

PART 1

**PATENTS AND ECONOMIC PERFORMANCE:
ESTABLISHING THE LINKS**

Chapter 4

UNDERSTANDING BUSINESS PATENTING AND LICENSING: RESULTS OF A SURVEY¹

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To provide additional insight into the factors that have contributed to the growth in patenting, the OECD collaborated with the Business and Industry Advisory Committee to the OECD (BIAC) in 2003 to conduct a survey of businesses regarding their patenting and licensing practices. The purpose of the survey was to gather qualitative information that would provide insight into evolving business strategies for managing intellectual property, assist in interpreting results of more quantitative analyses of patenting trends (e.g. using the OECD Patents database) and compensate for the lack of consistent statistical information on patent licensing. Overall, results confirmed the increased importance of patents in business strategy over the past ten years, mainly due to increased innovation, more intensive competition and patent reform (notably expanded subject matter). Firms indicated that patents play an increasingly important role in disseminating technical information that is useful in planning their own R&D strategies, and stated that licensing is also gaining importance in complementing in-house R&D capabilities and accelerating innovation processes.

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1. The authors would like to thank Gilles Estord, Cristina Serra-Vallejo and Sandrine Kergroach for their assistance in compiling the database of survey responses and conducting preliminary extractions and analysis of this data.
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Introduction

Available statistics provide a clear indication of increased patenting in the major patent offices worldwide. The numbers of patent applications and grants at the European Patent Organisation (EPO), Japan Patent Office (JPO), and US Patent and Trademark Office (USPTO) grew rapidly between 1990 and 2000, as did the number of triadic patent families (applications applied to the EPO, JPO and USPTO to protect the same invention). A number of hypotheses have been proposed to explain the rapid growth in patenting, including increased inventiveness on the part of firms, changes in industry structure (*i.e.* the expansion of patent-intensive industries such as pharmaceuticals and information and communications technology), growing strategic use of patents to thwart competition, heightened importance of patents in facilitating co-operation and technology transfer, changes in patent regimes (*i.e.* expansion of patentable subject matter) and reduced administrative barriers to patenting. To date, however, limited empirical work has been undertaken to test these various hypotheses and compare their relative contributions to the growth in patenting.

To provide additional insight into the factors that have contributed to the growth in patenting, the OECD collaborated with the Business and Industry Advisory Committee to the OECD (BIAC) in 2003 to conduct a survey of businesses regarding their patenting and licensing practices. The purpose of the survey was to gather qualitative information about business patent and licensing practices and provide insight into evolving business strategies for managing intellectual property. The survey was designed to collect information that can assist in interpreting results of more quantitative analyses of patenting trends (*e.g.* using the OECD Patents database) and can compensate for the lack of consistent statistical information on patent licensing. This paper summarises the main results of the survey; aggregated responses to individual questions are set out in the annex to this chapter (see p. 99).

The survey instrument was developed jointly by staff of the OECD and BIAC. It included 23 questions about changes in patenting and licensing patterns, comparing the current situation to that of 10 years prior, and asking about expectations regarding future trends. To minimise the time required to complete the questionnaire and to encourage firms to participate in the exercise, the survey was designed to seek information on qualitative trends in patenting and licensing, not detailed quantitative data. To ensure confidentiality, respondents were instructed to send completed questionnaires directly to the BIAC Secretariat, which removed company-identifying information before sending anonymous results to the OECD for subsequent analysis. Information related to firm size, line of business, approximate level of R&D spending, and age of the firm were included in the information sent to the OECD and used to categorize responding firms. A preliminary questionnaire was tested on a small number of BIAC delegates in early 2003, and a revised questionnaire was distributed electronically to BIAC member organisations later in the year for subsequent dissemination to firms. Several OECD country delegations also contributed to the dissemination of the survey among firms.

As of 15 October 2003, 105 valid responses had been received by BIAC and sent to OECD (Table 4.1). Firms located in Europe returned the largest number of responses (68), followed by those in North America (20) and Asia-Pacific (17, mostly from Japan). The responses cover firms in a range of industry sectors, with the largest number of responses coming from the machinery, chemicals (excluding pharmaceuticals), pharmaceuticals, and ICT industries, with each region displaying slightly different distributions. For example, non-pharmaceutical chemicals and machinery accounted for most of the responses from Asia-Pacific; no responses were received from ICT firms in Asia-Pacific, despite their large presence in this region. European responses were most numerous from firms in the machinery industry, followed by pharmaceuticals, chemicals and ICT firms. More than half of North American responses came from machinery and pharmaceuticals companies. Nearly all responses were received from firms with 1 000 or more employees and with R&D budgets above USD 10 million. Only about 20% of respondents had fewer than 1 000 employees or less than USD 10 million in annual R&D spending. Although large firms

represent a small percentage of the population of innovative firms, they do tend to control a significant amount of R&D spending in most OECD countries; hence their responses may provide a good indication of overall patterns of patenting and licensing.

The results of the survey must be interpreted with caution, keeping in mind the limitations of the survey design. The small number of responses, for example, restricts the statistical validity of the results, especially considering the regional and sectoral biases outlined above. The classification of firms by sector of activity was mainly based on the choice of responding firms from a menu provided in the questionnaire, however, given that some firms opted for sectors of activity different from those in the menu, responses were finally aggregated in five broad sectors as set out below, using ISIC Rev 3 as a guide. In addition, while the survey was designed to capture the most recent trends in patenting and licensing — and their impact — by focusing on the previous ten-year period, the formulation may create additional biases across geographic regions, as patent reform and structural economic change have not proceeded at the same pace in all OECD countries. Hence, the survey results should be seen as providing indications of general trends in patenting and licensing strategies, rather than statistically robust results. Further empirical work will be needed, building on the results of this survey, to provide more precise, statistical information.

