VII. PRODUCTIVITY AND INNOVATION: THE IMPACT OF PRODUCT AND LABOUR MARKET POLICIES

Introduction and summary

Product and labour market policies influence growth

A substantial part of economic growth cannot be explained by increased utilisation of capital and labour. This part of growth, commonly labelled "multi-factor productivity", represents improvements in the efficiency of production. It is usually seen as the result of innovation by best-practice firms, technological catch-up by other firms, and reallocation of resources across firms and industries. This chapter focuses on the impact that policies affecting product market competition and labour market adaptability have on multi-factor productivity and some of its main determinants, *i.e.* innovation and the diffusion of new production techniques.[1]

The next section provides a brief overview of multi-factor productivity outcomes, innovative activity, and selected product and labour market policies in the OECD area, showing persisting cross-country differences in both performance and regulatory patterns. The following section explores the implications of product market regulations and hiring and firing rules for productivity, partly drawing on firm-level evidence. The final section looks at the linkages between product and labour market policies and research and development activity.

The analysis leads to the following main policy conclusions:

Easing regulatory restrictions enhances productivity

– Easing product market regulation and employment protection positively affects multi-factor productivity levels and technological catch-up by raising the incentives to improve efficiency and lowering the costs of doing so. These effects are likely to come about mostly through within-firm productivity gains but also through reallocation of output to more efficient firms, which are often new entrants in industries with rapidly evolving technologies (*e.g.* industries producing and using information and communication

1. This chapter follows on from previous OECD work on growth (OECD, 2001*a*; Scarpetta *et al.*, 2002) and product/labour market interactions (Nicoletti *et al.*, 2001; OECD, 2001*b*), bringing together firm and industry-level empirical evidence concerning the determinants of multi-factor productivity and the cross-market effects of regulatory policies.

technologies).

Policies that favour competition spur innovation

– Product market liberalisation also has positive effects on the innovative effort of firms (as measured by research and development expenditure). These beneficial effects are best exploited when intellectual property rights provide sufficient incentives to innovate, and the scope for potentially anti-competition strategic use of innovation spending or patenting is restricted.

The effects on innovation of easing job protection are complex

– The effects on research and development of easing hiring and firing rules are more ambiguous. On the one hand, innovation-driven changes in the skill mix of jobs often imply hiring and firing of workers, which is easier with less statutory job protection. On the other hand, in countries where industrial relations systems are centralised, changes in the skill mix are often implemented by in-house training of the existing workforce and restrictions on worker turnover may therefore not be an impediment to innovations. The effects of job protection on innovation also depend on the way innovations are implemented in industries with different technological characteristics.

Performance and regulatory patterns in the OECD area

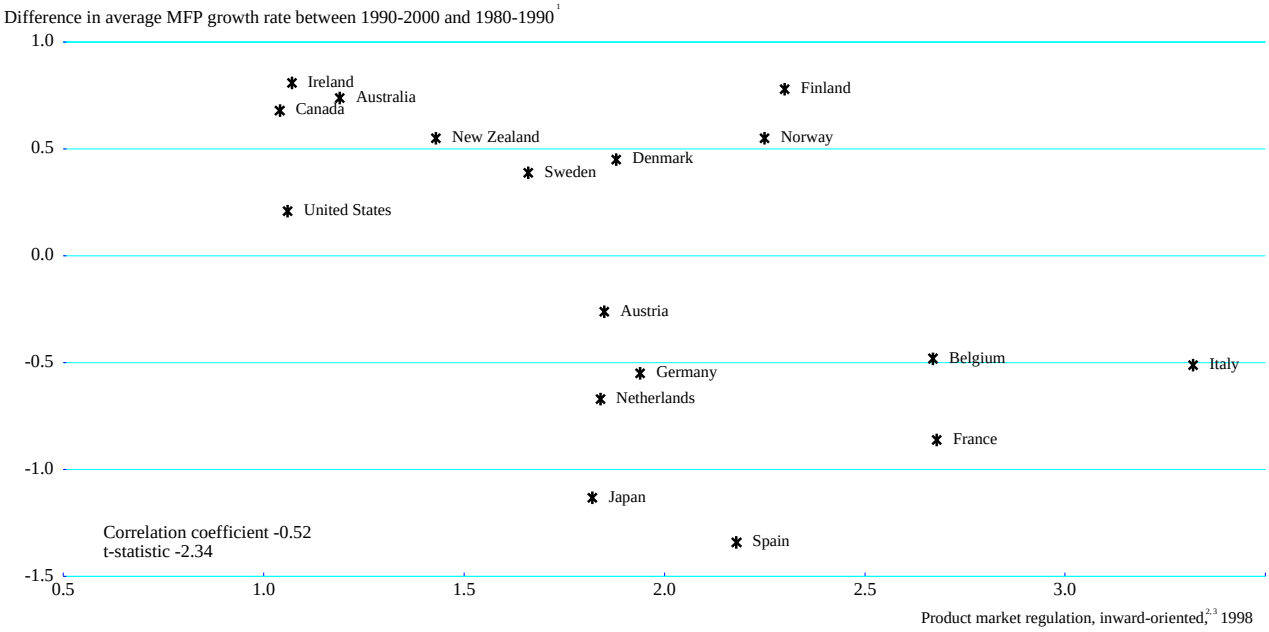
Productivity performance varies across countries…

