECD economies,

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1. A short summary of the detailed analysis can be found in *The Policy Agenda for Growth* (available on line at: <http://www.oecd.org/pdf/M00040000/M00040320.pdf>).
  2. A version of this chapter including a much wider selection of indicators in tabular or graphical format can be found in de Serres (2003).

with trend GDP *per capita* growing faster in the United States than in Japan and the large EU member countries (Table V.1). Nonetheless, convergence towards US GDP *per capita* has continued for some countries where growth also accelerated after 1995, in particular Canada, Spain, Australia, Sweden, Finland, Ireland and Greece.

— Table V.1. Average trend growth in GDP per capita over selected periods —

	1980-1995	1995-2002	Change between first and second period
Australia	1.7	2.6	0.8
Austria	2.0	1.9	0.0
Belgium	1.9	2.0	0.2
Canada	1.3	2.5	1.3
Czech Republic	..	2.0	..
Denmark	1.8	2.0	0.2
Finland	1.6	3.5	1.9
France	1.5	1.9	0.4
Germany <sup>a</sup>	1.6	1.4	-0.3
Greece	0.6	3.0	2.4
Hungary	..	3.9	..
Iceland	1.2	2.3	1.1
Ireland	3.8	7.1	3.3
Italy	2.0	1.5	-0.5
Japan	2.9	0.6	-2.3
Korea	6.7	4.3	-2.4
Luxembourg	4.2	3.7	-0.6
Mexico	0.2	2.3	2.1
Netherlands	1.7	2.2	0.5
New Zealand	1.3	2.2	1.0
Norway <sup>b</sup>	1.5	2.0	0.4
Poland	..	4.1	..
Portugal	3.1	2.5	-0.6
Slovak Republic	..	1.7	..
Spain	2.3	2.7	0.4
Sweden	1.3	2.5	1.2
Switzerland	0.9	0.8	-0.1
Turkey	2.1	0.4	-1.8
United Kingdom	2.1	2.2	0.1
United States	2.0	2.3	0.3
<i>Weighted averages</i>			
European Union	1.8	2.0	0.2
Total OECD <sup>c</sup>	2.1	1.9	-0.2

a) West Germany before 1991. For 1980-1995 average excludes 1991.

b) Mainland only.

c) Excluding Czech Republic, Hungary, Poland and Slovak Republic.

Source: OECD *Economic Outlook*, No 72.

*... reflecting changes in growth of labour productivity and hours worked*

A closer examination of the proximate sources of change in total GDP growth after 1995 shows that while trend labour productivity accelerated in the United States, it slowed in the European Union and Japan, resulting in a convergence of productivity growth rates across the three major economies (Figure V.1). In the case of the European Union, the impact on GDP growth from the slowdown in productivity per hour was partly offset by an increase in employment growth. Despite such improvement in labour market performance, even faster employment growth in the United States accounted for most of the differences in growth in GDP *per capita* between the two economies. Japan is the only country having faced a deceleration in both productivity and labour resource utilisation. Conversely, only a few countries (Canada, Sweden, Finland, Ireland and Greece) enjoyed a clear improvement in both sources of growth in GDP *per capita* after 1995.

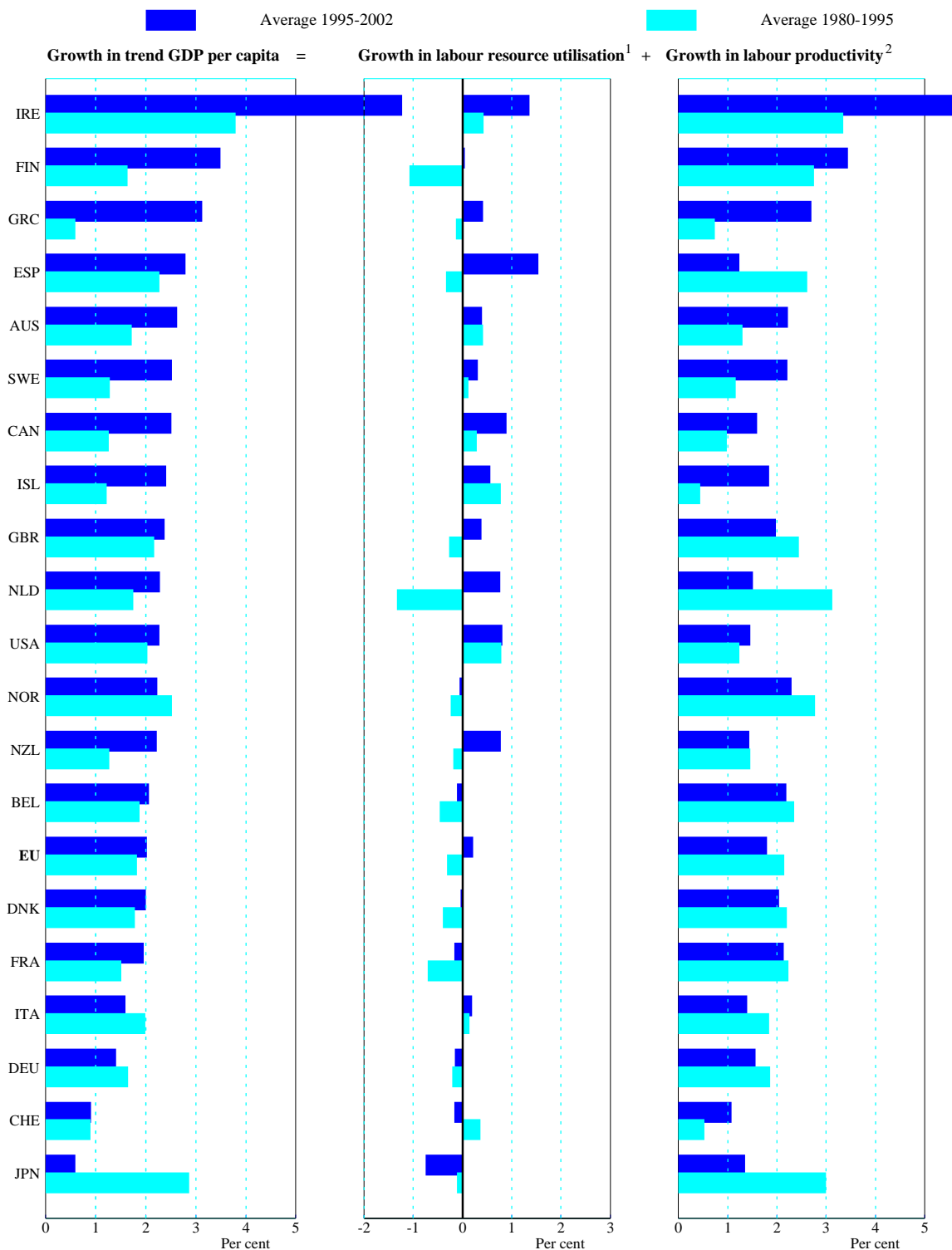
*Resuming the convergence process calls for policy changes*

Considering that GDP *per capita* in both the European Union and Japan remains around 30 per cent behind that in the United States, the pause -- and even reversal -- in the convergence process points to the need for changing policies so as to stimulate growth in the two lagging areas. Differences in the sources of the real income gap *vis-à-vis* the United States suggest, however, that the policy priorities faced by the European Union and Japan may be different. In the case of Japan, the gap in GDP *per capita* is due entirely to the lagging performance in productivity. In the EU case, while the process of catch-up in GDP *per capita* had already stalled in the 1980s, convergence in productivity levels continued until the mid-1990s, narrowing the gap to less than 10 per cent of the US level (although this partly reflected the shedding of low-skilled labour). As a result, the relatively low employment rates, combined with the smaller number of hours worked per person employed, account for most of the difference in GDP *per capita* relative to the United States.

### **Explaining the differences in labour resource utilisation**

To the extent that it seems natural for people to demand more leisure as their real income levels go up, an increasing use of labour potential both in terms of employment and hours worked does not necessarily imply a welfare improvement. It is likely, however, that the large discrepancies observed in cross-country employment rates have more to do with the pervasive influence of structural policies on incentives both to hire and to take-up work than with differences in preferences for leisure.

**Figure V.1. Sources of growth in trend GDP per capita**



1. Growth rate of total trend hours worked as a ratio of total population.  
 2. Growth of trend GDP per hour worked.  
 Source: OECD.