Table 4.1. **Survey responses by industry and region**

| Sector | Total | Asia-Pacific | Europe | North America |
|---------------------------------------|-------|--------------|--------|---------------|
| Chemicals (excluding pharmaceuticals) | 21 | 8 | 11 | 2 |
| Pharmaceuticals | 22 | 1 | 15 | 6 |
| Information and communications | 13 | 0 | 10 | 3 |
| Machinery | 33 | 7 | 20 | 6 |
| Other | 16 | 1 | 12 | 3 |
| Total | 105 | 17 | 68 | 20 |

Note: Information and communications includes computing and communications equipment manufacturing and services. Machinery includes instruments, machinery and motor vehicles. Other includes energy and utilities, financial and business services, and remaining sectors.

Results

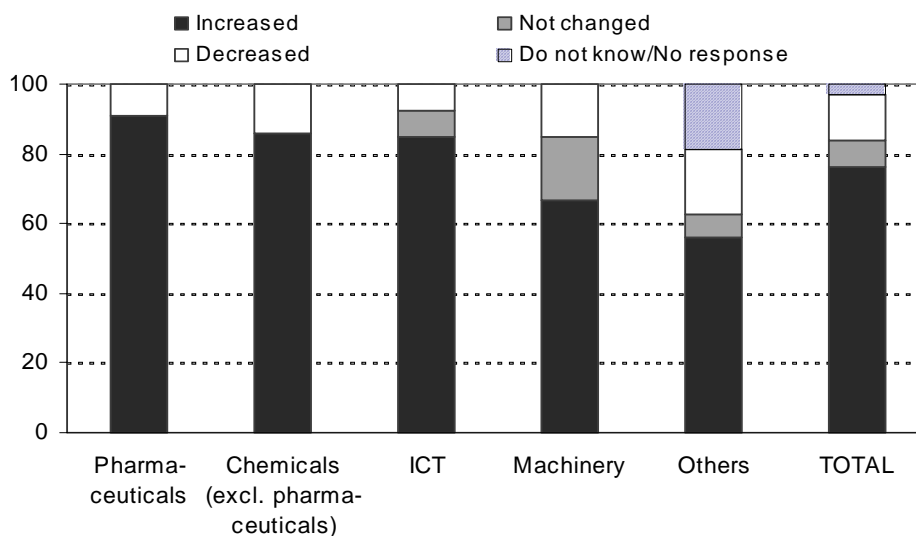
Firm-level patenting has increased across industry sectors

Responses indicate that firm level patenting has increased in all industry sectors, although to somewhat different degrees. Across all industry sectors, 80% of firms report filing more patents now than 10 years ago (see Q.1 in Annex), despite the fact that 84% of firms report increase in the total cost of patenting, including the cost of filing, maintaining, and defending an individual patent (Q.9). Growth was most pronounced in the ICT, pharmaceuticals and chemicals sectors, where more than 85% of respondents reported an increase, compared to firms in the machinery sector, where only 67% reported an increase and 18% reported no change. Around 15% of firms in machinery and chemicals reported a decrease in patents, compared to between 8-9% in ICT and pharmaceuticals. Growth was reported more often in larger firms than smaller firms, by a margin of more than 80% to less than 60%. More firms in North America (85%) and Europe (76%) reported growth in patenting than firms in Asia-Pacific (65%).

These results are consistent with available patent statistics and other surveys of business patenting, lending support to the credibility of the survey. In particular, the results agree with statistical evidence of a general increase in patenting across the OECD. Interestingly, growth in patenting by Japanese inventors has been slower than that of US or European inventors; hence the share of patents owned by Japanese

inventors fell between 1991 and 2001. This result is consistent with the lower levels of growth in patenting reported by Japanese firms in the survey. In addition, statistical evidence indicates that approximately 50% of growth in patenting is related to ICT and biotechnology inventions. The survey also shows a higher share of respondents in these industry sectors reporting increased patenting. This finding is also consistent with earlier industry surveys that found a higher reliance on patenting to protect competitive advantage in these sectors. As the survey indicates, the growth in patenting in these sectors (as well as others) results from increased patenting at the firm level, not just from an expansion of these sectors and an increase in the number of firms competing in them.

Figure 4.1. **Change in number of patents filed by respondents over the last 10 years**
Q.1: Percentage of respondents



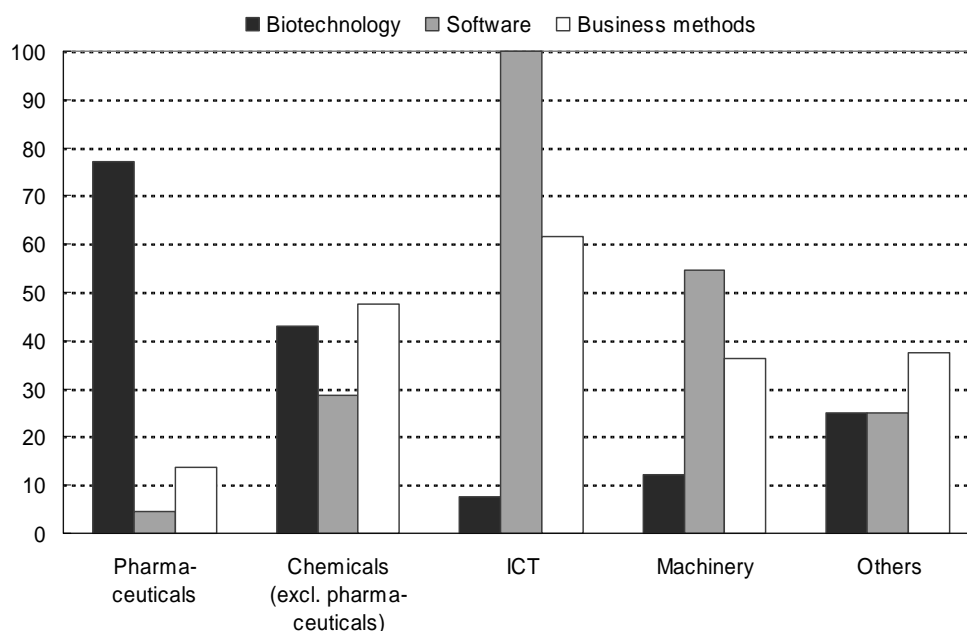
Growth in patenting appears to result in part from increased inventiveness. For example, 95% of firms reporting an increase in filings indicated that a very important or moderately important driver of such growth had been an increase in the number of inventions they had generated, with 71% of firms ranking increased inventions as very important (Q.2.1). This was more true in the ICT and pharmaceuticals industries (where respectively over 91% and 84% of firms reported increased inventiveness as a very important driver) than in the chemicals and machinery industries (where just 67% and 62%, respectively, reported increased inventiveness as very important). The effect was also more pronounced in North America, where it was cited by 94% of the firms reporting increased patenting, than in Europe (67%) or Asia-Pacific (55%). Regional differences may, in turn, reflect sectoral differences, as the Asia-Pacific region included no respondent from the ICT sector and only one respondent from pharmaceuticals, whereas more than 50% of the respondents in North America and Europe came from those industries.