Improvements in multi-factor productivity (henceforth MFP) play a crucial role in the process of economic growth. Recent OECD estimates suggest that, in most countries, MFP growth accounted for between one third and one half of the average business sector GDP growth observed over the past two decades.[2] Cross-country growth differentials were heavily affected by differences in MFP growth rates over the 1990s. Australia, Canada, Ireland, New Zealand, the Nordic countries and the United States experienced an acceleration in MFP growth, recovering to various degrees from the slowdown that occurred in the previous two decades (Figure VII.1, vertical axis). In other OECD countries for which data are available, MFP performance worsened, significantly so in France, Japan and Spain.

2. MFP growth represents the residual output growth once the direct contribution of changes in the quality and quantity of capital and labour inputs are accounted for. Therefore, MFP estimates involve a number of difficult measurement problems. For instance, it is hard to make adjustment for quality and compositional changes in the labour input and, especially, the capital stock. Other potential sources of measurement error are economies of scale and mark-up pricing, see Morrison (1999). For detailed results on growth decomposition in OECD countries, see Scarpetta *et al.* (2000).

Figure VII.1. Multifactor productivity acceleration, product market regulation and employment protection legislation

Product market regulation and MFP growth



Employment protection legislation and MFP growth

1. Adjusted for hours worked.
2. Excluding barriers to trade and investment.
3. The scale of indicators is 0-6 from least to most restrictive. See Nicoletti et al. (1999).
Source: OECD.

… reflecting the ability to reach and shift the technological frontier…

Since it reflects changes in output over and above those resulting from changes in factor inputs, MFP improvement is the component of growth that is most closely related to technological progress. MFP growth results from both innovations that improve upon best-practice production techniques and the catch-up *via* the adoption of state-of-the-art technologies and organisational practices. For instance, the recovery in MFP growth in the United States over the 1990s has been linked to innovations in information and communication technology industries and the subsequent boost to overall technical progress implied by the diffusion of this technology in other industries. It is likely that similar innovation and diffusion processes also played an important role in other OECD countries, though this effect is more difficult to identify.[3]

… which depends on innovative effort

There is a wide consensus that innovative activity is one of the main sources of technological progress and, ultimately, economic growth.[4] Measurement of innovative activity is notoriously difficult in part because of data limitations. A commonly used measure is reported expenditure for research and development (henceforth R&D), which has a wide country, industry and time coverage. This measure is attractive because of this wide coverage, but it is imperfect since it does not account for the economic significance of R&D output.[5] Figure VII.2 shows that business R&D intensity (*i.e.* the ratio of R&D expenditure to output) varies significantly across countries, with the highest intensity in Sweden, the United States and Japan, and the lowest in Portugal, Greece and Poland. In a majority of countries, relatively low intensity in individual industries explains most of the deviations of aggregate R&D intensity from the OECD average. However, industry composition effects are sizeable in several countries and account for the bulk of these deviations in Australia, Austria, Finland, Greece, Italy, Korea and Norway.[6]

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3. See Bassanini *et al.*, 2000. In the major European countries and Japan the contribution to growth of investment related to information and communication technologies has been less important than in the United States, but it did play an important role in the pick up of growth in Australia and Finland (Colecchia and Schreyer, 2001).