***Rising employment rates would help confront adverse demographic trends***

A look at the sources of growth in labour resource utilisation in EU countries since the mid-1990s shows that the continued decline in average hours worked per person employed was more than offset by the positive impact from rising participation and employment rates (Figure V.2). While such positive trends cannot go on indefinitely, there is still scope in some countries for employment and participation rates to offset the projected negative contribution from demographics. In fact, despite the considerable progress achieved in some of the member countries (the United Kingdom, the Netherlands and Ireland) during the past decade, structural unemployment still remains relatively high in the European Union, leaving significant room for improvement. Related to this, the incidence of long-term unemployment remains quite high in EU countries compared with Japan and the United States and it has not diminished during the 1990s.

***Where they occur, weak employment rates concern specific groups***

Furthermore, the problem of high unemployment in several EU member countries is compounded by low participation rates, resulting in even larger cross-country differences in overall employment rates.<sup>3</sup> Yet, the situation of prime-age males is fairly similar across most OECD countries. The problem of low labour resource utilisation in the European Union is thus concentrated in much lower participation and employment rates of young, old and female workers.

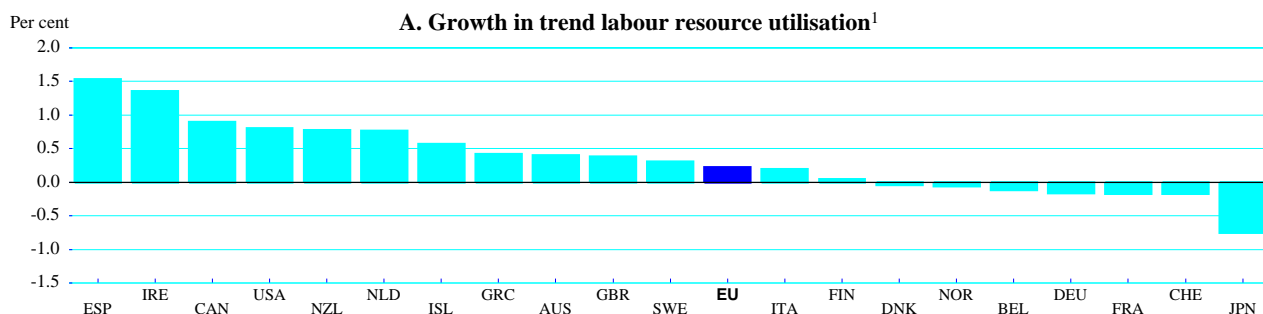
***The key policies to raise labour utilisation are well known***

The key structural policies responsible for the diverse labour market performance are well known and their influence has been the object of a comprehensive analysis in the context of the *OECD Jobs Strategy* (OECD, 1999a). They can be regrouped into two broad categories: *i*) the tax and benefit system which includes unemployment support and tax wedges and *ii*) labour and product market regulation which covers employment protection legislation, rules regarding minimum wages and other working conditions as well as administrative burdens on the start-up of firms and other barriers to competition. Some of the policy instruments, such as the minimum wage and the level of the out-of-work benefits relative to in-work net income, may have a direct impact on structural unemployment *via* wage floors or by raising workers' reservation wage. For many other policies, however, the main impact is rather indirect, operating *via* their combined effects on the speed and extent of real wage adjustment, the persistence of unemployment and the resilience of labour markets to shocks. In all cases, such policies have been introduced with specific objectives in mind and negative employment effects as an unintended side-effect. Nonetheless, in many cases those objectives may be obtained through other policy instruments with less undesirable side-effects. In other cases, consideration of the negative consequences would justify some compromise in terms of the primary objectives.

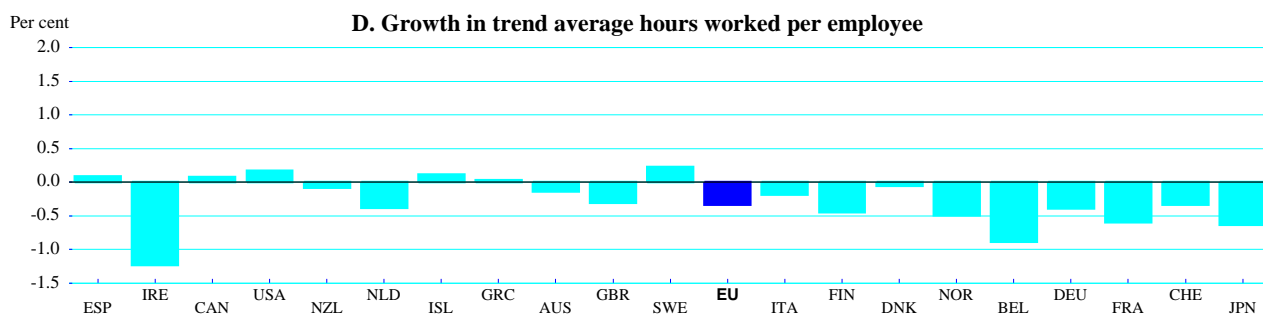
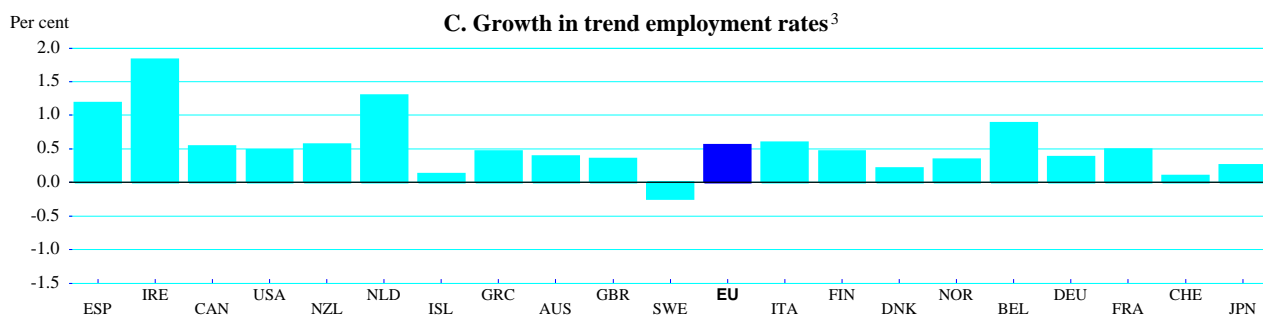
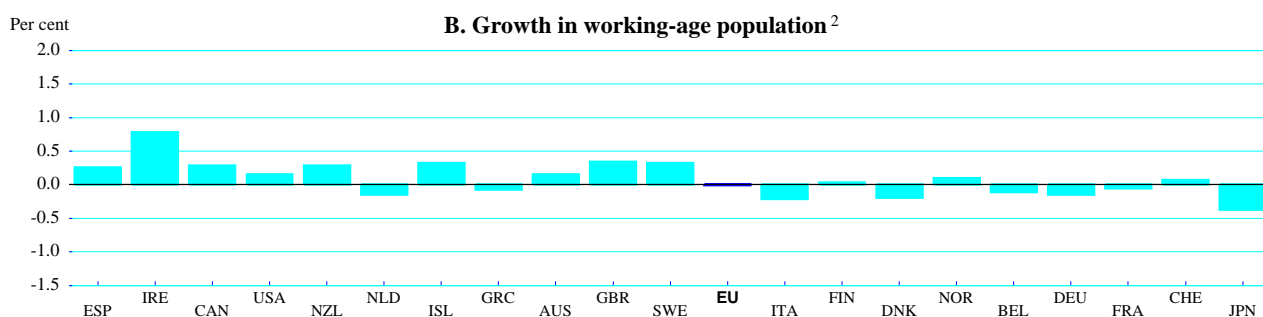
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3. This is in contrast with the performance of other European countries (Iceland, Switzerland and the Scandinavian countries) which have the highest employment rates among OECD countries.

**Figure V.2. Sources of growth in trend labour resource utilisation**  
Average over 1995-2002



of which:



1.  $A=B+C+D$ . Trend labour resource utilisation is measured as the trend total number of hours worked in a year divided by total population.

2. Measured as the growth rate of the ratio of the population of working age to the total population.

3. Measured as the growth rate of the ratio of trend total employment to working-age population.

Source: OECD.