Nevertheless, changing patenting strategies also contributed to increasing patent rates. 69% of all respondents reported that they now patent inventions that they would not have sought to patent 10 years ago even if those inventions were patentable then (Q.3). This effect was also most pronounced in the chemicals industry, followed by the pharmaceuticals and ICT industry. It was also more pronounced in Europe and Asia-Pacific than in North America. This latter finding may reflect the high share of pharmaceutical companies among US respondents, given that pharmaceutical firms have long considered patents an essential tool for protecting their competitive advantage. To a lesser extent, firms also report that they now file more patents per invention than 10 years ago (Q.2.2). Firms are also more likely to seek protection for a single invention in multiple patent offices (Q.2.3), further raising their total patent counts.

Changes in patentability affect research spending

The expansion of patent protection to new types of inventions (*e.g.* those related to biotechnology, software and business methods) has had pronounced effects on related fields of research (Q.4). Changes in the patentability of software had the largest effect on research, with roughly half of all respondents reporting increased software-related research as a result of changed patentability criteria. The effect was most pronounced among ICT firms, all of which reported increased research in software, but even in the machinery industry 55% of firms reported an increase, reflecting the broad product lines of many machinery firms and the importance of embedded software in a number of mechanical products. The patentability of business method inventions had a noticeable effect on research across industry sectors, with more than 60% of ICT firms and almost 40% of chemicals and machinery firms reporting an increase in related research. Pharmaceuticals were an exception to the latter rule with only 14% citing increased research as a result of the patentability of business methods. The impact of genetic patenting was much more localised, with 77% of pharmaceuticals firms and 43% of chemicals firms reporting increased research, compared to around 10% of ICT and machinery firms. The patentability of biotechnology-based inventions was the only change in patentability that had a significant effect on pharmaceutical firms, despite the increasing role of informatics and related software in sequencing and analysis.

Figure 4.2. **Effect of changing patentability criteria for on research spending**
Q.4: Percentage of respondents reporting and increase in research due to patentability changes



Differences in responses by firm size and region are also interesting. Large firms reported increases in related research in all three areas more frequently than smaller firms, most likely reflecting both their greater financial resources (*i.e.* more money to invest in R&D) and their broader research portfolios. Nevertheless, the existence of start-up firms and their ability to invest at all in research and development is often contingent on patentability of their inventions (a necessary requirement for venture capital in some fields), an effect that may not be revealed in the survey. Changes in patentability had the largest effects on research among Asia-Pacific respondents, followed by North American and European firms. This reflects, to some extent, the sectoral distribution of responses from the regions: the larger share of Asia-Pacific responses from the chemicals and machinery industries meant that changes in patentability of software and business methods had significant effects. In the United States, the strongest effects were attributed to bio-

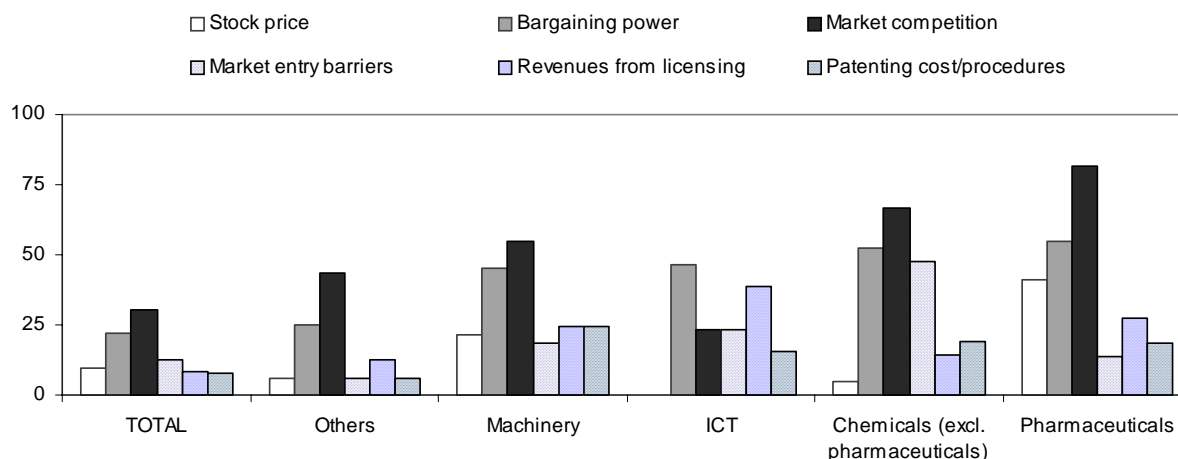
technology patenting, reflecting the large share of pharmaceutical firms among respondents. In none of the fields did a majority of European firms report increases in related research.