4. OECD (2000*a*, 2000*b*) and Scarpetta *et al.* (2002), among others, provide evidence on the linkage between research and development and growth.

5. As well, R&D data usually capture only activities that are explicitly classified under R&D expenditures or employment in companies' accounts. However, a large part of innovative activity, notably in service sectors, occurs through organisational changes within firms, which are not reported in statistics. Moreover, innovative activity by small and medium-sized firms is typically under-reported in official statistics concerning R&D. Innovation counts and patents are imperfect indicators of innovation output mainly because they often convey little information about the economic significance (*i.e.* the "quality") of innovations. See Nicoletti *et al.* (2001) and Ahn (2002) for brief discussions of these measurement issues.

6. The cross-country variability observed in patents per capita, another widely-used indicator of innovative activity, is similar to that of R&D intensity (Bassanini and Ernst, 2002*a*).

Figure VII.2. Differences in business R&D intensity across countries: within-industry and industry specialisation effects
Percentage deviations from OECD average

Source: Nicoletti et al. (2001).

Regulatory policies help explain performance differentials

Cross-country patterns of innovation and MFP depend on several factors,[7] but OECD work suggests that the policy environment may bear critically on performance differentials. Differences in product and labour market regulations were still significant in the late 1990s in the OECD area. Focusing on domestic product market regulations and employment protection legislation (EPL), Figure VII.1 (horizontal axis) shows that the regulatory policies against which MFP performances were achieved in the past decade differed a lot across countries.[8] By affecting the incentives to

7. Differences in industry structure influence the potential for innovation and MFP growth, particularly as the contribution of particular industrial sub-sectors (such as industries producing and using information and communication technologies) becomes stronger. Moreover, despite increasing convergence across the OECD, differences in human capital, trade openness, industrial relations regimes, financial structure and governance systems are important structural determinants of cross-country variation in innovative activity and economic growth, on which policies have only limited leverage, at least in the short to medium term.

8. More details on these differences can be found in OECD (1999*a*, 1999*b*). Figure VII.1 illustrates cross-country differences in domestic (inward-oriented) product market regulation and employment protection legislation in 1998. The focus is on domestic regulations because OECD countries are much more similar in their outward policy orientation (*e.g.* regulations concerning international trade and foreign direct investment). The summary indicators developed by the OECD rank countries on a scale 0-6 which is increasing in the level of restrictions to competition and the severity of employment protection legislation. Nicoletti *et al.* (1999) provides details on these indicators. Since 1998, OECD countries have implemented labour and product market reforms that may have altered these rankings. Reforms implemented recently in some OECD countries are reported in the *OECD Reviews of Regulatory Reform* and the *OECD Economic Surveys*.

innovate and improve efficiency, regulations that limit product market competition (*e.g.* by imposing entry or operational restrictions) or affect labour market adaptability (*e.g.* hiring and firing rules) can have important side effects on innovation, technology diffusion and MFP performance. Thus, as shown in Figure VII.1, the ability of some OECD countries to recover from the earlier productivity slowdown may have been impaired by excessively restrictive rules in product and labour markets.[9] The correlations in the figure are illustrative but are borne out by more rigorous multivariate empirical evidence (discussed below). They indeed suggest that cross-country differences in regulatory policies may explain differences in productivity performance, even after accounting for other factors that are known to affect productivity.

The influence on technological catch up and multi-factor productivity

Pro-competition policies encourage productivity growth and catch-up…

There are basically three ways in which MFP improvements can be achieved: eliminating slack in the use of resources, adopting more efficient technologies and increasing innovative effort. Firm-level evidence recently gathered by the OECD shows that, at least over the short to medium term, both labour and multi-factor productivity growth is dominated by within-firm productivity growth.[10] Therefore, good framework conditions for within-firm adjustment are crucial for robust aggregate MFP performance.