### *Tax and benefit system*

***Achieving social objectives with minimum impact on incentives is a challenge...***

In reforming the system of tax and benefits, policymakers are frequently confronted with a trade-off between meeting social objectives and minimising disincentives to work. For instance, unemployment benefits provide needed support to individuals and households experiencing job losses. However, high replacement rates can raise the structural unemployment rate by lowering the gap between the income from work and the income received on support. This is particularly the case if high replacement rates are accompanied by a lengthy entitlement period. An extended benefit period can contribute to lengthening the average unemployment spell, thus leading to a loss of human capital and a reinforcement of insider-outsider mechanisms,<sup>4</sup> potentially reducing the overall wage sensitivity to labour market conditions.

***... as illustrated by the difficulty in lowering high replacement rates...***

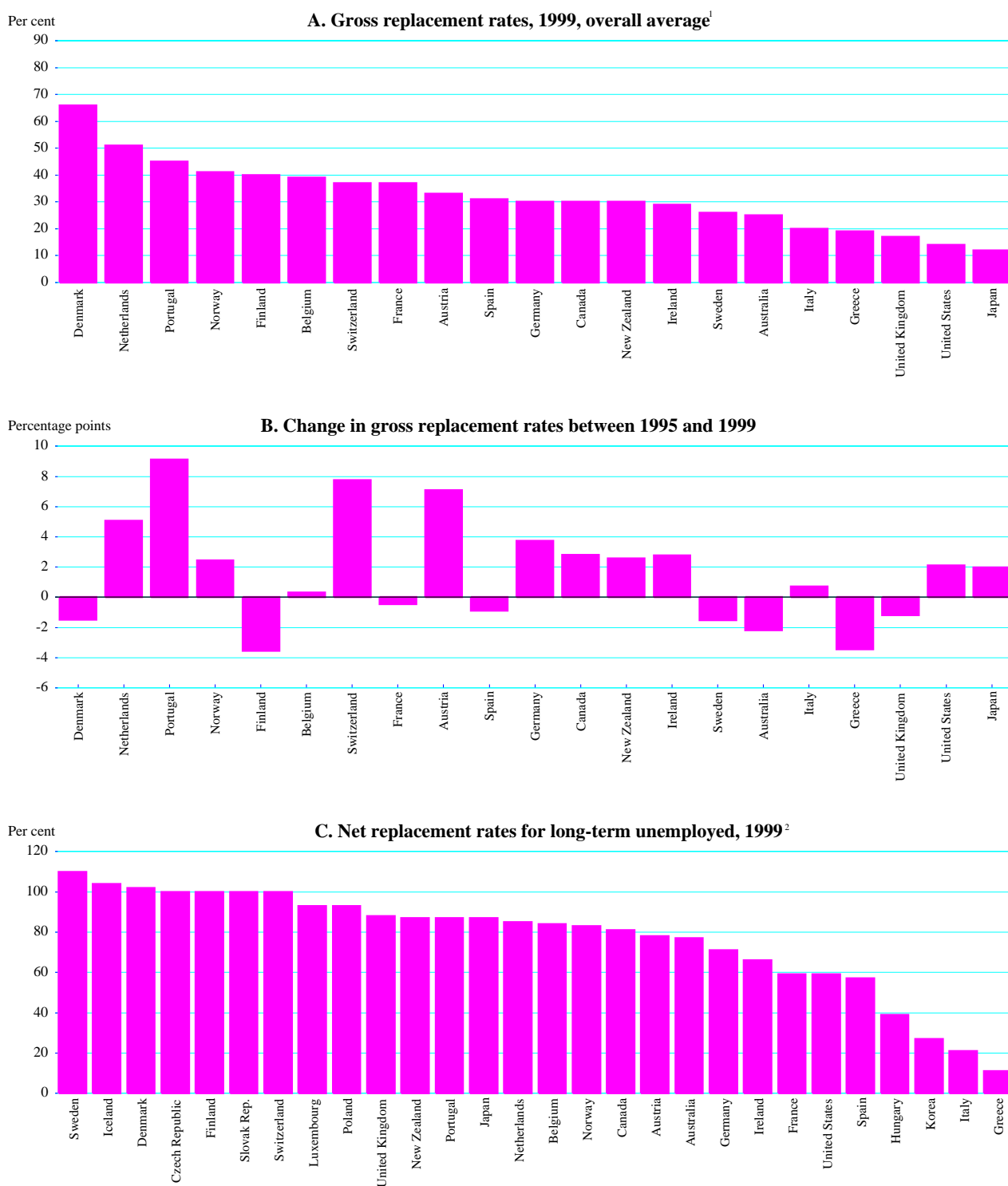
Indicators combining replacement rates and duration of benefits show that unemployment income support relative to the wage level can be quite high in several countries (Figure V.3, panel A), especially in the case of the long-term unemployed whose earnings' potential in the labour market is often less than that of the average production worker (Figure V.3, panel C). Yet, despite empirical evidence that high replacement rates and long benefit duration can have a sizeable impact on structural unemployment, reform in this area has proved to be difficult.<sup>5</sup> In fact, the gross replacement rate indicator has continued to rise in many countries between 1995 and 1999 (Figure V.3, panel B).

***... but countries have improved the trade-off by tightening requirements***

Most countries have nevertheless taken measures to improve the trade-off. While the level and duration of benefits have generally been maintained to avoid adverse social consequences, eligibility and work-availability requirements have been tightened. For instance, the minimum amount of time spent in employment required to satisfy qualifying criteria has been raised and the scope for turning down job offers repeatedly without facing some penalty has been reduced. Furthermore, eligibility to benefits for certain groups has been made conditional on enrolling in various schemes such as schooling, vocational training, voluntary work or a subsidised job. In return, governments are providing more intensive job-search assistance, including personalised job counselling and follow-ups so as to improve matching. Some countries have managed to combine high replacement rates with high employment rates (Denmark, Switzerland and Iceland). The majority of countries have

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4. A labour market characterised by a strong insider-outsider mechanism is one where unemployed workers (outsiders) have little or no influence on the outcome of wage bargaining between employees (insiders) and firms' managers, even when the unemployment rate is relatively high. As a result, the real wage fails to adjust in a way that would facilitate the re-absorption of unemployed workers.
  5. For empirical evidence on the effect of replacement rates on unemployment rates in OECD countries, see Elmeskov *et al.* (1998) and Nickell and Layard (1998).

**Figure V.3. Estimates of gross and net replacement rates**



1. Average of gross rates computed for different family situations, earning levels and durations of unemployment.

2. After tax and including family and housing benefits for long-term benefit recipients; situation corresponding to a couple with 2 children and a single earner paid 66.7% of the average production worker's salary.

Source: OECD, Benefits and wages database.



raised active support to the unemployed in order to reduce long-term dependence on benefits, although the amount of resources spent on active labour market policies (ALMPs) varies substantially across countries both in terms of GDP and as a per cent of total expenditures on active and passive measures. Past experience has shown that ALMPs need to be both well designed and well targeted (Martin, 2000).<sup>6</sup> Otherwise, the cost can rise quickly and the higher employment prospects of participants may be more than offset by significant dead-weight losses and the adverse effect of raising taxes to finance such programmes.

***The trade-offs are particularly difficult for workers with low earnings potential***

The trade-offs involved in the case of low productivity workers at the margin of the labour market can be particularly painful considering their low earnings potential. First, a significant reduction in out-of-work benefits could push many into poverty. Second, to avoid this, many countries have chosen to provide in-work benefits or payroll tax rebates combined with a minimum wage, in both cases incurring fiscal costs. Third, to limit the fiscal costs, the benefits are typically means-tested, but a rapid withdrawal as earned income increases generates high marginal effective tax rates, lowering incentives to increase work effort beyond a certain threshold (poverty trap). Fourth, raising the threshold for benefit withdrawal and/or lowering its pace pushes the problem of high marginal effective tax rates further up the earnings scale and can rapidly increase the budgetary cost, which may imply higher tax rates.

***Some countries have increased in-work benefits for low income workers...***

These concerns notwithstanding, several countries have favoured measures to top-up wages of low-income households with in-work benefits. In addition, even though these benefits remain for the most part means-tested, the phasing-out has been made more gradual. While the Earned Income Tax Credit and the Working Family Tax Credit programmes implemented respectively in the United States and the United Kingdom represent well-known examples of schemes aimed at improving in-work benefits of low-wage earners, similar measures also exist in France, Canada, Australia, Finland, Belgium, Ireland and New Zealand.

