

## **FINAL REPORT**

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## Abstract

The Corporate Governance and Product Innovation project, co-ordinated by Prof. Andrew Tylecote of the University of Sheffield, ran from the beginning of December 1998 to the end of November 2001. It covered six countries (the UK, France, Germany, Italy, the Netherlands and Sweden) and six sectors (machine tools, motor vehicles, fine chemicals, software, banking, pharma/biotechnologies).

The main hypotheses of the project can be stated as follows:

- Industries vary in the degree of novelty in their technologies and markets, and (linked to this) in the frequency and extent of organisational reconfiguration they require. The higher their novelty, the more firms need their corporate governance and financial system (CG&FS) to show industry-specific expertise; the more their requirement for reconfiguration, the more they need it to impose pressure for shareholder value.
- Industries also vary in the visibility of the process of innovation. Low visibility means that performance cannot be properly monitored without the CG&FS showing high firm-specific perceptiveness. It tends to be associated with high spill-overs in innovation; which are best coped with by some kind of 'stakeholder inclusion'.
- Outsider-dominated corporate governance and financial systems are generally better at developing industry-specific expertise and imposing pressure for shareholder value. Insider-dominated CG&F systems are generally better at developing firm-specific expertise and organising stakeholder inclusion.

The COPI project has analysed the six sectors in terms of their degrees of visibility, and novelty, their need for reconfiguration and extent of spill-overs; and the six countries in terms of the effectiveness of their systems of corporate governance in dealing with such characteristics. Its main findings can be summarised as follows:

- 1) Different sectors do indeed present different combinations in the intensities of the three variables; some, software at least, have high novelty AND low visibility, high need for reconfiguration AND high spill-overs. All sectors, even that with the highest visibility (pharmaceuticals), require considerable firm-specific perceptiveness from at least their principal shareholders.
- 2) While it is generally true that the one outsider-dominated CG&F system (the UK) is relatively high in industry-specific expertise, it shows less of this than the USA. Likewise our insider-dominated CG&F systems vary substantially in firm-specific perceptiveness, and in stakeholder inclusion; and this, almost regardless of how far they have moved towards outsider-domination. These variations have the effects predicted.
- 3) The five countries with insider-dominated CG&F systems are shifting at various speeds towards the outsider end of the continuum. France is well in the lead, Italy and the Netherlands in the rear. These changes are having broadly the predicted effects.
- 4) Some of the 'new' (or 'renewed') institutional shareholders associated with the move to outsider-domination have shown the ability to develop a high degree of industry-specific expertise AND firm-specific perceptiveness. The latter in particular is related to their degree of 'engagement' with firms in which they hold a major stake.

This last finding is the key to our main policy recommendations: to encourage engagement by 'new' institutional shareholders, partly by discouraging the alternatives; and at least until this has taken hold, not to act aggressively to accelerate the loss of influence of the old insider shareholders.

## 1. Executive summary

The Corporate Governance and Product Innovation project, co-ordinated by Professor Andrew Tylecote of the University of Sheffield, ran from December 1999 to the end of November 2001 and covered six countries (the UK, France, Germany, Italy, the Netherlands and Sweden). Its remit was

- to examine how well the system of corporate governance (broadly defined) in each country supports and encourages product innovation, and innovation more generally, in a range of industries;
- how favourable present trends in corporate governance are from this viewpoint; and
- what might be done (by government, investors and managers) to improve matters.

Interview-based case studies and questionnaire surveys were carried out for all countries in banking, and for two or three countries in each of the other sectors studied: machine tools & machinery, and motor vehicles (“medium-tech.sectors”), fine chemicals (“medium-high”) software and pharmaceuticals & biotechnology (“high-tech. sectors”). The UK team also interviewed extensively among institutional investors.

### 1.1 Outsiders and insiders, high-tech and medium-tech

Our countries fall into two categories, outsider-dominated and insider-dominated, with only one country (as yet) in the first. In the accepted jargon, the UK has an ‘outsider-dominated’ system of corporate governance in which shareholders are overwhelmingly ‘outsiders’ without any on-going commitment to the firm. Listed companies’ managers accept their responsibilities to inform and maximise shareholder value to a much greater extent than in any Continental country, where traditionally firms have been controlled by “insiders” of one kind or another. (Thus the UK scores much better than any other European country on compliance with corporate governance codes; though as our study confirmed, Continental firms are gradually coming into line: the convergence in the priority given to shareholder value was particularly marked in Sweden.) The conventional assumption is that ‘outsider-domination’ is an excellent system for high technology but inferior for medium-technology sectors. We believe that there is some truth in this, since:

- High-technology sectors tend to display high novelty in technologies and markets, and largely in consequence tend to require more frequent and radical organisational reconfiguration. Outsider-dominated corporate governance and financial systems are better at developing the industry-specific expertise needed to cope with the first, and the pressure for shareholder value that can overcome resistance to the second.
- Medium-technology sectors tend to display low visibility in the process of innovation, which means that performance cannot be properly monitored without high firm-specific perceptiveness. Insider shareholders are generally better at developing this. They also tend to have high spillovers in innovation – or to put it in other words, particular difficulty with appropriability: other stakeholders besides shareholders (employees, suppliers, customers....) tend to get a large share of the benefits. This is best coped with through some kind of ‘stakeholder inclusion’, which is easier, though not automatic, in an insider-dominated system.

### 1.2 A muddier reality

However, our results indicate that matters are not so simple:

- (1) One of our high-tech. sectors, software, showed various characteristics suggesting that on visibility and appropriability it was about as low as the typical medium-tech. sector. This suggests that it too needs a good measure of stakeholder inclusion and firm-specific perceptiveness – as well as high industry-specific expertise and pressure for shareholder value. It appears that the same is true for high-tech. hardware in IT and electronics. The other of our

high-tech sectors, pharmaceuticals, appears from our questionnaire data to conform relatively well to the high-tech. picture given above. However our case studies indicate that visibility is nonetheless a problem, even in pharma: there are clear limits to what can be publicly explained, and partly in consequence senior management felt a need for a considerable degree of shareholder 'engagement' – to generate firm-specific perceptiveness.

- (2) The mere fact that a corporate governance and financial system is outsider-dominated does not guarantee high industry-specific expertise. For example, our UK senior managers interviewed were unanimous that this was lower among UK institutional investors than among US ditto.
- (3) Firm-specific perceptiveness is certainly much needed in medium-tech. sectors, but again it is not guaranteed by insider-domination of the old-fashioned kind (major shareholdings held long-term by banks, families etc.). Throughout the Continent and most audibly in Germany there has been scathing comment on the (alleged) 'Drips in Pinstripes' (*Nieten in Nadelstreifen* – title of a German bestseller of the mid-90s) who represent such shareholders on company boards. Our questionnaire results on managers' perceptions of how well shareholders understand their business, are entirely consistent with limited firm-specific perceptiveness in such quarters.

### 1.3 Conclusions, by country

#### UK

The most conspicuous area of British success is the pharmaceutical industry, in which two British-based firms (GlaxoSmithKline and AstraZeneca) are among the top dozen firms in the world; in which (untypically for the UK) the R&D intensity of the industry in Britain is above the world average and that of GSK and AZ is still higher. Consequently, pharmaceuticals accounts for an exceptionally high proportion of the country's R&D expenditure. As suggested above, this result rhymes with the fact that pharma appears to fit rather well into the high-technology stereotype of requirements from corporate governance. There are however two causes for concern:

- (1) As mentioned above, even in pharma, visibility is limited, and firm-specific perceptiveness is therefore required. There is no sign of this in the requisite degree among UK institutional shareholders. Nor is there as much industry-specific expertise as in the US.
- (2) The process of innovation in the world pharmaceutical industry has been very effectively globalised, as is indicated by the fact that both GSK and AZ have R&D headquarters outside the UK: respectively the US and Sweden. (We believe that it is precisely those characteristics which have made pharma well-suited to the British corporate governance system, which have allowed this degree of globalisation.) Given that pharma firms live by innovation and their innovation depends utterly on their R&D, the dynamic heart of these firms is now outside Britain. One of them, AZ, already is only minority UK-owned, its two largest shareholders are US and Swedish respectively, and it reports in dollars. GSK and AZ could easily move their HQs and their incorporation outside the UK. They are the more likely to do this, the more dissatisfied they are with the 'engagement' (or lack of it) of UK shareholders (as well as with the UK science base).

The other high-tech. area where British-owned firms are strong and their R&D intensity is relatively high, is aerospace. We have not made a specific study of this sector, but it is known to be exceptional in corporate governance terms, since the British government has a 'golden share' in both the key firms (British Aerospace and Rolls-Royce) making them effectively 'take-over proof'.<sup>1</sup> In the remaining high-technology sectors (software, IT hardware, and medical & scientific instruments) UK-owned firms are either doing alarmingly little R&D (software) or are few and relatively small (the other two). We see these weaknesses as reflecting the deficiencies of the UK corporate governance system (at least as it relates to listed companies) in the face of a combined need for industry-specific expertise and firm-specific perceptiveness

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<sup>1</sup> An up-to-date survey of 'golden shares' across Europe, and the threats to them, is in Osborn (2002).

In most of the medium-technology sectors the UK has a weakness which is of long standing. It can be clearly related to the need for, and lack of, firm-specific perceptiveness to cope with the low visibility which is typical of these sectors; also to the need for and lack of stakeholder inclusion. One sector which we looked at in some detail is worth singling out: chemicals. Until the 1990s the UK chemical industry was notable for relatively high R&D intensity, almost entirely through the efforts of ICI, the firm which dominated it. (Whether this was justified by contribution to profit is another matter.) Significantly, ICI used to be regarded as ‘take-over proof’ and thus able to give demands for short-term profit, relatively low priority. It lost this special status in the early 90s, and its component parts were rapidly exposed to the normal UK corporate governance pressures. As we would have expected, the R&D intensity of UK chemicals plummeted.

## Sweden

The ‘Swedish model’ which was famous and widely respected in the 1960s and 70s was one of ‘stakeholder inclusion’ *par excellence*. At all levels – national, sectoral and firm – employees, as represented by the unions in which they were virtually all members, were accepted partners in industry. At all those levels employers were strongly organised and cohesive. The State completed the trio of “social partners”. Less visible to foreigners were the corporate governance underpinnings of these arrangements: the large firms which even then dominated the Swedish economy were themselves very discreetly dominated by ‘stable shareholders’, most notably the two main business groups: the Wallenberg family through their vehicle, Investor, and the Skandinaviska Enskilda Banken; and the Svenska Handelsbanken group, with its vehicle, Industrivärden. Control by these groups and others was facilitated by the dual share arrangements which were general in Swedish firms, whereby A shares carried most of the votes and B shares most of the capital value. The controlling shareholders were not accustomed to interfere in management, but they nonetheless had an important role in encouraging long time horizons, heavy spending on R&D and innovation generally, and co-operation with other firms and unions.

However Swedish corporate governance proved an excellent basis for developments which during the 1980s and 90s helped to undermine the Swedish model: the globalisation of large Swedish-based firms. The dual share system allowed large amounts of capital to be raised to finance acquisitions abroad without the controlling shareholders losing control. (Another facilitating factor was the open, high-trust nature of Swedish society: US and other foreign investors felt comfortable with Swedish insider-controlled firms as they would not have done with (for example) Italian ones. But much of the capital came from the pension funds which accounted for a large and growing share of Swedish equity capital.) Since it was generally convenient to go on doing most of the R&D for these enterprises in Sweden, its R&D intensity went on rising.

In low-visibility sectors the size and complexity of the new very large Swedish firms called for firm-specific perceptiveness of a high order on the part of shareholders. In high-novelty sectors the required industry-specific expertise was rising. The old insiders rose to the challenge: during the 1970s and 80s the Wallenberg and Handelsbanken groups consolidated and specialised to good effect. The trend during the 1980s was towards increased concentration of ownership (Johansson, 2002). There are many examples of the Wallenberg group (in particular) having played an important role in accelerating the restructuring of firms and industries (Lindgren, 1994). They have made intelligent use of outsider pressure: as Johansson puts it (2002, p.56), ‘the controlled companies are usually listed on the stock exchange. The stock market has been viewed as an important instrument for external evaluation and control.’ Swedish stock market capitalisation is high by Continental standards. The two main groups still control more than 50% of Swedish industry by stock market capitalisation (Sundin & Sundqvist, 1997) – with a far smaller percentage of its total equity capital in their hands.

Only from the late 90s did signs appear that further adaptation might be necessary. In the two large pharma firms, Astra (a Wallenberg company) and Pharmacia, the problem was solved in good time by merger with a UK and a US firm respectively which effectively handed over control to another, outsider-dominated corporate governance system. Other sectors have been more troubled. Ericsson and ABB are good examples. The Wallenbergs who had (and retain) control could congratulate themselves until the late 90s on having backed their management in massive programmes of (respectively) organic and ‘in-organic’ expansion. It belatedly became clear in ABB’s case that a

number of its acquisitions had been extremely unwise or at least unfortunate, and that contrary to much adoring journalism, its charismatic CEO Percy Barnevik (replaced in February 2002 as head of Investor) had by no means solved the managerial problems of achieving synergies across a geographically and sectorally extended group<sup>2</sup>. Likewise Ericsson's spectacular defeat in mobile phones at the hands of its Finnish rival Nokia exposed embarrassing differences in structure. Quite unlike Nokia, Ericsson had retained its mobile phone operation as just one division among others – in spite of the fact that it alone was producing for a mass consumer rather than an industrial market. One thing outsider-dominated systems are good at is forcing necessary reconfiguration and where necessary demerger (see, in the UK case, Vodafone's emergence from Racal, and Zeneca's from ICI). (Nokia's remaking as a pure-play mobile phone firm was driven largely by desperation in the Finnish economic crisis of the early 90s, not shareholder pressure (Ali-Yrkkö *et al.*, 2000, ch.4).

Accordingly important elements of the Swedish system of corporate governance are being further remade in the American image. An asset management community is emerging in Stockholm which is technologically expert and rapidly developing industry-specific expertise in the sectors in which Sweden has substantial involvement. As in the United States, this meshes with venture capital operating in the same sectors. (The Swedish team's study of the software industry showed a mixture of large listed and smaller firms subject to very much the US high-tech rules of the primacy of shareholder value combined with employee inclusion - which can be reconciled by employee shareholding). Wider structures of inclusion are less evident.) At the same time the old insiders, with their investment companies, are holding their ground. As Investor has recently pointed out, its shares have consistently outperformed the Swedish stockmarket.<sup>3</sup>

It seems clear that the Wallenbergs and the Handelsbank group, will have to go further yet in specialisation and consolidation, and this may (further) improve their performance<sup>4</sup>. But old and new insiders unite in defending the dual share system, which is threatened in Brussels, not in Stockholm.<sup>5</sup> Clearly it makes it easier for 'engaged' shareholders to exercise control or at least influence, and it resolves the cruel dilemma faced not least by the new science-based entrepreneurs: how can one raise equity capital without giving up control? There is no danger, given Swedish law and custom, of the 'expropriation' of minority shareholders by controlling shareholders<sup>6</sup>; and new principles of good corporate governance like the separation of the chairman's role from the CEO's, are old in Sweden.

Somebody seems, at all events, to be doing something right, to judge by the data we have selected from the latest European Innovation Scoreboard as particularly indicative of the effects of corporate governance and the financial system (Table E1, next page). Sweden leads our six countries on three of the seven indicators, by level, and three out of six, by (late 90s) trend:

- Swedish business R&D intensity has continued to rise, consolidating its position at the top of world league tables;
- It has a strong and rapidly-improving performance in high technology venture capital and patent applications.
- High-technology services make up a higher proportion of employment than in any of the other countries; the same is true of high technology manufacturing as a proportion of total manufacturing value-added. There is a startling difference in trend between Sweden and the others: between 1993 and 1997 its share of the total high technology value added of the Triad increased by 70%, while that of all the others, fell. Biotechnology in particular is now booming<sup>7</sup>.

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<sup>2</sup> 'Investors have criticised the group's.....reluctance to be more aggressive in refocusing its large portfolio of businesses, most of which have few synergies with each other', George and Hall (2001, p.28).

<sup>3</sup> 'Sweden's Investor: Prepare to board', *Economist*, June 9<sup>th</sup> 2001.

<sup>4</sup> Martin Ebner, the interventionist Swiss investor who during 2000/1 acquired over 10% of Investor's shares, has demanded radical moves in this direction (*Economist, op.cit.*).

<sup>5</sup> Some retreat seems likely from the extremes of 'duality': Ericsson, which has A shares with 1000 times the voting power of B shares, has promised to consider cutting the differential to 10:1 (Brown-Humes, 2002, p.27). Some major firms, such as ABB, have accepted a single share structure (George & Hall, *op.cit.*)

<sup>6</sup> As Shleifer and Vishny (1997) and LaPorta *et al.* (1998) show, Swedish law gives effective protection; and the control premium is low.

<sup>7</sup> Sweden has more biotechnology firms per capita than any other country in the world (Hilary Barnes, 'Among Europe's élite', *Financial Times Survey of Sweden*, 3, 12 December 2001).

**Table E1: Selected Data from European Innovation Scoreboard 2001.**

Country	S	trend	UK	trend	NL	trend	D	Trend	F	trend	I	trend
Indicator												
1. BERD/GDP	2.85	+11	1.20	-8	1.05	+1	1.63	+9	1.36	-3	0.56	+6
2. high-tech pats/pop	26.2	+95	16.7	+55	27.7	+55	21.9	+80	16.8	+58	4.5	+55
3. % SMEs innovating in-house	44.8		35.8		51.0		58.7		36.0		44.4	
4. % vent. Capital/GDP	0.204	+110	0.256	+75	0.162	+90	0.068	+30	0.074	+50	0.041	+170
5. % h-tech value-added, in m'facturing	18.8	+70	11.8	-1	7.5	-26	5.7	-25	9.7	-11	5.9	-31
6. % empl.h-tech services	4.8	+19	4.2	+22	3.6	+26	2.8	+1	3.8	+6	2.7	+6
7. % empl. m-h&h-tech manufacturing	8.3	0	7.6	-1	4.7	-8	10.9	-1	7.2	+2	7.6	+4

Indicators: 1: Business spending on R&D, % of GDP, 1999. Trend: from 95/7. 2: Average, EPO hi-tech patent applications/million population, 1999, and USPTO ditto, 1998. Trend: from 2/4 yrs previously. 3: SMEs innovating in-house (% of manufacturing SMEs). 4: High technology venture capital investment (% of GDP), 2000. Trend: from 98. 5: Share of manufacturing value-added in high tech sectors. Trend: 93-97 change in the national share of total value-added from high technology sectors in the EU, US and Japan. 6: Employment in high-tech services, % of total workforce, 1999. Trend: from 95/7. 7: ditto in medium-high and high-tech manufacturing, 1999. Trend: from 95/7. See EIS Annex 1 & 2.

Trends are estimated by eye (except for 7.) from Annex 2 figures and show % change from earlier period given above.

**Table E2: Not enough time and money is put into product innovation**

(1= thoroughly disagree; 7= thoroughly agree)

Country	Mean	N	Std. Deviation
Italy	4,50	32	1,65
France	4,13	15	1,13
UK	3,45	20	1,90
Germany	3,33	15	1,76
Netherlands	3,31	13	1,70
Sweden	3,13	63	1,68
Total	3,58	158	1,73

Source: COPI questionnaire survey; see Table 26 in main report.

**Table E3: Ranking of "lack of appropriate sources of finance" as a factor hampering innovation, 1990-1992\***

Employees	Belgium	Denmark	Germany	Spain	Ireland	Italy	Norway
20-99	5	3	<b>2</b>	2	2	<b>2</b>	5
100-249	4	5	<b>8</b>	2	4	<b>3</b>	9
250-499	5	4	<b>12</b>	3	5	<b>3</b>	7
500+	4	4	<b>7</b>	2	12	<b>3</b>	9

Source: own calculations on CIS database. Eurostat (1997).

\*The question asked to the managers was the following: If any of the list of difficulties hindered the realisation of innovations in your enterprise during 1990-92, please indicate its relative importance to any of your innovative activities.

Scale: 1=insignificant; 2=slightly significant; 3=moderately significant; 4=very significant; 5=crucial. The 18 factors were then ranked in order of importance by Eurostat (1=most important) and this table reports the ranking of "lack of appropriate sources of finance".

*[Ranking of our countries by severity of financial constraints on innovation (from OECD (1995), quoting a survey of 2000 chief (and other senior) executives in 22 OECD countries): Germany, Sweden, Netherlands, France, UK, Italy.]*

## **Germany**

The 'German model' of the economic miracle is very similar to that of Sweden described above in that it involved multi-level co-operation and cohesion. One difference was and is that employee inclusion depends more on legal provisions (co-determination, broadly defined) and less on union power. Another was and is that the insider shareholders in the large firms very much include banks (not allowed to hold industrial shares in Sweden), while there is no one 'insider' with the power and influence of the Wallenbergs. A third is that very large firms do not dominate the German economy as much as the Swedish, and they are balanced by a large Mittelstand of middle-sized firms which are family-controlled. Accordingly, with a less-globalised economy the multi-level co-operation and cohesion has been less (though still somewhat) undermined.

What the two countries certainly have in common is that the role of the insider-shareholders in large companies is strongly challenged. Back in the 1970s the Big Three banks were accused of having too much industrial power for the good of democracy, and steps were taken to reduce it. Since 1980 the emphasis of the challenge to them and other big insider-shareholders has been on poor performance. There is evidence of declining 'control performance', at least of the banks: for example Schmid (1996, quoted in Ehrentreich & Schmidt, 2002) found a positive relationship between equity positions of German banks and firm performance in a 1974 sample, but none in a sample for 1985.

Again, we can formulate the difficulties of the old insiders in terms of the exceptional firm-specific perceptiveness needed to cope with very large and diversified firms in low-visibility sectors, and the rising industry-specific expertise required in high-novelty sectors. They certainly seem not to have done well in the latter. Germany's performance overall in high-tech (as opposed to medium-high) sectors has been poor and deteriorating, as Table 1 shows. In pharmaceuticals, the performance of the major German firms in world competition was poor. For example, the market share of German-based firms in bestselling new medicines plummeted between the late 80s and the late 90s (BmB+F, 2001, Table 6.5). Like Ericsson, German chemical/pharma conglomerates needed to reconfigure radically, by floating off their pharma divisions, and did so late (Hoechst) or not at all (Bayer). Our British pharma informants accuse German pharma of slowness to reconfigure generally. Again, one can surmise that shareholder pressure was lacking. Although we did not study other high-tech manufacturing, Germany's failure in high technology in general, suggests inadequate industry-specific expertise and pressure for shareholder value.

Until very recently there has been little sign of fundamental change. Business R&D spending went on rising from an already high level, from the mid 90s to the late 90s, but the specialisation in the medium and medium high technology sectors has been consolidated. The German banks' share of total shareholdings was still, as of 1996, over 50% higher than in 1960: 12.3% against 8%. The seven biggest corporate shareholders held, as of 2001, 80% of the 40% of the market capitalisation of Germany's 460 largest companies which is tied up in crossholdings (Wojcic, 2002). On stock options as of 2000, on audit and remuneration committees as of 1998, the signs of Anglo-American corporate governance practices in big German firms were minimal (Goyer, 2001). There was a great growth of venture capital in the late 90s, but it came mainly from the traditional financiers: the banks<sup>8</sup>.

Now, at last, the log-jam is moving. The Mittelstand with their family ownership, have been exempt from stock market pressures as long as they could get external capital on favourable terms as long term bank loans, and comparative international data show how remarkably unconstrained they were (as of the early 90s) by finance (Table E3). Accordingly Germany leads our six nations in proportion of SMEs innovating in-house (Table E1). Now they are facing increasing bank reluctance to provide them with those loans (Major, 2002). It is agreed that they will now have to depend increasingly on external equity finance: and the banks will not be providing much of that. On the contrary: the Deutsche Bank, the largest bank shareholder, plans with all convenient speed to sell its

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<sup>8</sup> By 2001 that had changed, and pension funds were almost level with banks as venture capital providers (Ehrentreich and Schmidt, 2002, p.28).

entire portfolio of industrial shareholdings, €14 billion worth (Economist, 2002). This has been made possible by the legal change in early 2002 that allows companies to sell shareholdings without capital gains tax. Others of the big seven are considering following suit.

Now that its stable shareholders may be departing, German industry has demanded, and received, legal protection (in January 2002) against hostile takeover, after German MEPs blocked a less permissive common takeover directive at EU level (in July 2001) (Ehrentreich & Schmidt, 2002). But at the same time it is accepting the need to please the new, 'unstable' shareholders: "across Europe...in terms of transparency of decisions and the whole concept of investor relations...Germany is moving the fastest." (a British institutional investor, quoted in Bender (2002)). Differential voting rights for ordinary shares were banned in 1998 (Ehrentreich & Schmidt, 2002) and many large firms have now abandoned preferred (non-voting) shares (e.g. Benoit, 2001). What we do not find in the news from Germany, or the recent literature, is any evidence of intelligent strategic ownership, such as we saw in Sweden.

## Netherlands

The Netherlands resembles Sweden and Germany in its longstanding commitment to 'stakeholder capitalism' with the interests of employees at centre stage. This has been facilitated by its corporate governance structures - a surprising judgement when one looks at share registers. Unlike Sweden and Germany, the usual suspects in insider domination, families and banks, are conspicuous by their unimportance as shareholders. The Dutch financial system is of similar maturity to the US and UK systems and is similarly dominated by pension funds and insurance companies. However, what is strikingly different from the US and the UK (particularly the latter) is the longstanding protection of incumbent management from shareholder pressures. There is a long tradition of ingenious *ad hoc* methods for providing this protection, which were supplemented for large firms by the Structural Law of 1970. This law transferred important shareholder rights to the supervisory board, which is obliged by law to take into account the interests of other stakeholders as well. The protection of large firms from takeover became almost complete, while the power of shareholders through 'voice' was also very limited (De Jong *et al.*, 2000).

Over the last decade pressure for change has steadily increased. One of the key drivers has been the increase in the proportion of shares in pension fund portfolios, after the relaxation of legal restrictions on this proportion. The weight of their domestic shareholdings has grown even faster, due to the growth of their total assets. The large Dutch pension funds have become particularly vocal on governance issues<sup>9</sup>. Finally the Socio-Economic Council in 2001 recommended real reforms which would in effect restore shareholder rights – without getting rid of employee influence. However the shareholders who will be dominant in the new dispensation are not outsiders *a l'anglaise*. Dutch pension funds and insurance companies commit themselves for the long term to a company for two reasons. First, they are convinced that focusing on short-term successes is not the best strategy to pursue in general (if that is the tendency of the UK investors, one must remember that they are part of a 'trader' culture in the City of London; the Dutch investors are part of a stakeholder culture.) Second, they own very large packages that cannot be sold easily: they are effectively 'locked in', except where take-over is an option. The decreasing use of anti-take-over devices makes takeover increasingly an option, but not necessarily an attractive one to these shareholders: again culture makes them well able to note the evidence that mergers tend to fail. The large Dutch institutional shareholders do not want to hand over their responsibilities: they want to exercise them – to 'engage'.

One might have expected the protection from shareholder demands, and clear inclusion of other stakeholders, to lead to heavy R&D spending, as in Sweden and Germany – but on the contrary, the Netherlands' R&D intensity has long been below the OECD average. However, this figure should be seen in the light of the Dutch industrial structure. Two of the three largest (very large) firms are in oil and gas (Royal Dutch) and food processing (Unilever), two sectors with low R&D intensity, worldwide. An unusually large fraction of the economy is in services, which also typically have low R&D intensity. The Netherlands does not have a large Mittelstand: in manufacturing, most of the

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<sup>9</sup> Gordon Cramb, "Who's afraid of the non-execs?" *Financial Times*, 9 Feb.2001, p.24.

employment which is not in the very large firms is in small ones, and it is well known that small firms under-report R&D because they tend to carry it out informally. They are also less inclined to patent.

Accordingly the low figure for business (and overall) R&D should not be treated as evidence of any ‘underspending’ on R&D by comparison with the other countries (except of course for Sweden). We do, moreover, have definite evidence (in Table E1) of a strong and well-directed innovative effort:

- By proportion of innovating SMEs the Netherlands is a good second to Germany.
- On high technology venture capital the Netherlands is a good third to Britain and Sweden.
- On high technology patenting, the Netherlands leads.

The managers of large Dutch firms have clearly now started a difficult adaptation to much stronger pressure for shareholder value. As our case studies make clear, they begin with a clear conviction, much like that in Sweden, that (by discussion and persuasion) a consensus can be built, including employees, for whatever reconfiguration is required for shareholder value; and unlike Sweden, there will probably be real employee power, entrenched by law, to support that conviction. Again like Sweden, and apparently unlike Germany, there are actors within the system already – in the Dutch case, mainly the larger pension funds and insurance companies – which are perfectly capable of playing the role of engaged shareholder in the new dispensation; and entirely willing to do so.

## France

Even before the transformations of the last decade and a half, France was extremely difficult to categorise as insider- or outsider-dominated. Those insiders involved in Northern European ‘stakeholder inclusion’ were certainly not dominant: France lacked close bank-industry relationships; there was no tradition of close inter-firm relationships; as to employees, unions were not accepted partners in industry, nor was there any structure of co-determination. On the other hand the typical institutional investors of Anglo-American capitalism (pension funds, mutual funds, insurance companies) had few shares and less power. Control of industry lay with family shareholders, and the central state. The former could certainly be described as insiders; the latter could not, in any meaningful way, except perhaps for the very largest firms whose fate was of particular interest to government, since the locus of decision-making is distant from management. Consequently one could not expect central state decision makers to develop the high level of firm-specific perceptiveness needed to cope with low-visibility activities.

As Tylecote & Conesa (1999) argued, this deficiency helps explain that part of French industrial specialisation which it has long had in common with the UK and US – its weakness in areas such as capital goods in which the visibility of innovation and development of competences is low. (This and the lack of ‘stakeholder inclusion’ largely explains the similar French weakness, also shared with the US and the UK, in assembled products such as motor vehicles.) However the role of the State explains the strength of industries supplying State purchasers and/or able to benefit from large-scale infusions of patient state capital. (In many of these the US and UK are weak.)