The main effect of product market regulations that favour competition is to strengthen the *incentives* to improve MFP and adopt new technologies. In weakly competitive markets, there are relatively few opportunities for comparing firm performances, and firm survival is not immediately threatened by inefficient practices. Therefore, slack and the suboptimal use of factor inputs can persist. As competitive pressures increase, performance comparisons become easier and the risk of losing market shares encourages the elimination of slack. In parallel, the need to meet the cost efficiency of competing firms provides a powerful motivation for adjusting technology and work organisation to best practice. Cross-country empirical evidence at the industry level indeed suggests that MFP is positively affected by regulatory environments that favour competition, even after accounting for other potential influences, such as R&D and country and industry-specific factors.[11] Pro-competition regulation appears to improve MFP performance both directly and, especially, by enabling a faster catch-up to best practice in countries that are far from the technological frontier. For example, product market reforms that would align the overall regulatory stance with that of the most liberal OECD

9. The indicators of product and labour market regulation in Figure VII.1 relate to 1998. However, since the cross-country pattern of regulation appears to be highly persistent over time, the indicators are likely to portray the influences on productivity growth over the 1990s.

10. See OECD(2001*a*).

11. The cross-country, cross-industry evidence discussed here is drawn from Scarpetta *et al.* (2002).

country are estimated to reduce in the long run the MFP gap *vis-à-vis* the leading country by around 10 per cent in high-gap countries such as Greece and Portugal, and by 2 to 4 per cent in several other continental European countries and Japan.

… by making required adjustments in factors of production easier…

Although labour market regulations are primarily designed to ensure desirable social outcomes,[12] certain regulations in this area can change the *costs* of measures to improve efficiency and catch up to best practice. For instance, excessively strict hiring and firing rules can raise the cost of the workforce reorganisations that are implied by a better utilisation of inputs or new vintages of technology. If firms cannot shift those costs onto lower wages, the net returns of such efficiency improvements are reduced. In this case, easing employment protection legislation can encourage adjustments towards the technological frontier. Empirical analysis of the experience of OECD countries in the past two decades confirms that employment protection legislation influences MFP performance, at least under certain wage-bargaining regimes. According to these estimates, a lowering of hiring and firing costs would improve MFP performance where employers were not able to offset these costs through bargaining over aggregate and relative wages (*e.g.* in countries where bargaining is mostly at the industry level and not co-ordinated nationally). At the same time, empirical estimates suggest that low hiring and firing costs (*e.g.* shorter and simpler procedures) may speed up the convergence of MFP to best practice in countries that are far from the technological frontier, independent of their bargaining regimes.

… as well as facilitating new entry…

Product and labour market policies can also have repercussions on the turnover of firms, which is an important determinant of economy-wide MFP improvements. Product market regulations that raise the cost of entry (*e.g.* administrative burdens) or prevent it altogether (*e.g.* legal limitations on the number of competitors) tend to lower industry-specific and aggregate entry rates. A similar effect can result from some labour market regulations. For instance, minimum wage provisions, administrative extension of collective agreements, and strict hiring and firing rules can raise the costs faced by new entrants, which are often small-sized firms.[13] Recent OECD empirical work based on firm-level data covering both manufacturing and services in ten OECD countries over a decade shows that countries with relatively low administrative barriers, pro-competition sector-specific regulations and flexible hiring and firing rules typically experienced higher entry rates of small-sized firms, though not very small firms that are often exempted from such regulations.[14]

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12. For instance, well-designed policies can provide insurance against the risk of job loss, improve matching and commitment in worker-firm relationships and encourage skill upgrading.

13. Strict employment protection provisions, for instance concerning collective dismissals, can also make exit more burdensome for inefficient firms.

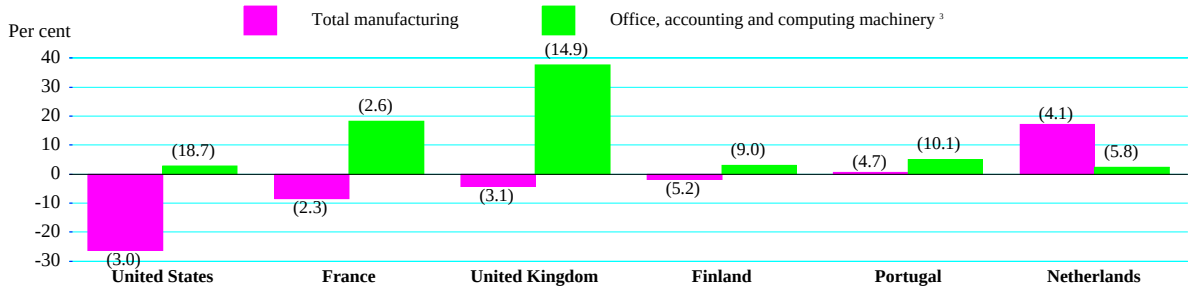
14. Entry rates in different countries by industry were estimated from firm-level data collected and harmonised by the OECD, see Scarpetta *et al.* (2002).