***... while others are lowering tax wedges to stimulate labour demand***

In order to lower the cost of low-paid jobs and stimulate labour demand, several countries have reduced the wedge between the wage paid by the employers and the take-home pay of employees by cutting labour taxes (in particular employers' and/or employees' contributions to social security). After rising steadily from the mid-1970s to the mid-1990s, tax wedges have been reduced in several countries, including in some EU member countries (France, Italy and the Netherlands) where wedges were (and still are) relatively high. In fact, the reduction in tax wedges in the late 1990s may have been a key factor behind the relatively strong EU employment performance, especially in countries where the measures

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6. For instance, a recent study assessing the various programmes available in Sweden for unemployed adults found that employment subsidies are by far the most effective in having a sustained impact on labour market attachment, though the cost-effectiveness of such measures remains highly questionable owing to large negative displacement and dead-weight effects (Sianesi, 2002).

were indeed targeted at the low paid jobs.<sup>7</sup> In these countries, high payroll taxes had had particularly deleterious employment effects on low productivity workers, since they could not be shifted to labour in the form of lower wages, owing to statutory or negotiated wage floors. However, in a context of deteriorating public finances, the scope for further reductions in tax wedges may be limited without tighter control on expenditure.

***Older workers' low activity rates result from various benefit schemes***

Considering the particularly high rate of inactivity among workers aged between 55 and 65, one area which could be given particular attention is the incentives for early retirement resulting from existing public pension and other benefit schemes.<sup>8</sup> Indeed, in a large number of countries where the official retirement age remains at 65, the average effective withdrawal age is up to several years lower. The effective retirement age has declined over time even as life expectancy at that age has increased significantly. In many countries, such patterns have been encouraged by public pension policies of high replacement rates combined with a low return on extra years spent in work beyond a certain age or number of years of contributions. More importantly, special early retirement programmes, unemployment-related benefits and disability schemes have provided older workers with an early route out of the labour market. Yet, in countries where participation rates of older workers are high, so are their employment rates suggesting no inherent barriers to employment at an old age. Considering that the burden of early retirement on output and public finances is set to intensify over the next decades, the disincentives to work at older ages should be removed.

***Labour and product-market regulation***

***While the direct effect of EPL on unemployment is ambiguous...***

Employment protection legislation (EPL) provides a good example of the possible effect of labour market institutions on structural unemployment *via* their influence on the shock transmission mechanism. By raising the cost of dismissal it reduces the incidence of lay-offs and hence the flow into unemployment. On the other hand, strict firing restrictions make firms more hesitant in their hiring process, making it harder for the unemployed to re-enter employment (Boeri *et al.*, 2000). The direct net effect of EPL on unemployment is thus ambiguous (OECD, 1999b).

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7. While reductions in labour taxes usually have a positive impact on employment, whether or not they also stimulate labour supply depends on the extent to which part of the benefits accrues to employees in the form of higher after-tax wages. Hence, the net effect on unemployment may depend on employers' and employees' respective bargaining power and, at least in the short run, on the labour market situation at the time the cuts are introduced.
  8. For a discussion of policies and institutions having an impact on the retirement age, see Chapter V in OECD (2002a).

*... it may have adverse indirect effects on the proportion of long-term unemployed*

Even so, EPL may have adverse indirect effects by reducing the speed of real wage adjustment as well as aggregate wage flexibility. The lower job turnover associated with strict EPL often implies an increase in the average duration of unemployment and the proportion of long-term unemployment, raising persistence and potentially reducing the impact of unemployment on wage setting. As noted earlier, it is striking to observe that countries with rising shares of long-term unemployed are also the ones generally facing increases in structural unemployment rates (Figure V.4). While this says nothing about the direction of causality, it is at least consistent with the notion that adverse shocks, even temporary ones, are more likely to raise unemployment persistently in countries where policies contribute to strengthen insider-outsider mechanisms.

**Figure V.4. Changes in long-term unemployment and structural unemployment rates**  
Between 1990 and 2001<sup>1</sup>, in percentage points



1. 1991-2001 for Finland and Switzerland; 1990-1999 for Ireland, Netherlands; 1990-2000 for Germany.  
Source: OECD, Analytical Data Base and Employment Outlook, June 2002.

*Reform of EPL has concentrated on temporary contracts*

Although reform of EPL has taken place in Europe during the past decade, the general tendency has been towards the easing of regulations affecting temporary contracts, with little change on regular contracts. This has been accompanied since the mid-1990s by a substantial increase in many countries in the share of temporary jobs in total employment (Germany, France, Italy, the Netherlands, Portugal and

Spain).<sup>9</sup> While these developments may have contributed to lower labour adjustment costs, the burden of adjustment is heavily concentrated on one category of workers, raising equity concerns. At the same time, the power of “insiders” (who are typically employed on permanent contracts) in wage bargaining may have increased as they could feel even more sheltered from unemployment than before, possibly reducing the responsiveness of wages to shocks.

***Uniform minimum wages may affect specific categories of workers***

As in the case of EPL, the net direct incidence of a statutory minimum wage on overall employment could arguably be limited, especially when it is set at a moderate level relative to the average wage. However, even though the level beyond which the adverse employment effects dominate is bound to vary across groups and regions, a uniform rate is often applied nation-wide, with the risk of affecting disproportionately specific categories of workers, such as youth in search of a first job experience. While any negative impact of statutory minimum wages is likely to have fallen in the past decade, owing in many cases to their gradual erosion in relative terms, they remain high in some countries (e.g. France, Australia and Ireland), which may prevent relative wages from reflecting productivity differentials

***Extension of collective agreements also imposes a floor on the wage of less productive workers***

While many countries do not have a statutory minimum wage, binding floors on the wage of less productive workers are sometimes imposed via administrative extension of collective agreement from unionised to non-unionised sectors. In some cases (e.g. the Netherlands and Belgium), these floors can exceed the statutory minimum wage. The difference between the proportion of employees covered by collective contracts and the proportion represented by unions provides some indications of the potential extent of economy-wide binding floors arising from this practice. The degree of extended coverage tends to be particularly high in euro area countries (except in Finland and Ireland).

***Product-market regulatory reforms can boost employment in the longer run***

Empirical evidence has shown that labour market performance can also be influenced by product market regulations having an impact on the degree of competition. Regulatory reforms aimed at lowering trade barriers, the stringency of state control and firms’ entry costs can stimulate output and employment by raising the elasticity of product demand, reducing thereby price mark-ups and lessening labour-market segmentation. Progress in reforming such regulation may have boosted employment rates by between ½ and 2½ percentage points across OECD countries over the past two decades (Nicoletti *et al.*, 2001). Clearly, an increase in product market competition puts downward pressures on wages in the short run, especially in highly protected sectors where the scope for rent-seeking behaviour by workers is largest. Indeed, one of the reasons why reforming labour market policies has proved difficult in many countries is the

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9. The combination of easier regulation for temporary contracts with strict EPL for permanent ones is only one among several factors behind the rise in the share of temporary employment (See Chapter III in OECD, 2002b). Some evidence of a significant impact has been found in the cases of Spain (Dolado *et al.*, 2001), France, (Blanchard and Landier, 2001) and Italy (Nannincini, 2001).

associated rent enjoyed by specific groups that are well positioned to resist (Blanchard and Giavazzi, 2001). In the longer run, however, stronger competition tends to boost real wages *via* its favourable impact on productivity.

## **Explaining the differences in the intensity of physical and human capital formation**

### *Physical capital*

#### ***Investment in physical capital boosts output growth***

Business investment (particularly in machinery and equipment) has long been identified as one of the key drivers of output growth (Ahn and Hemmings, 2001; Harris, 1999; De Long and Summers, 1992).<sup>10</sup> First, an increase in the quantity of physical capital has a direct positive, albeit transitory, influence on labour productivity growth through capital deepening. Second, investment in new machinery and equipment can also lead to a sustained increase in productivity growth if capital-embodied technical changes are introduced more quickly. However, this presumes that investment takes place in an environment that is conducive to innovation and where profitable opportunities exist, lest capital formation translates into diminishing returns rather than a strong output performance.