Family shareholders have kept considerable power in French industry in spite of the wave of nationalisation in the early 1980s. According to Goyer (2001, p.145) nine out of the CAC 40 (the forty largest firms by market capitalisation) are under ‘effective family control’<sup>10</sup> and one can assume that the proportion increases as the size of firm diminishes. However France, like the UK, lacks any equivalent of the large German ‘Mittelstand’ where families could be expected to dominate. Related to this is the lack of strong bank-industry links which could allow family-controlled businesses to use loan capital to expand rapidly without diluting the family’s shareholding. (See the poor innovative performance of SMEs in Table E1.)

The key differentiating characteristic was therefore the industrial power of the central state, and the key change, since the mid-80s, has been its retreat. According to Goyer, only two of the

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<sup>10</sup> As of 1998? As of 2001? It is not clear in the source.

CAC40 (France Telecom and Renault) were still under effective state control. Successive French governments tried to hand over to a sort of imitation German system, with active banks and 'hard core' shareholdings (held by other firms, in a web of cross-holdings) which would protect the management of the privatised firms from new outsider shareholders. The banks reverted quickly to type. The cross-holdings lasted longer; but between 1995 and 1998, they collapsed. The average cross-shareholdings of CAC 40 firms fell from 5.8 to 2.1 %; the average equity stake of the core shareholder group in CAC 40 firms stood at a meager 20.5% as of January 1998 (Morin, 1998, p.24). Both figures have continued to fall. Foreign share ownership increased – by 1997 to over 35% of French stock market capitalisation, and for CAC40 firms to 43% by May 1998. Both figures have continued to rise. In 1999 foreign shareholders' choices decided the success of two hostile bids (BNP for Paribas and Total for Elf-Aquitaine) and the failure of another (BNP for Société Générale) (Goyer, 2001).

One modest move towards a new sort of insider-shareholder – and stakeholder inclusion - has taken place with the development of the 'actionnariat salarié', collective employee shareholdings comparable to the US ESOPs. According to Commissariat du Plan (2001, pp.63-64) more than 40% of enterprises with over 500 employees now have such plans, and they on average account for about 7% of the capital. (At a shareholding above 3%, employees are entitled to representation on the supervisory board.) France resembles the US also in a matter more conventionally American: it is second in the world in use of stock options (CdP 2001, p.64; Goyer, 2001). These cannot be counted as employee inclusion, rather as aligning senior managerial interest to shareholder interest, as they only account for a small proportion of employees – 1% on average in CAC40 firms (CdP 2001, p.64).

For the moment, we must assume that it is the effect of stock options which is by far the more important, and which helps to reinforce the commitment of French senior managers to shareholder value (*valeur actionnariale*) – a commitment also favoured by the appearance of the market for corporate control as instanced by the successful take-over bids referred to above. One must expect this change to show itself in policies towards innovation: that large firms would spend less, particularly in sectors of low visibility, and that they would focus more closely on spending which would clearly improve profits in future. Just this appears to have been happening, if we take the example of Alstom as typical: according to its chief executive, Pierre Bilger, they have recently cut their R&D spending by 30-40% and focused their innovation effort on market needs.<sup>11</sup> There are other signs of 'outsider-dominated' behaviour. Business R&D intensity fell, during the 1990s, and was still falling in the late 90s (Table E1), unlike every other EU country except for Britain and Greece. On the other hand the industry best able to cope with outsider-domination – pharmaceuticals – improved its performance, as measured (for example) by its proportion of best-selling medicines, between the late 80s and late 90s. (BmB+F, 2001, T.6.5)

As the pressures to cut innovation spending in large firms mounted, the French state put ever-increasing effort into increasing the innovation spend in SMEs – traditionally low. It was precisely in the late 90s that this really became apparent, with (among other changes) a fourfold increase in the funds invested in the venture capital industry between 1996 and 1998 (Cieply, 2001, p174) and the overtaking of Britain in seed and start-up venture capital by 1999 (Lehrer, 2000).

## Italy

The Italian system of corporate governance can be identified as the most insider-dominated of our six countries. All the principal variables indicated by Berglöf (1997) as being characteristic of the insider type can be found in Italy: Italian firms depend heavily on bank finance; financial markets have historically been shallow and small; ownership and control are concentrated; groups of firms with pyramid structures are very widespread and used as a mechanism to separate ownership and control, which leads to conflicts of interest between minority and majority shareholders; boards of directors play a limited role; the market for corporate control is not active, and hostile take-overs are difficult and unlikely.

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<sup>11</sup> Bilger, P., 'L'entreprise face à l'innovation', Les Échos, 12 Jan. 2000, quoted in CdP (p.102).

In terms of the theoretical framework employed in this project, the Italian system of corporate governance appears to be characterised on average by a high degree of *firm-specific perceptiveness*, a fairly high (but uneven) level of *stakeholder inclusion* and a low degree of *industry-specific expertise*.

There is, in fact, a very high *firm-specific perceptiveness* among shareholders of both small and large private firms. Family control is one of the most widespread forms of control and the owners and their families usually operate actively within the firm. Codified and tacit knowledge is transferred from one generation to the other in a process which starts very early in the life of family members. Short-term pressures coming from the shareholders are therefore very unlikely; least of all those arising via threat of hostile takeover. Even when control is indirect and exercised through a chain of equity shares (i.e. pyramidal groups of firms), at the end of the chain there is usually a family (for example the Agnellis in FIAT) exercising influence. In this case, the family's *firm-specific perceptiveness* allows firms to overcome capital market inefficiencies. Thus, the capital acquired by one firm can be re-directed to another firm within the same group to ameliorate problems of liquidity.

It is at a higher institutional level that the limits of the Italian model become evident. Banks and other financial institutions have never played a central role in the corporate governance of Italian firms. The only exceptions have been the Milanese investment bank Mediobanca, banks within districts, and banks related to large firms through interlocking directorates. This means that there is often no-one available to supplement or substitute the role of family shareholders when (as notoriously and recently with FIAT – Betts, 2002) their capacity for oversight wanes. It also leads to serious financial constraint: an insider-dominated system such as Italy's has a natural dependence on bank capital, and where the links between banks and industry are not close, this cannot be counted on for innovative projects. (As Table E3 shows, Italy has one of the highest scores in Europe for financial constraints as obstacles to innovation, and this applies at all sizes of firm.)

A peculiarity of the Italian system is the role played by the state. Before the beginning of the privatisation process public firms were present in several industrial and service sectors, accounting for 20 per cent of the value added. Tylecote and Conesa (1999, p.34) argued in relation to France that the state had "no more capacity than outsider investors to monitor and evaluate innovation carried out in a multitude of smallish firms or subdivisions of large firms". In Italy, as public managers were usually appointed for political reasons and very often were politicians rather than managers, that point can be made even more strongly. Moreover, in many cases, investments were not made on the basis of expected future profits, but with other aims - macroeconomic or strategic.

In some measure and manner Italian industry does practise the *inclusion* of stakeholders, both with regard to employees and customers/suppliers. It appears that the interests of the *employees* are taken into consideration, to the point that firms will sacrifice some profit in order to maintain employment. This is for several reasons. First, for legal reasons firms are allowed to fire employees only for *giusta causa* or *giustificato motivo*, reasons that are very difficult to sustain. Second, the employee-employer relationship is usually based on loyalty and trust, especially in small and medium sized firms. Third, as in Germany, entrepreneurs usually have a feeling of social responsibility towards the community they live in. Finally, especially among large firms, unions are very powerful and operate to make sure that the interests of the employees are respected. But union pressures are crude and confrontational by comparison with the consensus-building systems of North Continental Europe: Italian employees do not have the right of co-determination as they do in large German firms, and their representatives cannot sit on boards of directors. The limits of informal consensus-building in large Italian firms were brought out vividly in the aftermath of the takeover of Zanussi by the Swedish firm Electrolux (Lorenz, 1989). It is here that the limits of employee inclusion become apparent; this is one of the reasons why Italy is much weaker than Germany in scale-intensive sectors like motor vehicles.

Suppliers and customers play a very important role in the process of innovation of Italian firms and close long-term inter-firm relationships are very common - especially among groups of firms, and within districts. Moreover, as the Community Innovation Survey data shows, in many of the traditional sectors, the purchase of high technology machinery represents the largest part of the costs for innovation. Equipment producers usually know the needs of the users and work together with them for the introduction of new and advanced machinery. (It is typical of the way the Italian national system of innovation has adapted itself to its relatively low-technology niche that there is a longstanding subsidy (the Lei Sabatini) for the purchase of machinery. This helps to guarantee to Italian machine makers, the domestic 'lead customers' they need.) Again, however, co-operative

relationships among firms are not generalised, unlike in North Continental Europe: in particular, there are not the same agreements and understandings over training among the employers (and with unions) in each region and sector.

As in the German system – but more, because of the difficulty in consensus-building - the *inclusion* of employees in Italy must work to increase conservatism, particularly in large firms, and this makes the system weak when innovation requires radical change. In fact, resistance to change within the firm was one of the main obstacles to innovation, after financial reasons, indicated by Italian managers in the 1990-1992 Community Innovation Survey. At the same time new start-up firms in the high technology sectors seem to encounter serious difficulties in finding capital, as the venture capital market is still young, and tends to finance more traditional sectors. In addition, banks and other financial institutions in general lack any sort of *industry-specific expertise* as for legal reasons (they could not acquire equity shares in non-financial firms) they have never found it convenient to invest in this kind of knowledge. Only within industrial districts does the situation appear to be different, as the presence of interlocking directorates between banks and firms should mean that a certain level of *industry-specific expertise* is/has been available. This is to be expected, given the specialisation of each district by sector; alas, the specialisation is never in a high-technology sector. The state seems to have a certain degree of *industry-specific expertise*, as the public agencies in charge of evaluating innovative projects for financing are composed of professionals and experts of the various sectors. However, until now, public schemes have mainly been used by large firms, for already existing projects and rarely by small new-start up firms. This suggests that the public sector's *industry-specific expertise* has not been used to cope with *novelty*.

Along with the other insider systems, Italy too has slowly begun to move towards the outsider position. The process of privatisation has been reducing the role of the state and will continue to result in increasing the number of listed firms as well as increasing the stock market capitalisation. The Italian stock market has developed to a much higher level of liquidity and transparency than ever before. The role of financial institutions is increasing and firms are experiencing new forms of financing in addition to bank loans. The private equity and venture capital markets have undergone a spectacular development, in relative terms. Many pyramidal groups have undergone processes of restructuring, reducing the number of levels and therefore increasing transparency. Moreover, the new Draghi reform of financial markets has introduced new mechanisms for the protection of minority shareholders, therefore reducing conflicts of interest between them and controlling shareholders.

There is, however, little sign of real institutional renewal. So far, the retreat of the state has been more hesitant than that in France, and where it has taken place the results have been similar to the first stages in France: it has been replaced as controlling shareholder by an Italian group or groups (Bianchi, 2002). In other words, a corporate governance arrangement which has shown severe limitations for the large firms to which it has already been applied – *vide* FIAT - is being extended to more large firms. Meanwhile, some of the strengths the system had, are being eroded. Globalisation is weakening long-term inter-firm relationships. Firms are making increasing use of unskilled employees from less-developed countries, hired on short-term contracts and in no sense *included*.

Not surprisingly, the situation as revealed by Table E1 (and supported by E2) is dire. Business R&D intensity is barely half that of the next lowest of our countries and fell during the 1990s (although some small recovery is evident late in the decade). High-tech patenting is at less than a third of the rate of the next lowest country. Venture capital, though admittedly expanding very fast, is still clearly the lowest of the six. The proportion of high tech value-added in manufacturing is almost the lowest; the share of employment in high tech. services *is* the lowest; and Italy's share of Triad high technology value-added has been falling fastest of all.

## **1.4 Overall conclusions**

### ***1.4.1 High technology, industry-specific expertise and pressure for reconfiguration***

The high technology sectors in which Europe as a whole is notoriously weak are characterised by a high need for industry-specific expertise and for reconfiguration pressure. It is clear that the 'old insider' shareholders which, sometimes jointly with the state, have dominated all our Continental countries except the Netherlands, have generally been unable to provide such expertise and pressure.

Outsider-shareholders such as are characteristic of the US and UK system can more easily gain the global, sector-wide view which is required. But the deficiencies of the UK system show that high industry-specific expertise is not an automatic corollary of outsider-domination. The successes of the Swedish system suggest that ‘old insiders’ such as the Wallenbergs may be able to remake themselves to gain such expertise, and use it.

#### ***1.4.2 High technology, firm-specific perceptiveness and stakeholder inclusion***

Even in the highest-visibility sector, pharmaceuticals, we have found that a substantial degree of firm-specific perceptiveness (allied with industry-specific expertise) is required for real understanding of the firm’s strategy and performance. The same is true *a fortiori* of the other high technology sectors, particularly those like software in which it is extremely difficult to protect intellectual property by patenting and copyright. High technology sectors depend heavily on the creation of human capital which can ‘walk down the road’ to rivals: a fact at variance with any assumption that the firm simply belongs to outside shareholders.

This means that (at a minimum) there must be major shareholders who ‘engage’ with the firm to the point where they can tell the difference between a fall in profit due to mere poor performance and one due to an expensive but well-conceived and –executed strategy of innovation and new product development. This most certainly is not an automatic corollary of outsider-domination: it has, on the contrary, been largely absent from the British system, and largely accounts for the serious under-spending on R&D and other elements of innovation in most high-technology sectors in the UK over the last twenty-five years.

#### ***1.4.3 Medium-technology sectors: their old and new requirements***

It is in the medium-high and the medium-low technology sectors that Europe (Continental Europe) has been most successful in international competition, and our studies have brought out clearly the key reasons for this. Such sectors have low visibility and high spill-overs, demanding a high degree of firm-specific perceptiveness and stakeholder inclusion (both employees and related firms). At their best the Continental systems have provided these ingredients in full measure, and continue to do so. It is awesome to behold (for example) the innovative drive of a Northern Italian chief executive in a mature industry who owns fifty per cent of his firm, has access to debt finance on favourable terms, and is determined to protect the jobs of the firm’s employees in the town in which he lives and his children go to school. But family or quasi-family succession of suitable quality is not to be guaranteed, least of all in large firms (*vide* the saga of the Agnellis and FIAT). Nor is the maintenance of the standard of institutional engagement where the shareholder is (for example) a bank, as often in the case of large German firms. The skills of bank engagement with large firms were built up in Germany in a period when the bulk of their capital was committed in massive loans which (given the gearing) were effectively risk capital. Skilful engagement was a competence vital to the survival of the bank. Those skills were renewed in the immediate post-war period when again German industry, large and small, depended heavily on bank loans. They atrophied as that dependence faded, particularly among large firms. Banks, particularly big ones, now have many sources of earnings and diverse competences are required.

Even if (*per impossibile*) the clock could be turned back it would not be enough, for large firms. They are too complex and their reach too global. It is moreover not only the high-technology firms which (as we argued above) require industry-specific expertise and pressure for reconfiguration. Radically new technologies (particularly those related to ICTs and e-business) are affecting or threatening medium-technology sectors too.

#### ***1.4.4 The funds are coming and need to be managed***

There is a degree of inevitability in the shift in ownership to the institutional forms of capital associated with outsider domination. On the one hand, there is privatisation, and a lot of selling by insiders – from the unwinding of bank stakes and cross-holdings to the steady and natural attrition of family firms. On the other hand, the main accumulation of capital is by ‘outsider’ institutions such as pension funds and mutual funds which naturally seek diversified, largely equity, portfolios. Supply

meets demand. Indeed this shift is already far advanced in a number of European countries – not only Britain, but also (in our sample) the Netherlands and Sweden. The difference among those three relates not so much to ownership by outsiders as to the extent to which outsider shareholders have been allowed to dominate corporate governance. Mechanisms such as dual shares have been used to (partly) insulate Swedish managements from pressures from outsiders. Similar mechanisms have until recently protected many Dutch managements from pressures from *all* shareholders. British management, as we have seen, has no such protection. However, the impact of ‘outsider capital’ depends less and less on the very negative question of how far management is protected from it – more and more on the positive question of how the ‘outsider capital’ is managed.

As our UK report has shown, there are three alternative modes of cautious portfolio investment: *Mode 1* is ‘passive’, index-tracking in which the shares of listed firms are bought and held in proportions dictated solely by their weighting in stock market indices. It needs negligible expertise, is very safe, and very cheap. *Mode 2* is ‘active trading’, in which skilled professionals (mostly ‘external’ asset management firms investing funds owned by others) seek to do better than the market (and therefore than *Mode 1*) by buying shares before they go up and selling before they go down. It is clearly less cheap and less safe (but nonetheless the portfolios are diversified and so are far less risky than an individual firm’s shares).

What both these modes have in common is that there is no intention to engage with the firm: what has been bought, and may be sold, is a piece of paper whose value is determined by others, not an entitlement to influence. In this they are unlike *Mode 3*, which involves ‘engagement’ with the firm (which may, but need not, make it an ‘insider’ in the sense of having market-sensitive information which prevents it legally trading). *Mode 1* guarantees very small stakes in each firm; in *Mode 2* fund managers go ‘overweight’ in shares which look like a good investment prospect – but do not want to accumulate too large a stake because this would make it difficult to sell without depressing the price; in *Mode 3* there will be more incentive to go overweight, since there are fixed costs of engagement, and the influence desired requires a substantial stake; and there will be less worry about selling. *Mode 3* therefore looks riskier, in actuarial terms – though of course if expertly executed could well be safer than *Mode 2*: you intervene to turn what would be bad investments into good ones.

We have now a palette with which to paint two nightmare scenarios and one rosy one. In all of our scenarios, we assume that the new institutional investors’ preference for equity investment persists, and it is indulged by regulators: they allow the majority of assets bought by pension funds to be equities. Accordingly European stock markets fill up with a rising tide of new equity capital. Let us begin with our nightmares.

### **Nightmare Scenario 1: King Log**

*Mode 1*, passive trading, dominates among the new institutional investors. This means that the large bulk of the new equity capital is invested in large listed firms. All big firms have highly fragmented shareholdings (apart from the remaining ‘old insiders’) and there would be little or no scope for direct pressure from the new outsider shareholders. Management (and/or any remaining insider shareholder) have control and only feel pressure from outsiders in the indirect sense of fearing a share price fall which would reduce the value of stock options, expose them to a hostile bid, etc.<sup>12</sup> Not surprisingly, given the brainlessness of the new outsider capital, regulators allow all kinds of protections against hostile takeover. The managers of large firms thus chart their courses much as before: there is little firm-specific perceptiveness in the corporate governance system, and less industry-specific expertise or pressure for shareholder value. The smaller, non-listed firms remain largely starved of capital.

### **Nightmare Scenario 2: King Stork**

*Mode 2*, active but dis-engaged trading, dominates among the new institutional investors. The skilled exponents of the art are balanced, and fed with trading opportunities, by *Mode 2* Mugs who (as explained in our UK report) sell when skilled investors see that a share will rise, and buy when a share

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<sup>12</sup> Some *Mode 2* holdings must be assumed in this version in order to make share prices respond to performance. The behaviour of share prices in a firm whose shareholders were all in *Mode 1* would be very odd indeed.

will fall. (As explained in our UK report, skilled Mode 2 investors can only make a supra-normal return if there is an adequate population of Mode 2 Mugs to trade with.) The Mode 2 investors, dis-engaged as they are, are vocal enough within firms to impose pressure for shareholder value: they are capable of applying direct pressure on big high-visibility issues like major restructuring, and of getting the standard rules and codes of corporate governance applied. They are also vocal enough in the public and political spheres to ensure that there are no effective protection measures for management against hostile takeover. Their dis-engagement prevents them, however, from understanding and supporting the less visible long term innovative strategies: they cannot help but put short term pressures on the firms they own. (The more Mode 2 Mugs there are, and the worse informed they are, the more one can count on even skilled Mode 2 investors to put short term pressures on firms.) Like Mode 1, they are averse to investing in unlisted firms or even the smaller listed ones; in their case because any stake which is worth having will be difficult to unload. No great feat of the imagination is needed to see what will follow from this scenario in terms of industrial performance: just look at Britain's defects, and double them in spades.

### **The Rosy Scenario: the Philosopher King**

Let us suppose that regulators, at EU and national level, look across the Channel and do not like what they see. They look across the Atlantic, and recognise first that engagement of one sort or another is much more common in the US than the stereotypes of financial systems suggest, and second, that where it is absent (across much of the medium and lower technology sectors) US performance is in fact rather poor. They therefore seek to promote intelligent engagement by all possible means. It is not Mode 1 that (within limits) is the enemy. It is too inert to be harmful, in moderation; and indeed one can imagine coalitions of Mode 1 shareholders being formed which engineered engagement to some degree – perhaps through non-executive directors. Mode 2, done badly, is the devil: the attempt to use an understanding of what will lead to changes in share prices to profit from them, without helping to promote it. Those investment houses without the skills to practise Mode 2 successfully are (in the Rosy Scenario) diverted to Mode 1. The fewer Mode 2 Mugs there are in the market, the less scope there is for even the skilled investor to practise Mode 2 successfully. It is thus the easier to divert the skilled investor to Mode 3. (And indeed, as our UK report has shown, a skilled Mode 2 investor can operate symbiotically with a strong Mode 3 investor.)

The new Mode 3 investors operate in two ways. The first is that demonstrated by the US house Capital in AstraZeneca (see the AstraZeneca case study). They choose a small number of sectors in which they will invest heavily (if that seems incautious they can always maintain a fraction of Mode 1 equity investing, plus bonds of course). They build up industry-specific expertise by various means, choose promising firms, get a substantial shareholding in them, engage in a dialogue with management in order to assess their competence and strategy, and if they like what they see (or think they can improve it), buy more. They may, like Capital, avoid becoming an insider debarred from trading, or they may accept such a status. In the former case they are a more effective 'bell-wether'<sup>13</sup> for other shareholders: for example, when management has announced a decision which they believe to be in the long run interests of the firm (but will reduce profits in the short run) they buy; the dis-engaged shareholders who would otherwise sell in the face of such news, are less likely to do so.

The second way of implementing Mode 3 is to invest heavily in private equity institutions - institutions which take substantial equity stakes in non-listed firms. There are two main types of private equity: venture capital, i.e. equity investment in genuinely new small firms; and buy-out or buy-in capital, in which established listed firms, or part of them, are 'taken private' by their management and need outside equity (as well as loan capital) to complete the deal. In our Rosy Scenario the role of private equity in buy-outs and buy-ins will be crucial, and dual. Its direct impact will come through the industry-specific expertise and firm-specific perceptiveness of the private equity investors. They have every reason to specialise by sector (thus the industry-specific expertise) and to get to know firms in which they have a major stake (thus the perceptiveness). Its indirect impact will be equally valuable. During the twilight of insider capitalism, managers built many corporate empires in which the synergies were far less than they claimed. They need to be broken up, first because they

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<sup>13</sup> That is, a sheep which is trusted, and therefore followed, by the rest of the flock.

can be run better that way, and second because shareholders find it much easier to engage with a firm which is clearly focused on one sector in which they are, or can become, expert. The AstraZeneca with which Capital so expertly engages is a pharmaceutical firm *tout court*, not (as Zeneca used to be) diversified across speciality- and agro-chemicals. Who better to buy the bits than private equity?<sup>14</sup>

The classic pattern for private equity investment is to aim for an early exit via an IPO – initial public offering; so, for a buy-in or buy-out, a return to the stock market. There is no reason, of course, why the private equity investor should not maintain a substantial share stake after the IPO, as is common in the United States.<sup>15</sup> Still, if the effect of private equity is as benign as a recent UK study indicates (BVCA, 2001) it would be good in many cases (particularly the smaller firms) to prolong it beyond the five-year period typical for the United States. A tiered system will naturally develop (as it has done in the United States) with time and an abundant enough supply of private equity. The first tier is the initial private equity investor, who takes most risk and trouble and needs most expertise. The second tier are the other investors, who come in later – with a venture capital start-up it is normally to provide finance for expansion, but with a private equity buy-out or buy-in it could be to provide the initial investor with a profitable partial exit, instead of, or pending, an IPO. The initial investor, being the more expert, commits to keeping a substantial stake and continuing to engage with the firm. The second tier of private equity is less profitable but also less risky.

How is the Rosy Scenario to be brought about?

There are two ways of doing this. One is permissive: there must be no regulations (such as proposed by some countries for pension funds) which in any way prevent financial institutions putting a substantial proportion of their assets into private equity. (Seen from first principles there is absolutely no reason why doing so should be risky. A fund could take small stakes in a number of private equity providers, operating in different sectors and/or countries.) The second is dissuasive: it is necessary to discourage Mode 2 investing, and this can be done by giving more favourable tax treatment for long-term holdings: the unskilled investor can always make these Mode 1.

What will *not* achieve the required result, is what was tried in parts of Eastern Europe: “let us abolish the old institutions, let markets reign, and automatically the institutions to make them work well, will appear”. If that were so, the UK economy would be the dynamo of Europe. The economy that looks far likelier to be Europe’s dynamo in the next decade – Sweden – has, as we have seen, been much more selective about the introduction of the outsider-dominated model. Sure, shareholder value is the ultimate, long-term test of performance in Sweden – but a wide measure of (particularly) employee inclusion is seen as consistent with that. So is massive spending on R&D and other innovative activity. If shareholders are concerned that this might be mis-spent, well, they are free to engage with management, and increasingly do – there are new strategic investors joining the old ones. Law and custom demand openness and protection of minority shareholders. Neither demands that firms should be vulnerable to hostile takeover; the dual class share system ensures that they are not.

This is not to recommend a particular mechanism of protection, but to argue that each national system may choose its own way of ensuring a degree of institutional continuity: we need new and more expert shareholders to engage with management, and while they are building up their shareholdings and their expertise we should not pull down existing structures of engagement.

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<sup>14</sup> Of course many ‘bits’ could and some should be bought by firms focused on their area. But even horizontal mergers have a poor record.

<sup>15</sup> It is interesting to consider why this should pay a private investor who is accustomed to seeking much higher returns than normally available from listed stocks: the price which ordinary stock market investors are prepared to pay for equity at the IPO will be much higher if the private equity investor commits to keeping a large stake, because this both indicates confidence in the firm’s prospects and guarantees an expert shareholder in the background. One might get more for part than one would get for the whole!

## 2. Background and objectives

### 2.1 Introduction

Innovation is one of the most fundamental components of a capitalist economy and achieving the appropriate level and most effective way of spending in projects that present the highest potentiality for success is essential to sustained economic development. What are then the best conditions to fulfil this goal? What should the characteristics of those who are in control be to ensure that the allocation of resources follows the correct path? What type of information is needed by the financiers of innovation to understand the potentialities of the investment projects they are asked to finance? What is the best structure of incentives for managers and employees to obtain their maximum participation in the innovation process? To whom are the returns of investment to be allocated?

Answering these questions is the main goal of the COPI project. To do this we employ the theoretical framework that was first put forward in Tylecote and Conesa (1999). In short, the main hypothesis that we try to test is the following:

**Different industries differ in the degree of *visibility*, *appropriability* and *novelty* of innovation. Systems of corporate governance and financial systems appear to differ in their ability to cope with these characteristics, which, in turn, affects the sectoral specialization of a country.**

This section contains a general and synthetic background to the framework employed in the project. This is mainly to provide the reader with the necessary instruments to understand the originality of the approach adopted and the importance of the issues under investigation. In particular, Section 2.2 reports a summary of the literature on Systems of Innovation, as the theoretical background is part of this new approach to the study of innovation. Section 2.3, declines the various components of the framework. Section 2.4 deals with systems of corporate governance and Section 2.5 concludes.

### 2.2 Systems of Innovation

Product innovation is one of the main driving forces of any economic system. Recognizing that innovation is not an exogenous phenomenon and that firms play an active role in the innovation process has been a fundamental achievement over the past century. Unfortunately, an agreement on which firms' characteristics determine their innovativeness has yet to be reached. Scale, level of R&D, cash flow, and diversification are all factors that have been studied for decades without obtaining any definite result.

In the last ten years a new approach for the study of innovation has emerged. Such an approach, known as the Systems of Innovation approach, stresses that firms do not innovate in isolation but in conjunction with other actors. Drawing in large part on the evolutionary theories of Nelson and Winter (1977, 1982), this approach puts knowledge, and in particular the process of its formation (i.e. learning) at the centre of attention and argues that it "is predominantly an interactive and therefore socially embedded process which cannot be understood without taking into consideration its institutional and cultural context" (Lundvall, 1992, p.1).<sup>16</sup> The interaction occurs between each firm and other organisations, with the aim of exchanging resources, information and above all various kinds of knowledge. "These organisations might be other firms (suppliers, customers and other resources) but also universities, research institutes, investment banks, schools, government ministries, etc. Through their innovative activities, firms often establish relations with each other and other kinds of organisations; therefore it does not make sense to regard innovating firms as isolated, individual decision-making units" (Edquist, 1997, p.2).

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<sup>16</sup> "According to this author's recollections, the first person to use the expression 'National System of Innovation' was Bengt-Åke Lundvall and he is also the editor of a highly original and thought-provoking book (1992) on this subject. However, as he and his colleagues would be first to agree (and as Lundvall himself points out) the idea actually goes back at least to Friederich List's conception of 'The National System of Political Economy' (1841), which might just as well have been called 'The National System of Innovation'" (Freeman, 1995, p.5).

The problem is where to set the borders of the system. Some authors believe that the focus should be on a national basis. This is for several reasons ranging from market and natural resource determinants (similar resource base and similar revenues and consumer tastes); to the fact that user-producer and most of the other types of informal collaborations occur more frequently within the national economy than on an international level; to the fact that technically-based interdependences are more likely to occur within national economies and finally to the role played by the State in the direction and rhythm of technological innovation (Niosi, *et al.* 1993).

Two of the most important and earliest works that adopt the systemic approach, namely Lundvall's (1992) *National Systems of Innovation: Towards a Theory of Innovation and Interactive Learning* and Nelson's (1993) *National Systems of Innovation: A Comparative Study*, even if in a different way,<sup>17</sup> put the boundaries of the system at the national level. Other authors place a major emphasis on *regional systems of innovation*, where regions might cross the national borders or be part of a wider national system. For example Hans-Joachim Braczyk *et al.* (1998), trace the history and the structural characteristics of fourteen regional systems of innovation.