… which is a source of growth in rapidly evolving industries

The effect of regulations on entry is particularly important for productivity performance in industries in which technology is rapidly evolving, such as information and communication technology industries or industries characterised by high adoption of this technology. In these industries new entry contributes more strongly to productivity growth than in the rest of the economy (Figure VII.3), because new entrants play an important role in introducing new vintages of technology. Therefore, product and labour market regulations that minimise the prospective costs faced by new entrants are likely to create favourable conditions for increasing the contribution of information and communication technology to productivity growth.

Figure VII.3. Contribution of new entry to labour productivity growth in manufacturing and selected ICT industries, 1992-97 [1]

Percentage share of total productivity growth [2]



1. Except for Finland 1989-94 and France 1987-92.
2. Total productivity growth in parentheses.
3. Electrical machinery and apparatus n.e.c. for France, the Netherlands and Portugal.
Source: OECD.

The influence on incentives to invest in research and development

Pro-competition product market regulations encourage innovation …

Recent economic analyses suggest that vibrant product market competition is essential to generate the *ex ante* incentives to engage in innovative activity.[15] Thus, regulations concerning entry and business activity (*e.g.* licensing, administrative procedures and barriers to trade) need to be made friendly to competition by liberalising potentially competitive markets, reducing administrative burdens, lifting price and other operational controls. At the same time, R&D may be encouraged when innovating firms are granted some degree of market power over new products (or processes) *after* they innovate. Therefore, the right policy environment for innovative activity is one that generates expected rents that are sufficiently high to cover the cost of innovation, while unleashing competitive pressures that force firms to strive for survival by

15. At the same time, co-operation between firms (e.g. collaborative R&D, joint R&D ventures or technology licensing agreements) and with other institutions (e.g. universities and public research organisations) is increasingly used to efficiently exploit potential synergies in innovative activity (Shapiro, 2002).

implementing innovations. In practice, it is difficult to strike the right balance between competition and the protection of intellectual property rights (*e.g.* patents, trade marks, copyright). Nonetheless, appropriate rules and institutions, including international agreements, can guarantee the protection of intellectual property rights while making sure that the diffusion and transfer of technological progress is not thwarted (see Box).

Recent empirical research has shown that product market regulations conducive to competition have a positive effect on R&D intensity in manufacturing.[16] Cross-country differences in such regulations explain a good deal of the industry-by-industry deviations of Member countries' R&D intensity from the OECD average in the late 1990s (Figure VII.4). They were estimated to account for almost one third of the higher R&D intensity in the United States, Japan, Germany and Sweden relative to the OECD average and provide a large positive contribution in the United Kingdom, Canada and Ireland. The opposite effect was particularly strong in Italy and Greece, where regulatory restrictions to competition accounted for one third and two thirds, respectively, of their shortfall in R&D intensity. Regulatory restrictions also provided a large negative contribution to R&D in France, Belgium and Norway. These estimates, together with *prima facie* evidence that excessive regulation may discourage specialisation in innovative industries (see below), suggest that further liberalisation of product markets might spur innovative activity significantly in several OECD countries.

… by stimulating efficiency increases and product diversification

The impacts of competition on R&D may manifest themselves differently across industries. In low-technology industries (*e.g.* textiles), competitive pressures encourage R&D investment and innovations that are primarily aimed at preserving market shares by reducing costs and cutting prices. In high-technology industries where firms share relatively homogeneous "dominant" technologies (*e.g.* motor vehicles), competition compels firms to engage in a process of "cumulative" innovation aimed at reducing costs and improving product quality relative to those of competitors (so-called "neck-and-neck" competition). Empirical evidence based on industry-level data shows that R&D investment in both sets of industries leads to significant improvements in their MFP.[17] In other high-technology industries (*e.g.* precision instruments), free entry leads to competition between several different technological trajectories, each promoted by different innovating firms. As a result, R&D investments are mainly aimed at differentiating products and acquire shares in "niche" markets, with an impact on MFP that is more difficult to identify.[18]

16. There is a growing body of empirical evidence showing that strong product market competition is beneficial for innovative activity when IPR are adequately protected. See, for instance, Bassanini and Ernst (2002*a*) and, for a review, Ahn (2002).