#### ***Investment in ICT-capital has varied across countries...***

Furthermore, the impact on growth could also differ according to the composition of investment. Of particular interest is the relative importance of information and communication technologies (ICT) given their alleged contribution to the US growth performance of the late 1990s. Indeed, all countries have since the early 1980s experienced a significant increase in the share of ICT in total investment, albeit to an extent that varies substantially across countries (Figure V.5).<sup>11</sup> The United States appears to maintain a significant lead.

#### ***... reflecting in part differences in relative prices of equipment***

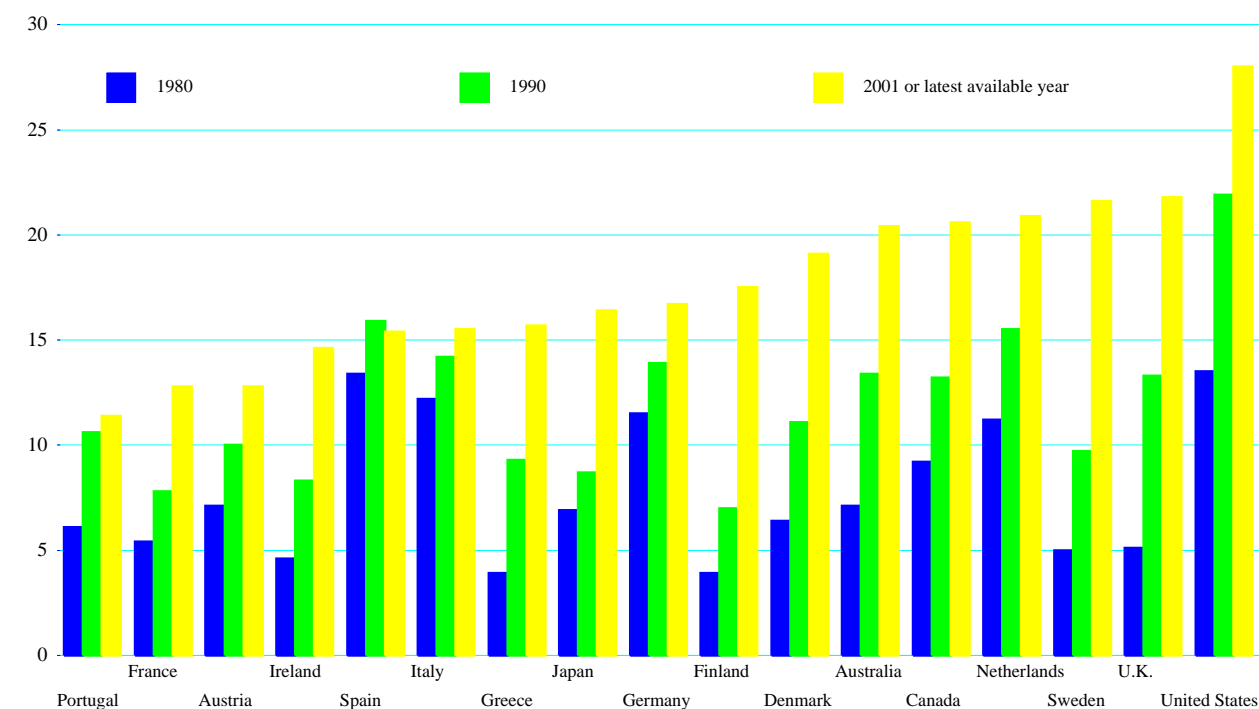
In several countries, a low rate of ICT investment can be partly explained by a relatively high purchasing price of computer and telecommunication hardware. Even though ICT equipment is an internationally traded good, substantial cross-country price variations have persisted, reflecting in part differences in taxation, but also the presence of significant non-tariff barriers related to technical standards, import licensing and public procurement.

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10. Empirically, the correlation between physical investment (as a share of GDP) and growth in GDP *per capita* and/or labour productivity stands out as particularly significant and robust (OECD, 2003a).
  11. The differences shown in the shares could partly reflect discrepancies in the measurement and treatment of software investment across countries.

**While financial market development is important to spur investment in general...**

Cross-country differences in the level and composition of investment continue to be shaped by domestic factors having an influence on the overall cost of capital and access to finance, although foreign direct investment and other capital flows may be growing in significance. Recent empirical work has underscored the importance of domestic financial market development on output growth performance, *via* its impact on risk-diversification and investment (Leahy *et al.*, 2001). As well, financial markets and institutions play an important role in the monitoring of corporate performance and in imposing discipline on corporate governance. One area where access to finance can play a critical role is in the development of new, innovative products or technologies which by nature tend to be high-risk activities. In this regard, the contribution of venture

**Figure V.5. ICT investment in selected OECD countries**  
 In current price, as a percentage of non-residential gross fixed capital formation, total economy



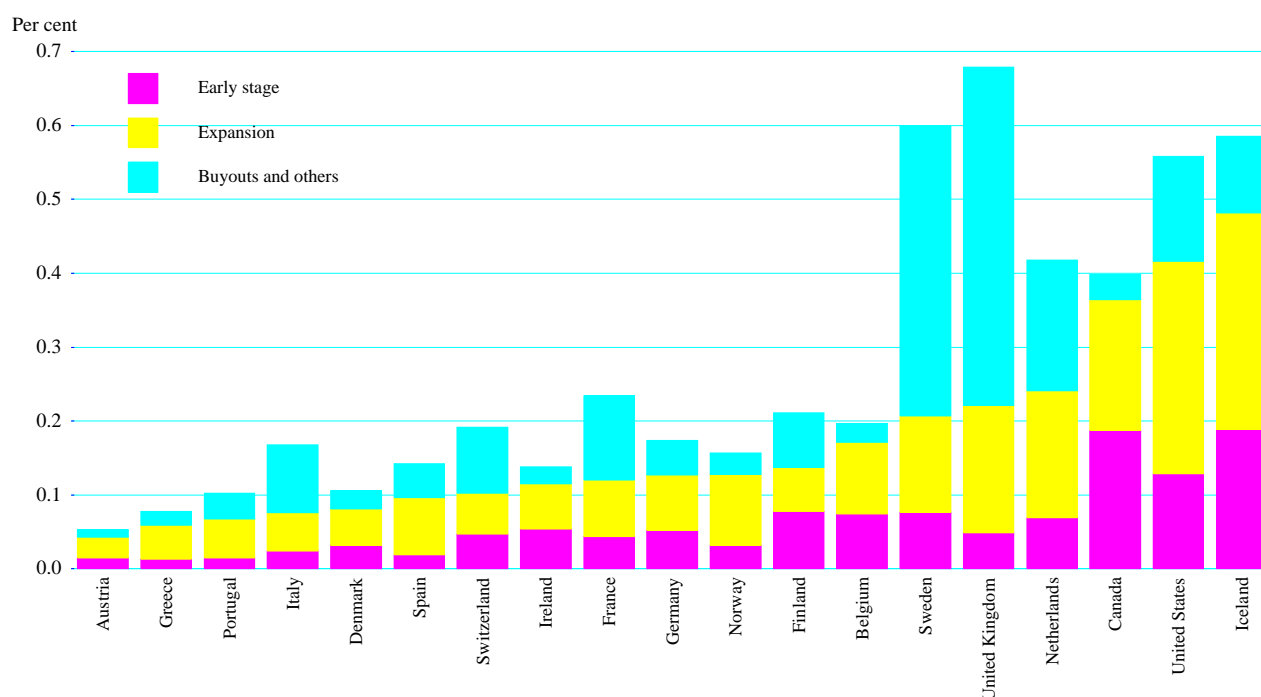
Source: OECD (2003b).

capital to strong entrepreneurial activity in the United States has been recognised as an important ingredient behind the growth performance,<sup>12</sup> although this influence is difficult to assess with precision.

*... the presence of venture capital markets is essential for innovative activities...*

Data on venture capital investment show that substantial cross-country variations prevailed over the period 1998-2001, both in terms of the overall amount invested and the share devoted to activities in the early stage and the expansion phase of developments, with euro area countries generally trailing significantly behind the United States and Canada (Figure V.6). Similar divergences are reflected in less formal indicators such as the funding of activity by business angel networks. Yet, the development of an active venture capital market in the euro area would seem particularly important given the prevalence of a bank-based financial system and the difficulty of new firms with risky projects and little collateral to attract bank loans.<sup>13</sup> Several countries have introduced tax

**Figure V.6. Venture capital investment by stages**  
Per cent of GDP, 1998-2001



1. The definition of private equity/venture capital varies across countries. Countries are ranked according to the sum of early stage and expansion. Source: OECD venture capital database, January 2003; Baygan and Freudenberg (2000).