Patenting becoming a more effective means of protecting competitive position

Firms report that over the past 10 years, patents have become a more effective means of protecting competitive advantage. Two thirds of respondents perceived a rise in the economic value of patents, such as the value to be gained through exploiting the patented invention or licensing it to others (Q.10), and 89% reported higher risks associated with not patenting, such as might accrue from competitors making use of an unpatented invention (Q.11). The two factors that have the most influence on firm’s patenting strategies appear to be increased product market competition and the bargaining power of a strong patent portfolio in negotiations with other firms. More than 80% of firms found them either very important or moderately important (Q.12). 60% of respondents cited product market competition, and almost 48% cited bargaining power as a very important determinant of patenting strategy. Patents are used by holders for securing their position both in competitive and co-operative processes. Other factors – reduced barriers to entry, potential licensing revenues, changes in the administrative ease and cost of filing patents, and effects on stock price – were considered very important by around 20% of respondents and not important by larger shares of respondents.

These findings were roughly consistent across geographic regions, although Asia-Pacific and North American firms tended to place greater emphasis than European firms on the importance of bargaining power, and North American firms rated product market competition and reduced entry barriers as less important than European or Asia-Pacific firms. The share of firms rating licensing revenues as a very important factor influencing patent strategies was higher in North America than in Europe and Asia-Pacific.

Figure 4.3. **Relative importance of factors influencing firm patenting strategies**
Q.12: Percentage of respondents rating each factor “very important”



Sectoral patterns were roughly consistent with the aggregate pattern, with the notable exception of the ICT sector. ICT firms placed considerably less emphasis than firms in other sectors on the importance of product market competition, with only 23% of firms rating it as a very important determinant of patenting strategy, compared to 55% of firms in machinery, 67% in chemicals and 82% in pharmaceuticals. In addition, ICT firms placed greater emphasis on potential licensing revenues as a determinant of patenting strategy. 39% of ICT firms cited licensing revenues as very important (compared to between 14% and 27% of firms in other sectors), making it the second most important factor for ICT firms after bargaining power.

This result is consistent with results discussed below related to the high levels of inter-firm licensing of technology in the ICT sector. ICT firms did not consider very important the effects of patents on stock price, which more than 20% of firms in machinery and pharmaceuticals considered very important. Another notable sectoral difference is the high significance firms in the chemicals sector place on the influence of reduced barriers to entry in their markets on their patent strategy.

The survey supports the notion that the increased use of patents to protect competitive advantage results from the increased control patent holders now have over their inventions. Firms reported a perceived strengthening of patent holders rights in all geographic regions, but most notably in North America (Q.6). This may reflect changes in the US patent system, such as the establishment in 1982 of the Court of Appeals of the Federal Circuit to hear cases related to patent infringement, which has tended to protect patent holders' rights and has led to growing levels of damage awards in the United States. Interestingly, firms were more likely to report stronger patent holders' rights in their home regions than in foreign patent offices (*i.e.* Japanese firms reported strengthened rights in the Japanese patent office than in Europe or the United States). In addition, more than 70% of firms reported growing involvement in patent infringement suits, whether as the claimant or the defendant (Q.7). This trend was more prevalent among larger firms (in which almost 80% reported growing involvement in infringement suits) than among smaller firms (only 23% of which reported involvement in infringement suits). This could reflect the larger patent portfolios of large firms, which creates more opportunities for infringement, and the larger financial resources they have for engaging in legal suits.

Increased patenting also appears to be affecting the research plans of firms. Some 46% of all respondents reported a heightened likelihood of competitors' patents blocking their research projects, and 44% reported no change (Q.8). This was the case more often in the chemicals, where 76% of firms reported that research projects had been blocked in the previous 10 years, than in the ICT sector, where 77% of respondents cited no change. Responses from firms in machinery and pharmaceutical sectors were balanced between reporting an increased likelihood of R&D projects being blocked due to patents and reporting no change in that respect. As with patent infringement suits, larger firms were more likely than smaller firms to report blocked research projects (by a margin of 50% to 32%), a finding that may also be influenced by the broader research portfolios of larger firms. These results are consistent with the disclosure function of patents, which serves to avoid duplication of research. What is not clear from the survey, however, is whether patents more frequently block duplicative research or follow-on research that may be important to incremental innovation. While the phrase "blocking research" implies that latter, the finding reported below that a number of respondents find the information provided by patents more useful now than 10 years ago highlights the importance of disclosure for research planning and information sharing.

Patents still an effective vehicle for technology diffusion

Despite the perceived increase in patent holders' rights and resulting limitations on the use of patented inventions, firms continue to find patents and patent licensing an important channel for diffusing technology. Almost 90% of firms report that patents are a useful source of information for their own R&D efforts (Q.13). Interestingly, this appears to be less true in the ICT sectors than in other industries; whereas half of all respondents found patents a useful source of information; half did not. Similar results were found in all three regions, with differences reflecting the sectoral responses by region. The value of patents for information diffusion appears to be more pronounced in larger than smaller firms.