Both of these approaches, however, embrace all the industries existing in a specific country or region and do not take into consideration the possible variations among industries. The so-called Technological Systems of Innovation (TS) approach, instead, defines a system as "a dynamic network of agents interacting in a specific economic/industrial area under a particular institutional infrastructure and involved in the generation, diffusion, and utilisation of technology" (Carlsson and Stankiewicz, 1991, p.93). Their focus is therefore on innovations in specific technological systems, which differ in economic competences, networks of entrepreneurs and institutional infrastructures. In line with this approach, but with some differences, is the Sectoral System of Innovation (SIS) approach of Breschi & Malerba (1997). According to these authors a SIS "is composed of those firms that are active in developing and making a sector's products and in generating and utilising a sector's technologies; such a system of firms is related in two different ways: through processes of interaction and cooperation in artefact-technology development and through processes of competition and selection in innovative and market activities" (*ibid.*, 1997, p.131). Further, "the perspective offered by SIS is different from the TS notion. While the concept of TS looks at networks of vertically integrated as well as horizontally connected agents and organisations engaged in the development of specific technologies, the concept of SIS focuses on competitive relationships among firms by explicitly considering the role of selection environment" (*ibid.*, 1997, p.131). Breschi & Malerba do not deny the importance of institutions but their centre of attention is the firm and its relationship with other firms.

The theoretical framework used in this project, was first put forward by Tylecote and Conesa (1999), in "Corporate Governance, Innovation Systems and Industrial Performance". It can be defined as a "National-Technological System of Innovation" as it distinguishes both between nations and between industries that employ different technologies. In addition, even if it adopts a systemic approach, and tries to point out the main elements influencing innovation for each sector (user-producer relationships, flows of information, institutions, educational system and so on), it tends to focus on a particular distinguishing aspect of each country, namely their system of corporate governance. This is a new line of study within the National Systems of Innovation approach<sup>18</sup> and it is not necessarily reductive since, as Edquist (1997) argues, focusing on a single aspect of the system is often appropriate. "A system of innovation should be looked upon as a 'whole' because many of its elements are – more or less closely - related to each other- otherwise, there would be no 'system'. But it is also sometimes necessary to deal only with parts of the system – one at a time or a few in relation to each other. Hence, it may sometimes be necessary to restrict the analysis to various subsystems of a system of innovation. To divide the complex 'whole' into pieces [...] it is sometimes useful – and sometimes even a necessary way of understanding and creating theories about the relations between various parts or 'elements' involved in the process of technological and organisational change. In other

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<sup>17</sup> Nelson's book focuses mainly on different national R&D systems, whereas Lundvall's book adopts a more theoretical approach and each chapter is dedicated to a different aspect of the national system of innovation approach, including the relationship between producers and consumers, the financial system and so on.

<sup>18</sup> The only other author that studies systems of corporate governance and innovation is Lazonick (1998). See also Soskice (1997) for a similar, but distinct, approach.

words, a study limited to, for example, the financing of innovation is not necessarily reductionism” (*ibid.*, 1995, p.18).

## 2.3 Corporate governance, innovation systems and industrial performance

As mentioned before, the main argument put forward in this project is that different industries differ in the degree of *visibility*, *appropriability* and *novelty* of innovation. Systems of corporate governance and financial systems appear to differ in their ability to cope with these characteristics, which, in turn, affects the sectoral specialisation of a country.

**Table 1. Summary of the possible cases**

	Visibility		Appropriability		Novelty	
	High	Low	High	Low	High	Low
<b>Requirements in terms of corporate governance</b>	High firm-specific perceptiveness	Low firm-specific perceptiveness	Shareholders first strategy	Inclusion of the stakeholders	High Industry-specific expertise	Low industry-specific expertise

### 2.3.1 The degree of visibility

The *visibility* of innovation measures “how easy is it for someone who is not closely involved in managing the development of a new product or process, to judge what resources are being devoted to it and how well they are being spent” (Tylecote and Conesa, 1999, p.25).

The level of *visibility* of an industry is influenced by several factors. A first and important one is the level of spending on physical capital as opposed to low *visibility* activities like production and marketing. In fact, as suggested by Tylecote and Conesa (1999) spending on physical capital and, depending on the accounting regime, also some elements of R&D expenditures are capitalised in the accounts and therefore not subtracted from profit. On the other hand, it is much more difficult for someone who is not directly involved in the innovation process to control whether higher expenses in production or marketing are justified or only due to inefficiency. Other factors that deeply influence the *visibility* of innovation are: the level of centralisation of the innovative activity (which is easier for basic and applied research and more difficult for development); the degree of codifiability of the knowledge involved in the innovation process; the importance of economies of scale and therefore the firms’ average size; the distance in space, the hierarchical and cultural distances between those who have direct responsibility for and direct knowledge of the conduct of the process of innovation and those who have control over the provision of finance; finally the distance in time between the expenditures for innovation, the market launch and the financial payoff.

When the degree of *visibility* is low, an observer must be very perceptive “in order to judge whether the firm should be funded, and to monitor progress. In general, this perceptiveness needs to be firm-specific – the closer the acquaintance with that particular firm, the better; although no doubt a general knowledge of the industry will help too” (Tylecote and Conesa, 1999, p.27). Therefore, according to this theoretical framework, systems of corporate governance where insiders play an important role will have an advantage in low *visibility* industries over outsider types of systems. On the other hand, in high *visibility* industries, the *firm-specific* perceptiveness of the insider shareholders becomes redundant and all other things being equal, outsider-dominated systems present an advantage over the insider-dominated ones.

### 2.3.2 The degree of appropriability

The *appropriability* of innovation refers to the level of appropriation of the returns on investment by those who provide capital. As suggested by Arrow (1962), the production of new economic knowledge suffers from several causes of market failure one of which is its public nature, which means that it “inevitably involves spillovers to others besides the shareholders such as the

employees and the customers/suppliers” (Arrow, 1962, p.10). This phenomenon is therefore extremely acute when instruments of appropriation such as patenting are not very effective and secrecy becomes more important, when innovation “requires and involves a large element of cumulative learning on the shop floor” (Tylecote and Conesa, 1999, p.28) as in the object-oriented industries<sup>19</sup> and, finally, when it “requires and involves close contact with suppliers or customers” (*ibid.* p.28).

According to Tylecote and Conesa (1999) there are two polar approaches that can be used and that present different degrees of efficiency according to the level of *appropriability*. When it is high, the best strategy seems to be the *shareholders first and last*, where “the only stakeholders whose interests are considered are the shareholders. Accordingly, it is only them (or management on their behalf) who provide the resources for the innovation. Strategies of innovation and means of appropriation are chosen to maximize shareholders’ return” (*ibid.* p.27). On the other hand, when the degree of *appropriability* is low and there are many spillovers to others such as employees, suppliers and customers, the best strategy seems to be that of constructing some kind of coalition with the other beneficiaries of the innovation who therefore turn out to be *included*.

### 2.3.3 The novelty of innovation

The *novelty* of innovation indicates the extent to which an innovation requires “radically new means of development or production, and/or radically new markets or selling methods” (*ibid.*, 1999, p.30). The degree of *novelty* of a particular industry therefore synthesizes types of information such as the degree to which technological change is characterized by a recurrent or, unusual but ongoing, radical break with the past (for example the speed at which new technologies are being integrated into the industry’s dominant processes and products, the introduction of new materials); the experience of fundamental changes in the nature or the behaviour of the market which affects the way technological processes are carried out; the occurrence of important changes in the methods of appropriation such as the shift in the software industry from copyright to patenting and so on. When the degree of *novelty* is very high, new start-up firms might have an advantage as they do not have anything to unlearn. These firms will not have financiers with a good *firm-specific perceptiveness*, as this requires time. They will therefore need someone within the system with access to capital who has a high level of *industry-specific expertise*. “That capital should then be put into selected firms – all or most of it as equity, and the *industry-specific expert* should take a hand in corporate governance in at least the early stages of the firm’s development. This is ‘venture capital’. The requirement for established firms is not dissimilar: *industry-specific expertise* will allow a shareholder or other stakeholder to judge the firm’s current plans and projects and organization against what appears appropriate now in the industry – whatever the firm’s track record” (*ibid.* p.36).

## 2.4 Outsider and insider systems and innovative performance

In the previous paragraphs we have referred to two main types of systems of corporate governance, namely the outsider-dominated and the insider-dominated ones. This distinction is the most widely accepted and as it appears from the above discussion the differences between the two systems constitute the main building blocks of the framework. It is therefore important to point them out in this part of the report, before proceeding with the resumé of the main results of the study.

A summary of the main differences between the systems is contained in Table 1.1. In the outsider-dominated systems, firms are directly controlled by their managers but indirectly controlled through the market for corporate control, by their shareholders, mainly institutions that trade and invest on the Stock Exchange. In the insider-dominated systems, the ownership tends to be rather concentrated and several subjects other than the shareholders have the power to influence the management of a firm, such as banks, the state, the employees, the customers and so on.

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<sup>19</sup> Itami (1994) suggests that when the technology is object-oriented, or in other words, when it is aimed at producing a fixed object like in the steel and automobile industries, the importance of the accumulation of skills on the shop floor is much higher than when the technology is function-oriented that is, when it is aimed at producing something “with a fixed and targeted function, like a chemical to provide a certain reaction or a computer software to provide a certain information processing function” (*ibid.*, p.5).

In outsider systems, the degree of concentration of ownership is very low, investors tend to have a portfolio orientation and as a consequence the share of control-oriented finance is low. A large number of firms are listed on the stock exchange, which guarantees a high degree of liquidity. Agency conflicts between the managers and the shareholders are very common. The market for corporate control operating over the public stock exchanges is an essential mechanism for the substitution of inefficient management. The role of the board of directors is very important and the use of mechanisms for separating control and capital base are limited, often by regulation.

**Table 2. Corporate governance systems**

	Type of financial system	
	Control-oriented (insider)	Arm's-length (outsider)
Share of control-oriented finance	High	Low
Financial markets	Small, less liquid	Large, highly liquid
Share of firms listed on exchanges	Small	Large
Ownership of debt and equity	Concentrated	Dispersed
Investor orientation	Control-oriented	Portfolio-oriented
Use of mechanisms for separating control and capital base	Frequent	Limited (often by regulation)
Dominant agency conflict	Controlling vs. minority shareholders	Shareholders vs. management
Role of the board of directors	Limited	Important
Role of hostile takeovers	Very limited	Potentially important

Source: Berglöf (1997).

On the other hand, in insider systems, ownership is usually rather concentrated in the hands of majority shareholders who play an active role in the control of the firm. As a consequence, financial markets are rather illiquid and hostile takeovers are infrequent. Opportunities for diversification are much lower than in outsider systems and the use of mechanisms for separating ownership from control is common. Conflicts of interest arise between majority and minority shareholders and, especially when the legal system does not properly protect the latter, “in the process of using his control rights to maximise his own welfare, the large investors can redistribute wealth – in both efficient and inefficient ways – from others” (Shleifer and Vishny, 1997, p.758). Finally the number of firms listed on the stock exchange is rather low.

The insider shareholders (family members, banks or other firms) and the powerful stakeholders (employees, customers and suppliers) characterising the former systems are expected to present a good degree of *firm-specific perceptiveness* and as a consequence to deal well with low *visibility* activities. In addition, the presence of *included* stakeholders should allow coping with innovative activities characterised by low *appropriability*. At the same time, the presence of these same powerful stakeholders and of coalitions among them introduces some degree of conservatism and organisational slack within firms, which, therefore, will pose difficulties in innovating in sectors characterised by a high degree of *novelty*.

On the contrary, outsider systems present a comparative advantage in high novelty sectors. In fact, in outsider systems, managers “can force through changes which employees might resist” (Tylecote and Conesa, 1999, p.35), and, as they are under constant pressure in various markets, they are also driven to the maximum efficiency. Certainly, firms in outsider systems need the support of financiers with a high degree of *industry-specific expertise* to be successfully innovative. At the same time, outsider systems, with their outsider shareholders and arm's length type of relationships with the major stakeholders, will have a comparative disadvantage in sectors characterized by low *visibility* and low *appropriability*.

Up to a few years ago, there was a clear cut distinction between the US and the UK on one side (outsider systems) and all the Continental European countries and the whole of East Asia on the other (insider systems), even if it was possible to highlight several differences between the countries within the two groups (Tylecote, 1999). Now, however, such distinction is much more blurred. As it

will be shown, several countries previously insider are moving at various speeds towards the outsider position, whereas in some cases the large institutional shareholders typical of the outsider systems appear to behave as a particular type of insider. As reported in Tylecote and Visintin (2002):

“There is no doubt that there is a general trend towards outsider-domination of financial systems. We can detect the following factors driving it:

- Stakeholder coalitions are much easier to build and maintain at a national, even regional or local, level. This is most clearly apparent with employees as stakeholders. Thus Japanese firms cannot and do not treat their foreign employees in the same way as their Japanese core employees; and once they have a large fraction of foreign employees then the considerations justifying their special commitment to their Japanese core employees, weaken. The German firm’s understanding with its employees is underpinned by the German system of co-determination. Once a large fraction of its employees is outside Germany, then that system is less effective (Tylecote, 1999).
- A number of insider types are showing a clear tendency to retreat from control in most if not all of the insider-dominated systems. Family shareholders are one example – there is a natural tendency in each firm founded by one or two individuals to pass into the ownership and control of their family heirs, for that to be subdivided by further inheritance, and for the family heirs in due course to lose interest and give up control. If the population of firms is not rejuvenated by a surge of entrepreneurial activity – which in Europe and Japan, unlike the US, last took place during the post-war recovery – the proportion of family controlled firms naturally falls. Bank power had in some ways complemented family control; in Germany and to a lesser extent in Japan it reached its apogee during the 1950s and 60s. In Germany it thenceforth came under attack, and has ever since been in retreat (Ehrentreich and Schmidt, 1999). The Japanese banks seem to have lost ground more suddenly, in the 1980s bubble and the 1990s creeping collapse of the banking system (Kikkawa, 2001). But the most clear-cut insider retreat has been that of the state as owner (Tylecote, 1999).
- There is a general view, which developed for obvious reasons during the 1990s, that the US system of corporate governance and finance is the one to copy. The authors have for example heard Finns admiringly describe what amounts to the industry-specific expertise of the American institutional investors buying into their industries – which had often been run by engineers of rather narrow horizons in terms of market possibilities and limited exposure to market disciplines (Risto Tainio, personal communication). The managers of insider-dominated firms are usually very much limited in their opportunities for expansion, since to do so with debt will increase gearing and thus the risk of insolvency, while an expansion of the equity base dilutes the shareholding of the existing major shareholders and thus threatens to deprive them of control. Outsider-dominated capitalism, by contrast, provides exhilarating freedom.

### **3. Scientific description of the project results and methodology**

The COPI project is a European-based project including 6 countries (France, Germany, Italy, the Netherlands, the UK and Sweden) and 7 teams (Vrije University, Amsterdam, The Netherlands; University of Goteborg, Sweden; University of Udine, Italy; Martin-Luther Universitaet, Halle, Germany; TU Bergakademie, Freiberg, Germany; GATE/University of Lyon, France). It was co-ordinated by Professor Andrew Tylecote, of the University of Sheffield and it ran from December 1998 to the end of November 2001.

Table 3 contains the original content of the project. Table 4 reports the deliverables and their current status.

**ORIGINAL WORK CONTENT (Table 3)**

**COUNTRY PARTNERS**

<b>Work Package</b>	Sheffield	Amsterdam	Lyon	Udine	Halle	Freiberg	Goteborg
1. Critical literature review	Responsible						
2. Technology survey of :	Pharmaceuticals and scientific instruments	Software	Banking <sup>1</sup> and defence electronics	Fine chemicals	Banking <sup>1</sup>	Machine tools	Motor vehicles
3. Corporate governance review of:	UK	Netherlands	France	Italy	Germany	-----	Sweden
4. Case studies of min. 2 firms in banking AND :	Pharmaceuticals and defence electronics/sc. instruments	Software and fine chemicals	Motor vehicles and defence electronics/sc. instruments	Machine tools and fine chemicals	Banking and pharmaceuticals	Machine tools, motor vehicles - (not banking)	Motor vehicles and software
5. Development and piloting of questionnaire	Lead devt. + pilot in min. 1 of own firms	Share devt. + pilot in min. 1 of own firms	Share devt. + pilot in min. 1 of own firms	Share devt. + pilot in min. 1 of own firms	Share devt. + pilot in min. 1 of own firms	Share devt., pilot in min. 1 of own firms	Share devt. + pilot in min. 1 of own firms
5. Administer questionnaire in min. 8 firms <sup>2</sup> in banking and ::(on 'Plan A <sup>3</sup> )	Sectors as in 4. above	Sectors as in 4. above	Sectors as in 4. above	Sectors as in 4. above	Sectors as in 4. above	Sectors as in 4. above	Sectors as in 4. above
5. Process, write up results of questionnaire (on 'Plan A')	Ditto	Ditto	Ditto	Ditto	Ditto	Ditto	Ditto
5. Administer questionnaire in min. 8 firms in banking and : (on 'Plan B')	One of sectors as in 4. above	Ditto	Ditto	One of sectors as in 4. Above	Ditto	Ditto	Ditto
5. Process, write up results of questionnaire (on 'Plan B')	Ditto	Ditto	Ditto	Ditto	Ditto	Ditto	Ditto
6. Dissemination w-shops	Own country	Own country	Own country	Own country	Own country	Own country	Own country
7. Final report	Sector as in 3. ; own country ; overall editing	Sector as in 3. ; own country	Sector as in 3. ; own country	Sector as in 3. ; own country	Sector as in 3. ; own country	Sector as in 3. ; own country	Sector as in 3. ; own country

Notes:

1. Halle and Lyon both have responsibility for banking in Work Packages 3. and 7. They will be expected to cooperate but the 'default' position is that each has responsibility for producing a report on banking. The position is the same for Halle and Freiberg regarding responsibility for the report on Germany in Work Package 7. Likewise in Work Package 6 Halle and Freiberg have joint responsibility for the two German dissemination workshops but the default position is that Freiberg has responsibility for a workshop in central or southern Germany and Halle for one in Berlin.
2. Assuming a sufficient population of firms.

3. 'Plan A' implies success in raising additional (presumably national) funding in order to extend the employment of the postdoctoral research fellows in Italy and the UK to 30 months. (See Resource Allocation, below.) 'Plan B' implies that such funds are not available and that the Post Doctoral Research Fellow's employment in these countries terminates after 18 or 20 months. In Sweden such funds have already been raised. As a more economical method of staffing has been chosen in the other three countries, not requiring extra funding, there is no difference for them between 'Plan A' and 'Plan B'.  
It may be possible for research teams in one or more 'fully-staffed' countries to carry out part or all of the questionnaire administration (etc.) for the (otherwise lost) third sector in an 'under-staffed' country, if they have spare capacity. (In the UK, at least, there would be no language problem.) This will not be a contractual obligation, however.

List of deliverables of the overall project and their status. Cells shadowed in blue indicate the deliverables that are being submitted with this final report. (Table 4)

	Deliverables	Udine	Halle, Freiberg	Amsterdam	Lyon	Sheffield	Gothenburg
	Overall review of the literature WP1					C	
	Country specific report (1) WP2	C	C	C	PC	C	C
	Country specific report (2) WP7	C	C	PC	->Sheffield	C	PC
	Overall overview of the case studies WP4					Conflated and C	
	Final Report WP7						
Chemicals	Sectoral report (1) WP3	C					
	Case Studies (for internal use only)	C		C			
	Comparison Case studies WP4			Conflated and PC			
	Sectoral report (2) WP7						
Machine tools	Sectoral report (1) WP3		C				
	Case Studies (for internal use only)	C	C			C	
	Comparison Case studies WP4	C					
	Sectoral report (2) WP7	C					
Software	Sectoral report (1) WP3			C			
	Case Studies (for internal use only)			C			C
	Comparison Case studies WP4						C
	Sectoral report (2) WP7						C
Banking	Sectoral report (1) WP3					Conflated and C	
	Case Studies (for internal use only)	C	C	C	C		C
	Comparison Case studies WP4		Conflated and C				
	Sectoral report (2) WP7						
Motor vehicles	Sectoral report (1) WP3				C		C
	Case Studies (for internal use only)		C				C
	Comparison Case studies WP4						C
	Sectoral report (2) WP7						C
Pharmaceuticals	Sectoral report (1) WP3					C	
	Case Studies (for internal use only)		C			C	
	Comparison Case studies WP4					Conflated and C	
	Sectoral report (2) WP7						
Scientific Instruments	Sectoral report (1) WP3					A	
	Case Studies (for internal use only)					A	
	Comparison Case studies WP4					A	
	Sectoral report (2) WP7					A	
Defence Electronics	Sectoral report (1) WP3				A		
	Case Studies (for internal use only)				A		
	Comparison Case studies WP4				A		
	Sectoral report (2) WP7				A		

C= Completed  
 PC= partially completed  
 A= Abandoned

The main differences between what was planned and what has been carried out are the following:

**Deliverables that were not originally planned but have been produced:**

1. WP4. The UK team has carried out a case study in heavy engineering, which allowed important comparisons with an Italian case study. The Italian case study included interviews with a Swedish subsidiary which yielded important insights. The UK team carried out interviews in two fine chemicals firms, one of which was a subsidiary of the Dutch fine chemicals firms studied; this has allowed interesting insights.
2. WP5. The UK team has piloted the questionnaire in the two fine chemicals firms.
3. WP7. The questionnaire was delivered to a much higher number of firms than had originally planned. In particular, the UK and Italian teams followed 'PLAN A' and carried out surveys in three sectors, even though they were not able to raise additional funding to extend the employment of the postdoctoral research fellows to 30 months.
4. WP7. The Dutch team has combined all the data into an overall database, which will be used for further research and will certainly produce interesting results (see for example Annex 3). Preparing this database was essential to draw statistically significant conclusions on the characteristics of the various sectors studied in the project.

**Modifications in the allocation of the work packages:**

1. WP2. The French team wrote the sectoral report on motor vehicles in place of the Swedish one. The British team produced the sectoral report on banking (in addition to the one on pharmaceuticals) in place of the German team (Halle) and the French.
2. WP7. Most of the teams have not carried out a final sectoral report on the same sector on which they had written the original sectoral report (WP3). In particular, the Italian team has written a sectoral report on machine tools instead of fine chemicals; the Dutch team on fine chemicals instead of software; the Swedish team, in addition to the report on motor vehicles has also produced a final report on software.

**Deliverables not produced:**

1. WP2. Two sectors, namely scientific instruments and electronics have been abandoned (a preliminary sectoral report on electronics has been written by the British team, but no other work has been carried out on this sector). No case studies or surveys have been carried out on these sectors, except for a small number of individual interviews by the British team.
2. WP3. The corporate governance report of France was produced but never submitted (the coordinator judging it not yet of a high enough standard for submission).
3. WP5. All the teams (with the exception of the Italian and the Swedish) have conflated the report on the effects of corporate governance on product innovation on the basis of the case studies, with that produced on the basis of the questionnaire. Also the overview resulting from a combination and editing of the case studies has not been produced and it is in part conflated in the final report.
4. WP6. Only two countries, namely the British and the Italian, have so far carried out a dissemination workshop. The German teams had organized a workshop but the attendance was going to be very low, so it was canceled.
5. WP7. The French team did not produce a final report on corporate governance and innovation in France (this will be produced by the British team with the aid of materials provided by the French team). The Swedish and the Dutch teams have produced *rèsumès* of the recent literature on the corporate governance of their countries. The Halle team produced an updated version of their original report on corporate governance in Germany.

**Reasons for abandoning of deliverables:**

The reasons for abandoning a number of deliverables or for completing them only partially are the following:

1. There was an initial delay due to delays in receipt of signed contracts, in receipt of funding, and in recruitment that each team found difficult

to overcome. “Brussels did not receive the signed contracts from all the partners until the end of the first week of December 1999 and it was mid December – close to the Christmas period – until the participating universities could regard all the paperwork as completed. The partners did not receive the funds from Sheffield until late March. It appears that the two German teams could not even start to recruit until the funds had been received. Freiberg accordingly did not have their RA until mid May, and Halle not till the beginning of July. Udine’s RA began in late March. Sheffield’s RA began at the beginning of February. On the other hand, Amsterdam, Goteborg and Lyon had their RA in post (or at least at work) from the beginning of December, in the first two cases using other sources of funds. Goteborg on the other hand had a quite different problem: they lost their RA, to a well-paid industrial job, at the end of March, and were unable to replace him until t+12.” (12<sup>th</sup> month report).

2. “The under-funding by one third had derailed the original plan to use postdoctoral researchers for the full period. Only three teams had gone ahead nonetheless with postdocs from day one; the other four had economised by choosing to use doctoral students. As the co-ordinator had initially warned, this economy could prove expensive if the doctoral student turned out to need close supervision, and then didn’t get it.” (12 months report). Both the first and the second French junior researchers turned out to be in strong need of close supervision. The English of the second junior researcher, in particular, was poor and she was unable to communicate with other teams, except for the co-ordinator. This caused serious delays in the research.
3. The Lyon team leader had increasing family problems, which obliged him to spend more and more time in Paris, culminating in him leaving the University of Lyon for a research institute in Paris at the end of the second year. The team put much effort into producing data that could be compared with those of the other countries but were not able to complete their deliverables.
4. The delay in the preparation and administration of the questionnaire is the main cause of the incompleteness of some of the final reports. The extension of the deadline was not sufficient for the firms to catch up. In particular, the Dutch team spent several months in preparing the overall database and by the time it had received all the data from the other teams it was too late to produce a complete final report on the Dutch system of corporate governance. As for the Swedish team, the incompleteness of the final report on the system of corporate governance is due to the initial delay that the team had (see previous periodical reports) and to the fact that it has taken over some of the tasks of the team from Freiberg as the junior researcher of that team had left the project in October 2001.

### **3.1 The method**

#### ***3.1.1 The review of the literature***

The first stage of the project consisted of a critical review of the secondary literature on the systems of corporate governance of the member countries (WP2). In this phase we tried to establish three main issues, namely to what extent shareholders, lenders and other stakeholders have the *firm-specific perceptiveness* required to cope with low *visibility*; to what extent those same groups have the required *industry-specific expertise* to cope with high degrees of *novelty*; and finally, what

degree of *inclusion* is granted to various types of stakeholders.

A high degree of *firm-specific perceptiveness* of the shareholders, lenders and other stakeholders derives from some sort of relationship with the firm, so a reasonable duration of such a relationship is regarded as necessary, even if not sufficient, for it. We therefore investigated whether there are any kinds of informed insiders, such as family shareholders, banks with a “relationship banking” tradition, active institutional investors or even well informed civil servants.

With regard to the *industry-specific expertise*, we analysed the expertise of banks and other financial institutions, venture capitalists, or individual investment analysts and of the state institutions that provide grants for R&D.

As for the degree of *inclusion* of customers, suppliers and employees, we studied the type of relationship firms have with these stakeholders. The issues investigated were the existence of networks of shareholdings with customers and suppliers, or of other forms of close long-term agreements, and also the degree of trust. As for the employees, we analysed their degree of permanence within the firm, their influence on the formulation of corporate strategy, and the type of relationship with the management. We investigated the system of wage determination and industrial relations to verify if these favour investments in skills by workers and firms. We studied the degree of employment protection in order to see whether this makes it difficult or expensive to dispose of surplus labour. Finally we considered the degree of conservatism of the employees that could hinder the innovation process.

All the country corporate governance reports (with the exception of the French one) and the critical review of the literature covering the whole field of corporate governance and innovation were delivered by the end of the first year of the project.

The second set of reports consisted of reviews of the nature and implications of product innovation in a certain number of medium and high-tech sectors (WP3). Originally the plan was to investigate the following sectors: software, defence electronics, scientific instruments, motor vehicles, machine tools, fine chemicals, pharmaceuticals and banking. All but two reports (defence electronics and scientific instruments) were delivered to the European Commission even if with various degrees of delay. The report on electronics, combining defence electronics and scientific instruments, which was the joint responsibility of Sheffield and Lyon, has not been produced and delivered.

In the analysis of the sectors, we have tried to establish the degree of *novelty* and *visibility* of the technology utilised in each sector and the degree of *appropriability* of the returns of innovation.

With particular reference to *novelty*, we tried to establish how far technological change in each sector is proceeding along an established trajectory. We did this by looking at the R&D intensity and at the rate of growth of industry sales and of patenting. Some of the teams also interviewed several experts<sup>20</sup> and made use of information contained in the CIS database.

As for the degree of *visibility*, we investigated three main issues. First of all, we analysed the *distance in space* between the people who have direct responsibility for and are directly involved in the innovation process and those who have control over the provision of finance and indeed the firm itself. This type of distance can take several forms. For example there could be geographical distance, which reduces the possibility of having face-to-face meetings. Alternatively, there could be hierarchical distance, if the firm is very complex and there are several hierarchical layers. There could also be cultural distance, both in terms of national culture and in terms of difficulties in communication between people with different backgrounds (technical and managerial). For obvious reasons, the distance in space is more likely to be small if firms are small and if innovative activities are centralised. In addition, it will also be lower for basic research rather than for design and development. Secondly, we focused on the *distance in time*, that is the time that elapses between the expenditure of money and the returns in terms of profits or market share. Thirdly, we analysed the *ease of evaluation* of expenditure on innovation. This is strongly influenced by the degree of codifiability of knowledge, by the proportion of expenditures in highly

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<sup>20</sup> In December 1999, the Italian team interviewed the economic expert of UCIMU, the Italian association of machine tool builders. At various stages the British team interviewed institutional investors of the City and various managers of large banks in London.

visible activities such as fixed capital as opposed to less tangible ones, and by the degree of secrecy maintained on innovation.

As for the degree of *appropriability*, we looked both at its level before the innovation and at that after the innovation takes place. In fact, the overall appropriability will be low even if patents or other forms of protection work effectively when the cooperation of other stakeholders is essential to achieve an innovation. We have investigated the effectiveness of forms of protection, like patents and secrecy, referring both to the literature and to the comments of the experts in the sector. We also studied the type of technology embodied in the products, in an attempt to categorise each sector as *function oriented* or *object oriented* (Itami, 1994) and also to study whether it requires a cumulative knowledge on the shop floor (which needs the cooperation of employees) or whether it is characterised by radical breaks with the past (which is favoured by a low degree of inclusion of a large part of the employees). The important role played by suppliers and customers in the innovation process is another indication of a low degree of appropriability.