12. See Kortum and Lerner (2000). Exploiting firm-level data, the authors found that a dollar of venture capital had a bigger impact on patenting in the United States than a dollar of business R&D, although this may reflect the influence of other factors (such as the quality of research infrastructures) not properly controlled for in the empirical analysis.
13. See Audretsch and Lehman (2002) for evidence that technology-based start-ups are more likely to suffer from financing gaps and lower performance if their access to finance is largely restricted to traditional banks.

incentives and have more actively supported the business angel network.<sup>14</sup> This notwithstanding, investment in venture capital in several European countries has been limited by the absence of large pension funds and, where such funds exist, by rules preventing these as well as other institutional investors from investing in venture capital. In comparison, pension funds have been an important source of venture capital in the United States, the United Kingdom, Australia, Sweden, Finland and New Zealand (OECD, 2001a).<sup>15</sup>

***... requiring the support of well-functioning secondary markets***

The development of venture capital also requires the support of well-functioning secondary financial markets for high-tech firms to allow investors to recover their funds via the flotation of start-ups.<sup>16</sup> More generally, the financing of new firms and innovative activity raises the difficulty of assessing prospects based on most accurate information. In this regard, principles of sound management, contract enforcement and transparency are essential features of financial markets.

***Human capital***

***Investment in human capital is also important for growth***

As is the case for physical capital, the accumulation of skills and competencies -- broadly referred to as human capital -- has a direct, though temporary, impact on output growth *via* the improvement in the “quality” of labour input. In fact, recent empirical work suggests that one extra year of average education (roughly equivalent to a 10 per cent rise in human capital) has in the past raised output *per capita* in the long run by around 4 to 7 per cent on average across OECD countries (Bassanini and Scarpetta, 2001).<sup>17</sup> Human capital formation may also have a permanent impact on output growth if a higher level of skills and knowledge facilitates the adoption of new technologies and/or the process of innovation, leading to an acceleration of technical progress. While the empirical literature has so far produced only mixed support for the latter assumption (Temple, 2001) -- at least among developed countries -- recent evidence based on a more comprehensive data set suggests, that the economy-wide returns to investment in primary and secondary education may be larger than those enjoyed by individuals (OECD, 2003a).

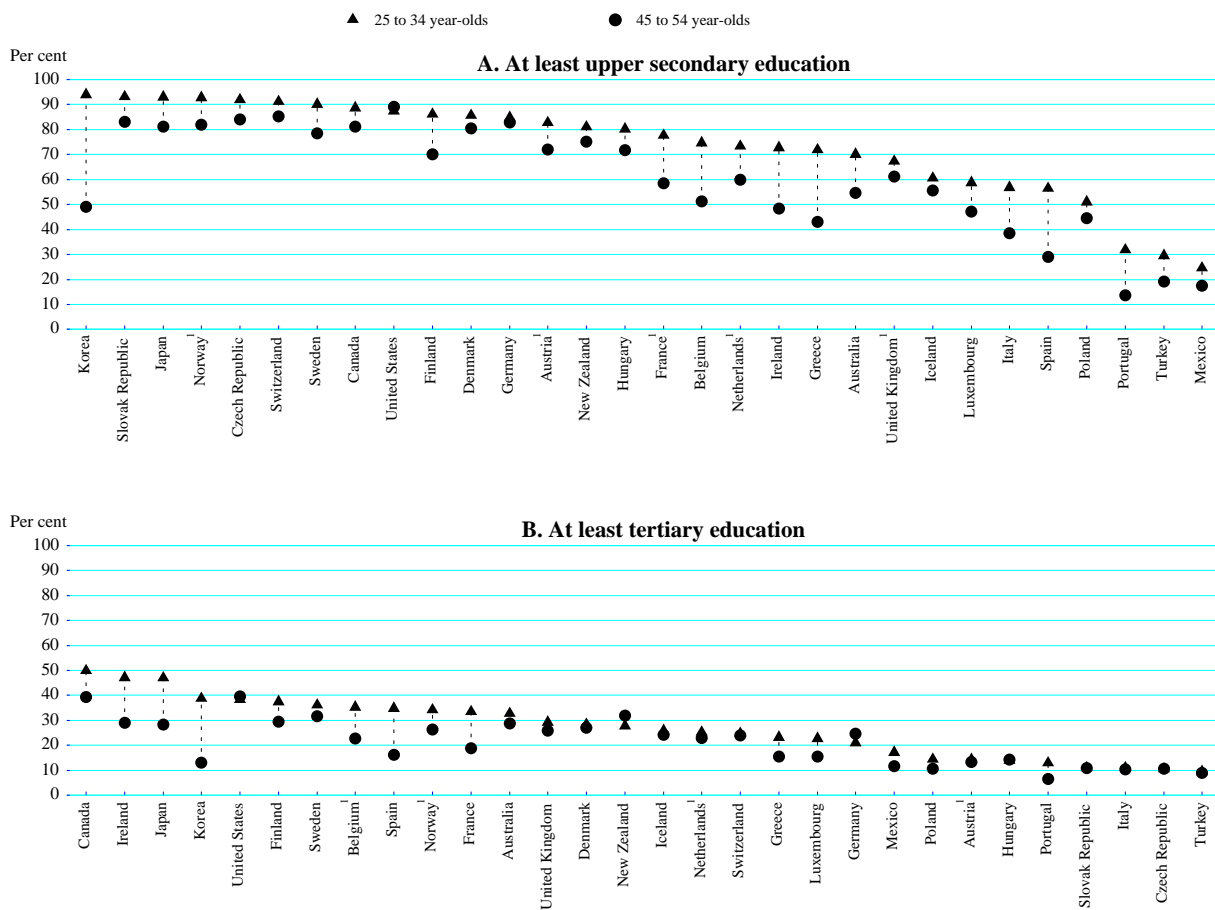
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14. Tax incentives tend to have a limited impact on venture capital activity owing to the fact that the largest investors are often tax-exempt (see Baygan, 2003)
  15. The absence of a venture capital industry has been cited as one of the factors behind the slowdown in R&D productivity in Japan during the 1990s. The reason is the greater difficulty for established firms to partner with more entrepreneurial and efficient firms to foster product development in the absence of venture capital (Branstetter and Nakamura, 2003).
  16. While the demise of the Neuer Market may, in this respect, be seen as a setback, its failure may also be a consequence of the lack of economies of scale of European secondary markets.
  17. These results were obtained over a period during which low-educated cohorts were being replaced by workers with higher levels of education. It is not clear that additional schooling will have as large an impact on average across OECD countries in the future.



**Educational achievements have improved in most countries**

Given the absence of direct measures, human capital is usually assessed in terms of educational attainment. The latter can in turn be measured on the basis of various indicators, such as the average number of years of education or the percentage of population that has reached a certain level of education.<sup>18</sup> Both indicators suggest that educational achievements have improved significantly in most countries over the past two or three decades and that the cross-country variations have also narrowed. Nevertheless, the percentage of the population having completed at least upper secondary education varies from over 90 per cent in the group of leading countries, to less than 70 per cent in others (Figure V.7). The gap is particularly large in the case of Portugal, Turkey and Mexico.

**Figure V.7. Percentage of the population that has attained a certain level of education, 2001**  
By age group



1. Year of reference 2000.  
Source: OECD.

18. For purposes of comparison, the levels identified are usually determined on the basis of the International Standard Classification of Education (ISCED), which classifies educational programmes according to various objective criteria. Under this classification, upper secondary education corresponds to level 3 and tertiary education to levels 5A and 6.

**While government investment in compulsory education brings benefit for society...**

It is broadly recognised that widespread basic educational services brings benefits to the society and this recognition has led governments in all countries to be involved not only as a source of financing but in most cases as a direct provider. In 1999, OECD countries spent from 2.7 per cent of GDP (Japan) to over 5 per cent (Sweden) of what are essentially public funds on schooling at the primary and secondary levels, which typically corresponds to the years of compulsory education (Table V.2). As is the case for physical capital the appropriateness of the amount invested should, to some extent, be judged against some measures of return on capital. Unfortunately, the latter can be particularly hard to measure in the case of compulsory education. Even so, there seems to be no clear correspondence between the amounts invested and the performance in terms of educational attainment and student abilities across countries which suggest that potential efficiency gains could be reaped by further reform. Indeed, the results from an OECD study on tests of 15 year-old students' abilities in reading, mathematics and sciences show that the countries doing relatively well are not necessarily the ones spending the most per student (OECD, 2001b).