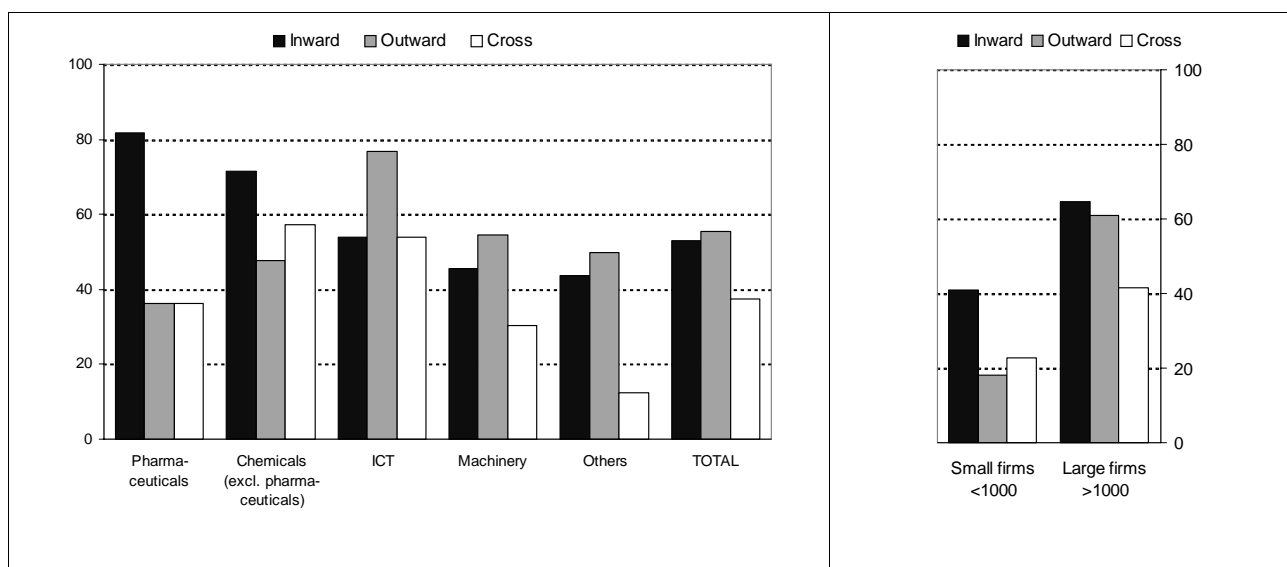
Furthermore, the utility of information contained in patents appears to have increased over the past decade. 44% of respondents reported increased utility; only 5% of firms reported a decline in usefulness, whereas 44% detected no change (Q.13.1). This result might suggest that firms are more active in reviewing relevant patents in planning their own R&D activities. The sector with the highest share of

respondents reporting an increased utility of patents (62%) was the pharmaceutical sector, which has also seen the sharpest rise in patenting, according to the survey results. A higher share of firms from Asia Pacific reported increased utility, compared to firms from Europe or North America.

The survey also indicates that licensing of patented inventions has become a more effective channel for diffusing scientific and technological know-how. In total, approximately 60% of responding firms reported increased inward and outward licensing of technology over the past decade (Q.14 and Q.18). Almost 40% reported increased cross-licensing (Q.17). Growth in inward and outward licensing was reported more frequently by firms in Asia Pacific and North America than Europe; growth in cross-licensing was reported most frequently in North American firms. Larger firms were more likely to report increased licensing of all types than were smaller firms. No significant changes were reported in refusals to license (Q.16); nor did the survey reveal significant obstacles to licensing (Q.19).

A sectoral decomposition of survey responses shows interesting differences in licensing patterns across industries. The machinery industry, for example showed higher levels of outward- than inward-licensing, and only 28% of firms reported increased cross-licensing. The ICT sectors had the highest share of respondents citing increases in outward licensing (77% of responses), reflecting the fact that many of the best-known outward licensors of technology tend to come from this sector (*e.g.* IBM, Texas Instruments). A large share of respondents from the ICT sector (54%) also reported increases in both inward and cross-licensing, highlighting the importance of technology sharing in this industry. The pharmaceuticals industry reported the highest levels of inward licensing (nearly 90% of respondents), a relatively low level of cross-licensing and below-average level in outward licensing. This result likely reflects the presence of large, multinational firms in the sample, many of which are active in acquiring technology from smaller biotechnology start-ups. Chemicals companies also tended to report high levels of inward licensing, and were most likely to report increased cross-licensing.

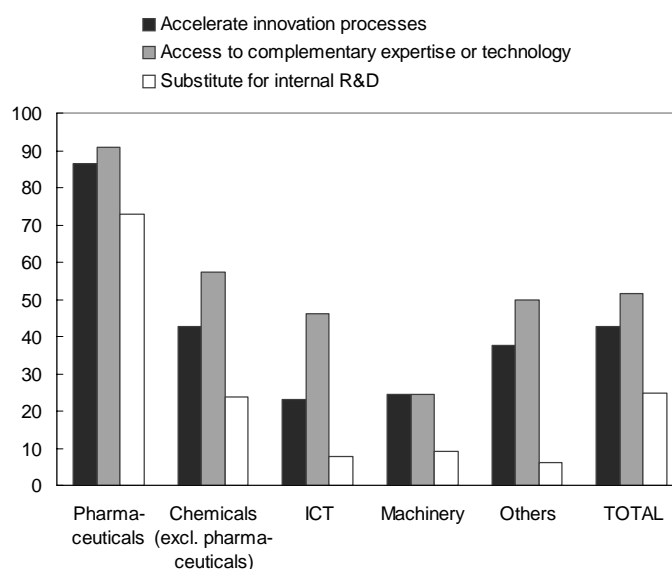
Figure 4.4. Increase in inward, outward and cross licensing of patented technology
Q.14, Q.18 and Q.17: Percentage of firms reporting increased licensing



For the most part, the increased inward licensing of technology complements firms' internal R&D efforts. More than half of all respondents (54%) cited the need for complementary knowledge as a very important factor in shaping their licensing strategy (Q.15.2). The need to accelerate innovation processes—often the result of increased competition—was considered very important by approximately 45% of respondents (Q.15.1). Only 26% saw substitution for internal R&D as a very important driver, and it was

considered not important by the largest share of firms (Q.15.3). These results were roughly consistent across industry sectors, with the relative importance of the three factors remaining the same, except for the machinery industry, in which the same percentage of firms rated acceleration of innovation and complementary knowledge as very important. There were also differences in the degree to which firms in different sectors cited these factors as very important. The pharmaceuticals sector had by far the largest share of firms report all three drivers as very important determinants of their licensing strategy, signalling the overall importance of inward licensing in driving innovation in pharmaceuticals and the need to focus their internal R&D projects.