Naturally, the available literature was not sufficient in order to gather satisfactory information about all of the issues under investigation. This is because the data are usually collected in order to test particular theories and the theoretical framework utilised in this project is fundamentally new. For this reason, the following phase in the research was carried out through case studies. In fact, case studies, especially if of the illustrative type, are an essential tool during any type of exploratory analysis. Case studies allow the investigation of issues with which a researcher is not very familiar, such as when the literature is not extensive. In addition, as reported by Yin (1994) case studies are the preferred strategy when the research aims not only to explore certain phenomena, but also to understand them within a particular context, and more in general when "how" or "why" questions are being posed. At this stage it would not have been possible to proceed with a questionnaire for example, because our understanding of the mechanisms of product innovation and corporate governance in the various sectors was still not sufficient, and we could have risked asking inappropriate questions. Case studies were therefore used to improve our knowledge of the sectors and of the type of pressures felt by the various parts of the organisations. For the same reason we carried out semi-structured interviews which, even if time consuming, allow us to explore answers in more depth. As summarised by Burgess (1982), semi-structured or unstructured interviews are an "opportunity for the researcher to probe deeply to uncover new clues, open up new dimensions of a problem and to secure vivid, accurate, inclusive accounts that are based on personal experience" (*ibid.*, p.170). In addition, as suggested also by Easterby-Smith, Thorpe and Lowe (1991), unstructured and semi-structured interviews are an appropriate method when the subject matter is highly confidential and commercially sensitive and when the interviewee may be reluctant to be truthful about the issue under consideration other than confidentially in a one-to-one situation. Indeed, innovation is undoubtedly a highly confidential matter.

### **3.1.2 The case studies**

The objective was to conduct and analyse two or three case studies in each sector in at least two countries, and two or three case studies of banks in every country. On two occasions, interviews were carried out in the headquarters of a firm and in a foreign subsidiary. Such was the case of the Italian team that carried out a case study of an Italian heavy engineering company and of its Swedish subsidiary, and of the British team that studied a British pharmaceutical company and its Swedish R&D headquarters.

Table 5 reports the sectors studied by each country and the number of case studies carried out. The use of case studies at this stage of the analysis was not meant to test any hypotheses but an attempt to widen our knowledge of the topic in order to proceed wisely and effectively to the next stage. Therefore the small sample size should not be of any concern.

**Table 5. Case Studies**

<b>Countries</b>	<b>Sectors</b>
France	Banking (2 case studies)
Germany (Halle, Freiberg)	Pharmaceuticals (2 case studies) Car Industry (2 case studies), Machine Tools (2 case studies), Banking (2 case studies)
Italy	Fine chemicals (2 case studies) Machine tools (2 case studies) Banking (2 case studies)
Sweden	Software (4 case studies) Car industry (2 case studies) Banking (3 case studies)
The Netherlands	Fine chemicals (2 case studies) Software (2 case studies) Banking (2 case studies)
The UK	Pharmaceuticals (2 case studies) Machine tools- Heavy engineering (1 case study) Fine chemicals (various interviews in 2 firms) Banking (various interviews in different banks)

Among the various sources that are usually used in collecting data for a case study, such as documents, archive records, interviews, direct observation, participant observation and physical artefacts, we focused mainly on publicly available information and on semi-structured interviews. Secondary data comprised company annual reports, newspaper articles, journal articles and industry/market reports. These data were found by searching libraries and browsing the Internet. Internal reports were provided by the companies.

The semi-structured interviews were mostly carried out through a *cascade*, starting from the highest levels in the firms and proceeding to the lower ones.

The topic of the research was thoroughly explained to the interviewees immediately before starting the interview. All interviews were conducted face-to-face. On average the teams did not use the audio recorder both because the topic covered some confidential and commercially sensitive information and also because we thought that the interviewee would not have been as comfortable in conveying their personal opinions. In addition, note taking is usually a very good means of data reduction.

Every team asked country-specific and sector-specific questions. However, all the teams tried to find answers to the questions illustrated in Table 6. Most of the questions ask about figures and explanations of company processes. Some are “yes or no” questions. In some cases, the questions require an evaluation from the interviewee, for example in question 5.b.i which concerns the ability of the shareholders to assess the information they get from the firm.

**Table 6: Interviews with the top management and majority shareholders**

<ol style="list-style-type: none"> <li><b>1. <u>Overview of firm’s activities</u></b></li> <li><b>2. <u>Structure of the firm</u></b> <ol style="list-style-type: none"> <li>a. Structure of ownership (presence of insider shareholders and their involvement in activities such as influencing the general strategy, influencing the remuneration of the top management and its composition.)</li> <li>b. Managerial lines of command, from the top management down to those who generate the innovations.</li> <li>c. Number of R&amp;D centres.</li> </ol> </li> <li><b>3. <u>Financial and accounting matters</u></b> <ol style="list-style-type: none"> <li>a. Number of profit centres or cost centres.</li> <li>b. Type of evaluation and control.</li> <li>c. Financial structure</li> <li>d. Forms of financing of R&amp;D and more in general innovation.</li> </ol> </li> </ol>
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#### **4. Product innovation**

- a. Who has the first new idea? (Customers, suppliers, employees or other?)
- b. Who decides whether the idea is feasible and on what basis?
- c. How long does it take to bring a product innovation to market, from initial conception to launch?
- d. Is there a system of rewarding those who produce a good idea? And if yes, of what type?
- e. How is R&D and all other activities connected to the innovation, financed?
- f. Which is the most effective means of protecting product innovation from the competitors: patents on products and processes, secrecy or long-term contracts? Do you use any other form of protection?
- g. Does the need for secrecy represent a real obstacle in explaining to shareholders the work on product innovation taking place in your company?
- h. Do you think you are sufficiently investing in all the activities connected to product innovation? And if not, what are the main reasons?
- i. How would you define the technology employed in your sector? Are there frequent and radical breaks with the past, or is the technology proceeding along an established path? And in comparison to 5 years ago?

#### **5. Relationship with shareholders and lenders and other stakeholders**

- a. What information do the shareholders and lenders ask for and get? (Purely financial information? Broader information about its market position? In depth analysis of its technology strategy and progress in achieving it?)
- b. How well able are they to assess it?
  - i. Do they have a null, medium or high understanding of the firm and its managers, such that they can at least decide whether their information about the firm can be believed? In particular, what is their understanding of the company's financial and competitive position, its corporate strategy; its short and long-term technology strategy and the quality and competence of the current management team?
  - ii. Do they have a null, medium or high understanding of the industry and the technology? In particular what is their understanding of the market trends and the nature of the key technologies and the way they are developing?
- c. What are the consequences for the firm of them receiving various types of information about its performance? In other words, how would they react if the firm intended to cut its dividends in order to raise its R&D?
- d. Is the priority given in the formulation of the corporate strategy to the main stakeholders of the firm such as customers, suppliers, employees, society at large and government, null, medium or high? Is the company's priority that of maximising the shareholders' value even at the expense of the interests of these stakeholders?
- e. Has your company ever carried out/might it consider carrying out a major restructuring operation which involved/would involve dismissing a substantial number of employees? If yes, would the following considerations influence your decision? Problems of conscience: the inner feeling of responsibility to the employees; the social position in the local community would make it difficult; it would throw away skills which are likely to be valuable and thus in the long-run might be self-defeating; effectively blocked by our legal obligations to the workforce.

These interviews were conducted in order to gain an overview of the firms' activities and organisation and also to identify the main steps of the innovation process, the financing of innovation and the current and ideal level of spending in R&D and innovative activities in general. At the same time, managerial lines of command were identified, through departments and subsidiaries, down to middle managers and other stakeholders with hands-on involvement in the innovation. This allowed us to identify the best candidates for the successive interviews, which were arranged and planned during the first interview. During the interviews with the top managers we were also interested in finding out about the relationship of the firm with shareholders, lenders

and powerful stakeholders. The focus was on information flows and understanding, and their consequences. For example, we asked what type of information the shareholders, lenders and other stakeholders required and subsequently obtained and how well they were able to assess it. We were also interested in their usual reaction to long-term investment projects, or in other words, whether they were *patient* or not. We also asked about the role played by the interests of other stakeholders in the formulation of the corporate strategy. We focused mainly on the customers, suppliers and employees, as, from the literature review of the sector, these appeared to be the main stakeholders in the innovation process.

These interviews proved to be very important as they kept us apprised of the important issues in the workflow and enabled us to ask more informed questions in the subsequent interviews. In the following interviews, the central issue was the pattern of performance pressures imposed from the level above in the company hierarchy (See Table 7)

**Table 7 Interviews with middle managers**

<p><b>1. <u>Product Innovation</u></b></p> <p>a. Is enough being spent on innovation? If not, are top managers aware of it?</p> <p>b. How strong are the performance pressures? (Null, Medium, High) In what way are they influencing the innovation process? Has the situation changed over the years?</p> <p>c. What is the system of remuneration? Are there profit-based bonuses? Is this influencing your incentives and perceptions?</p> <p>d. What considerations have played the most important role in deciding to pursue or discontinue an innovation project? For example, is more importance given to short-term profit or to long-term profit? To the interests of employment, to those of the manager in charge of the project, or to a fair share between divisions and departments?</p> <p>e. How often is there a flow of information between the top management and the lower levels in the organisation? What kind of information is circulated? Purely financial information or more detailed reports, which include more technical information about the new product?</p> <p><b>2. <u>Interaction among functions</u></b></p> <p>a. The interaction among which functions is considered important for an effective innovation process in this sector? (Not important, Medium, Very Important)</p> <p>b. Is the level of interaction among such functions redundant, sufficient or lower than what is necessary? If it is lower, why do you think it is so?</p> <p><b>3. <u>Employees</u></b></p> <p>a. To what extent are the skills of the various categories of employees specific to the firm or relevant throughout the industry? (Not important, Medium, Very Important)</p> <p>b. What degree of autonomy do the technicians and blue-collar workers have in carrying out their activity? (Null, Medium, High)</p> <p>c. Is there any form of incentive for this class of employees to contribute to the innovation process?</p> <p>d. Would their suggestions be considered? And rewarded?</p> <p><b>4. <u>Relationship with the subsidiary</u></b></p> <p>a. How many times per year are there face-to-face meetings with the Headquarters of the group?</p> <p>b. What is the degree of autonomy from Headquarters? (Null, Medium, High)</p> <p>c. What performance measures do the Headquarters employ in the evaluation of the subsidiary?</p> <p>d. How tight do you perceive the financial control from Headquarters, in terms of how they respond to a failure to meet financial targets? (Not tight, Medium, Very tight) And what about the non-financial control?</p> <p>e. How would you define the activities of your company relative to those of the group? Central or peripheral?</p> <p>f. Are there any factors that reduce the amount spent on innovation by the subsidiary, such as for example: Tightness of financial targets; Remuneration by profit centre results; Lack of centre's attention to/understanding of the underlying non-financial</p>
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performance of the company; Difficulty of getting funding for product innovation.

The questions were similar to those mentioned above with the difference that in place of the shareholders were the higher levels in the organisation. For example, we asked how the performance pressures affected innovation and if enough was being spent in any type of activity connected to product innovation. We also asked about the system of remuneration and whether it was influencing managers' incentives and perceptions. We tried to understand what considerations played the most important role in deciding to pursue or discontinue an innovation project. For example, was more importance given to short-term profit or to long-term profit? To the interests of the employment, to those of the manager in the lead of the project, or to a fair share between divisions and departments?

We also wanted to know what type of skills are important for product innovation in this sector (firm-specific or industrial specific) and if those who had the ability to contribute to innovation were free to do it and had the incentive to do it. We asked what control measures were used by the higher levels in the organisation and whether such measures were perceived as short-term pressures. We also focused on the importance of interaction among various functions within the organisation, asking whether the current level was near the ideal level or lower.

While interviewing the top manager of a subsidiary we asked about the type of relationship that existed with the Headquarters, trying to uncover problems of distance in space and whether this had changed over time, due to mergers or acquisitions. We also asked about the type of control measures in place and how they were influencing the investment in innovation. We were also interested in knowing whether the subsidiary's business was at the core of the group's business or at its periphery, as this could influence the degree of industry-specific expertise of the Headquarters.

The qualitative information noted down during the interviews was processed immediately afterwards. The interviews were typed, then the data was categorised and interrelated, and finally a summary of the interview was produced. Interviewees were allowed to read draft reports as a check on interpretations, and if required, to make changes.

In addition to the interviews which formed part of case studies of firms, the Sheffield team carried out an extensive series of interviews of personnel of City of London institutional investors: insurance companies and asset management houses. These are described extensively in the UK final report. The Udine team interviewed an official of UCIMU, the Italian Machine Tools industry association. This is drawn on in the relevant reports for Italy.

### ***3.1.3 The COPI survey***

The original idea was to develop the questionnaire on the basis of the results of the case studies. This unfortunately was only partially possible as many teams, for various reasons, were late in completing their tasks (see periodical reports).

The questionnaire for the survey was developed between January and October 2000. A copy of the questionnaire can be found in Annex 1. It comprises four different sections. The first is dedicated to the relationship of the firm with its shareholders and major stakeholders. The second refers to R&D and the third to the relationships with employment. The fourth section was to be answered in place of the first one in case the firm was a subsidiary of a group or multinational. The first draft of the questionnaire was prepared by the British team with a contribution by the Italian team. This draft was discussed and revised in two subsequent workshops, in Sheffield (April, 2000) and in Halle, Germany (May, 2000). The final revised draft was ready for piloting in June 2000. Each country was free to add country specific questions to investigate certain aspects that were specific only to that country. In addition, each pair of countries working on the same sector could agree to joint marginal modifications linked to the specificity of the sector. The COPI survey is therefore composed of a harmonised questionnaire and of several nation-specific and sector-specific versions of the questionnaire. The final harmonised questionnaire, following modifications resulting from the piloting, was ready in November 2000.

As a result of the piloting, several questions were modified. In particular, several country

specific questions needed to be added due to the small size of the firms in certain countries and to the absence of listed firms. Questions on the relationship with outsider shareholders were therefore not applicable and other questions on the identity of majority shareholders, their role in the firm, the percentage of shares and the existence of family links among the shareholders were added.

### **France**

In France the survey was carried out in the car industry and in banking. The questionnaire was sent out respectively in March and November 2001; the response rate was around 10%.

### **Italy**

The piloting of the machine tool questionnaire for Italy was carried out in two different firms in August 2000. As a result of the piloting, several questions were modified. In particular, several country-specific questions needed to be added due to the small size of the firms and to the absence of listed firms. Questions on the relationship with outsider shareholders were therefore not applicable and other questions on the identity of the majority shareholders, their role in the firm, the percentage of shares and the existence of family links among shareholders were added. In addition, in the harmonised questionnaire, not much stress was put on the type of relationship with customers and suppliers, especially suppliers of CNCs. A few questions were therefore added on these issues.

In Italy, the questionnaire was sent out in November 2000 to 106 machine tools producers. The sample was representative<sup>21</sup> and accounted for nearly a quarter of the whole population. The questionnaires were sent to the CEO or to the President, who were asked to answer Sections 1 or 4 and to distribute Sections 2 and 3 to the R&D director and to the Personnel director respectively. In order to find out the names of the CEO or President, each company was contacted by telephone over a period of 10 days. A pre-paid envelope with the return address was included with the questionnaire. We also included a letter explaining the purpose of the questionnaire and assured the confidentiality of the information provided by the respondents. The firms were asked to answer within 4 weeks. After 4 weeks only 1 firm had answered. All the other firms were contacted by phone. Around 50 of them said they were not interested in participating. The others asked to be sent the questionnaire again. This was done in December. More reminder phone calls were made during January and February. In February the questionnaire was sent again by e-mail or fax. Of the 106 firms, 21 answered, giving a response rate of 19.8%.

As for banking, the piloting of the questionnaire sector was made with Prof. Vezzani, an expert in banking at the University of Udine and Modena. Prof. Vezzani also suggested a list of the 100 most representative Italian banks. The questionnaire was sent out in January 2001, and after several reminder phone calls, the response rate was 11%.

The piloting of the questionnaire in the chemicals sector was made in two firms during July 2000. The method employed was the same as for the machine tools sector (pre-paid envelope, reminder phone calls etc.). The questionnaires were sent out in January 2001 to 60 firms, i.e. all the firms belonging to the Association of Fine Chemicals Producers. The response rate was 22%.

### **Germany**

In Germany the survey was carried out in machine tools, and motor vehicles (Freiberg) pharmaceuticals, and banking (Halle). The piloting was done in two firms (two machine tool firms). Freiberg sent the questionnaire out in September 2000. As the response rate of the first try was very low, in April a second round of questionnaires was sent to another 10 firms. Several phone calls were made, first to find the exact names of the managers to whom the questionnaires were sent and then as a reminder. The response rate remained low. Halle sent their questionnaires out later and got a much higher response rate, particularly for banking (24 firms replied).

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<sup>21</sup> The stratification variables were the following: dimension both in terms of employment and of turnover, geographical localisation, and association with UCIMU.

## Sweden

In Sweden the questionnaire was administered in banking, in software and in the car industry. Section 1 on the shareholders was sent to the CEO of each company. Section 2 on the R&D was sent to the R&D manager. Section 3 on personnel issues was sent to the Personnel manager and, finally, Section 4 was sent to the CEO of the subsidiary.

As for banking, the number of sections sent was 135 (respectively 42 of Section 1, 45 of Section 2, 45 of Section 3 and 4 of Section 4). The number of sections answered was 69 (from 34 firms), which gives a response rate of 51%.

In Software, the number of sections sent was 157 (respectively 38 of Section 1, 52 of Section 2, 52 of Section 3 and 15 of Section 4) and the response rate was 31% (41 sections from 27 firms). In the motor vehicles the number of single sections sent was 243 (respectively 30 of Section 1, 79 of Section 2, 79 of Section 3 and 55 of Section 4, for a total of 55 firms) and the response rate was 42%.

## The Netherlands

In the Netherlands the questionnaire was not piloted in companies but in a seminar with controllers who follow a special two-year post-doc training course. They used 4 controllers. Each questionnaire was answered by one controller and when they were ready the team went through the whole questionnaire with them.

Each section of the questionnaire was sent separately to the CEO, the R&D director, the Personnel Director. Each firm was contacted by phone beforehand to find out the names of the various managers. Several reminder phone calls were made to try and increase the response rate.

The Netherlands were in charge of studying chemicals, software and banking. As for chemicals they sent 62 single sections of the questionnaire and had a response rate of 29%. They contacted 15 firms and 12 of them replied with one or more questionnaires.

As for banking, the Netherlands sent 83 single sections of the questionnaire to 12 banks and received back 24 sections overall, at least one from each bank.

As for software, the number of sections sent out was 68 to 11 firms. They received back 15 sections from 8 firms.

## The UK

In the UK, the questionnaire was sent to 115 machine tool firms and the response rate was 5.21%. The questionnaire was the same as the Italian one in the questions relative to the technology but in part different in the country-specific questions on corporate governance. The questionnaire was sent out in April-May 2000. It was sent to the Chief executive of all the manufacturing firms in the sector. After four weeks the team made a reminder phone call. At this stage all the firms that had not responded replied that they would not participate, mainly due to lack of time. As for banking and biotechnologies, the response rate was 33% and 11.7% respectively.

**Table 8. Number of firms responding by country and sector.**

	Machine tools	Fine chemicals	Software	Car industry	Pharmaceuticals	Biotechnology	Banking	Total
France				16			8	24
Germany (Halle, Freiberg)	5			16	26		24	71
Italy	21	12					11	44
Sweden			27	55			34	116
The Netherlands		12	8				12	34
The UK	8	2				6	9	25
Total	34	26	35	87	26	6	102	316

## 3.2 Description of the results

### 3.2.1 Expectations about sectors based on secondary literature

As mentioned above, the hypothesis that was being tested in this project was that different sectors differ in their degree of visibility, appropriability and novelty, and that different systems of corporate governance differ in their ability to deal with these differences.

As for the degree of visibility, Tylecote and Conesa (1999), drawing on secondary literature, argue that industries characterised by more frequent incremental and component innovations present on average a low degree of *visibility*. This is because incremental and component innovations are based on the core capabilities of a firm, which are in large part tacit types of knowledge and, therefore very difficult to assess by an outsider. On the contrary, architectural and radical innovations often require a deep process of codification of the tacit knowledge in order to carry out the essential organisational reengineering. For example engineering industries are characterised by relatively higher spending in the low *visibility* areas of development, design and engineering. The process of innovation is generally decentralised and the low effectiveness of patents (see Table 10) requires the maintenance of a high level of secrecy, which inevitably reduces the degree of *visibility*. Other industries such as chemicals and pharmaceuticals exhibit a higher *visibility*.

**Table 9: Average percentage distribution of innovation costs of Italian innovating firms by item.**

	R&D	Design, engineering and pre-production developments	Innovative capital goods	Marketing	Acquisition of patents and licences
<i>Supplier dominated</i>					
Clothing	16.5	36.2	27.1	18.9	1.3
Leather and footwear	15.5	17	63.4	2.8	1.3
Wood products	9.7	10.2	78.1	1.3	0.7
<i>Specialised supplier</i>					
Machine-tools	47.6	27.6	22.2	2.1	0.5
Industrial machinery	38.9	31.1	24.8	2.3	2.9
Instruments	54	21.3	21.3	2	1.4
<i>Scale intensive</i>					
Basic industrial chemicals	47.3	6.4	45	0.8	0.5
Domestic appliances	27.2	14.7	54.1	1.1	2.9
Motor vehicles	37.8	4	58.1	0.1	-
<i>Science based</i>					
Pharmaceuticals	66.7	8.7	18	2.1	4.5
Office machinery and computers	64.8	21.7	12.4	1	0.1
Radio, TV and communication equipment	66.1	18.2	13.7	1.2	0.8

Source: ISTAT (1995:Table 11).

As shown in Table 9, the share of spending in highly *visible* activities (mainly R&D and fixed capital) is very high. Moreover, as illustrated in Table 10, both of the industries present a relatively large proportion of spending in the areas of basic and applied research. Likewise, for the chemical sector, Moretti (1999) reports that the degree of cultural distance on average appears to be low and the degree of codifiability and the effectiveness of patenting are definitely high. As for the pharmaceutical sector, Ramirez and Tylecote (1999) report that firms regularly display their expenditures on capital, R&D and marketing; the research and especially the development

processes are extremely regulated<sup>22</sup> and generally very centralised; and the final product embodies a high degree of codified knowledge.

**Table 10. Distribution of R&D activity in 1985, UK**

Sector	Basic research	Applied research	Development	Total
<b>Mechanical engineering</b>	35.4	20.8	43.8	100
<b>Motor vehicles and other transport equipment</b>	29.2	20.5	50.3	100
<b>Electrical and electronic engineering</b>	29.3	24.9	45.8	100
<b>Aerospace</b>	36.6	17.3	46.1	100
<b>Office machinery</b>	0.8	24.4	74.8	100
<b>Chemicals and pharmaceuticals</b>	30.4	54.7	14.9	100
<b>Food, drink and tobacco</b>	48.2	38.6	13.2	100

Source: Doudeyns and Hayman (1993).

**Table 11. Inventions that would not have been developed in the absence of patent protection (%)**

Sectors	Number of inventions
<b>Electrical equipment</b>	11
<b>Machinery</b>	17
<b>Motor vehicles</b>	0
<b>Fabricated metal products</b>	12
<b>Instruments</b>	1
Office equipment	0
Primary metals	1
Rubber	0
Chemicals	38
Pharmaceuticals	60

Source: Mansfield (1986).

According to the two authors, it is also possible to distinguish between sectors with a low level of *appropriability* such as engineering and industries with a high level of *appropriability* such as the chemical and pharmaceutical ones. The former group is in fact based on *object-oriented* technology (with a heavy demand of accumulation of skills on the shop floor and importance of core competences) and it is characterised by a need for close long-term inter-firm relationships due to the use of components and other sub-systems supplied by other firms. In addition, as mentioned before, means of appropriation such as patenting do not seem to be as effective as in other sectors and firms tend to rely more on secrecy. On the other hand, chemicals and pharmaceuticals are based on a *function-oriented* technology and the use of patents appears to be essential in the innovation process<sup>23</sup> (see Table 11). At the same time, however, within engineering there are sectors, such as electronics, characterised by a high level of change of the key technologies, for which it can be assumed that the relationships with suppliers and customers need to change very rapidly, “in an almost kaleidoscopic way”. On the other hand, within chemicals it is necessary to distinguish between volumes chemicals,<sup>24</sup> “where one may expect to find arms-length relationships

<sup>22</sup> During the development process companies have to provide data and information to the regulatory authorities.

<sup>23</sup> See Archibugi and Pianta (1996).

<sup>24</sup> Bulk steel, glass production, etc.

with customers”, chemicals effects,<sup>25</sup> “where the needs of particular customers are likely to be of importance and CLIR (close long-term inter-firm relationships) therefore seem likely to be helpful” and pharmaceuticals and agro-chemicals, “where the customers are too numerous for CLIR to be relevant, and relationships upstream are rather unimportant” (ibid., p.29).

Finally, so far as novelty is concerned, sectors such as electronics, pharmaceuticals and part of chemicals, present a much higher degree of *novelty* than the engineering industries in general (which however, have undergone quite important changes with the invention of NC<sup>26</sup> and CNC<sup>27</sup> machine-tools and the introduction of CAD<sup>28</sup> and CAM<sup>29</sup> technologies).

### ***3.2.2 Degree of visibility, appropriability and novelty resulting from to the project***

The arguments reported above were mainly based on secondary literature. The following sections contain the results of the COPI survey. The latter consisted of a series of questions that were asked with the specific purpose of highlighting the degree of visibility, appropriability and novelty of the sectors under study. As it will be shown, most of the results are in line with the inferences made by Tylecote and Conesa (1999) on the basis of the secondary literature. However, through the data collected *ad hoc* for this project we are now able to explain with much more accuracy and precision the issues under investigation. Moreover, sectors such as software or biotechnologies have become very important only in the last few years and there is not sufficient secondary literature about them. Finally, the banking sector has changed profoundly since the introduction of ICTs and a thorough investigation of this sector requires a totally new approach.

As will be shown, the hypothesis that high-tech sectors (pharmaceuticals and biotechnologies) have a higher degree of visibility, appropriability and novelty than the medium-low technology sectors (machine tools, car industry, chemicals, banking) appear to be supported by the data. The major surprise has been software, where the low effectiveness of patents and copyrights and the high reliance on secrecy appear to suggest a low degree of visibility.

#### *Visibility*

As was mentioned in Section 3.1, the visibility of a sector was analysed referring to the importance played by patents and other means of protection of an innovation, the importance of secrecy, the relative weight of various types of expenditure on innovation and the distance in time.

Patents are in fact public and therefore visible in themselves and allow further public discussion with some protection against imitation by rivals. Two of our high technology sectors (pharmaceuticals and biotechnologies) did indeed show significantly higher ‘*importance of patents on products to protect your product innovation from competitors*’ than the rest. The medium-high technology sector, fine chemicals, was in the middle group with machine tools and motor vehicles; and the other high-tech sector, software, was almost as low on this measure as the lowest, banking (Table 12).

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<sup>25</sup> Paints, adhesives etc.

<sup>26</sup> Numerical controls.

<sup>27</sup> Computer numerical controls.

<sup>28</sup> Computer aided design.

<sup>29</sup> Computer aided manufacturing.

Table 12. Which of the following do you count on to protect your product innovations from competitors? Please indicate their importance now and five years ago (1= Not Used; 7= Very important)

Sector of activity		Patents on processes, now	Patents on products, now	Copyrights, now	Your firm's specific knowledge and expertise, now	Complementary assets, now	Secrecy, now	Long term contracts, now
Machine Tools	Mean	2,03	3,45	1,56	5,39	5,04	4,55	3,24
	N	31	31	27	31	27	31	29
	Std. Dev	1,87	2,63	1,45	1,71	1,87	2,13	1,83
Chemicals	Mean	3,17	3,67	1,62	5,00	3,81	5,18	3,63
	N	18	18	16	16	16	17	16
	Std. Dev	2,43	2,57	1,20	1,32	1,72	1,70	2,16
Software	Mean	1,85	2,86	3,93	5,77	4,93	5,14	4,79
	N	13	14	14	13	14	14	14
	Std. Dev	1,14	1,83	1,64	1,01	1,64	1,56	1,12
Pharmaceuticals	Mean	4,63	5,90	5,00	5,06	4,94	5,33	
	N	19	20	16	18	17	18	
	Std. Dev	1,98	1,52	1,46	1,55	1,25	1,08	
Car industry	Mean	3,54	4,51	3,00	5,41	5,17	5,16	5,10
	N	50	51	36	49	40	51	52
	Std. Dev	1,94	2,05	1,80	1,58	1,72	1,59	1,61
Biotechnology	Mean	6,17	6,83	2,83	5,83	3,67	5,33	5,00
	N	6	6	6	6	6	6	6
	Std. Dev	,98	,41	2,14	1,17	2,34	1,63	2,00
Banking	Mean	1,67	1,52	2,32	4,97	4,59	4,62	3,05
	N	24	23	25	30	27	26	22
	Std. Dev	1,24	,95	1,77	1,59	1,82	1,88	1,43

The more a firm depends on secrecy to protect its innovations, the less visible it will be to shareholders, and the more it needs to include stakeholders (particularly employees) to prevent leakage. Here our results are mixed. When we asked ‘how much importance is given to secrecy in protecting product innovations’, all the high tech sectors rated it high or very high; so did the others, less surprisingly (Table 12). Changing the question to ‘Is the need for secrecy a real obstacle to explaining to shareholders the work on product innovation?’ produced a very different picture. The figure for pharmaceuticals was low; but so was that for machine tools. The highest result was for the car industry; biotechnologies, software and banking also have high values (Table 13).

**Table 13. Is the need for secrecy a real obstacle in explaining to shareholders the work on PI?**

<b>Sector of activity</b>	<b>Mean</b>	<b>N</b>	<b>Std. Deviation</b>
<b>Machine Tools</b>	2,10	20	1,94
<b>Chemicals</b>	2,56	9	2,46
<b>Software</b>	3,65	17	2,03
<b>Pharmaceuticals</b>	1,93	15	1,16
<b>Car industry</b>	2,91	23	2,11
<b>Biotechnology</b>	3,20	5	1,92
<b>Banking</b>	3,27	55	1,55
<b>Total</b>	2,91	144	1,85

The explanation seems to be as follows:

Machine tool firms in general (and our sample in particular) are relatively small firms, mostly owned (majority or 100%) by insider shareholders with whom secrets can be shared. This is not the case for pharmaceuticals: but in pharmaceuticals there is a long time to market from the inception of work on an innovation, and secrecy counts mostly at the beginning. Most of the money is spent in the later stages when the firm is relying on patent protection – and that is the part that needs to be explained to shareholders. Our biotechnology firms, many of which are part of the pharmaceuticals sector, operate in the ‘early’ part of the innovation process, and therefore most of what they are doing is affected by secrecy. Software and banking, as we have seen, can rely little on patent protection and therefore depend heavily on secrecy throughout their innovation process.