17. See Scarpetta *et al.* (2002).

18. In these industries, the main result of innovative activity is product diversification, a phenomenon that translates into increased consumer welfare rather than enhanced productive efficiency.

Box VII.1. **The role of intellectual property rights**

Intellectual property rights (IPR) confer on the owner the right to prohibit others from making, using, selling or importing the protected idea or invention for a defined period. They also impose on the owner certain obligations, for instance concerning disclosure. There are several types of IPR, including patents, copyrights, trademarks, trade secrets and other *sui generis* protections. The most relevant for high technology industries are utility patents (applying to inventions of new, useful processes and products), copyrights and trade secrets. The most patent-intensive products are pharmaceuticals and chemicals, biotechnology products, mechanical products, information technology products, telecommunications and software. IPR are covered by international agreements, but are granted and enforced nationally. There is a wide variation across countries in subject matters covered by IPR, their administration and interpretation and the way they are legally enforced, leading to international differences in their value.

The goal of IPR is to provide innovators with the incentive to create, discover and disclose new knowledge and information. Their economic rationale is that, because new ideas and research results are common knowledge, absence of protection would thwart incentives to innovate, keeping investment in research and development below its socially optimal level.[1] However, by conferring an exclusive right over a resource, IPR may curb product market competition by raising the costs of entry into a market. There is evidence that incumbent firms sometimes use patents strategically to block their competitors from developing products or as bargaining "chips" in cross-licensing agreements. Escalating R&D investment can be used to increase the fixed (sunk) costs faced by potential new entrants and patenting can be used in ways that deter competition, for instance to fence off new products against possible substitutes or block entry into the potential market niches in which competitors could thrive (Shapiro, 2002). Moreover, to the extent that innovations are cumulative and interrelated, excessive IPR protection may also hinder the development of new processes and products that build on previous innovations.[2] Therefore, the design of IPR involves a delicate balance between incentives to innovators and stimulus to competition, also calling for effective competition law enforcement in the field of IPR. The table below shows that there is a positive correlation across countries between innovation and a widely-used index of IPR protection. However, the direction of causation is unclear, since the strength and accuracy of IPR could be driven by the propensity of a country to innovate.

Intellectual property rights and innovative activity

Cross-country correlation coefficients [a]

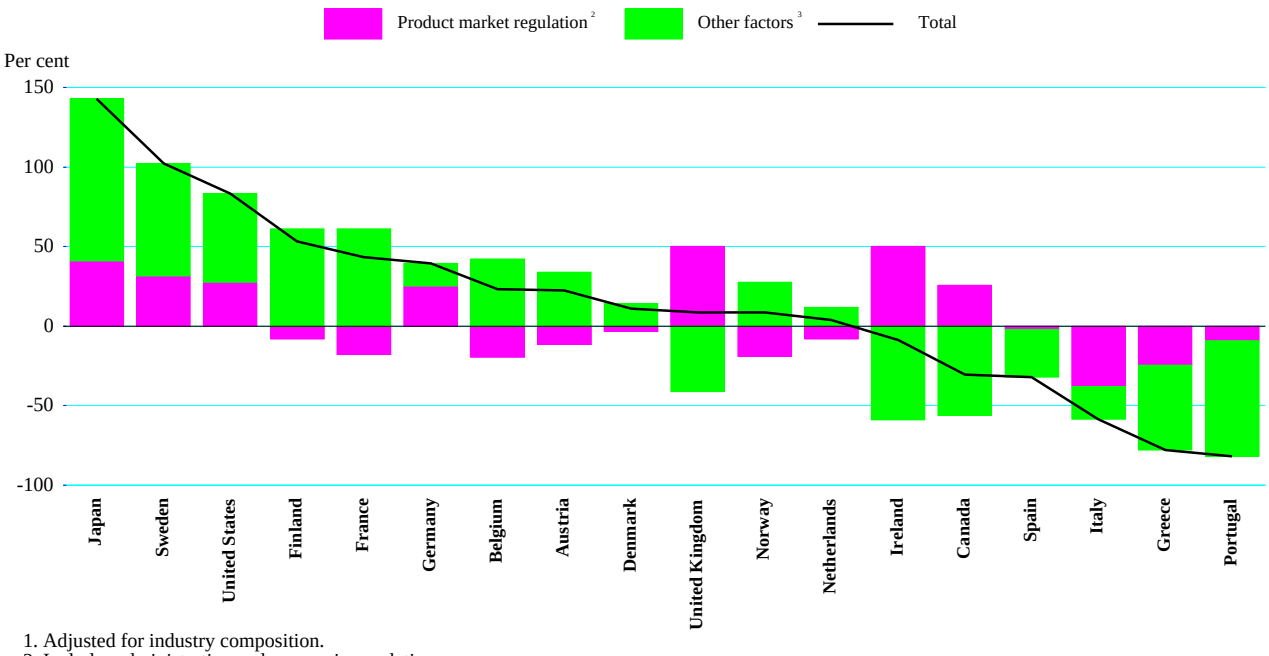
	Intellectual property rights index[b]
Patents per capita[c]	0.68
	(4.41)
R&D intensity	0.64
	(3.94)