Figure 4.5. **Factors influencing licensing strategies**
Q.15: Percentage of firms rating the factor very important



Looking to the future

Most survey respondents indicated that ongoing trends would likely persist into the near future (*e.g.* over the next five years). More than 80% of responding firms indicated that patents would become a more important form of intellectual property protection in the next five years (Q.20). This response was consistent across industry sectors, firm size and geographic region. The 15% of firms that did not foresee patents becoming more important tended to be based in Europe and reported that patents are already considered very important in their firms and were unlikely to become more so. Interestingly, patent statistics do show a drop in the growth rate of patent applications after 2001 and in patent families beginning in the late 1990s. While the former is consistent with a general slowdown in business R&D spending after 2001, the latter decline in patent families could suggest a more fundamental slowdown in the rate of patent growth.

Survey respondents agreed that licensing would become a more important part of company strategy, although the role of inward licensing was more universally accepted than outward licensing. More than 70% of firms expect inward licensing to increase in the coming five years, to gain access to complementary technology, reduce R&D costs and innovation time (Q.22). This tendency was seen more strongly in larger firms and in sectors other than machinery, but was supported in all three geographic regions. Outward licensing is expected to grow in two-thirds of responding firms (Q.21). This sentiment was overwhelmingly supported by respondents from the ICT, pharmaceutical and chemicals sectors, but only by half of the firms in the machinery sector. Likewise, only half of the firms with fewer than 1 000

employees and only just half of all firms from the Asia-Pacific region reported expected growth in outward licensing. Comments received along with the survey indicate continuing concerns in some firms about losing their competitive advantage through licensing. Although many such firms report increased inward and cross-licensing, they seem to be less inclined to license technology to other firms.

Firms offered a number of suggestions for improving patent systems. These tended to cluster into three areas:

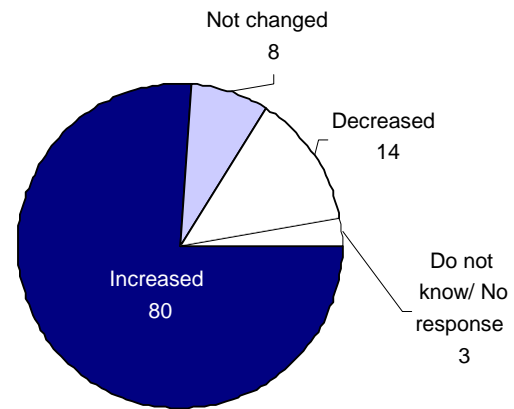
- *Increased harmonisation.* Many firms cited a need for improved consistency across patent regimes in terms of patentability of inventions (e.g. software, business methods) and in practices for evaluating prior art and enforcing patent rights. Firms from all regions supported the creation of a European patent. There was also some support for a shift from the first-to-invent to a first-to-file system in the US, which would further harmonise the US Patent and Trademark Office with the Japanese and European Patent offices.
- *Administrative reforms.* Firms called for reforms to speed the examination and patent-granting processes, citing the increase rate of innovation as a driving factor. Several firms saw a need to further reduce patenting costs, especially for SMEs.
- *Improved quality.* Firms recognised the importance of patent quality in ensuring the integrity of the patent system and the utility of patents in spurring innovation. They saw a need for better examination processes and higher standards for novelty and non-obviousness, especially in areas such as software and business methods.

Conclusions

Overall, the survey confirmed the increased importance of patents in business strategy over the past ten years. This is due mainly to a combination of increased innovation, more intensive competition and patent reform (notably expanded subject matter). While firms find themselves more frequently involved in patent litigation, they also report that patents play an increasingly important role in disseminating technical information that is useful in planning their own R&D strategies. The survey also shows the increased importance of licensing, notably for complementing in-house R&D capabilities and accelerating innovation processes. Cross-industry differences in this regard are significant; with pharmaceutical companies focusing on inward licensing while chemical and ICT companies are relatively heavier users of cross-licensing. This finding highlights the importance of market-based exchanges in facilitating knowledge diffusion and innovation in a range of industry sectors.

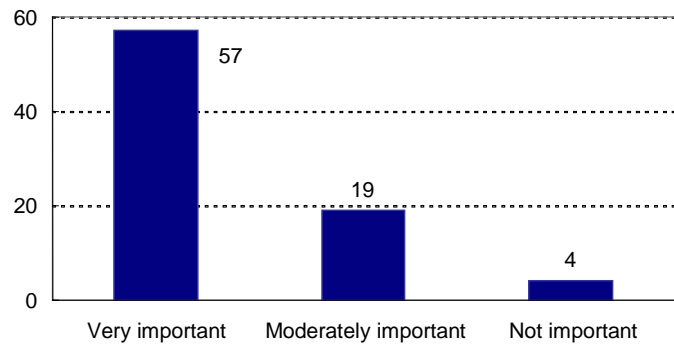
ANNEX: RESULTS FROM THE OECD/BIAC SURVEY

Q.1. Has the number of patents filed annually by your company changed with respect to 10 years ago?