As for the importance of the various types of expenditure on innovation, the results are not clear. The only significant difference is in training. Training, seems to be a lower visibility activity and one which is harder to appropriate. If a great deal of training is required for an innovation to succeed, this will tend to favour firms dominated by insiders and ones which include stakeholders, including employees. We found that our medium tech sectors rated training a significantly (10% significance) more important contributor to product innovation than the high technology sectors (Table 14).

**Table 14. On a scale of 1 to 7, indicate the importance of different types of expenditure on product innovation in previous 12 months.**

Sector of activity		Development and design	Fixed capital	Marketing and sales	Research (IT for banking)	Training
Machine Tools	Mean	6,07	3,71	4,20	4,63	4,07
	N	30	31	30	30	29
	Std. Deviation	1,08	1,55	1,56	1,83	1,51
Chemicals	Mean	5,11	4,16	4,68	4,68	4,21
	N	19	19	19	19	19
	Std. Deviation	1,49	,83	1,57	1,63	1,65
Software	Mean	5,54	2,50	4,69	3,77	3,62
	N	13	12	13	13	13
	Std. Deviation	,97	1,09	1,18	1,79	1,33
Pharmaceuticals	Mean	6,00	3,68	3,95	5,38	3,80
	N	20	19	20	21	20
	Std. Deviation	1,03	1,60	1,54	2,01	1,64
Car industry	Mean	5,27	3,64	4,00	4,65	4,01
	N	49	39	48	48	49
	Std. Deviation	1,67	1,42	1,60	1,99	1,49
Biotechnology	Mean	4,40	3,00	1,50	5,40	2,00
	N	5	4	4	5	5
	Std. Deviation	2,41	1,41	,58	2,61	1,41
Banking	Mean	4,60	3,44	4,93	5,65	4,25
	N	15	39	40	40	28
	Std. Deviation	1,80	1,47	1,53	1,03	1,32
Total	Mean	5,43	3,57	4,31	4,92	3,97
	N	151	163	174	176	163
	Std. Deviation	1,52	1,43	1,61	1,81	1,52

1= None or insignificant

7= A major element of product innovation expenditure.

As for the distance in time, high-tech sectors appear to take much more time in introducing a radical innovation than medium-tech sectors. This data must be interpreted together with the effectiveness of patents. In fact, even if the development process takes a long time, if firms can make use of patents very early in the life of the product, the distance in time may not have great influence on the visibility of the innovation. In pharmaceuticals and bio, the two sectors where patents appear most effective, the long distance in time does not reduce the degree of visibility. Software shows the highest distance in time and at the same time it does not receive strong protection by means other than secrecy, such as patents or copyrights (Table 15 – next page).

On average we can therefore identify three main groups of sectors: a group of high-tech sectors with medium-high visibility (pharma and bio); a second set of medium-tech sectors with low visibility (machine tools, chemicals, banking and car industry); and, finally, the software sector that even if it is a high tech sector presents a low degree of visibility. It must be mentioned that even though in the car industry patents appear to work effectively, secrecy remains very important because of the “style effect”, that is, competition is now based more on an innovation in style rather than in the technology. And style cannot be patented (Pagué, 2000).

**Table 15. On average, how much time does it take to bring a product innovation to market - from initial conception to launch?**

Sector of activity		Time to market for clearly new products	Time to market for incremental change in existing products
Machine Tools	Mean	1,4897	,7220
	N	29	25
	Std. Deviation	,8322	,2948
Chemicals	Mean	3,3658	1,5447
	N	19	19
	Std. Deviation	3,7725	2,4681
Software	Mean	10,1538	3,9583
	N	13	12
	Std. Deviation	7,4369	2,5087
Pharmaceuticals	Mean	7,4118	4,1667
	N	17	18
	Std. Deviation	2,9381	2,3326
Car industry	Mean	2,6333	1,7565
	N	36	46
	Std. Deviation	1,6603	1,6848
Biotechnology	Mean	7,3333	3,7000
	N	6	5
	Std. Deviation	3,4448	1,9875
Banking	Mean	3,6460	1,4848
	N	26	26
	Std. Deviation	4,9034	1,9899
Total	Mean	4,1010	2,0384
	N	146	151
	Std. Deviation	4,4338	2,1835

#### *Appropriability*

In Tylecote and Conesa (1999) it was argued that when the degree of appropriability is high, the best strategy is to maximise the value for the shareholders. Instead, when there are spillovers to others, there is the need to form a much wider coalition, or in other words, the best strategy is to include the other main stakeholders of the innovation. As will be shown, there are no sectors where the appropriability is complete or where the maximisation of the shareholders value is the best strategy. In all sectors, even if with different degrees, there is the need to include at least one group of stakeholders. This is one of the main findings of the COPI survey. On the one hand, it shows that the shareholders perspective is not the best in absolute terms, as a large part of the literature on corporate governance argues. On the other hand, it also shows that it is not convenient to give consideration to every group of stakeholders “for their own sake” (Donaldson and Preston, 1995, p.67), as the stakeholders’ perspective suggest. In every sector there are different groups of stakeholders that need to be included for the risk of spillovers or for their firm-specific investments.

We mentioned above that the degree of appropriability is deeply influenced by the effectiveness of patents and other means of protection of innovation. These are significantly more effective as means of appropriation in pharmaceuticals and biotechnologies than in the medium-tech sectors (machine tools, chemicals and banking). As mentioned above, software is the only high-tech sector that appears to have a low degree of appropriability; the effectiveness of patents is significantly (1%) lower than in the other high-tech sectors. The car industry, on the other hand, is the only medium-tech sector where patents on products are rather important means of protection. However, as mentioned above, spillovers concerning the appearance and style of a car force firms to maintain a high degree of secrecy over their models until the very last minute before launch.

With respect to the employees, the need to include them in the overall strategy of the firm, can arise for two main reason. On the one hand, when secrecy is important and there are no means to protect innovation effectively, an employee could walk away with the secrets concerning the

innovation. On the other hand, when the innovation is the result of the activity of employees with firm-specific skills, these need to be included to offer an incentive to invest in skills that could not be used by the employees in another firm and are therefore at risk (Soskice, 1999).

In the medium-tech sectors on average, and in machine tools in particular, every section of the workforce appears to have a higher degree of firm-specificity than in the high-tech sectors. However, the issue of the firm-specificity explained above, affects only machine tools where every section of the workforce can in various ways contribute to the innovation process (Visintin, 2001). In the other medium-technology sectors the key innovation workers are to be found among the “graduate engineers and technologists” and, for banking, among the “graduate IT personnel” whose skills appear to be on average more industry-specific rather than firm-specific. Nevertheless, the low effectiveness of patents suggests that in all the medium-tech sectors, the key innovation workers need to be included. The same applies to the high-tech sectors. This is because, also in these sectors secrecy is important and those employees that play an active part in the innovation process need to be included to avoid spillovers (Table 16).



**Table 16.**For the following categories of employees to what extent are their skills specific to the firm or relevant throughout the industry? (1=Specific to the firm; 7=Relevant through the industry) .

<b>Sector of activity</b>		<b>direct production operatives</b>	<b>graduate engineers, technologist</b>	<b>graduate IT personnel</b>	<b>sales and marketing managers</b>	<b>sales representatives</b>	<b>senior management</b>	<b>service engineers</b>	<b>technicians/manual workers</b>	<b>technicians/non graduate programmers</b>
<b>Machine Tools</b>	Mean	4,03	3,86	3,48	3,74	4,21	4,11	3,59	4,50	4,07
	N	30	29	29	31	29	27	27	30	29
	Std. Dev.	1,67	1,46	1,40	1,65	1,42	1,89	1,87	1,63	1,46
<b>Chemicals</b>	Mean	5,07	5,07	4,21	4,46	4,75	5,00	4,82	4,93	4,57
	N	14	14	14	13	12	12	11	14	14
	Std. Dev.	1,64	1,64	1,72	1,94	1,48	1,21	2,09	1,44	1,40
<b>Software</b>	Mean	5,30	4,50	4,81	5,24	5,19	5,67	5,17	4,79	5,29
	N	10	14	16	17	16	15	12	14	14
	Std. Dev.	1,16	1,95	2,26	1,44	1,68	1,23	1,70	1,63	2,02
<b>Pharmaceuticals</b>	Mean	4,00	4,75	1,00	3,93	3,55	1,00	3,55	3,94	4,38
	N	16	16	3	15	11	3	11	16	16
	Std. Dev.	1,67	1,29	,00	1,83	1,63	,00	1,63	1,44	1,26
<b>Car industry</b>	Mean	4,13	4,98	4,86	4,64	4,24	5,29	3,71	4,50	4,43
	N	40	41	35	39	38	34	31	40	37
	Std. Dev.	1,74	1,21	1,59	1,37	1,58	1,27	1,40	1,48	1,52
<b>Biotechnology</b>	Mean	6,00	5,00	4,83	5,00	5,00	5,83	-	6,00	5,50
	N	1	1	6	1	1	6	-	1	6
	Std. Dev.	0	0	1,47	0	0	1,17	-	0	1,22
<b>Banking</b>	Mean	3,57	3,85	5,09	4,44	4,64	4,33	3,00	4,42	4,76
	N	7	39	45	48	39	58	2	12	50
	Std. Dev.	1,27	1,51	1,49	1,58	1,65	1,76	1,41	1,98	1,64
<b>Total</b>	Mean	4,28	4,42	4,51	4,40	4,44	4,68	3,96	4,51	4,58
	N	118	154	148	164	146	155	94	127	166
	Std. Dev.	1,67	1,53	1,76	1,62	1,60	1,73	1,76	1,57	1,57

The ideal degree of interaction with customers for purposes of innovation is rather high in all sectors and there are no significant differences between high and medium-tech sectors. All the sectors (we do not have any data for pharmaceuticals) present a mean that is significantly higher than the value 4.5 (biotechnologies at the 10% level, all the other sectors at the 1% level).

The ideal degree of interaction with suppliers is significantly lower in the high-tech sectors (biotechnologies and software) than in the medium-tech sectors. The difference in mean is 1,59 at the 5% level. None of the companies in pharmaceuticals answered this question (Table 17).

**Table 17. On a scale of 1 to 7 what is the degree of interaction with the following in relation to product innovation; and what should it ideally be in such a business as yours? (For customers we are not concerned with retailers, wholesalers or households; where these are the only important customers please tick Not Applicable.)**

Sector of activity		Ideal degree of interaction between firm and its customers	Ideal degree of interaction between firm and its suppliers	Present degree of interaction between firm and its customers	Present degree of interaction between firm and its suppliers
Machine Tools	Mean	5,97	5,12	5,14	4,34
	N	30	31	29	29
	Std. Deviation	1,10	1,76	1,53	1,56
Chemicals	Mean	6,32	4,84	4,61	4,05
	N	19	19	18	19
	Std. Deviation	,95	1,21	1,50	1,47
Software	Mean	5,64	4,70	4,71	3,60
	N	14	10	14	10
	Std. Deviation	1,34	1,06	1,20	,84
Car industry	Mean	6,00	5,60	4,78	4,14
	N	50	48	51	49
	Std. Deviation	1,09	1,11	1,25	1,31
Biotechnology	Mean	5,60	3,50	5,60	3,00
	N	5	6	5	6
	Std. Deviation	1,14	1,76	1,14	1,55
Banking	Mean	5,68	5,45	4,44	4,53
	N	34	38	32	38
	Std. Deviation	1,07	1,25	1,19	1,33
Total	Mean	5,91	5,23	4,78	4,19
	N	152	152	149	151
	Std. Deviation	1,10	1,39	1,33	1,39

1= None; 7= Very High.

**Table 18. Sources of innovation (1998).**

Proportion of enterprises which used these sources of innovation		Product innovation	Process innovation
Buyers (general)	Motor vehicles	67	n.a
	Other manufacturing	71	n.a
Direct customers suggestions	Motor vehicles	62	n.a
	Other manufacturing	59	n.a
Anonymous surveys	Motor vehicles	38	n.a
	Other manufacturing	39	n.a
Suppliers	Motor vehicles	37	24*
	Other manufacturing	28	14
Competitors	Motor vehicles	37	19**
	Other manufacturing	31	8
Science	Motor vehicles	23	13
	Other manufacturing	14	8

\* significant at the 0.1% level; \*\* significant at the 0,05% level.

Source: *Zur technologischen Leistungsfähigkeit Deutschlands, 2000: Zusammenfassender Endbericht 2000*, Bundesministerium fuer Bildung und Forschung, Bonn, March 2001

In particular, the importance of the suppliers in the innovation process of firms in the car industry (and in particular for the process innovation) is confirmed also by secondary data (see Table 18). The same applies to the competitors.

To conclude, both in the high-tech and in the medium-tech sectors the key innovation workers and the customers should be included. The suppliers, instead, appear to require some sort of inclusion only in the medium-tech sectors and much lower in the high-tech sectors.

#### *Novelty*

As mentioned above the degree of novelty of a sector can be measured by the R&D intensity, by the percentage of employees who spend more than 50% of their time doing R&D and by the percentage of turnover deriving from products innovated in the last 3 years. Pharmaceuticals and biotechnologies present very high proportions of the workforce who spend more than 50% of their time doing R&D and show also very high R&D intensities (Table 19 and Table 20).

**Table 19. Percentage of the workforce that spend more than 50% of their time doing R&D**

Sector of activity	Mean	N	Std. Dev.
Machine Tools	5,71	24	4,7006
Chemicals	8,49	9	12,9551
Software	6,15	6	9,2670
Pharmaceuticals	24,69	12	28,8430
Car industry	,9412	9	2,0520
Biotechnology	63,7	4	318,64
Banking	4,83	31	4,1561
Total	16,80	95	72,77

**Table 20. R&D intensity**

Sector of activity	Mean	N	Std. Dev.
Machine Tools	4,3257	18	3,9365
Chemicals	4,6182	3	4,8242
Software	9,6099	3	7,9644
Pharmaceuticals	122,3563	10	180,6365
Car industry	13,8589	7	22,6474
Biotechnology	287,9630	3	430,4062
Total	52,3866	44	148,4359

In pharmaceuticals, however, only 20% of turnover derives from products innovated in the last three years. Software, instead, does not show high values for R&D intensity or for the percentage of employees working on innovation. At the same time, as much as 53% of the turnover derives from products innovated in the last three years (significantly higher than pharmaceuticals, car industry, chemicals and banking). The other sectors do not present significant differences and show rather low values in all three variables, especially if the medians are considered (Table 21 – next page).

To summarise and conclude, pharmaceuticals and bio-technologies are high tech sectors, characterised by high visibility, medium-high appropriability and high novelty. Software is a medium-high technology sector, with a rather low degree of visibility, medium appropriability and medium high degree of novelty. The other sectors (machine tools, car industry, banking, chemicals) are medium technology sectors with a low degree of visibility (with the possible exception of the car industry where patents on products appear to work rather effectively), low appropriability and low novelty.

**Table 21. What percentage of your turnover is from products innovated in the last 3 years?**

<b>Machine Tools</b>	Mean	33,04
	Median	30,00
<b>Chemicals</b>	Mean	21,71
	Median	20,00
<b>Software</b>	Mean	53,57
	Median	40,00
<b>Pharmaceuticals</b>	Mean	20,16
	Median	20,00
<b>Car industry</b>	Mean	26,27
	Median	11,00
<b>Biotechnology</b>	Mean	60,50
	Median	60,50
<b>Banking</b>	Mean	16,15
	Median	10,50

### **3.3.3 Systems of corporate governance**

As was mentioned in Section 2, our starting point was the expectation that high technology sectors such as pharmaceuticals and biotechnologies had a number of common characteristics which made them relatively well suited to ‘outsider-dominated’ financial and corporate governance systems like that of the UK and the US – compared to medium technology areas like motor vehicles, and machine tools, which were better-suited to ‘insider-dominated’ systems, particularly when these involved the ‘inclusion’ of stakeholders like employees and suppliers (as in Germany and Japan). In this section we report the main findings of the COPI project with respect to the characteristics of the corporate governance systems of the six countries participating in the project.

The first important result arising from the COPI survey, is that on average, all top managers say that they give more priority to the shareholders than they used to do 5 years ago (see Table 22).<sup>i</sup> However this can be seen as a return to the past rather than as indicating that things are being done in the ‘Anglo-Saxon’ way. German Mittelstand firms owned and controlled by a founding family have a reputation for caring a great deal about profitability, short-term and long term; so do their Italian equivalents, one of which we have studied in great depth. Relative indifference to profitability is characteristic of large management-controlled firms with dispersed ownership in which those owners were half asleep – of which there were a great number in the UK in the 1950s and 60s, before the owners, still dispersed, became more active in various ways. Large German firms (and this is probably true of other Continental countries) entered this phase later and are leaving it later. Their reassertion of the importance of profitability may be done with an English phrase, but that does not imply all the Anglo-Saxon baggage comes with it. For example, companies are not yet generally vulnerable to hostile take-overs in any of the Continental countries – though vulnerability has increased greatly in France.

However there is no doubt that shareholders are showing more impatience with low profits. And there is no doubt that when a large diversified German (or any) firm reasserts the importance of profitability (and starts for the first time talking about its share price) it is likely to do so by putting stress on accounting measures of the performance of divisions, which are notorious for inducing (excessive)<sup>ii</sup> interest in short term profit and discouraging co-operation among divisions. Our questionnaire data shows that exactly this is happening (Table 23).<sup>iii</sup>

**Table 22. Is your main priority to maximise shareholder value, if necessary at the expense of the interests of other stakeholders?**

	N	Mean	St. D.
<b>Total</b>			
Now	95	3.82*	1.82
5 years ago	86	3.37*	1.76
<b>Germany</b>			
Now	30	3.87**	1.5
5 years ago	23	3.48**	1.24
<b>Sweden</b>			
Now	30	4.20*	1.83
5 years ago	28	3.50*	1.90
<b>Italy</b>			
Now	28	3.57	2.10
5 years ago	29	3.48	1.99
<b>Netherlands</b>			
Now	5	2.80	2.05
5 years ago	4	1.75	0.96
<b>France</b>			
Now	2	3.50	0.71
5 years ago	2	2	1.41

\*Differences in means significant at the 1% level (2-paired sample T-test).

\*\* Differences in means significant at the 5% level (2-paired sample T-test)

**1= We always insist on balancing the interests of the shareholders with those of the other stakeholders.**

**7= We give complete priority to shareholders' interests.**

**Table 23. On a scale 1 to 7, how tight do you perceive the financial control from Headquarters, in terms of how they respond to a failure to meet the financial targets?**

Total	Financial control today	Financial control 5 years ago	Financial control should be
N	65	60	66
Mean	5.33	4.64	5.25
St.dev	1.27	1.39	1.22

5.33>4.64 significant at the 1% level

5.33>5.25 not significant

1=Very loose

7=Very strict

#### *Degree of firm-specific perceptiveness*

In the COPI survey, the degree of firm specific perceptiveness has been studied analysing the understanding by the shareholders of a series of issues concerning the firm, its short and long-term technology strategy, and the involvement of the shareholders in the management of the firm. On average, in the Netherlands the shareholders (both the majority shareholder and the average shareholders) appear to have the lowest firm-specific perceptiveness (differences in means are significant at the 10% level with respect to Italy, Germany and Sweden as far as the understanding of the general situation is concerned), even lower than in the UK. The UK, as expected, shows lower values than the other countries both for the majority shareholders and for the average shareholders. Outsider shareholders should in fact not have market-sensitive information to be free to buy and sell shares on the market. We were actually expecting even lower values for the UK but the presence of insider shareholders in small firms and of venture capitalists in high-tech firms might have raised the means.

The influence of the shareholders on the general strategy, on the selection of the top management team and on the remuneration system is rather high in all countries with the exception of the Netherlands. The latter shows significantly lower values than any other country for the

variable “influence on the general strategy” and lower values than France, Sweden and Germany for the variable “selection of the top management team”. The UK shows rather high absolute values (even if on average lower than the other insider countries), with the exception of the variable “influence on the remuneration system”.

This data can be easily explained by reference to the systems of corporate governance of the various countries.

In Italy there is a very high *firm-specific perceptiveness* among shareholders of both small and large firms. Family control is one of the most widespread forms of control and the owners and their families usually operate actively within the firm. Codified and tacit knowledge is transferred from one generation to the other in a process which starts very early in the life of the family members. Short-term pressures coming from the shareholders are therefore very unlikely and in general do not prevent firms from investing in innovative projects. Moreover, as in practical terms there are no threats of take-overs, short-term pressures are also not performed by the market for corporate control. Even when control is indirect and exercised through the chain of equity shares (i.e. groups of firms), at the end of the chain there is usually a family (for example Agnelli family) exercising influence. In this case, the *firm-specific perceptiveness* allows firms to overcome the inefficiencies of the capital market. Thus, the capital acquired by one firm could be re-directed to another firm within the same group to ameliorate problems of liquidity. On the other hand, banks and other financial institutions have never played a central role in the corporate governance of Italian firms. The only exceptions have been Mediobanca, banks within districts, and banks related to large firms through interlocking directorates.

A peculiarity of the Italian system is the role played by the state. Before the beginning of the privatisation process public firms were present in several industrial and service sectors, accounting for 20 per cent of the value added. Nevertheless, as public managers were usually appointed for political reasons and very often they were politicians rather than managers, it can be argued that, much as in France, they have “no more capacity than outsider investors to monitor and evaluate innovation carried out in a multitude of smallish firms or subdivisions of large firms” (Tylecote and Conesa, 1999, p.34). Moreover, in many cases, investments were not made on the basis of the expected future profits, but were inspired by other aims such as macroeconomic objectives or the development of strategic sectors.

The state has now retreated to some extent. Thus, among the 20 largest firms in 1989 there was IRI (the largest public holding with partial or 100% holdings in firms in strategic sectors), Fiat, the public groups Eni, Enel, Efi and the joint venture of Eni (Enimont and Fintermica). These were followed by the largest family groups, Mondadori, Barilla, la Smi of Orlando, Burgo, Falck, Rizzoli, Marzotto, Pesenti with Italcementi. During the 1990s, the various firms controlled by Iri have been acquired by various large family groups (the last privatisations occurred during June 2000-Finmeccanica), notably Benetton together with other firms of the districts of the Veneto region (spectacles, furniture, etc). At the moment it is possible to distinguish 4 main groups among the largest firms in Italy:

- 1) those of foreign origin (Esso, IBM, Autogerma, Omitel of Mannesman and Vodafone);
- 2) the still public firms (Enel, Poste, Railways and Iri until 2000) and the public companies with a large share in the hands of the state ( Eni and in 2000 Finmeccanica);
- 3) the family firms with a pact among the larger shareholders (Agnelli-Ifi- Fiat, Pirelli-Tronchetti Provera, Parmalat-Tanzi, Riva Acciai, Berlusconi-Fininvest-Mediasset, Pesenti-Italmobiliare-Italcementi);
- 4) the public companies with a larger shareholder (Compart and Telecom).

So, there are no outsider-dominated companies at all yet (Bianchi, 2002): as the state retreats, the families advance.

The Swedish system of corporate governance is in some respects similar to the Italian one. Both systems are characterised by a high concentration of ownership and control of listed firms in the hands of a few families, even though the percentage of ownership in the hands of individuals has in Sweden progressively decreased since the 1970s. This, however, has not reduced the

concentration of control as the widespread use of dual class shares<sup>30</sup> allows keeping control with a small percentage of shares. This situation is however changing very rapidly.

As a consequence of the concentration of ownership (or at least of the shares with voting power), as much as in Italy, the market for corporate control in Sweden is to a large extent located outside the ordinary stock market. The stock exchange in Sweden is however much more liquid and developed than the Italian one and the percentage of shares in the hands of financial institutions is much higher than in Italy. Since the 1970s there has been an emergence of investment companies which, apart from operating as venture capitalists, tend to establish strategic long-term minority positions in a few publicly-traded operating companies and to play an active role in the corporate governance of these firms. Their importance has however decreased during the 1990s, with the penetration of foreign investors.

Public ownership of business sector companies has never been extensive in Sweden and during the 1990s the process of privatization has further reduced this presence.

As for the role played by banks, we need to go back to the fall of the Kreuger empire in 1932, when several banks were heavily damaged. In response, the Company Act and bank legislation were reformed. Since then banks have no longer been allowed to own shares except to protect bad debts and for a limited period. Nevertheless some of them set up investment companies, transferred their industrial shares to those holding companies and offered to their own shareholders the shares of the investment companies. In addition, the industrial firms, whose shares were in large part in the hands of the same investment companies, were also customers of the banks. During this period the so-called “bank spheres” were also established. They are characterized by managerial cooperation, mutual membership in Boards of Directors and support in internationalization effort, resembling in this way the German model. Within the spheres, “banks provided financial problem solving and to a considerable extent, industrial leadership, with a long-term perspective” (Adolfsson *et al.*, 1999).

On average, therefore, the degree of firm-specific perceptiveness of the Swedish shareholders is high. In the last few years, however, many firms have become increasingly large, internationalized and with subsidiaries in several sectors. This is putting a lot of pressure on those same insider shareholders that until the late 90s have backed the massive programs of expansion.

Those firms that do not have insider shareholders are subjected to the same rules of the outsider system.

The low values for the firm-specific perceptiveness of Dutch shareholders can be explained in terms of the peculiar characteristics of the corporate governance system in the Netherlands.

The structure of industry is characterised by many small firms and very few large firms. In 1998, the number of firms with more than 500 employees in the industry sector was 245, whereas the number of firms with less than 100 employees was more than 44 thousands. In large Dutch firms, families do not play the same important role as insider shareholders as they do in Italy, for example. Only a few large firms are listed on the stock exchange and the use of particular instruments for separating ownership from control protects the management from the disciplining actions of the shareholders. As reported by Go-Feij (1999, p.40), the Dutch corporate governance system is by definition “an ‘insider-dominated’ system. However this does not mean that control over management is directly exercised by individual (or groups of) shareholders (as for example in Italy largely by families, or in France during the 1980s by the central state). On the contrary, what appears to happen in the Netherlands in the larger firms is that the protective measures are used to allow management (using the term broadly to include non-executive directors) to find its own preferred balance among the interests of the various stakeholders. In some countries this self-control by management might be abused for its private interest. Dutch culture and the strictness of regulatory procedures guard against this. On the contrary, what appears to result is a clear-cut case of broad stakeholder coalition, with strong influence of workers on the larger firms affected by the structural law, and scope for influence of suppliers, customers, creditors etc.” Shareholders with direct control are very rare in Dutch companies, mainly because of the fact that at least 80% of

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<sup>30</sup> Swedish corporations can issue shares with different voting rights with a normal maximum ratio of 10:1 between A-class and B-class shares.

them have shares with multiple voting rights, or list their shares as depository receipts that do not carry voting rights.

The German system of corporate governance has always been defined as an insider type of system. A large proportion of firms in this country is characterized by a “Sole Proprietor” (71.3% of the total number of companies and 14.2% for taxable share), which means that the owner runs his company alone without any interference from others. Only a small number of firms take the form of Public limited companies (AG), that is companies whose shares can be bought and sold on the stock exchange. Such companies, produce around 20% of the total sales of the country. The few large firms in the country tend to take this form and have as main insider shareholders banks or other non-financial companies, which take a high degree of interest in the corporate governance of the firms they control (Ehrentreich and Schmidt, 1999). These are also the companies that do most of the formalized R&D activity (all the pharmaceutical companies take this form). The rest are mainly middle-sized companies that are by definition family-businesses.

The French system of corporate governance has undergone important transformations in the last few years and “French corporations have gone to great lengths to meet the preferences of Anglo-Saxon institutional investors” (Goyer, 2001). Among the Continental European countries France is certainly the one that has more significantly shifted towards the outsider position. Even before this transformation, it was difficult to define the French system as either insider or outsider. In fact, in France, some stakeholders that in the other Continental European countries play an important role in the corporate governance of firms have never been central figures. For example, the relationships with banks have never been close and long term; likewise, French firms have never relied for their innovative activities on the co-operation with other firms, namely suppliers or customers. Rather as in the Italian case, families controlled a large proportion of the private capital of the country, but at the same time, also the State played a central role. The latter could certainly not be defined as an insider, since the locus of decision-making was distant from management. With the retreat of the state from the largest firms (in France medium and small firms do not play a central role in the economy of the country) during the privatization process of the 1980s, a large fraction of the ownership of French firms has moved to foreign institutional investors, which, as in the UK, do not aim at being insiders.

As explained above, the degree of firm-specific perceptiveness of British shareholders appears to be lower than in the other countries (with the exception of the Netherlands) but still higher than what we were expecting for an outsider country. As mentioned above, the data might have been influenced by the presence in the sample of small family firms and high-tech firms financed by venture capitalists.

The data on the stock market capitalisation and on the low concentration of shareholdings confirms the UK as an outsider system. However, recent and imperceptible developments might indicate a slow but progressive shift of this system towards the insider position. A clear synthesis of the situation in the UK is offered by Tylecote *et al.* (2002, p.10): “Not only has the proportion of shares held by institutional investors increased in the UK, but also the proportion of the market held by a selected number of institutional investors has also risen. Indeed, 11% of the UK stock market is owned by the three largest institutional investors.<sup>31</sup> Not only do some investment institutions hold a large proportion of the stock market in aggregate, but they also own a large proportion of the shares of certain companies. For example in 1996, Mercury Asset Management held 22% of the shares of RMC and 18% of British Steel (Mallin, 1998). At that time, stakes in the other top ten FTSE100 companies held by these institutions range from 12% to 15%.<sup>32</sup>” This has a considerable effect on the British system of corporate governance. In fact “the larger the absolute value of an institution’s stake in a firm, the more it will gain from a given improvement in the firm’s performance. Moreover the larger the percentage stake in a firm, the easier it will find it to get the management to listen to it; and the harder it will find it to sell its stake without lowering

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<sup>31</sup> Mallin (1998) shows that Mercury Asset Management, Prudential and Schroders together own 11% of the UK stock market. Her data is sourced from Gaved (1998).