Note: t-statistics in parentheses.
a) All OECD countries except Iceland, Luxembourg, Mexico, Slovak Republic and Turkey.
b) The index is a composite of five indicators: the extent of coverage, the membership in international patent agreements, provisions for loss of protection, enforcement mechanisms and duration of protection (see Ginarte and Park, 1997).
c) Patents are defined as consolidated family of patent at European patent office (EPO), US patent office (USPTO) and Japanese patent office (JPO) by country of invention and in year 1993.
Source: OECD.

1. In fact, even though new ideas and research results are a public good, developing the capacity to absorb the related knowledge involves costs for competing firms.

2. At the same time, patenting can also allow firms to codify knowledge in such a way that it can be disseminated via licenses, while continuing to appropriate some of the returns of R&D (via royalties).

Figure VII.4. Contribution of product market regulation to differences in R&D intensity across countries
Percentage deviations from OECD average[1]



1. Adjusted for industry composition.
2. Includes administrative and economic regulations.
3. Includes EPL, other controls, country-spedific effects and unexplained residual.
Source: OECD.

Labour arrangements have side effects on innovative activity…

In much the same way as they influence MFP, labour market policies can have side effects on aggregate R&D spending and innovation. For instance, policies that make hiring and firing difficult can increase the cost of implementing innovations, when these require labour downsizing or reorganisation; and policies that favour the bargaining power of insiders can reduce the ability of firms to appropriate innovation rents, especially when post-innovation wage re-negotiation is possible. These potential side effects on innovative activity need to be taken into account when assessing the costs and benefits of maintaining or reforming policy settings in the labour market.[19]

… whose size depends on the interplay of policies and institutions…

The side effects of labour market policies on innovative activity differ across OECD countries, due to the interaction with other country-specific labour market institutions, such as industrial relations regimes. For instance, some estimates suggest that the impact of hiring and firing restrictions on R&D may depend on the degree of co-ordination of collective bargaining.[20] Employment protection legislation typically reinforces the bargaining power of insiders and reduces worker turnover

19. Another potentially important side effect of strict hiring and firing rules is to lower worker mobility. Mobility has been shown to help diffuse technology among firms, between industry sectors, and between universities (or government laboratories) and industry.

20. The evidence discussed here and below is drawn mostly from Bassanini and Ernst (2002*a*).

(*i.e.* the process of laying off workers and hiring new workers on the labour market). Therefore, it can be expected to deter innovative activity. However, this negative side effect of employment protection is likely to be weaker where there is little scope for post-innovation wage re-negotiation and little recourse to worker turnover for reshuffling the workforce in the wake of innovations. In turn, the extent of wage re-negotiation and worker turnover during the innovation process are influenced by the features of collective bargaining institutions.