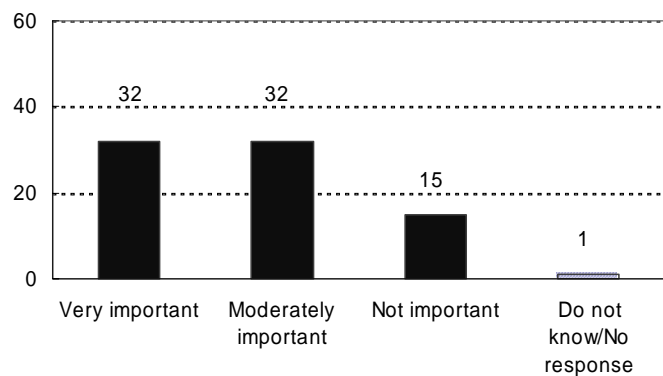


Q.2. If your company is filing more patents now than 10 years ago, please indicate what has been the relative importance of the following factors for this trend.

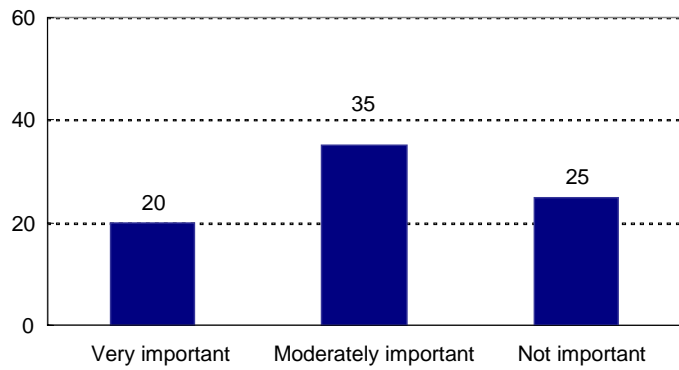
Q.2.1. An increase in the number of inventions generated at your firm



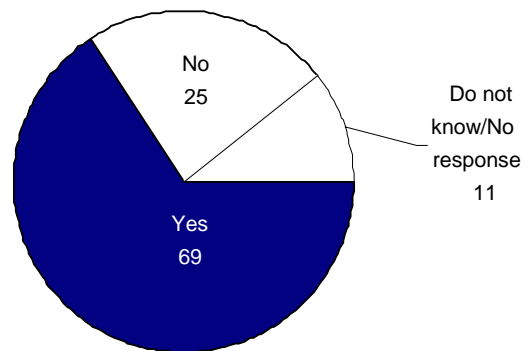
Q.2.2. An increase in the number of patents filed by your company at each PTO to protect an individual invention



Q.2.3. An increase in the number of countries in which your company seeks patent protection for a given invention

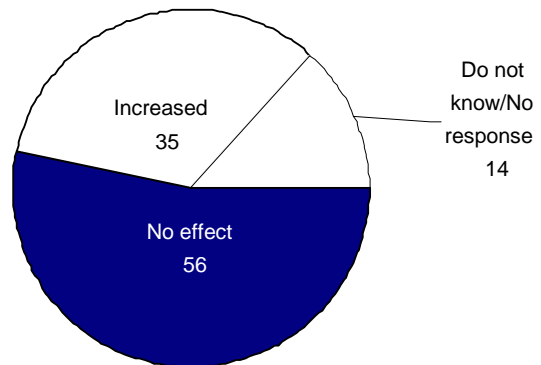


Q.3. Does your company seek patent protection now on inventions for which it would have been unlikely to seek patent protection 10 years ago (assuming they would have been patentable then)?



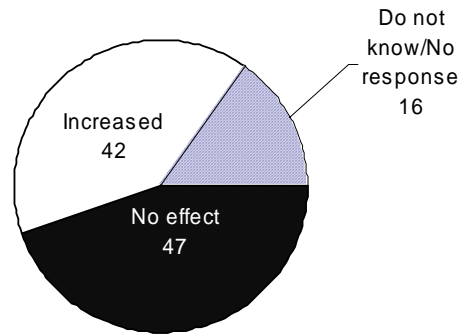
Q.4. What has been the effect of the expansion of patentability to new types of inventions on research at your company in the fields listed below?⁴

Q.4.1. Biotechnology

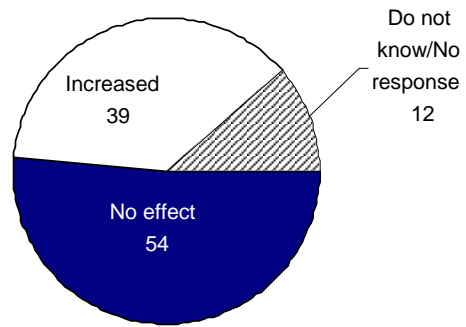


4. The option “decreased” was not chosen by any respondent and was thus not represented in the graph.

Q.4.2. Software

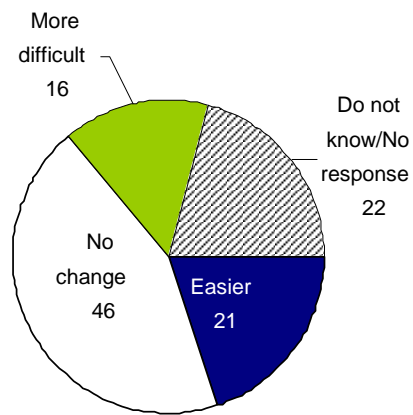


Q.4.3. Business methods

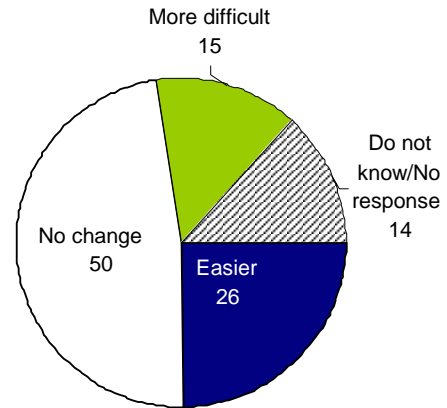


Q.5. In your experience, as compared with 10 years ago, obtaining patents at the following major patent offices has become