<sup>32</sup> For example, Rolls Royce, Scottish & Newcastle, Forte, Enterprise Oil, Granada, Arjo Wiggins and Kingfisher.

share prices.” However, “a really close relationship with firms, would involve them in difficulty. A shareholder in possession of ‘market-sensitive’ information about a firm released by its management and not available to shareholders generally is, in the technical sense of the term, an insider, and may not legally trade the firm’s shares until the market has the information. Of course, insiders may trade and not be caught; and moreover it is permissible for one employee of an investing institution to have insider information and another to trade so long as the first keeps the information to himself or herself: ‘Chinese walls’.” In particular, British institutional investors appear to be progressively, even if at a very low speed, more interested in acquiring a good degree of *firm-specific perceptiveness* and, sometimes, but very rarely, to take a pre-emptive action. It is still too early to suggest a real shift towards the insider position, but, as it will be explained below, maintaining a competitive advantage in high-tech sectors might require going in this direction.

#### *Industry-specific expertise*

The degree of industry specific expertise refers (in our questionnaires) to the understanding that a shareholder could have of key technologies used by a firm, and (more arguably) to its general situation (its profitability, capacity utilisation and market trends). In other words, it is an understanding that an outsider shareholder could have without receiving market-sensitive information. Obviously, if a shareholder is an insider and works actively within a firm, its understanding will (or should be) be very high. This is the case for all the small firms and in particular for those in the high-tech sectors where firms of a small scale are usually spin-offs from other high-tech firms. To evaluate the degree of industry specific expertise for those sections of shareholders in which we are interested (the outsider shareholders) we will therefore focus on the section “average shareholder” of those firms that are certainly listed on the stock exchange. A “largest shareholder” of a listed company could easily be an insider or even a manager of the company and have, therefore, a high level of industry-specific expertise. At the same time, we would also be interested in the degree of industry-specific expertise of financial institutions with a large stake in a company without being an insider. Our data, however, do not allow us to distinguish between insider majority shareholders and outsider majority shareholders.

Outsider shareholders of companies belonging to different countries do not appear to have significant differences in the degree of industry-specific expertise and they all appear to have a rather good understanding (see Table 24). However, we do not have sufficient data to perform a comparative cross-country analysis of the differences in means and of the significance of the results. In particular, we do not have any data for the UK where a good degree of industry specific expertise would be important to compensate for the low degree of firm-specific perceptiveness. In general, however, from our case studies and from the review of the literature on the various systems of corporate governance, we can with no doubt argue that the insider shareholders of the insider countries have a good degree of industry-specific expertise (with the exception of the Netherlands where the shareholders do not behave as insiders) whereas in the UK the degree of industry specific expertise appears to be rather low. Insider systems however do not appear to have institutional investors with a good understanding of industrial sectors (with the exception maybe of the German banks) and with the ability to support important investments in innovation, even if the situation appears to be changing significantly in Sweden and in the Netherlands.

**Table 24. Listed firms.**

Country		Now, The average shareholders understanding of the general situation	Now, The average shareholders understanding of the key technologies
<b>Italy</b>	Mean	4,90	3,90
	N	10	10
	Std. Deviation	1,29	1,91
<b>Germany</b>	Mean	5,33	5,13
	N	9	8
	Std. Deviation	1,22	1,46
<b>Netherlands</b>	Mean	5,25	4,50
	N	4	4
	Std. Deviation	,50	,58
<b>France</b>	Mean	4,00	5,50
	N	2	2
	Std. Deviation	,00	,71
<b>Sweden</b>	Mean	4,06	3,75
	N	16	16
	Std. Deviation	1,69	1,44
<b>Total</b>	Mean	4,66	4,23
	N	41	40
	Std. Deviation	1,44	1,56

1=Has no understanding

7=Has full understanding

For example, in Italy, the venture capital market is still young, and tends to finance more traditional sectors. In addition, banks and other financial institutions in general lack any sort of industry-specific expertise as, for legal reasons (they could not acquire equity shares in non-financial firms) they have never found it convenient to invest in this kind of knowledge. Only within industrial districts does the situation appear to be different, as the presence of interlocking directorates between banks and firms should mean that a certain level of industry-specific expertise is/has been available. The state seems to have a certain degree of industry-specific expertise as the public agencies in charge of evaluating innovative projects for financing are composed of professionals and experts of the various sectors. However, until now, public schemes have mainly been used by large firms, for already existing projects and only in a small percentage by small new-start up firms. This suggests that the public sector's industry-specific expertise has not been used to cope with novelty.

In Sweden, in addition to the high-industry specific expertise of the insider shareholders, there is an emerging asset management community which is progressively specialising on high-tech sectors and accumulating a certain degree of industry-specific expertise.

In the Netherlands, "The rapid early rise of venture capital [...] may seem reassuring in terms of the industry-specific expertise available to back new firms in high technology areas, but as we have shown above, since the 'shake-out' in the venture capital industry there has been a marked preference for later-stage investment." (Go-Feij, 1999, p.35).

In Germany, the system can also introduce industry-specific expertise into the corporate governance of companies through the appointment of consultants or people with industry wide expertise to the supervisory board. However to finance innovation in the high-tech sector or for start up firms, there is a need for forms of finance coming from outside the company (or the single individual in the case of start-ups).

In France, "the educational formation and the role of knowledge-bearing elites promoted the development of large mission-oriented efforts to develop specific technologies. The access to patient capital and the highly visible nature of the tasks at hand facilitated the undertaking and successful completion of radical innovation projects" (Goyer, 2001, p.149-150).

In the UK, "the system clearly suffers from some very serious weaknesses. There is no strong evidence that there are institutional or other important investors with substantial industry-specific expertise, whether for use in venture capitalism or elsewhere. In this respect, the contrast

with the United States is stark, and the implications for industries involving high novelty, most worrying” (Solomon, Tylecote, Solomon, 1999, p.35).

*Inclusion of the stakeholders.*

The degree of appropriation of the returns to an innovation depends, among other things, on the role played by other stakeholders in the innovation process itself. In numerous sectors, where the degree of appropriability is rather low, suppliers, customers and employees play an essential role in the innovation process. In particular they might be required to make specific investments (in machinery or research or in the accumulation of expertise), which cannot be used in other ways. This strongly enhances the degree of innovativeness of the firm. In situations like these, the best strategy is to build up some sort of coalition with those stakeholders. These coalitions do not need to take the form of a joint venture or of an exchange of shareholding. In many cases, they can be based on trust or on informal agreements. For example, the innovative firm may agree to pay a higher price to the supplier, may finance part of its R&D expenditure, or may offer support in other ways.

As for the employees, the coalition might take an obviously institutionalised form, as in Germany for example, or else a more subtle form. In this latter case, there could be an informal promise of a lifetime employment (see Japan)<sup>33</sup> or, in small firms, a strong relationship of trust with the entrepreneur, or finally the legislation for the protection of employees might pose serious obstacles in laying off workers.

All these forms of coalition play an essential role in obtaining the collaboration of the various stakeholders (firm-specific investments by the suppliers, or accumulation of firm-specific skills by the employees and an active role in the innovation process, etc), collaboration that a pure shareholders first strategy would not achieve. This, however, does not mean that coalitions are always necessary. In fact, there are several highly innovative sectors where long-term relationships would obstruct change, and impede the achievement of the most effective process of change.

The most widely adopted strategy in Italy is certainly the *inclusion* of stakeholders one, both with regards to the employees and the customers/suppliers. In fact, even though representatives of Italian employees do not have the right of codetermination as they do in Germany and they cannot sit in the management boards, it appears that the interests of the employees are taken into consideration in the decision making processes. This is for several reasons. Firstly, for legal reasons firms are allowed to fire employees only for *giusta causa* or *giustificato motivo*, which are two reasons that are very difficult to sustain. In addition, as the employee-employer relationship is usually based on loyalty and trust, especially in small and medium sized firms, employers hardly ever make use of their limited right to fire employees. Moreover, as in Germany, entrepreneurs usually have a feeling of social responsibility towards the community they live in, and they do not usually consider the price of the equity shares as more important than the employment level (Table 25). Furthermore, especially among large firms, workers organisations are very powerful and operate to make sure that the interests of the employees are respected. Considerable importance is also given to the possible loss of valuable skills. This is linked to the fact that in Italy firms invest strongly in the skills of their employees as the system of vocational training is rather underdeveloped. As expected the risk of a strike plays a more important role than in the other countries.

Suppliers and customers contribute strongly to the process of innovation of Italian firms and close long-term inter-firm relationships are very common. Especially among groups of firms, and within districts, co-operation is essential and in many cases innovative projects are carried out by two or more firms along the value chain. Even in high-tech sectors Italian firms tend to maintain long-term and strong relationships with customers and suppliers. For example Finmec, a large Italian group of firms, specialised in the production of cell-phones and small components, maintains strong and close relationships with suppliers outside the group, strongly contributing to their processes of innovation (Basso, 2002).

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<sup>33</sup> Cf. Blair (1999).

In Germany, Sweden and the Netherlands, the commitment towards the stakeholders is a central element of the system of corporate governance. In Germany and in the Netherlands the inclusion depends on the system of codetermination whereas in Sweden, it is more linked to the power of the unions and to the collaborative spirit between entrepreneurs and employees that has characterised the system for a long time. As a matter of fact, our case studies have shown that in Germany the managers consider the power of codetermination as a factor hindering their decisional power and not as an opportunity for constructive discussion and collaboration. As for the Netherlands, Go-Feij (2002) argues: "Co-determination rights in the Netherlands suffer from several disadvantages. Dutch employers must consult the works council on social consequences of important economic decisions and on economic and financial consequences as well (Bolt, 1997). If workers become too influential they may pursue opportunistic objectives. It may also slow down decision-making within firms by requiring extensively lengthy procedures before decisions can be taken. Moreover, co-determination may reduce the flexibility of employment adjustments across firms and industries. The Dutch system lacks a countervailing shareholder power to balance increased influence of workers through works councils."

The situation in Sweden is rather different. The relationship between employees and employers is very collaborative and constructive. As reported by Persson (1997, p.131), "in Swedish working life there exists a consensus which remains deeply rooted at all levels of Swedish society, whatever the reductions in the social safety-net. [...] Today, there is greater interest among top management in introducing various types of Management By Objectives (MBO), combined with a greater element of individual wage setting. Often ideas from other countries are adopted. There has been interest in the steel industry in investigating the high degree of effectiveness to be found in mini-mills, at which, many writers claim, trust and commitment between management and labour also prevail. The basic feeling still exists in Sweden that decisions should largely be taken in agreement, even if management achieves its objectives in the end. This feeling creates an interest in organisational models involving trust and commitment". Within small and large firms, there is a certain amount of room for individual responsibility and that gives the worker a feeling of confidence. Employees know that the Swedish model has made it impossible for employees to be fired without a reason and that even if they were to be made redundant, the system of social security would ensure that they would not fare too badly. Therefore they dare to take responsibility, make mistakes, discuss and cooperate with the company management with no fear (Persson, 1997).

In France the unions have never been accepted partners in industry and there isn't in place any structure of co-determination. The delegation of the decision making process to the workforce is very limited and firms tend to define autonomously the job contents and the skills required on the basis of their own needs without involving the unions or the workers representatives. This has certainly been one of the causes of the poor performance of the French industry in sectors where innovation is the result of cumulative learning on the shop floor. In the last few years, however, there has been a modest move towards a new sort of stakeholder inclusion and insider-shareholder. This occurred with the development of the 'actionnariat salarié', collective employee shareholdings similar to the US ESOPs. When the employees achieve as much as 3% of the capital, they are entitled to representation on supervisory board. The Commissariat du Plan (2001, pp.63-64) has calculated that these plans are used in more than 40% of enterprises with over 500 employees. The latter have on average 7% of the capital.

In the UK, stakeholders other than the shareholders do not contribute to the planning of innovation and are, therefore, not included. As for the employees, Tylecote et al. (2002), report that there is only a very weak form of participation of the employees in the governance of innovation and that this is often granted by the management to avoid interference by the trade union representatives. As Table 25 shows, the only factor of interest to the management of British companies in deciding about the future of the workforce are the "shareholders financial interest" and the "loss of valuable skills". "The position in local community" and the "Legal obligations towards the workforce" that in other countries play a considerable role, are not perceived as important in the UK. As for customers and suppliers, several studies show that firms tend to keep with them loose and essentially short-term relationships (Lane, 1989; Sako, 1994; Cooke & Morgan, 1998).

**Table 25. If it seemed to the top management that the firm could gain in profit over the next three years by a strategy which involved dismissing a substantial number of employees, which of the following considerations would weigh against this, and how strongly? (1= 7=)**

Country		Problems of conscience	Social position in the local community	Loss of valuable skills	Damage of relationship between employees and management	Risk for a strike	Employee obstruction through codetermination	Blocked by legal obligations	Shareholders' financial interests	Credibility towards providers of debt
<b>Italy</b>	Mean	5,50	4,46	5,54	4,50	3,82	2,78	3,36	3,19	3,27
	N	28	28	28	28	28	27	28	27	15
	Std. Deviation	1,53	1,77	1,62	1,75	1,81	1,50	1,83	1,78	2,05
<b>Germany</b>	Mean	4,55	3,79	4,55	4,24	2,63	3,26	3,74	2,50	2,64
	N	38	29	38	38	38	38	27	18	22
	Std. Deviation	1,54	1,66	1,16	1,36	1,28	1,41	1,95	1,65	1,65
<b>UK</b>	Mean	4,42	2,74	4,16	3,63	1,71	2,00	1,69	6,00	1,00
	N	19	19	19	19	17	1	16	1	1
	Std. Deviation	1,87	1,76	1,83	1,92	,92	,	1,25	,	,
<b>Netherlands</b>	Mean	5,00	4,00		1,00	1,00	3,00	1,00	5,00	4,00
	N	1	1		1	1	1	1	1	1
	Std. Deviation	,	,		,	,	,	,	,	,
<b>France</b>	Mean	5,42	5,42	4,75	5,42	4,00	3,67	3,92	4,08	2,22
	N	12	12	12	12	12	12	12	12	9
	Std. Deviation	1,31	1,31	1,54	1,08	1,28	1,50	1,31	1,68	1,20
<b>Sweden</b>	Mean	4,68	3,12	4,88	4,10	2,59	2,21	3,64	4,25	4,32
	N	40	41	41	41	39	28	39	28	22
	Std. Deviation	1,54	1,73	1,14	1,46	1,48	1,13	1,74	2,01	1,99
<b>Total</b>	Mean	4,84	3,72	4,81	4,24	2,86	2,90	3,35	3,56	3,24
	N	138	130	138	139	135	107	123	87	70
	Std. Deviation	1,59	1,85	1,44	1,60	1,58	1,43	1,83	1,92	1,94

## 4. Conclusion and policy implications

The results of the COPI project are clearly useful in explaining the performance of firms and the specialisation of countries in the sectors under study.

In the COPI questionnaire there is a number of questions that were aimed at checking the performance of the various countries in product innovation. In particular one of the questions was: Considering the long-term interests of shareholders, how far would you agree with the following statement: “Not enough time and money is put into product innovation”?

**Table 26. At present: Not enough time and money is put into product innovation (1= thoroughly disagree; 7= thoroughly agree)**

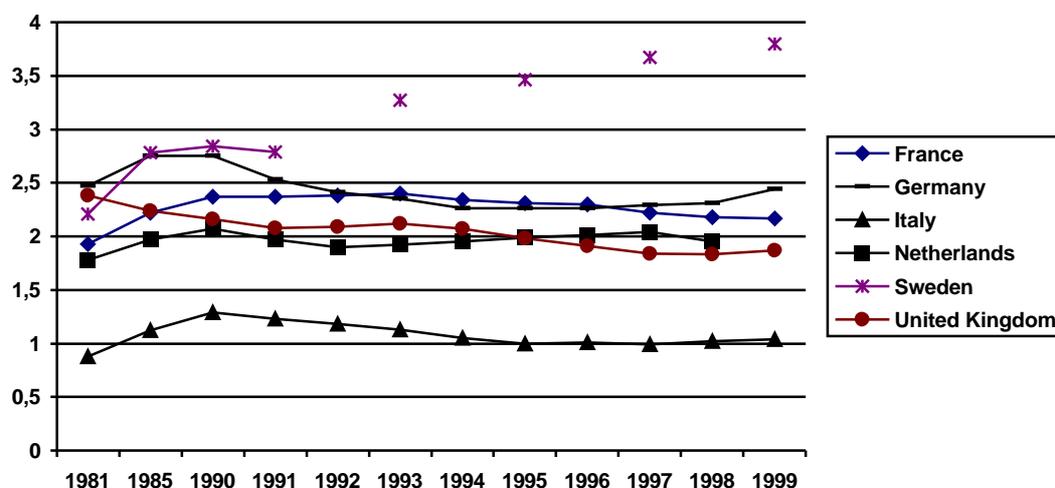
Country	Mean	N	Std. Deviation
Italy	4,50	32	1,65
France	4,13	15	1,13
UK	3,45	20	1,90
Germany	3,33	15	1,76
Netherlands	3,31	13	1,70
Sweden	3,13	63	1,68
Total	3,58	158	1,73

It seems that Italian, French and British firms have more problems in financing innovation than the other countries. The result for Italy is not a surprise. It is notorious that Italian firms consider the lack of sources of finance as one of the main factors hampering innovation. Firms are in fact of medium and small size and the self-financing of innovation is basically impossible for these firms. Public sources of finance exist but they are usually obtained by the large firms as the bureaucratic procedures are long and time consuming (i.e. medium and small firms do not have the resources to fill all the application forms required). The venture capital market is growing at a very fast speed. At the same time, however, Italian entrepreneurs are not willing to open their firms to external influences, to let outsiders enter the capital or list their firms on the stock exchange.

As for France and the UK, the result could be explained in terms of their system of corporate governance. It was argued above that France is the continental European country that has moved furthest towards the outsider position. The UK has an outsider system of corporate governance. Both countries have never been active in sectors characterised by incremental innovations and have rather succeeded in high-tech sectors with high visibility. However, we have showed that also sectors such as pharmaceuticals and biotechnology that have a degree of visibility, gain advantages from the presence of shareholders with a certain degree of firm-specific perceptiveness. The lack of insider shareholders in these countries, and especially in those sectors that were analysed in the survey, is probably causing under-spending on product innovation.

Also other data point in the same direction. As it is shown in the figure below, the R&D intensity of French and British firms has progressively decreased since the beginning of the 1990s. In the UK in particular it is now well below the level of 1981.

**Figure 1. Business enterprises R&D expenditure.**



Source: OECD (2001).

For the sectors studied in the COPI project, we can draw the following conclusions:

1. Only countries with a high level of firm-specific perceptiveness, a high degree of industry specific expertise, and a low level of stakeholder inclusion, apart from employees, will succeed in software, as it is a high-technology sector with a low level of visibility. Of the countries studied in our project, only Sweden presents suitable forms of corporate governance to succeed in this sector. On the contrary, even if the US was not included in the analysis, we know that the degree of firm specific perceptiveness in that country is much higher than in the UK and it is combined with a high degree of industry-specific expertise and low inclusion of stakeholders. As a matter of fact, among the 25 software firms that invest most in R&D and have the highest R&D intensity 22 are American, one is German, one is Dutch and one is French (see R&D Scoreboard, 2001). British firms perform rather poorly in this sector in terms of R&D. As shown in Table 27, the R&D intensity of British companies in the software sector is below the international average.

**Table 27. R&D by sector**

	R&D intensity		
	International	UK	Ratio
<b>1. Automotive</b>	4.0%	4.2%	1.0%
<b>2. Pharmaceuticals</b>	12.8%	14.8%	1.2%
<b>3. Electronics &amp; electrical</b>	5.8%	3.0%	0.5%
<b>4. Chemicals</b>	4.1%	1.4%	0.3%
<b>5. Software &amp; IT services</b>	14.3%	4.2%	0.3%
<b>6. Engineering</b>	2.8%	1.3%	0.5%

Source: R&D Scoreboard (2001)

2. Pharma/biotech emerges as the sector best suited to the ‘outsider-dominated’ approach of the UK (and largely the US) system. This is not at all surprising given the success and high R&D intensity of the UK pharmaceutical industry (Table 27). However even here we must have some reservations: visibility and appropriability clearly have their limits even in pharmaceuticals. This was confirmed by our interviewing in Glaxo Wellcome and AstraZeneca – which also confirmed the limited industry-specific expertise and (even more) limited firm-specific perceptiveness of British institutional investors. It appeared that – even in this industry – there was short-term pressure from British institutional investors, which would have been worse (in AstraZeneca’s case) had it not been for the support given by a major US investor. In a word,

outsiders are fine in pharmaceuticals– but ‘engaged’ outsiders, who appear to be more common in the US than the UK investing community.

As it is shown in Table 28, also Sweden presents a rather high degree of R&D intensity, even higher than that of the US and the UK. We mentioned above that in Sweden the degree of industry-specific expertise is growing fast and at the same the degree of firm-specific perceptiveness is rather high too.

The other ‘insider’ countries perform rather poorly in these sectors. The need for industry-specific expertise and reconfiguration pressures is in fact too strong to be handled by the ‘old insider’ shareholders characteristic of the Continental countries – including families like the Agnellis, and banks like the Deutsche Bank; perhaps even the rather ‘renewed’ Wallenbergs.

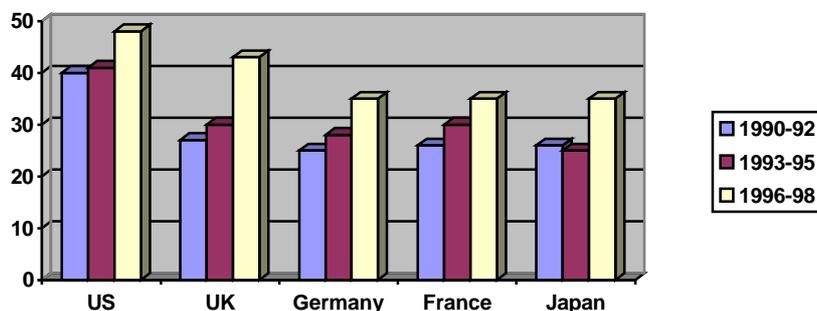
**Table 28 Classification of manufacturing industries based on technology. R&D intensity, 1991-1997 average.**

	United States	Germany	France	Italy	United Kingdom	Sweden
<b>High-technology industries</b>						
Aircraft and spacecraft	14,6	28,1	14,1	11,9	9,3	15,3
Pharmaceuticals	12,4	8,4	8,7	6,0	18,6	21,5
Office, accounting and computing machinery	14,7	7,5	5,6	7,2	2,0	12,0
Radio, television and communication equipment	8,6	13,0	10,3	11,7	5,2	17,8
Medical, precision and optical instruments	7,9	6,1	11,1	1,0	3,5	8,2
<b>Medium-high-technology industries</b>						
Motor vehicles, trailers and semi-trailers	4,5	4,6	3,2	3,3	2,9	6,1
Chemicals excluding pharmaceuticals	3,1	4,4	2,4	0,8	2,5	2,2
Machinery and equipment, n.e.c.	1,8	2,3	2,0	0,5	2,1	4,0

Source: OECD, National Accounts database; Education database; MSTI database and International Data Corporation, March 2001.

The higher effectiveness of outsider systems of corporate governance in pharmaceuticals and biotechnologies is also attested by the relevance of biotechnology for the discovery activity in Pharmaceuticals. The better the performance in the former the more effect it will have on the discovery activity of the latter. As is shown in Table 29, the role of biotechnologies in the discovery activity of pharmaceuticals has grown in the last ten years in all the countries, but it is still the highest in the US and in the UK.

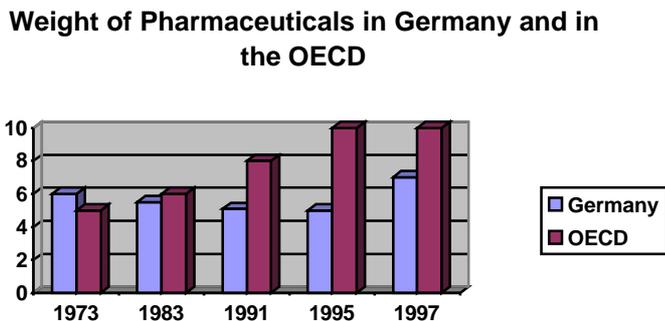
**Table 29. Relevance of Biotech for the discovery activity in Pharmaceuticals.**



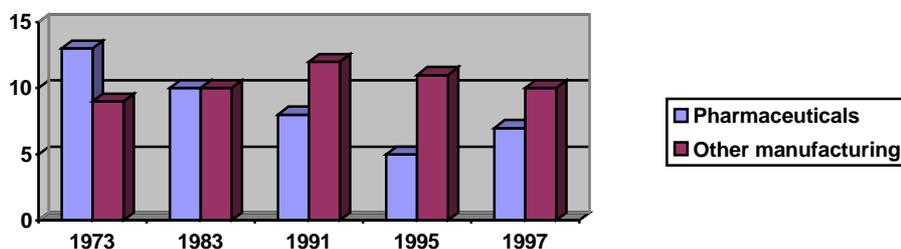
Source: *Zur technologischen Leistungsfähigkeit Deutschlands, 2000: Zusammenfassender Endbericht 2000*, Bundesministerium fuer Bildung und Forschung, Bonn, March 2001

If we focus on Germany, the data for the last 20 years show a considerable worsening of the level of R&D spending in the pharmaceuticals industry.

Figure 2 Proportion of the sector's R&D spend in that of manufacturing %



**Weight of German Pharmaceuticals in the world**

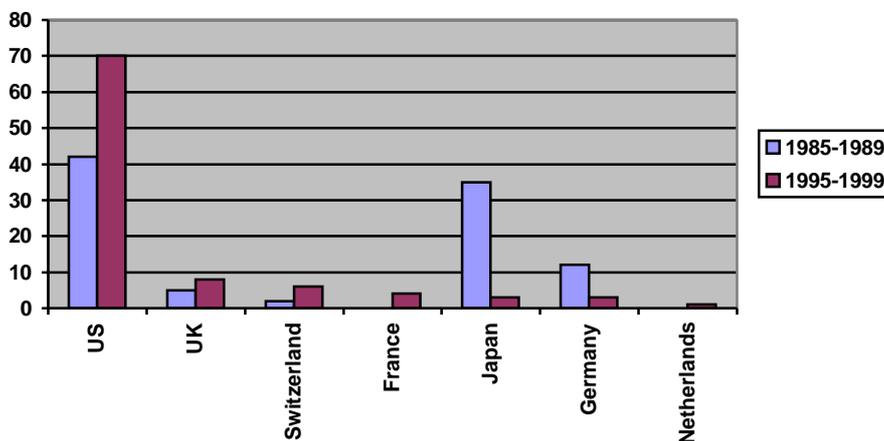


Source: *Zur technologischen Leistungsfähigkeit Deutschlands, 2000: Zusammenfassender Endbericht 2000*, Bundesministerium fuer Bildung und Forschung, Bonn, March 2001.

From the first graph, it is clear that the R&D spend of the German pharmaceutical firms as proportion of all the other sectors has grown at a much lower speed than the OECD average. In the second graph we can see that the weight in the world of the German R&D spend in pharmaceuticals has a clearly decreasing trend, whereas the weight in the world of the German R&D spend in the other manufacturing sectors has been rather steady.

Finally, Figure 3 shows clearly that the outsider systems (both the old and the new ones) have overtaken the insider ones in the pharmaceuticals sector.

Figure 3. Market share of the best selling new medicines, by country in which the main providing firm is based, in %.



Source: *Zur technologischen Leistungsfähigkeit Deutschlands, 2000: Zusammenfassender Endbericht 2000*, Bundesministerium fuer Bildung und Forschung, Bonn, March 2001

3. It is in the medium-high and the medium-low technology sectors that Europe (Germany and Sweden in particular) has been most successful in international competition, and our studies have brought out clearly the key reasons for this. Such sectors have low visibility and high spill-overs, demanding a high degree of firm-specific perceptiveness and stakeholder inclusion (both employees and related firms). At their best the European insider countries have provided these ingredients in full measure, and continue to do so. With respect to this the data about the German motor industry are rather significant. As it is shown in the weight of the R&D spend of the German motor industry, on the total R&D spend of the other sectors has progressively grown in the last 20 years at a much higher speed than the OECD average. The same argument applies to the weight of the R&D spend of the German motor vehicles firms over the world R&D spend of the sector. Such weight has grown in the last 20 years at a much higher speed of the weight of the German R&D spend in the other manufacturing sectors.

The presence of shareholders with a certain degree of firm-specific perceptiveness is therefore important, both in the high technology and in the medium technology sectors. But how can this be reconciled with the tendency of all the insider countries to move towards the outside direction? And how will the latter impact on the European industry?

As it was already mentioned in the executive summary, this will become clear from the following alternative scenarios:

#### **a. The nightmare scenario**

In spite of recent stock market disappointments, the preference for equity investment persists, and it is indulged by regulators of the dominant mechanism of asset accumulation, the pension fund: they allow the majority of assets bought to be equities, but only via the most conventional and cautious methods of portfolio diversification. Accordingly European stock markets fill up with a rising tide of new equity capital. Now as our UK report has shown, there are three alternative modes of cautious portfolio investment:

Mode 1 is 'passive', index-tracking in which the shares of listed firms are bought and held in proportions dictated solely by their weighting in stock market indices. It needs negligible expertise, is very safe, and very cheap.

Mode 2 is 'active trading', in which skilled professionals (mostly 'external' asset management firms investing funds owned by others) seek to do better than the market (and therefore than Mode 1) by buying shares before they go up and selling before they go down. It is clearly less cheap and less safe (but nonetheless the portfolios are diversified and so are far less risky than an individual firm's shares).

What both these modes have in common is that there is no intention to engage with the firm: what has been bought, and may be sold, is a piece of paper whose value is determined by others, not an entitlement to influence.