Although empirical estimates of the effects of employment protection legislation on innovative activity are not very precise, policies aimed at lowering hiring and firing costs are estimated to have on average (across industries) a positive effect on R&D intensity, especially in countries with a low or intermediate level of bargaining co-ordination (Table VII.1). In these countries, wage bargaining is decentralised, the scope for wage re-negotiation is relatively wide and adjustments in the composition of the workforce are typically made through worker turnover. Effects are estimated to be smaller in countries with highly co-ordinated bargaining systems, reflecting nation-wide wage setting and greater recourse to workforce adjustments internal to the firm, including firm-sponsored training aimed at creating the new skills required by innovations.[21]

Table VII.1. **Estimated effects on manufacturing R&D intensity of aligning employment protection to that of the United States**

(percentage points)

Industrial relations context[a]	Point estimate	Lower bound estimate	Upper bound estimate	Baseline R&D intensity (weighted average)
High coordination countries	0.25	0.03	0.72	1.36
Intermediate and low coordination countries	1.22	0.01	2.43	1.50

a) Average effect in countries with high collective bargaining coordination or intermediate or low collective bargaining coordination:
High coordination countries include Austria, Czech Republic, Denmark, Germany, Greece, Ireland, Italy, Japan, Korea, the Netherlands, Norway and Poland.
Intermediate or low coordination countries include Australia, Belgium, Canada, Finland, France, New Zealand, Portugal, Spain, Sweden and the United Kingdom.

Source: OECD.

21. In highly-co-ordinated systems, wages are usually compressed across skills (see *e.g.* Blau and Kahn, 1996; Gottschalk and Smeeding, 1997). This makes in-house training more profitable for firms because they can reap the greater difference between the marginal productivity of skilled workers and their earnings.

… as well as on the characteristics of each industry

The impact of employment protection legislation on innovative activity also varies across industries, reflecting the degree to which innovation-driven workforce adjustments are accommodated through worker turnover. Empirical estimates indicate that employment protection legislation can significantly deter R&D in industries where the innovation process is driven by product differentiation, with technologies often being renewed through entry and exit of firms and extensive worker turnover (*e.g.* precision instruments and software). A significant depressing effect of employment protection on R&D is also found in (mainly low-technology) industries characterised by product lines at the end of their life-cycles, where innovation often leads to downsizing. Conversely, employment protection appears to play no constraining role on R&D in high-technology industries characterised by a cumulative innovation process, supported by worker skills that are highly specific to individual firms (*e.g.* electronic components and aircraft). In these industries, the best worker competencies to complement innovations are often found within the firm, and upgrading skills of existing employees is likely to be less costly than training new workers.

The evidence concerning interactions between labour market policies, industrial relations systems and technological characteristics of different industries suggests that, depending on their institutional and policy setting, countries may have comparative advantages in different industries from the standpoint of innovative activity.[22] In countries with high bargaining co-ordination and relatively strict hiring and firing rules (*e.g.* Germany), innovative activity is likely to thrive in industries characterised by a dominant technology and a cumulative innovation process. Countries that have a decentralised bargaining system and laxer hiring and firing rules (*e.g.* the United States) are better equipped to innovate in industries characterised by multiple and rapidly evolving technologies. This can, at the same time, be seen as indicating that countries with low or intermediate levels of bargaining co-ordination and relatively strict employment protection (*e.g.* France and Spain) could enhance overall innovative activity by easing hiring and firing rules.

Pro-competition policies also help shifting output to innovative industries

Besides their effects on R&D intensity in individual industries, product and labour market policies can also affect the propensity of a country to concentrate production in innovative industries, for instance by affecting the pace of resource reallocation in the economy. Policies that reduce the adaptability of labour markets, of which employment protection was explored in this chapter, are associated with specialisation patterns that are unfavourable to innovative industries (OECD, 2001*b*). Such correlations are found also with regulations that increase costs for R&D-intensive firms (*e.g.* administrative burdens and barriers to competition).[23]

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22. See Bassanini and Ernst (2002*b*).

23. For instance, there is a significant negative cross-country correlation between industry specialisation in innovative industries and the OECD indicators of excess administrative burdens on corporations (*i.e.* the

These cross-country patterns of industry specialisation suggest that policies aimed at strengthening competitive forces and making labour markets more adaptable could stimulate structural adjustment towards innovative industries, thereby raising overall innovative activity.

difference between burdens imposed on corporations and sole-proprietor enterprises) and anti-competition product market regulations (see Nicoletti *et al.*, 2001).

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