Table V.2. **Spending at various levels of education**

1999, Per cent of GDP

	Public spending on education			Total spending on educational institutions	
	Primary and secondary <sup>a</sup>	Tertiary	of which : Student grants <sup>b</sup>	All levels of education	All levels of education
Australia	3.8	1.2	0.4	5.0	5.8
Austria	4.1	1.7	0.2	6.3	6.3
Belgium	3.5	1.5	0.2	5.5	5.5
Denmark	4.8	2.4	0.8	8.1	6.7
Finland	3.8	2.1	0.3	6.2	5.8
France	4.2	1.1	0.1	6.0	6.2
Germany	3.0	1.1	0.1	4.7	5.6
Greece	2.4	1.1	0.0	3.6	3.9
Ireland	3.1	1.2	0.2	4.3	4.6
Italy	3.2	0.8	0.1	4.5	4.8
Japan	2.7	0.5	0.0	3.5	4.7
Netherlands	3.1	1.3	0.3	4.8	4.7
New Zealand	4.8	1.2	0.3	6.3	..
Norway	4.6	2.0	0.6	7.4	6.6
Portugal	4.2	1.0	0.1	5.7	5.7
Spain	3.3	0.9	0.1	4.5	5.3
Sweden	5.1	2.1	0.6	7.7	6.7
Switzerland	4.0	1.2	0.0	5.5	5.9
United Kingdom	3.3	1.1	0.4	4.7	5.2
United States	3.5	1.4	0.3	5.2	6.5
<b>Country mean</b>	3.7	1.3	0.3	5.5	5.6

a) Includes post-secondary non-tertiary education.

b) Scholarships/other grants to households and student loans.

Source: OECD, *Education at a Glance*, 2002; OECD.

***... the extent of public involvement in tertiary education raises equity concerns***

At the tertiary level, an important share of the return on investment in human capital appears to accrue to the individual, raising questions about the extent of government involvement. In addition, given the significant sociological barriers that have historically kept children from poor and less-educated families away from tertiary education, low tuition fees often imply redistribution from poor to middle and upper-middle class families, raising equity concerns. The risk that a significant increase in tuition fees would lower private returns and hence participation in tertiary education could be lessened by an easier access to government-backed unsubsidised student loans.<sup>19</sup>

***Training is an important aspect of labour market flexibility***

Educational attainment represents only one facet of human capital development. Maintaining or improving workers' mobility generally requires providing them with opportunities and incentives to up-grade their skills throughout their professional life *via* vocational training or adult education. The lack of mobility may inhibit the scope for firms to bring about the changes in work practice and organisational structures that are often required to better exploit technologies, limiting thereby their own incentive to invest in the latter (OECD, 2003b). Even though the importance of adult education has grown during the past two decades, the share of adults aged over 35 in total enrolments remains fairly low, except in Australia, the United Kingdom and Sweden. This is partly due to the fact that, under existing institutional arrangements, which in many countries favour earlier retirement, financial incentives to invest in adult education diminish rapidly with age as the amortisation period for the investment shrinks (Blöndal *et al.*, 2002).

***The amount of training varies across countries...***

As regards vocational training, given the various forms that it can take and also considering the problems in measuring on-the-job training, comparable indicators of performance are difficult to develop. Nevertheless, drawing on different sources of survey-based training statistics, an OECD study found significantly different levels of formal training across countries, with relatively low levels observed in southern European countries such as Greece, Italy, Portugal and Spain and relatively high levels in the United Kingdom, France and most Nordic countries (OECD, 1999b).

***... but in most cases, less-educated workers are less likely to be trained***

Perhaps more significantly, the study also confirmed earlier findings that in most countries, less-educated workers and those working on a part-time and/or temporary contract basis are much less likely to receive training, especially when employed by a small firm. Many countries pursue policies to enhance training via subsidies or mandated employer spending on the premise that too little is provided. However, the appropriate amount of training is difficult to assess, suggesting that a focus on giving the right incentives might be more appropriate.

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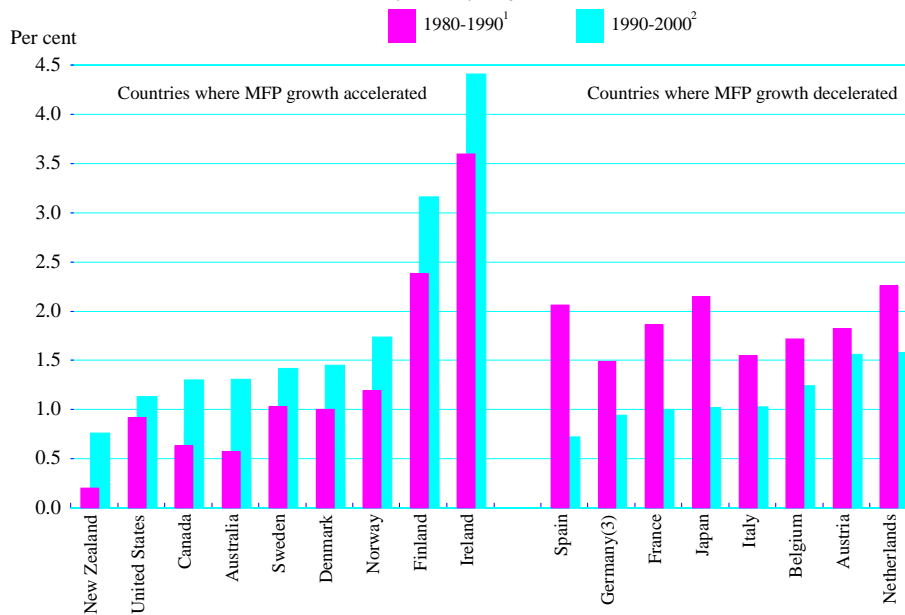
19. Higher tuition fees may also help to reduce the time spent by some students in education over and above the statutory duration required to obtain a diploma, which is a problem in some countries.

## Explaining the differences in technological progress

### *Fostering MFP gains is key to long-term growth*

Strong investment, in particular in new technologies such as ICT, has a direct impact on output and productivity growth via capital deepening or embodiment effects. However, the positive growth impact from the latter is likely to be transitory and last the time required to complete the transition to a higher level of capital intensity. Hence, for investment to have a durable impact on output and productivity growth, it must generate positive externalities over and above the direct benefits from raising employees' skills or from equipping them with more powerful machines. The significance of externalities, also referred to as *disembodied* technological progress, is often assessed using estimates of multi-factor productivity (MFP). Such estimates show that while MFP growth increased in English speaking and Nordic countries during the 1990s, it fell in Continental Europe and Japan, albeit in several cases from a relatively high level (Figure V.8).

**Figure V.8. Multi-factor productivity growth over selected periods**  
Business sector, 1990s and 1980s  
(based on cyclically-adjusted series)



1. 1983-1990 for Belgium, Denmark and Ireland, 1985-1990 for Austria and New Zealand.
  2. 1990-1996 for Ireland and Sweden, 1990-1997 for Austria, Belgium and New Zealand, 1990-1998 for Netherlands, 1990-1999 for Australia, Denmark, France, Italy, Japan and 1991-2000 for Germany.
  3. West Germany before 1991.
- Source: OECD.

### *MFP growth requires incentives to innovate and adopt best-practices*

MFP growth usually arises from eliminating the slack in the use of inputs, from the adoption of state-of-the-art technology and related organisational practices (catching-up to technological frontier) and/or from direct innovations in either goods produced or the production process (pushing out the frontier). While numerous factors can affect MFP *via* either channel, recent empirical work based on sectoral data has

underscored the important influence of product market competition, R&D intensity as well as labour market regulation and institutions (OECD, 2003a).

***Promoting product-market competition helps to raise MFP growth...***

There is a broad consensus that the incentives to actively seek efficiency gains via the *catching-up* process can be underpinned by policies and institutional settings strengthening product market competition. In particular, overly stringent product market regulation can have a key influence on the strength of competition in domestic markets either by exerting a direct control on economic activities, by imposing various barriers to entrepreneurial activity (through legal restrictions on market access or administrative burdens on new firm creation), or by maintaining high barriers to trade and foreign direct investment. In this regard, the parallel increase in market size (allowing firms to benefit from economies of scale) and exposure to foreign competition is seen as one of the main benefits from growing international trade and may explain the significant impact of cross-border activities on output growth observed in most empirical studies.