In this they are unlike Mode 3, which involves 'engagement' with the firm (which may, but need not, make it an 'insider' in the sense of having market-sensitive information which prevents it legally trading). Mode 1 guarantees very small stakes in each firm; in Mode 2 fund managers go 'overweight' in shares which look like a good investment prospect; in Mode 3 there will be more incentive to go overweight, since there are fixed costs of engagement, and the influence desired requires a substantial stake. Mode 3 therefore looks riskier, in actuarial terms – though of course if expertly executed could well be safer than Mode 2: you intervene to turn what would be bad investments into good ones.

Whether through regulation or through caution and lack of expertise, we shall assume, in this scenario, that Mode 3 is avoided. What follows depends to some extent on the proportions of Mode 1 and Mode 2. If Mode 1 dominated, all big firms would have highly fragmented shareholdings and there would be little or no scope for direct shareholder pressure. Management (and/or any remaining insider shareholder) would have control and would only feel pressure from outsiders in

the indirect sense of fearing a share price fall which would reduce the value of stock options, expose them to a hostile bid, etc.<sup>34</sup> If Mode 2 dominated, there would be in each firm substantial shareholders who were at least in a position to intervene, and who would (as now in the British system) do so on occasion, *faute de mieux*, when they had failed to make a timely exit from a firm which performed poorly.

Welcome, then, to the English disease of short-termism: large firms across Continental Europe would be exposed to increased pressure for shareholder value but of a kind which was unable to evaluate the quality of what was being done for future value, and accordingly tended to squeeze it.

## **b. The rosy scenario**

Let us suppose that regulators, at EU and national level, look across the Channel and do not like what they see. They look across the Atlantic, and recognise first that engagement of one sort or another is much more common in the US than the stereotypes of financial systems suggest, and second, that where it is absent (across much of the medium and lower technology sectors) US performance is in fact rather poor. They therefore seek to promote intelligent engagement by all possible means. It is not Mode 1 that (within limits) is the enemy. It is too inert to be harmful, in moderation; and indeed one can imagine coalitions of Mode 1 shareholders being formed which engineered engagement to some degree – perhaps through non-executive directors. Mode 2 is the devil: the attempt to use an understanding of what will lead to changes in share prices to profit from them, without helping to promote it. (Ironically, some Mode 2 investors can only succeed if there are others who fail: who else than an inexpert Mode 2 investor (a ‘Mode 2 mug’) is going to sell to you a share which will rise, or buy from you a share which will fall? If all Mode 2 investors were equally skilled their efforts would be self-defeating.) Those investment houses with the skills and the funds to practise Mode 2 have been diverted to Mode 3.

The new Mode 3 investors operate in two ways. The first is that demonstrated by the US house Capital in AstraZeneca (see the AstraZeneca case study). They choose a small number of sectors in which they will invest heavily (if that seems incautious they can always maintain a fraction of Mode 1 equity investing, plus bonds of course). They build up industry-specific expertise by various means, choose promising firms, get a substantial shareholding in them, engage in a dialogue with management in order to assess their competence and strategy, and if they like what they see (or think they can improve it), buy more. They may, like Capital, avoid becoming an insider debarred from trading, or they may accept such a status. In the former case they are a more effective ‘bell-wether’ for the rest of the flock<sup>35</sup>: for example, when management has announced a decision which they believe to be in the long run interests of the firm (but will reduce profits in the short run) they buy; the dis-engaged shareholders who would otherwise sell in the face of such news, are less likely to do so.

The second way of implementing Mode 3 is to invest heavily in private equity institutions: institutions which take substantial equity stakes in non-listed firms. There are two main types of private equity: venture capital, i.e. equity investment in genuinely new small firms; and buy-out or buy-in capital, in which established listed firms, or part of them, are ‘taken private’ by their management and need outside equity (as well as loan capital) to complete the deal. In our Rosy Scenario the role of private equity in buy-outs and buy-ins will be crucial, and dual. Its direct impact will come through the industry-specific expertise and firm-specific perceptiveness of the private equity investors. They have every reason to specialise by sector (thus the industry-specific expertise) and to get to know the firm in which they have a major stake (thus the perceptiveness). Its indirect impact will be equally valuable. During the twilight of insider capitalism, managers

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<sup>34</sup> Some Mode 2 holdings have to be assumed in this version in order to make share prices respond to performance. The behaviour of share prices in a firm all of whose shareholders were in Mode 1 would be very odd indeed.

<sup>35</sup> That is, a sheep which is trusted, and therefore followed, by the rest of the flock.

built many corporate empires in which the synergies were far less than they claimed. They need to be broken up, first because they can be run better that way, and second because shareholders find it a great deal easier to engage with a firm which is clearly focused on one sector in which they are, or can become, expert. The AstraZeneca with which Capital so expertly engages is a pharmaceutical firm *tout court*, not (as one of its components used to be) diversified across speciality- and agro-chemicals. Who better to buy the bits than private equity?<sup>36</sup>

The classic pattern for private equity investment is to aim for an early exit via an IPO – initial public offering; so, for a buy-in or buy-out, a return to the stock market. There is no reason, of course, why the private equity investor should not maintain a substantial share stake after the IPO, as is common in the United States.<sup>37</sup> Still, if the effect of private equity is as benign as a recent UK study indicates (BVCA 2001) it would be good in many cases (particularly the smaller firms) to prolong it beyond the five-year period typical for the United States. A tiered system will naturally develop (as it has done in the United States) with time and an abundant enough supply of private equity. The first tier is the initial private equity investor, who takes most risk and trouble and needs most expertise. The second tier are the other investors, who come in later – with a venture capital start-up it is normally to provide finance for expansion, but with a private equity buy-out or buy-in it could be to provide the initial investor with a profitable partial exit, instead of, or pending, an IPO. The initial investor, being the more expert, commits to keeping a substantial stake and continuing to engage with the firm. The second tier of private equity is less profitable but also less risky.

How is the Rosy Scenario to be brought about?

There are two ways of doing this. One is permissive: there must be no regulations (such as proposed by some countries for pension funds) which in any way prevent financial institutions putting a substantial proportion of their assets into private equity. (Seen from first principles there is absolutely no reason why doing so should be risky. A fund could take small stakes in a number of private equity providers, operating in different sectors and/or countries.) The second is dissuasive: it is necessary to discourage Mode 2 investing, and this can be done by favourable tax treatment for long-term holdings.

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<sup>36</sup> Of course many ‘bits’ could and some should be bought by firms focused on their area. But even horizontal mergers have a poor record.

<sup>37</sup> It is interesting to consider why this should pay a private investor who is accustomed to seeking much higher returns than normally available from listed stocks: the price which ordinary stock market investors are prepared to pay for equity at the IPO will be much higher if the private equity investor commits to keeping a large stake, because this both indicates confidence in the firm’s prospects and guarantees an expert shareholder in the background. One might get more for part than one would get for the whole!

## 5. Dissemination and/or exploitation of results

Table 30. Strategies for dissemination

Partners	Strategy for dissemination
<p style="text-align: center;"><b>Germany</b> (Professor R Schmidt; Professor D Grosse)</p>	<p style="text-align: center;"><b>Completed</b></p> <p><b>Papers:</b></p> <ul style="list-style-type: none"> <li>• Grosse D., 2001, "Corporate Governance and Innovation - Bericht über ein EU- Projekt" paper for a conference at the TU Bergakademie Freiberg.</li> </ul>
<p style="text-align: center;"><b>Italy</b> (Prof. Sergio Albertini)</p>	<p style="text-align: center;"><b>Completed</b></p> <ul style="list-style-type: none"> <li>• <b>PhD Thesis:</b> A PhD based on the COPI framework was concluded on the 4th of October 2001, by Dr. Francesca Visintin, the junior researcher of the Italian team, at the University of St.Andrews, Scotland. The title of the thesis was "Corporate Governance and Product innovation in the machine tools sector in Italy". The external examiner was Prof. Stan Metcalfe from the University of Manchester.</li> <li>• <b>Working papers and articles:</b> The Italian team has produced the following series of working papers and articles: <ul style="list-style-type: none"> <li>• Visintin F., 2001, "The Italian Sectoral Specialization: An explanation from the point of view of corporate governance, Working paper series, University of Udine.</li> <li>• Visintin F., 2001, "The upsurge of Japan and the decline of the US in the machine tools sector: an attempted explanation, Working paper series, University of Udine; submitted for publication to the periodical Industry and Innovation in February 2002.</li> <li>• Albertini S., Visintin F., 2001, "Corporate governance, employees' inclusion and reward systems in the Livenza industrial district", Paper for the EGOS - European Group for Organizational Studies - 17th Colloquium, July 5-7, Lyon (France), submitted for publication to the periodical The journal of management and governance in February 2002.</li> <li>• Albertini S., Visintin F., 2002, "Business governance e performance innovativa nel settore delle macchine utensili italiano", paper for the Annual Workshop of the Italian experts in Organization studies, Genoa, 7-8 February.</li> </ul> </li> <li>• <b>Workshops and Conferences:</b> <ul style="list-style-type: none"> <li>• <b>Udine, 3 July, 1999:</b> Symposium on Corporate Governance and Product innovation. Italian experts on corporate governance and members of the COPI project presented papers and discussed issues of major concern on corporate governance and product innovation.</li> <li>• <b>Brescia, 12 November, 2001:</b> Dissemination Workshop of the COPI project. All the Italian firms that participated to the COPI survey, the major experts in the field, and members of the public administration were invited to a workshop for the dissemination of the results of the COPI project. Speakers: Prof. Andrew Tylecote (The British situation); Prof. Sergio Albertini (Corporate governance and inclusion of the stakeholders); Dr. Francesca Visintin (The Italian situation).</li> </ul> </li> </ul> <p style="text-align: center;"><b>Planned</b></p> <ul style="list-style-type: none"> <li>• <b>Books:</b> <ul style="list-style-type: none"> <li>• Albertini A., Visintin F. (eds), 2003, <i>Corporate governance e innovazione di prodotto in Europa</i>, Carocci,</li> </ul> </li> </ul>

	<p>Milano.</p> <ul style="list-style-type: none"> <li>• <b>Workshops and Conferences:</b> <ul style="list-style-type: none"> <li>• Brescia, Fall 2002: Prof. Sergio Albertini, who is now working at the University of Brescia is organizing a workshop on Corporate governance and Product innovation. He will invite all the members of the COPI project and several other experts in the field.</li> </ul> </li> </ul>
<p><b>Sweden</b> (Prof. T. Lindblom)</p>	<p style="text-align: center;"><b>Completed</b></p> <ul style="list-style-type: none"> <li>• <b>Articles:</b> <ul style="list-style-type: none"> <li>• Mansuri, Z., 2002, “The processes of product innovation within the Swedish Swed Bank: A corporate governance perspective”, paper presented in the Skagen Conference, Denmark.</li> </ul> </li> </ul>
	<p style="text-align: center;"><b>Planned</b></p> <p><b>Conferences:</b></p> <ul style="list-style-type: none"> <li>• October 2002, Banking management and Financial Strategy. In this conference, the Swedish team will present findings concerning innovation in banks in Sweden.</li> <li>• October, 2002, Dissemination Workshop of the COPI project.</li> </ul>
<p><b>The Netherlands</b> (Prof. T. Groot)</p>	<p style="text-align: center;"><b>Completed</b></p> <ul style="list-style-type: none"> <li>• <b>Articles:</b> <ul style="list-style-type: none"> <li>• Denise Go-Feij, 1999, “Corporate governance and product innovation in the Netherlands: an overview” ARCA Research Memorandum ARCA-RM-99-03 Free University, Amsterdam, The Netherlands.</li> </ul> </li> </ul>
<p><b>The UK</b> (Prof. A. Tylecote)</p>	<p style="text-align: center;"><b>Completed</b></p> <ul style="list-style-type: none"> <li>• <b>Working papers and articles:</b> The British team has produced the following working papers and articles: <ul style="list-style-type: none"> <li>• Tylecote A. Conesa E., 1999, “Corporate Governance, Innovation Systems and Industrial Performance”, <i>Industry and Innovation</i>, vol.6, n.1, 25-50.</li> <li>• Tylecote A., Visintin F., 2002, “Financial and corporate governance systems and technological change: the incompleteness of fit of the UK and Italy”, <i>Working paper of the University of Sheffield</i>.</li> </ul> </li> <li>• <b>Workshops and conferences:</b> <ul style="list-style-type: none"> <li>• London, 10 May, 2002: Dissemination workshop.</li> </ul> </li> </ul>
	<p style="text-align: center;"><b>Planned</b></p> <ul style="list-style-type: none"> <li>• <b>Books:</b> <ul style="list-style-type: none"> <li>• Tylecote A., Visintin F., 2003, <i>Corporate governance and the technological advantage of nations</i>, Routledge.</li> </ul> </li> </ul>

The coordinator of the project is also planning to extend the study of the same sectors to other countries to allow more widespread comparisons and robust results. The study will be carried out with new partner-universities that have a particular specialization in the sectors of major interest, like software for example, and it will be done during the summer and fall 2002 to allow comparisons with the data collected through the COPI survey. The questionnaire will be shortened to increase the probability of achieving higher response rates. The analysis of the data collected through the COPI survey has indicated which of the questions did not produce interesting results. Therefore a shortened questionnaire will be as effective as the full version.

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## 7. Annexes

### Annex 1. Publications, conference presentations and other material.

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**Annex 2. The COPI questionnaire.**

## Section 1

### DEFINITIONS

**Product innovation:** The introduction of a good or service which (for the firm) is new or substantially improved.

**Process innovation:** The introduction of a new means of production which (for the firm) is new or substantially improved.

*\*\*Please answer only to the questions that apply to your firm\*\**

1. Name of Company.....
2. Sector of activity.....
3. Position of person filling in the questionnaire.....
4. How long have you been in this position?.....
5. How long have you been in the company?.....
6. Number of employees (total):.....
7. Gross Turnover of the company  
 1997.....1998.....1999.....

8. Are there majority shareholders who work actively and full time (or nearly) in the management of the firm?

- i. [..] Yes [..] No
- ii. If Yes, please answer only to questions n.8.1., 8.2., 8.3., 8.4., 9, 11,12, 14, 15, 19, 21, 22, 23, 23a o 23b, 24, 25, 26, 27.
- iii. If No, please go to question n.9 and then answer to all the questions, if applicable.

**8.a. List in order of percentage of equity the characteristics of those who have the highest number of shares in the firm**

Subjects	Type of shareholder	Percentage of shares	Does he/she have the direct control over the firm?		Does he/she have a vote agreement with other shareholders?	
			yes	no	yes	no
Shareholder a			yes	no	yes	no
Shareholder b			yes	no	yes	no
Shareholder c			yes	no	yes	no
Shareholder d			yes	no	yes	no

Type of shareholder:

- 1) Foreign individual or firm
- 2) Resident individual
- 3) Private national firm carrying on industrial activity
- 4) Public national firm carrying on industrial activity
- 5) Private or public firm non-carrying on industrial activity
- 6) National banks or other financial institutions
- 7) Foreign banks or other financial institutions

**8.b. Is there a family relationship among those who actively control (have shares and work) the firm?**

- a) yes among all
- b) no
- c) only among a few of them

**8.c. What kind of activity do the first four shareholders (if individuals) perform in the firm? (ie, management, administration, sales, production, finance, etc)**

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_

8.d Can you foresee the entrance of new shareholders (not belonging to the family) in the next 5 years?

Yes [..]  
 No [..] Please explain \_\_\_\_\_

**9. What priority was given to each of the following stakeholders in the company's corporate strategy five years ago and what priority is your company giving to each of its stakeholder groups in its current corporate strategy?**

Stakeholder groups	Time frame	No priority							High
		1	2	3	4	5	6	7	
Shareholders	Five years ago	1	2	3	4	5	6	7	
	At this moment	1	2	3	4	5	6	7	
Labour unions	Five years ago	1	2	3	4	5	6	7	
	At this moment	1	2	3	4	5	6	7	
Employees	Five years ago	1	2	3	4	5	6	7	
	At this moment	1	2	3	4	5	6	7	
Customers	Five years ago	1	2	3	4	5	6	7	
	At this moment	1	2	3	4	5	6	7	
Dealers and distributors	Five years ago	1	2	3	4	5	6	7	
	At this moment	1	2	3	4	5	6	7	
Society at large	Five years ago	1	2	3	4	5	6	7	
	At this moment	1	2	3	4	5	6	7	
Government & governmental agencies	Five years ago	1	2	3	4	5	6	7	
	At this moment	1	2	3	4	5	6	7	
Preferred suppliers	Five years ago	1	2	3	4	5	6	7	
	At this moment	1	2	3	4	5	6	7	
Other (non-preferred) Suppliers	Five years ago	1	2	3	4	5	6	7	
	At this moment	1	2	3	4	5	6	7	
Ecological pressure groups	Five years ago	1	2	3	4	5	6	7	
	At this moment	1	2	3	4	5	6	7	
Providers of debt capital	Five years ago	1	2	3	4	5	6	7	
	At this moment	1	2	3	4	5	6	7	

**10. On a scale of 1 to 7, to what extent are the non-executive directors on the board representatives of specific shareholders:**

None						All
1	2	3	4	5	6	7

**11. Are any of the non-executive directors on the board, representatives of some stakeholder such as banks, suppliers, customers, government, employees.**

No [..] Yes Banks [..]  
 Suppliers [..]  
 Customers [..]  
 Government [..]  
 Employees [..]  
 Other [..]

Please specify .....

**12. How often does the board of directors/supervisory board meet? .....**

**13. How many times a year does your company management hold a meeting, formal or informal, with your largest shareholders or their representatives? [Do not include board meetings, even those in which directors representing specific shareholders are present]**

- a. Less than once a year [..]
- b. Once a year [..]
- c. Twice or three times a year [..]
- d. Four or more times a year [..]

14. How many times a year does your company management hold a meeting, formal or informal, with the following stakeholders?

	Banks	Suppliers	Customers	Government	Unions
Less than once a year					
Once a year					
Twice or three times a year					
Four or more times a year					

15. How often do others in your company, besides the chief executive and finance director, participate in the meetings with shareholders?

	Never participates						Participates in all
a. R&D director	1	2	3	4	5	6	7
b. Leading scientists and technologists of the firm	1	2	3	4	5	6	7
c. Other, please specify	1	2	3	4	5	6	7

16. To what extent do the (a) largest shareholders and (b) average shareholders of your company have an in-depth understanding of the general situation and the key technologies of the industry?

	Has/had no understanding						Have/had full understanding
a. The general situation: profitability, capacity utilisation and market trends							
1. Largest shareholder now	1	2	3	4	5	6	7
2. Largest shareholder 5 years ago	1	2	3	4	5	6	7

years ago							
3. Average shareholder now	1	2	3	4	5	6	7
4. Average shareholder 5 years ago	1	2	3	4	5	6	7
b. The nature of the key technologies and the way they are developing							
1. Largest shareholder now	1	2	3	4	5	6	7
2. Largest shareholder 5 years ago	1	2	3	4	5	6	7
3. Average shareholder now	1	2	3	4	5	6	7
4. Average shareholder 5 years ago	1	2	3	4	5	6	7

17. On a scale of 1 to 7, to what extent do the largest shareholders and average shareholders of your company have an in-depth understanding of the following matters, and to what extent did they understand these matters five years ago

	Have/had no understanding					Have/had full understanding	
a. The company's financial and competitive position, and corporate strategy							
1. Largest shareholder now	1	2	3	4	5	6	7
2. Largest shareholder 5 years ago	1	2	3	4	5	6	7
3. Average shareholder now	1	2	3	4	5	6	7
4. Average shareholder 5 years ago	1	2	3	4	5	6	7
b. The company's short-term technology strategy, including products due for launch within the next two years							
1. Largest shareholder now	1	2	3	4	5	6	7
2. Largest shareholder 5 years ago	1	2	3	4	5	6	7
3. Average shareholder now	1	2	3	4	5	6	7
4. Average shareholder 5 years ago	1	2	3	4	5	6	7
c. The company's longer-term technology strategy, including products more than two years from launch							
1. Largest shareholder now	1	2	3	4	5	6	7
2. Largest shareholder 5 years ago	1	2	3	4	5	6	7
3. Average shareholder now	1	2	3	4	5	6	7
4. Average shareholder 5 years ago	1	2	3	4	5	6	7
d. The quality and competence of the current top management team							
1. Largest shareholder now	1	2	3	4	5	6	7
2. Largest shareholder 5 years ago	1	2	3	4	5	6	7
3. Average shareholder now	1	2	3	4	5	6	7
4. Average shareholder 5 years ago	1	2	3	4	5	6	7

**18.** Does 'Insider-Dealing' [or other] legislation represent a real obstacle in explaining to shareholders the work on innovation taking place in your company?

	Represents no obstacle at all						Represents real obstacle
	1	2	3	4	5	6	7
1. Largest shareholder							
2. Average shareholder							

**19.** Is your main priority to maximise shareholder value, if necessary at the expense of the interests of other stakeholders?

	We always insist on balancing the interests of shareholders with those of other stakeholders						We give complete priority to shareholders' interests
	1	2	3	4	5	6	7
Now							
5 years ago							

**20.** How far does the need for secrecy represent a real obstacle in explaining to shareholders the work on product innovation taking place in your company?

	Represents no obstacle at all						Represents a real obstacle
	1	2	3	4	5	6	7

**21.** To what extent are the main shareholders of your firm active in the following areas, and how was the situation in these respects 5 years ago?

	Show no interest						Routinely insists on full explanation and expects the last word on the matter
<b>a. Influencing general strategy (incl. major mergers and acquisitions)</b>							
Now	1	2	3	4	5	6	7
5 years ago	1	2	3	4	5	6	7
<b>b. Influencing the remuneration system of top management</b>							
Now	1	2	3	4	5	6	7
5 years ago	1	2	3	4	5	6	7
<b>c. Influencing the selection of top management</b>							
Now	1	2	3	4	5	6	7
5 years ago	1	2	3	4	5	6	7

**22.** How far would you agree that the following statement is true for your firm: "The nature of the relationship with shareholders leads to less resources going to product innovation than would be optimal for long-term shareholder value?"

	Strongly disagree						Strongly agree
	1	2	3	4	5	6	7
Now							
5 years ago							

**23.** In the last three years, has your company carried out a major restructuring operation which involved dismissing a substantial number of employees?

[..] Yes → **Please answer question 23a**  
 [..] No → **Please answer question 23b**

23a. In carrying out the restructuring operation, what was the influence of the following considerations on the strategy you followed at that time?

23b. If it seemed to the top management that the firm could gain in profit over the next three years by a strategy which involved dismissing a substantial number of employees, which of the following considerations would weigh against this, and how strongly?

	Did/would not have any influence						Did/would have a major influence
	1	2	3	4	5	6	7
<b>Problems of conscience: inner feeling of responsibility to the employees</b>							
<b>Social position in the local community would make it difficult</b>							
<b>Would throw away skills which are likely to be valuable and thus in the long run might be self-defeating</b>							
<b>Would damage the co-operative relationship between employees and management and in the long run be self defeating</b>							
<b>The union would react by a damaging strike or other industrial action</b>							
<b>The workers would obstruct it by using their powers under co-determination</b>							
<b>Effectively blocked by our legal obligations to the workforce</b>							
<b>Financial interests of shareholders</b>							
<b>Credibility towards providers of debt (banks)</b>							

## Section 2

### DEFINITIONS

**Product innovation:** The introduction of a good or service which (for the firm) is new or substantially improved.

**Process innovation:** The introduction of a new means of production which (for the firm) is new or substantially improved.

***\*\*Please answer only the questions that apply to your firm\*\****

1. Name of Company.....
2. Sector of activity.....
3. Position of person filling in the questionnaire.....
4. How long have you been in this position?.....
5. How long have you been in the company?.....
  
6. Approximate number of employees working on Research and Development more than 50% of their time.....
  
7. R&D expenditure  
     1997..... 1998..... 1999.....

8. On a scale of 1 to 7, indicate the importance of different types of expenditure *on product innovation in previous 12 months*

	None						A major element of product innovation expenditure
a) Research	1	2	3	4	5	6	7
b) Dev. & Design	1	2	3	4	5	6	7
c) Marketing & Sales	1	2	3	4	5	6	7
d) Training	1	2	3	4	5	6	7
e) Fixed capital	1	2	3	4	5	6	7

9. On a scale of 1 to 7, indicate to what extent is the research and development work for your *product* innovations done in-house? (Joint ventures should be put in the middle of the scale.)

All the R&D work for product innovation is done outside the firm						We rely entirely on in-house activities on in-house activities
1	2	3	4	5	6	7

10. How many R&D units or laboratories does your company have? If you only have one please go to question 12.....

11. On a scale of 1 to 7 mark the present and ideal level of interaction among the different R&D units of your company.

	None						Very High
	1	2	3	4	5	6	7
Present level of interaction	1	2	3	4	5	6	7
Ideal level of interaction	1	2	3	4	5	6	7

12. On a scale of 1 to 7 what is the degree of interaction between the following different functions in relation to product innovation; and what should it ideally be in such a business as yours? (please tick 'Not Applicable' if your firm is not structured in this way)

	Not applicable	None						Very high
		1	2	3	4	5	6	7
<b>1. Between Marketing e R&amp;S</b>								
Present level		1	2	3	4	5	6	7
Ideal level	[...]	1	2	3	4	5	6	7
<b>2. Between Production &amp; R&amp;S</b>								
Present level		1	2	3	4	5	6	7
Ideal level	[...]	1	2	3	4	5	6	7
<b>3. Between Research &amp; Development (if separate)</b>								
Present level		1	2	3	4	5	6	7
Ideal level	[...]	1	2	3	4	5	6	7
<b>4. Among different product divisions</b>								
Present level		1	2	3	4	5	6	7
Ideal level	[...]	1	2	3	4	5	6	7
<b>5. Among different geographical divisions</b>								
Present level		1	2	3	4	5	6	7
Ideal level	[...]	1	2	3	4	5	6	7

13. On a scale of 1 to 7 what is the degree of interaction with the following in relation to product innovation; and what should it ideally be in such a business as yours? (For customers we are not concerned with retailers, wholesalers or households; where these are the only important customers please tick Not Applicable.)

	Not applicable	None						Very high
		1	2	3	4	5	6	7
<b>1. Firm and its customers</b>								
Present level		1	2	3	4	5	6	7
Ideal level	[..]	1	2	3	4	5	6	7
<b>2. Firm and its suppliers</b>								
Present level		1	2	3	4	5	6	7
Ideal level	[..]	1	2	3	4	5	6	7
<b>3. Firm and its competitors</b>								
Present level		1	2	3	4	5	6	7
Ideal level	[..]	1	2	3	4	5	6	7

If at b) (relationship with the suppliers) you answered 1,2 or 3, this is because:

- a) Secrecy is too important and therefore we only buy very simple parts from our suppliers.
- b) We find difficulties in trusting them.
- c) They do not do research.
- d) Other.....

14. On average, how much time does it take to bring a product innovation to market - from initial conception to launch?

Incremental change in existing product .....

Clearly new product.....

15. Considering the long-term interests of shareholders, how far would you agree with the following statement: "Not enough time and money is put into product innovation"?

Thoroughly disagree						Thoroughly agree
1	2	3	4	5	6	7

**15.a. If your answer to question 16 is 5, 6 or 7, is this because:**

- a. These projects will not pay back soon enough [..]
- b. The target/hurdle rate of return is set too high [..]
- c. There is not enough funding/staff for exploratory work [..]
- d. There is not enough funding for R&D overall [..]
- e. There is not enough funding put into launching new products and building up their market share [..]
- f. There are a number of different divisions or profit centres which would have to co-operate and are unwilling to do so. [..]
- g. Other, please specify..... [..]

**16. How has the use and importance of financial performance criteria in the selection and continuation of product innovation projects changed in the last 5 years?**

Diminished substantially	Diminished	No change	Gone up	Gone up substantially
1	2	3	4	5

**17. Which of the following do you count on to protect your product innovations from competitors? Please indicate their importance now and five years ago.**

	Not used/negligible						Very important
<b>1. Patents on products</b>							
Now	1	2	3	4	5	6	7
5 years ago	1	2	3	4	5	6	7
<b>2. Patents on processes</b>							
Now	1	2	3	4	5	6	7
5 years ago	1	2	3	4	5	6	7
<b>3. Copyright</b>							
Now	1	2	3	4	5	6	7
5 years ago	1	2	3	4	5	6	7
<b>4. Your firm's specific knowledge and expertise</b>							
Now	1	2	3	4	5	6	7
5 years ago	1	2	3	4	5	6	7
<b>5. Complementary assets (eg: capital investment, distribution network, brand image)</b>							
Now	1	2	3	4	5	6	7
5 years ago	1	2	3	4	5	6	7

<b>6. Secrecy</b>							
Now	1	2	3	4	5	6	7
5 years ago	1	2	3	4	5	6	7
<b>7. Long-term contracts</b>							
Now	1	2	3	4	5	6	7
5 years ago	1	2	3	4	5	6	7
<b>8. Other, please specify</b>							
Now	1	2	3	4	5	6	7
5 years ago	1	2	3	4	5	6	7

**18. What percentage of your turnover is from products innovated in the last three years?.....%**

**19. On a scale from 1 to 7, to what extent do you consider product innovation in your industry to be more or less radical compared to five years ago?**

Substantially less radical							Substantially more radical
1	2	3	4	5	6	7	

**20. On a scale from 1 to 7, to what extent do you consider product innovation in your firm to be more or less radical relative to (a) that of other national firms; (b) firms abroad in your industry?**

	Much less radical						Much more radical
National firms	1	2	3	4	5	6	7
Firms abroad	1	2	3	4	5	6	7

**21. If your firm is working with radically new technologies what is their main source? (tick more than one if appropriate)**

These technologies are developed in- house	[..]
These technologies are developed jointly with academic institutions	[..]
These technologies are developed in collaboration with other firms:	
Suppliers	
Rivals	[..]
Customers	[..]
Others.....	[..]
	[..]
These technologies are brought in through mergers and acquisitions	[..]

**22. Is your firm working on leading-edge technologies that are unlikely to affect market share in the next 5 years?**

Is working on these technologies	[..]
Is working on them but makes sure that they are a very small proportion of the overall assets (activities) of the firm	[..]
We are making a substantial commitment in collaboration with other firms	[..]
We are making a substantial commitment on our own	[..]
Other, please specify.....	[..]

**23. Have you ever received public funding for innovation?**

- 1) No, we have never asked for it.
- 2) No, we would have like to apply but the burocratic procedures are too long.
- 3) No, we apply for it but we never received any.
- 4) Yes, but rarely.
- 5) Yes, very often.
- 6) Other, please specify.....



9.a. Has your company introduced share options to remunerate the following sections of the workforce and did it have such measures 5 years ago?

	Yes	No
<b>Top management</b>		
Now	[..]	[..]
5 years ago	[..]	[..]
<b>Middle management</b>		
Now	[..]	[..]
5 years ago	[..]	[..]
<b>Key Innovation workers(eg: scientists, senior programmers in IT)</b>		
Now	[..]	[..]
5 years ago	[..]	[..]
<b>All the workforce</b>		
Now	[..]	[..]
5 years ago	[..]	[..]

10. Are there any incentives for the following employees to come up with innovative suggestions?

	Yes	No
Production	[..]	[..]
Sales and marketing	[..]	[..]

11. How many years does the average employee in the following categories stay with the firm?

	0-2	2-5	5-10	More than 10
<b>a. Senior management</b>	[..]	[..]	[..]	[..]
<b>b. Research, development and design/IT development</b>				
Graduate scientists and technologists	[..]	[..]	[..]	[..]
Technicians/non-graduate programmers	[..]	[..]	[..]	[..]
<b>c. Production</b>				
Graduate engineers and technologists	[..]	[..]	[..]	[..]
Technicians/ manual workers	[..]	[..]	[..]	[..]
Direct production operatives	[..]	[..]	[..]	[..]
<b>d. Sales, marketing and after-sales service</b>				
Sales and marketing managers	[..]	[..]	[..]	[..]
Sales representatives	[..]	[..]	[..]	[..]
Service engineers	[..]	[..]	[..]	[..]

12. For the following categories of employees to what extent are their skills specific to the firm or relevant throughout the industry?

	Totally specific to the firm							Relevant throughout the industry
	1	2	3	4	5	6	7	
<b>a. Senior management</b>								
<b>b. Research, development and design/IT development</b>								
Graduate scientists and technologists	1	2	3	4	5	6	7	
Technicians/non-graduate programmers	1	2	3	4	5	6	7	
<b>c. Production</b>								
Graduate engineers and technologists	1	2	3	4	5	6	7	
Technicians/ manual workers	1	2	3	4	5	6	7	
Direct production operatives	1	2	3	4	5	6	7	
<b>d. Sales, marketing and after-sales service</b>								
Sales and marketing managers	1	2	3	4	5	6	7	
Sales representatives	1	2	3	4	5	6	7	
Service engineers	1	2	3	4	5	6	7	

13. How much do you spend on all kinds of training as a percentage of turnover?.....%

14. What percentage of the workforce belongs to a union? .....

15. Do you have any form of employee representation beyond what the law provides?

[..] Yes [..] No

If Yes, please specify

.....

16. Do the unions or other forms of representation have any role in the decision-making process?

[..] Yes [..] No

If Yes, please specify.....

17. With respect to (1) Product Innovation (2) Change in processes, how would you describe the attitude of manual production employees on the following scale

	Deliberately obstruct change						Thoroughly co-operative attitude
	1	2	3	4	5	6	7
Product innovation							
Process innovation							

18. What are the trends of employment in the firm for the following categories of employees?

	Employment is falling by more than 10% per year			There is no change			Employment is rising by more than 10% per year		
	1	2	3	4	5	6	7	8	9
Middle management									
Key innovation workers									
All the workforce									

19. In a scale from 1 to 7, what is the role of the education system in preparing the students to work in this sector?

None. The preparation of the students is too general and training takes place mainly within the firm	1	2	3	4	5	6	7	Very good. The students are very qualified

## Section 4

### DEFINITIONS

**Product innovation:** The introduction of a good or service which (for the firm) is new or substantially improved.

**Process innovation:** The introduction of a new means of production which (for the firm) is new or substantially improved.

*\*\* Please answer only the questions that apply to your firm \*\**

1. Name of Company.....
2. Nationality of Company.....
3. Name of parent company.....
4. Nationality of parent company.....
5. Sector of activity.....
6. Position of person filling in the questionnaire.....
7. How long have you been in this position?.....
8. How long have you been in the group?.....
9. And in the subsidiary?.....
10. Number of employees of this subsidiary.....
11. Gross Turnover of this subsidiary  
     1997..... 1998..... 1999.....
12. What proportion of this turnover is sold within the group to which you belong?  
     .....
13. Is your parent company's shareholding in your company 100%, or less?  
     100% [...]                      Less than 100% .....
14. As a profit centre does your company report directly to headquarters, or is there an intermediate level to which you report – i.e. are you a subsidiary of a subsidiary?  
     We report directly to HQ [...]                      We report to an intermediate level [...]

### Relationship with the HQ

15. How many times per year are there face-to-face meetings between the headquarters and the management of your company?.....
16. How many times per year are there face-to-face meetings between the intermediate level and the management of your company?.....

17. On a scale of 1 to 7, to what extent would you describe the activity of your profit centre as part of the core activities of the group?

Totally peripheral						Right at the core
1	2	3	4	5	6	7

18. What is the degree of autonomy of the subsidiary from the Headquarters in the following functions, and what was it five years ago?

	Entirely provided by the parent					The company raises its funds independently	
	1	2	3	4	5	6	7
<b>Finance*</b>							
	Entirely carried out by headquarters					Independent function of the company	
	1	2	3	4	5	6	7
<b>Marketing &amp; Sales</b>							
	Entirely carried out by headquarters					Independent function of the company	
	1	2	3	4	5	6	7
<b>R&amp;S</b>							

\*Degree of freedom to finance activities or to find funding for projects.

19. If the subsidiary has its own R&D department or unit, what is the percentage of R&D directly financed by Headquarters, and what was it five years ago?

Financed NOW .....                      Financed five years ago .....

20. If some R&D for the subsidiary is (or can be) carried out by the central R&D department, to what extent does the subsidiary have to pay for this and does it have discretion to decide how much is done for it; and what was the situation five years ago?

Does not have to pay						Has to pay all	
1	2	3	4	5	6	7	
<b>Has no discretion</b>							
						It is free to decide	
	1	2	3	4	5	6	7

21. The following list contains performance measures. Please indicate for each measure how important it is in Headquarters' final evaluation of the overall performance of your subsidiary. The following list contains performance measures. Please indicate for each measure how important it is in Headquarters' final evaluation of the overall performance of your subsidiary.

	Totally unimportant							Of decisive importance
1. Production efficiency	1	2	3	4	5	6	7	
2. Changes in net profit	1	2	3	4	5	6	7	
3. Employee satisfaction	1	2	3	4	5	6	7	
4. Market share	1	2	3	4	5	6	7	
5. Adherence to cost estimates	1	2	3	4	5	6	7	
6. Time to market of new products	1	2	3	4	5	6	7	
7. Economic value added (eg. EVA, CFROI)	1	2	3	4	5	6	7	
8. Ability to rapidly renew products and processes	1	2	3	4	5	6	7	
9. Net profit (corporate overhead included)	1	2	3	4	5	6	7	
10. Active support for corporate strategy	1	2	3	4	5	6	7	
11. Quality of final products and services	1	2	3	4	5	6	7	
12. Adherence to the budget line items	1	2	3	4	5	6	7	

13. Return on Investment (ROI) or on (Net) Assets (ROA)	1	2	3	4	5	6	7
14. Customer satisfaction	1	2	3	4	5	6	7

22. On a scale of 1 to 7, how tight do you perceive the financial control from Headquarters, in terms of how they respond to a failure to meet financial targets; how tight do you think financial control from Headquarters *should* be?

	Very loose (any excuse will do)			Very strict (no excuses)			
1. How tight do you perceive financial control today?	1	2	3	4	5	6	7
2. How tight do you think financial control <i>should</i> be?	1	2	3	4	5	6	7

23. On a scale of 1 to 7, how tight do you perceive the non-financial control from Headquarters, in terms of how they respond to a failure to meet financial targets; how tight do you think non- financial control from Headquarters *should* be?

	Very loose (any excuse will do)						Very strict (no excuses)
1. How tight do you perceive non-financial control today?	1	2	3	4	5	6	7
2. How tight do you think non-financial control <i>should</i> be?	1	2	3	4	5	6	7

24. To what extent do the following tend to reduce your subsidiary's expenditure of money and labour on product innovation; to what extent did they reduce it five years ago?

	No effect/not relevant						Reduce very severely
1. Tightness of financial targets	1	2	3	4	5	6	7
2. Remuneration by profit centre results	1	2	3	4	5	6	7
3. Lack of centre's attention to/understanding of the underlying non-financial performance of the company	1	2	3	4	5	6	7
4. Difficulty of getting	1	2	3	4	5	6	7

funding for product innovation

### Annex 3. In-depth statistical investigations.

#### An overview of responses (text provided by Professor Tom Groot of the Amsterdam team)

The database contains 314 responses, distributed among six countries and seven sectors. By far the largest sector is banking (one third of the cases).

A2 Sector of activity \* A0 Country Crosstabulation

Count		A0 Country						Total
		Italy	Germany	UK	Netherlands	France	Sweden	
A2	Machine Tools	21	5	8				34
Sector of activity	Chemicals	12			12			24
	Software				8		27	35
	Pharmaceuticals		26					26
	Car industry		16			16	55	87
	Biotechnology			6				6
	Banking	11	24	9	16	8	34	102
	Total		44	71	23	36	24	116

89 companies are listed, 144 non-listed and 81 companies did not respond to this question.

A2 Sector of activity \* A0 Country \* A8 Is your company listed? (Yes=1; No=0) Crosstabulation

Count			A0 Country						Total
			Italy	Germany	UK	Netherlands	France	Sweden	
no	A2 Sector of activity	Machine Tools	21		8				29
		Chemicals	8			5			13
		Software				2		14	16
		Car industry		7				35	42
		Biotechnology			2				2
		Banking	6			6		30	42
		Total	35	7	10	13		79	144
	yes	A2 Sector of activity	Chemicals	4			7		11
	Software				6		13	19	
	Pharmaceuticals		1					1	
	Car industry		3				20	23	
	Biotechnology			4				4	
	Banking	5	7	3	10	2	4	31	
	Total	9	11	7	23	2	37	89	

#### Innovation strategies

In the original documents of our project, we expected that innovation strategies can be characterized by three important dimensions: *visibility*, *appropriability* and *novelty*. We included many different questions around these topics in our survey. Now it is important to test whether the respondents recognized these same aspects of innovation strategy. In order to identify the underlying dimensions in the respondents' answers I used *principal components analyses* followed by Varimax rotation with Kaiser Normalization. As we shall see, these analyses revealed *more different dimensions* than we anticipated. I included the following variables in the analyses: A15, A17, B8, B12, B13, B14, B17, B18, B20, B21 and B22. This choice has been made, because I expect these variables to be related to at least one the of three main dimensions.

#### Visibility

Here we mean visibility of R&D policy, activities and performance to the company's shareholders. The principal components analyses generate two different dimensions here: (1) R&D visibility to

average shareholders (eigenvalue 1.86; explaining 37 % of the variance) and (2) R&D visibility to largest shareholders (eigenvalue 1.83; explaining 36% of the variance).

**Rotated Component Matrix**

	Component	
	1	2
A15A How often does the R&D director participate in meetings with shareholders?	,207	,189
A17B1A Now, The largest shareholders understanding of the short term technology strategy	,137	<b>,945</b>
A17B2A Now, The average shareholders understanding of the short term technology strategy	<b>,926</b>	,205
A17C1A Now, The largest shareholders understanding of the long term technology strategy	,233	<b>,917</b>
A17C2A Now, The average shareholders understanding of the long term technology strategy	<b>,945</b>	,139

Extraction Method: Principal Component Analysis.  
 Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

Respondents do not seem to make a distinction between short-term or long-term R&D strategy, but they do make a distinction between average and large shareholder. Each of the resulting variables is consistent: visibility to average shareholders ( $\alpha=0.91$ ) and visibility to large shareholders ( $\alpha=0.92$ ).<sup>38</sup>

### **Appropriability and Novelty**

I mention these two dimensions jointly, because it turned out to be very difficult to empirically make a sharp distinction between these two dimensions. For instance, the variables “time to market for incremental change in existing products” (variable B14A) and “time to market for clearly new products” (variable B14B) contribute significantly to the total variance in appropriability-related and in novelty-related variables. Each variable can be considered as contributing to the appropriation of R&D rents by being the first mover *and* as contributing to repetitive novelty of (successive) R&D innovations.

In order to make a defensible decision, I joined all data which I expected would be related to **R&D strategy**, i.e. different ways of gaining an advantage by innovation. The first dimension, visibility, is clearly different from R&D strategy in the sense that visibility means the way in which management communicates R&D policies, activities and results to its shareholders.

<sup>38</sup>

Cronbach alpha coefficients above 0.5 or 0.6 are generally considered acceptable.

R&D strategy variables contain six distinct dimensions (refer to table on next page), each explaining between 6 and 9.5% of total variance and having an eigenvalue between 1.6 and 2.2 (very acceptable). I label the first component **Legal protection of property rights** consisting of “patents on products” (var. B17A1), “patents on processes” (B17B1) and “copyrights” (B17C1). The combined measure is reliable ( $\alpha=0.76$ ).

The second component is labelled **Market orientation** and is composed of “interaction between marketing and R&D” (B12A1), “interaction between firm and its customers” (B13A1) and “interaction between firm and its suppliers” (B13B1). The composite variable is reliable at  $\alpha=0.63$ .

The third component is labelled **Superior competencies** and results from “your firm’s specific knowledge and expertise” (B17D1), “complementary assets” (B17E1) and “long term contracts” (B17G1). The resulting variable is reliable ( $\alpha=0.61$ ).

I labelled the fourth component **Timeliness** because the composing variables stress the importance of getting innovations on the market quickly enough: “time to market for incremental change in existing products” (B14A) and “time to market for clearly new products” (B14B) ( $\alpha=0.77$ ).

The fifth component and seventh component have in common that both of them relate to **Investments in Innovative Capacity**. The fifth component relates to investments on the shorter term, while component seven relates to investments on the long term. Each component separately does not pass the reliability test. I therefore combined components 5 and 7 into the Investments dimension ( $\alpha=0.57$ ; the combined variable just passes the reliability test).

The sixth component is labelled **Novelty** and relates to the degree in which the firm’s product innovations are more radical to that of other national firms (B20) and to that of firms abroad (B20A). Reliability of the combined variable is good ( $\alpha=0.74$ ).

The remaining components 8 and 9 were very difficult to interpret and therefore were excluded from further analyses.

In conclusion, we now have identified the following innovation policy dimensions:

Category	Dimension (variable)	Var.name	Reliability ( $\alpha$ )
Visibility	Visibility to large shareholders	Vislarge	0.92
	Visibility to average shareholders	Visavera	0.91
Innovation strategy	Market orientation	Market	0.63
	Superior competencies	Compet	0.61
	Timeliness	Timeline	0.77
	Novelty	Novelty	0.74
Appropriability	Legal protection of property rights	Property	0.76
	Investments in Innovative Capacity	Inncap	0.57

Each variable is constructed by adding the scores of the composing original variables. The new variables are added to the COPI database.

Rotated Component Matrix<sup>a</sup>

	Component								
	1	2	3	4	5	6	7	8	9
B8A The importance of research expenditure on PI	,230	-1,94E-02	-9,09E-04	,228	,256	,216	<b>,606</b>	,107	,107
B8B The importance of development and design expenditure on PI	-1,36E-02	,173	-3,29E-02	5,342E-02	,245	2,759E-02	,330	-,172	,725
B8C The importance of marketing and sales expenditure on PI	-,116	,149	-8,95E-02	-,155	<b>,671</b>	,114	8,064E-02	7,572E-02	,194
B8D The importance of training expenditure on PI	-2,64E-02	-3,15E-02	,124	-8,15E-02	<b>,778</b>	6,208E-02	,220	-4,95E-02	-3,81E-02
B8E The importance of fixed capital expenditure on PI	-4,33E-02	-1,21E-02	,109	-,209	,170	-3,81E-03	<b>,670</b>	1,442E-02	-5,94E-02
B18 What percentage of your turnover is from PI in the last 3 years?	4,988E-02	-,105	,237	-5,11E-02	-2,72E-02	9,509E-02	-,155	6,567E-02	,784
B20 To what extent do you consider PI in your firm to be more or less radicale to that of other national firms?	4,759E-02	,121	3,350E-02	,118	8,018E-02	<b>,829</b>	,230	1,753E-02	,126
B20A To what extent do you consider PI in your firm to be more or less radicale relative to that of firms abroad	8,159E-03	,102	,121	9,139E-02	7,633E-02	<b>,863</b>	-6,42E-02	4,595E-03	-4,50E-03
B14A Time to market for incremental change in existing products	,177	9,586E-03	2,522E-02	<b>,912</b>	-,135	,118	2,413E-02	1,965E-02	-4,04E-02
B14B Time to market for clearly new products	9,237E-02	-,107	2,238E-02	<b>,895</b>	-5,89E-02	9,932E-02	-8,37E-02	7,676E-02	2,501E-02
B17A1 Patents on products, now	<b>,868</b>	-1,25E-02	,117	,113	-,144	7,621E-02	,186	1,677E-02	8,291E-02
B17B1 Patents on processes, now	<b>,858</b>	5,218E-02	,139	7,133E-02	-,110	2,898E-02	6,682E-02	3,559E-02	-6,35E-02
B17C1 Copyrights, now	<b>,598</b>	-9,13E-02	,165	,258	,371	-,101	-,200	,146	6,070E-02
B17D1 Your firm's specific knowledge and expertise, now	8,726E-02	,139	<b>,723</b>	,124	6,396E-02	1,052E-02	-4,94E-02	-6,33E-02	,202
B17E1 Complementary assets, now	-2,23E-03	-1,13E-03	<b>,658</b>	2,717E-02	,295	,237	,184	-,131	8,367E-02
B17F1 Secrecy, now	,255	-2,86E-02	,500	2,676E-02	-9,49E-02	6,425E-02	,493	7,758E-02	,167
B17G1 Long term contracts, now	,248	-7,85E-02	<b>,736</b>	-,123	-,177	-1,15E-03	6,202E-02	,206	-,116
B12A1 Present between Marketing and R&D	5,818E-02	<b>,778</b>	-,134	-7,58E-02	9,855E-02	5,621E-02	-6,24E-02	,193	1,959E-02
B12B1 Present between Production and R&D	-,277	,591	,224	5,946E-02	-,210	2,551E-03	,173	,166	,252
B13A1 Present degree of interaction between firm and its customers	7,857E-02	<b>,709</b>	3,731E-02	-,151	-7,05E-02	,113	-,102	-9,71E-02	2,592E-03
B13B1 Present degree of interaction between firm and its suppliers	-6,25E-02	<b>,632</b>	7,870E-02	,141	,295	6,930E-02	,116	-,197	-,136
B21A If your firm is working with radically new technologies what is their main source (tick=1, no tick=0), developed in-house	4,297E-02	-,129	,138	,133	,126	,203	-8,44E-02	,822	-3,55E-02
B22A working on leading-edge technologies in-house that are unlikely to affect market share in the next 5 years	8,873E-02	,206	-,137	-1,87E-02	-,124	-,226	,258	,713	-1,75E-02

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 8 iterations.

### Differences between corporate governance structures, sectors and countries on Innovation Strategy

Corporate governance structure is defined here as being listed or not (var. A8). As can be appreciated from the following table, being listed or not does not influence very much on innovation strategy variables.

	Is your company listed? (Yes=1; No=0)	
	no	yes
	Mean	Mean
Visibility to large shareholders	10,67	11,21
Visibility to average shareholders	8,04	7,76
Market orientation	13,49	12,88
Superior competencies	14,00	13,95
Timeliness of innovations	<b>2,89</b>	<b>8,80</b>
Novelty of innovations	8,92	9,18
Legal protection property rights	7,69	8,83
Investments in innovative capacity	16,29	16,58

**Mann-Whitney U-test,  $p < 0.000$**

Listed companies appear to need more time to bring new or improved products to the market (please notice that the *timeliness of innovations* variable is reversed coded: a low value means high timeliness because the firms only need a few years to bring new or innovated products on the market). This may be due to more complex and hence lengthy decision making processes in listed companies.

More differences are found when comparing countries. Sweden does not use as much customer and supplier information as the other countries do. The Dutch sample firms use to a much lesser extent their specific knowledge and expertise, assets and long term contracts to defend their innovations as the French sample firms do. Time to market is shorter for Dutch and Italian firms than for firms in other countries. French and German firms use more property rights to protect their innovations than firms in other countries do. Dutch and UK firms differ sharply in their investments in innovative capacity.

	Country					
	Italy	Germany	UK	Netherlands	France	Sweden
	Mean	Mean	Mean	Mean	Mean	Mean
Visibility to large shareholders	11,00	10,61	9,85	7,50	11,25	10,74
Visibility to average shareholders	7,94	9,20	,	6,20	6,50	7,74
Market orientation	13,37	14,45	15,17	14,00	14,92	<b>12,15</b>
Superior competencies	13,97	,	13,11	<b>10,90</b>	<b>16,33</b>	14,91
Timeliness of innovations	<b>3,04</b>	10,28	7,38	<b>3,65</b>	8,70	<b>5,57</b>
Novelty of innovations	8,47	9,23	9,41	9,18	9,62	8,76
Legal protection property rights	7,10	<b>14,22</b>	9,17	6,90	<b>11,43</b>	8,48
Investments in innovative capacity	17,32	17,58	<b>14,44</b>	<b>18,92</b>	18,10	15,63

**Differences are significant (Kruskal-Wallis Test and ANOVA, using post-hoc Bonferroni): bold numbers mean: this number is statistically significant from non-bold outcomes in the same variable, while bold and italic numbers mean that only these number are statistically significantly different from each other (and not from other non-boldded outcomes).**

Comparisons across sector of activity leads to most differences. Based on the following, we can differentiate several *clusters* of industrial sectors. Visibility to large shareholders is relatively low for chemical and banking sector. Machine tools, chemicals, car industry and banking need significantly less time to bring new or improved products on the market. The pharmaceutical industry uses more legal protection of property rights, while the banking sector uses significantly less than the other sectors. In biotechnology, investments in innovative capacity is significantly less than in other sectors.

	Sector of activity						
	Machine Tools	Chemicals	Software	Pharmaceuticals	Car industry	Biotechnology	Banking
	Mean	Mean	Mean	Mean	Mean	Mean	Mean
Visibility to large shareholders	13,00	<b>7,40</b>	11,13	10,73	11,39	11,83	<b>9,55</b>
Visibility to average shareholders	7,83	8,17	6,71	9,27	7,93	,	8,00
Market orientation	14,31	14,00	11,00	,	13,50	12,67	12,92
Superior competencies	13,89	12,33	15,46	,	15,74	14,50	12,64
Timeliness of innovations	<b>2,16</b>	<b>4,99</b>	13,71	11,19	<b>3,72</b>	11,30	<b>5,13</b>
Novelty of innovations	8,68	7,79	9,29	8,95	9,00	10,50	9,45
Legal protection property rights	<b>6,63</b>	<b>8,29</b>	<b>8,08</b>	15,63	<b>10,69</b>	<b>15,83</b>	5,09
Investments in innovative capacity	16,32	18,18	14,58	16,89	16,08	<b>11,00</b>	18,56

**Differences are significant (Kruskal-Wallis Test and ANOVA, using post-hoc Bonferroni): bold numbers mean: this number is statistically significant from non-bold outcomes in the same variable**

## Differences between corporate governance structures, sectors and countries on Innovation Success

We included in the questionnaire four questions that present an image of innovation *success*:

B18: Percentage of turnover that comes from Product Innovation in the last three years

B151: Respondent's opinion about the following statement: *We did not invest enough time and money in product innovation*

B20: Product innovation (PI) in our firm is more radicale than in other national firms

B20A: Product innovation (PI) in our firm is more radicale than in other firms abroad

No statistical significant differences exist between listed and non-listed companies on each of these success factors.

Only Italy seems to be slightly more dissatisfied with time and money put into product innovation than other countries. In percentage of product innovation, Germany seems to be less successful than France and Sweden.

	Country					
	Italy	Germany	UK	Netherlands	France	Sweden
	Mean	Mean	Mean	Mean	Mean	Mean
At present: Not enough time and money is put into product innovation.	5	3	3	3	4	3
What percentage of your turnover is from PI in the last 3 years?	32	13	18	22	38	31
To what extent do you consider PI in your firm to be more or less radicale to that of other national firms?	4	5	5	5	5	5
To what extent do you consider PI in your firm to be more or less radicale relative to that of firms abroad	4	4	4	4	5	4

More differences appear when sector of activity is considered. Three sectors generate a higher percentage of their turnover from product innovation: machine tools, software and biotechnology. Biotechnology firms report to be more radical in product innovation than chemical firms are.

	Sector of activity						
	Machine Tools	Chemicals	Software	Pharmaceuticals	Car industry	Biotechnology	Banking
	Mean	Mean	Mean	Mean	Mean	Mean	Mean
At present: Not enough time and money is put into product innovation.	4	4	3	3	4	3	3
What percentage of your turnover is from PI in the last 3 years?	33	20	54	20	26	61	16
To what extent do you consider PI in your firm to be more or less radicale to that of other national firms?	5	4	5	5	5	6	5
To what extent do you consider PI in your firm to be more or less radicale relative to that of firms abroad	4	4	5	4	4	5	5

### Innovation Strategies and Innovation Success

Increased turnover in the last three years seems to be mostly related to superior competencies (firm's specific knowledge and expertise, complementary assets and long term contracts). More radicale product innovation is related to visibility to average shareholders, timeliness, and investmens in innovative capacity.

	B18 Perc. of turnover from PI in last 3 years	B151 Not enough time and money in product innovation	B20 PI more radical to other national firms	B20A PI more radical to other firms abroad
Visibility to large shareholders	.141	-.069	.186	.188
Visibility to average shareholders	-.066	-.229	<b>.342*</b>	.029
Market orientation	-.065	.042	.143	.166
Superior competencies	<b>.273**</b>	-.141	.177	.166
Timeliness of innovations	.102	.036	.138	<b>.208*</b>
Legal protection of property rights	.153	.092	.080	.044
Investments in innovative capacity	.059	.094	<b>.286**</b>	<b>.213*</b>

Remark that *novelty* is not included. This is done because novelty is composed of two success measures (B20 and B20A); the correlation will not have any meaning.

### Shareholder relations and Product Innovation Success

The following table shows that shareholder's information and understanding of the company's strategy is mostly related to *radical product innovations*.

The influence of main shareholders in the selection of top management goes well with generating a higher percentage of turnover by product innovation but is negatively related to *radical product*

*innovation*. This result suggests that shareholders' preferences for top executives is mostly motivated by short term financial considerations and negatively related to longer term innovation considerations.

Firms that generate less turnover from product innovation in the last three years also report that the need for secrecy hampers their explanation of product innovation activities to shareholders and also that the concern for shareholders value leads to less than optimal resources for innovation.

	B18 Perc. of turnover from PI in last 3 years	B151 Not enough time and money in product innovation	B20 PI more radicale to other national firms	B20A PI more radicale to other firms abroad
A13 How many times a year does your company management meet with your largest shareholders?	.114	.188	.217	<b>.329*</b>
A16A2A The largest shareholders understanding of the general situation	-.033	<b>-.362*</b>	.221	.012
A16B2A The average shareholders understanding of the key technologies	-.071	-.212	<b>.327*</b>	.069
A17A2A The average shareholders understanding of strategy	-.116	-.219	<b>.296*</b>	-.022
A17B2A The average shareholders understanding of the short term technology strategy	-.074	-.173	<b>.308*</b>	.024
A17C2A The average shareholders understanding of the long term technology strategy	-.059	-.223	<b>.351*</b>	.031
A20 Is the need for secrecy a real obstacle in explaining to shareholders the work on PI?	<b>-.379**</b>	-.020	.119	.163
A21C1 The influence of main shareholders on selection of top management	<b>.269*</b>	-.008	<b>-.228*</b>	-.112
A22A The concern for shareholder value leads to less than optimal resources for innovation	<b>-.284*</b>	.031	-.104	-.142

**Importance of patents on products to protect your product innovation from competitors.**

	N	Mean	St.D.
<b>A. Software, Banking</b>	37	2,03	1,48
<b>B. Machine tools, chemicals, motor vehicles</b>	86	3,86	2,46
<b>C. Pharmaceuticals, Biotechnolgies</b>	26	6,12	1,40

C>B>A Significant at the 1% level.

**On a scale of 1 to 7, indicate the importance of different types of expenditure on product innovation in previous 12 months.**

	SEC	N	Mean	Std. Dev
Training	1	95	4,11**	1,45
	2	38	3,50**	1,59

SEC 1= Machine tools, car industry, banking  
 SEC 2= Software, pharmaceuticals, biotechnologies.

\*Differences in means significant at the 1% level (2-paired sample T-test).

\*\* Differences in means significant at the 5% level (2-paired sample T-test)

1= None or insignificant

7= A major element of product innovation expenditure.

### Endnotes

<sup>i</sup> The same is true for Finland, for which I have recent information from Risto Tainio and Pekka Yla-Anttila. An interesting study by the latter, *Globalisation of Business in a Small Country – Implications for Corporate Governance and National Systems of Innovation* (2000), finds that both foreign owned and Finnish owned firms in Finland say that their emphasis on shareholder value has increased – the foreign owned more, but not significantly. However the difference that is significant is in the rate of change of profits – which have gone up faster in the foreign-owned firms. This suggests that the foreigners really mean it more than the Finnish owners; or that the foreigners are more short-termist in their pursuit of it; or that in the foreign firms there is more pressure to make profits *look* high.

<sup>ii</sup> . Usually reliable sources inside Daimler-Benz have told me that just such a change in behaviour happened when Jurgen Schrempp imposed a share-price and profit-focused regime in 1997-8. There is a similar effect when a large firm's central R&D labs, criticised for concentrating on blue-sky research rather than profit-focused development, are broken up or otherwise made to dance to the tune of product divisions (vide Akzo which our Dutch team has studied). (This may well happen in consequence of pressures for profit.)

<sup>iii</sup>

However we may have to distinguish between immediate and long-term effects. One of the key factors which has been shown from the US literature, and our own research in the UK, to exacerbate short-term pressures, is diversification (particularly through acquisition). This is easily explained: it is difficult for corporate HQ, let alone shareholders, to get a rich understanding of what is going on right across the divisions in a diversified firm, particularly if they have been recently acquired. So they depend more on accounting information than they should.