***... but progress in reforming product-market regulation has been uneven***

While all OECD countries have eased anti-competitive regulation (barriers to entry or operational restrictions) during the 1980s and 1990s, some have gone much further than others, not least those that have benefited from an acceleration in MFP during the 1990s (the United States, Australia, Finland and New Zealand). Indeed, a positive link between pro-competition regulation and MFP growth is supported by cross-country evidence at the industry level, even after controlling for R&D investment and industry-specific factors (Nicoletti and Scarpetta, 2003). Regulatory measures having an impact on entry costs are particularly relevant for industries facing rapidly-changing technology, such as ICT-producing or ICT-using industries, given that the contribution of new firms to productivity growth appears to be much stronger in these industries than in the rest of the economy.

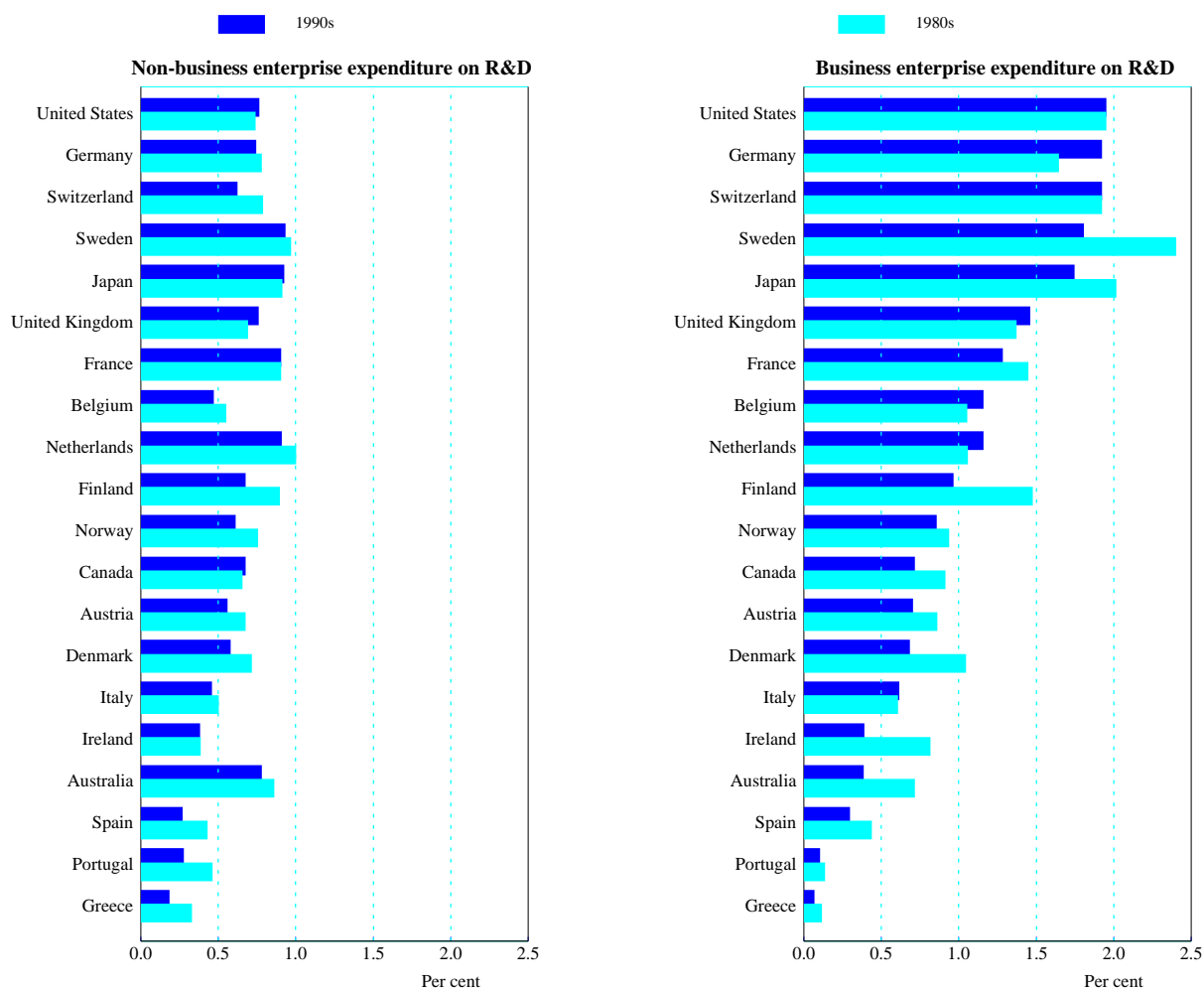
***R&D investment is necessary to foster innovation but public R&D can only go so far***

The strong and positive impact of R&D intensity on productivity growth has also been shown in various studies, both on the basis of aggregate and sectoral data.<sup>20</sup> Indeed, because of the perceived externalities, most countries provide support to R&D *via* direct expenditure and, in some cases, via tax incentives on private R&D. This notwithstanding, the intensity of both public and private R&D expenditure varies significantly across countries (Figure V.9). In the case of private R&D, the variations reflect also factors such as market size and industrial structure which are not directly amenable to innovation policy. Nevertheless, authorities in a growing number of countries have established explicit R&D targets to

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20. See Guellec and van Pottelsberghe (2001) for evidence based on aggregate data and Scarpetta and Tresselt (2002) for empirical support based on sectoral data.

**Figure V.9. Expenditure on R&D in OECD countries**  
Total expenditure on R&D as a percentage of GDP, 1980s and 1990s



Source: OECD (2003a).

narrow the gap *vis-à-vis* leading countries.<sup>21</sup> Yet, although a certain proportion of public R&D funding is considered as necessary to stimulate private R&D, the stimulating effect may diminish beyond a certain threshold.<sup>22</sup>

***Product and labour-market regulation may have an impact on private R&D spending***

Some of the differences in private R&D spending across countries within comparable industries could reflect the important influence that the policy environment may have on the private incentives to engage in innovative activity. Indeed, it appears a significant part of cross-country variations in R&D intensity within industries can be attributed to

21. See Sheehan and Wyckoff (2003) for a review of the economic and policy implications of efforts to meet targets for R&D spending.  
22. Such a threshold has been estimated in one study at around 13 per cent of business R&D (Guellec and van Pottelsberghe, 2000).

differences in product market regulation.<sup>23</sup> The evidence also suggests that labour market regulation plays an important role. This may be especially the case in industries where taking advantage of new opportunities requires significant labour re-allocation. By raising the cost of labour adjustment, stringent employment protection legislation reduces both the return to innovation and the incentive to spend on R&D.<sup>24</sup> In addition to these effects on R&D intensities in individual sectors, structural policy may also affect overall R&D investment through changes in the industry mix. Indeed, analysis indicates that the sectoral composition of the economy matters, as the bulk of R&D activity is concentrated in specific industries.

***Stimulating  
entrepreneurial activity  
requires allowing firms  
to enter and exit***

Although strong investment in R&D is a key determinant of innovation, other factors are important. For instance, the use and development of new technology requires firms to be able to experiment, and hence to be given the possibility of failure and re-entry. In this regard, having a bankruptcy regime allowing firms to exit with a limited social and financial stigma or burden on firms' owners and managers may boost innovative activity. However, stimulating entrepreneurial activity by facilitating both entry and exit may bring benefits beyond the impact on innovation. For instance, it may lessen the incentives for managers to make business decisions so as to delay as much as possible declaring bankruptcy even when the latter becomes inevitable, improving thereby resource allocation. Furthermore, the threat of exit, combined with competitive pressures from potential entrants, may stimulate productivity growth within firms by raising managerial effort. However, facilitating exit while providing investors with adequate protection in case of business failures may represent a difficult policy challenge.

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23. See Chapter VII in OECD (2002c).

24. The positive impact on R&D from a reduction in the stringency of EPL is estimated to be particularly strong in the case of high-tech industries (usually requiring higher turnover) in countries where the industrial system is characterised by low or intermediate levels of co-ordination (e.g. France, Spain and Portugal). See Chapter VI in OECD (2002a).

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