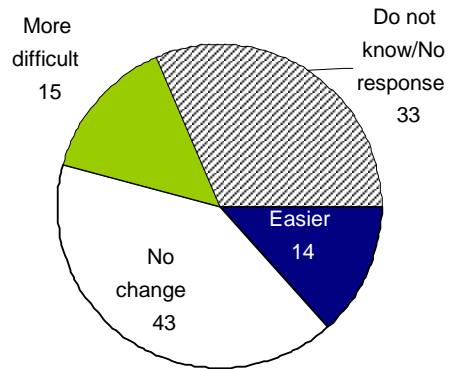
Q.5.1. USPTO



Q.5.2. EPO

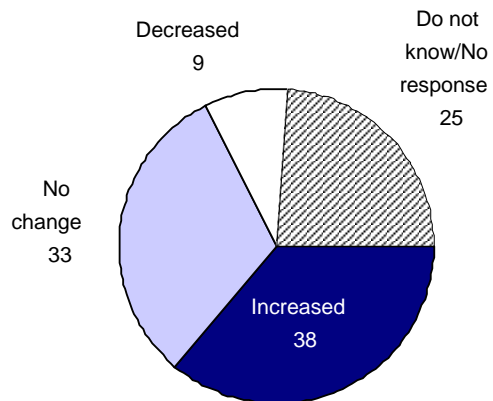


Q.5.3. JPO

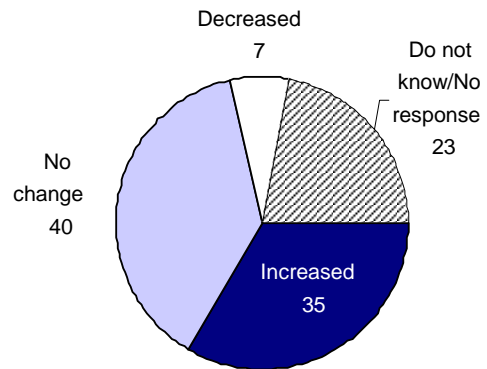


Q.6. In your opinion, has the ability of patentees to enforce the rights conferred by patents changed in the following regions in the past 10 years

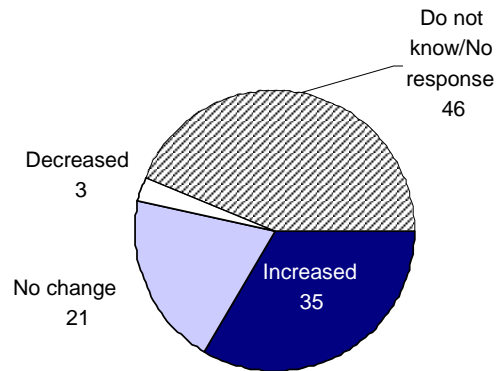
Q.6.1. United States



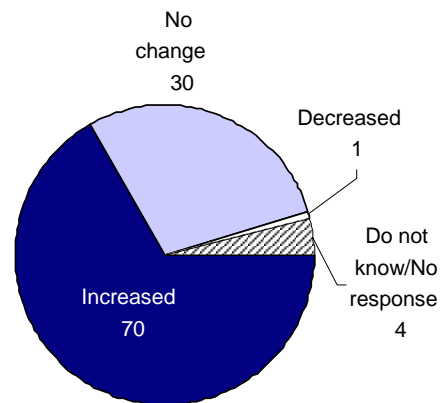
Q.6.2. Europe



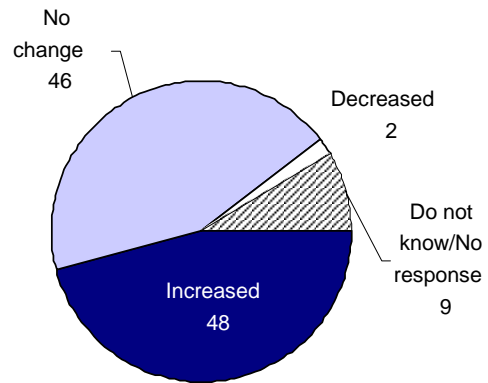
Q.6.3. Japan



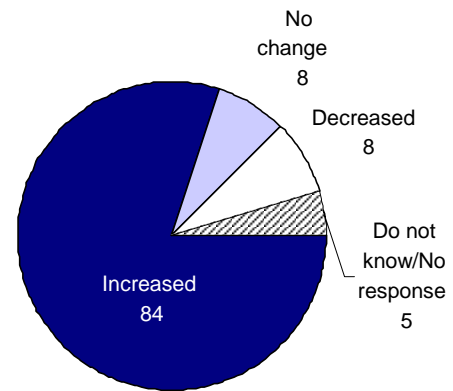
Q.7. Has the number of challenges related to patent infringement in which your company has been involved (either against or in favour of your company) changed with respect to 10 years ago?



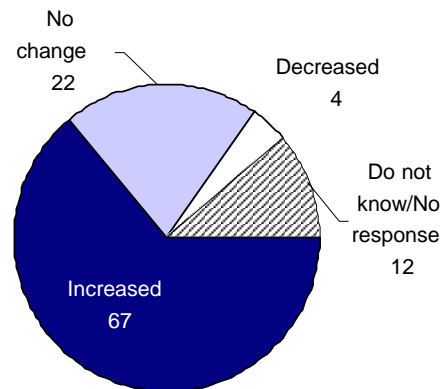
Q.8. Has the likelihood of research projects at your company being blocked (not started or stopped) due to patents from competitors changed with respect to 10 years ago?



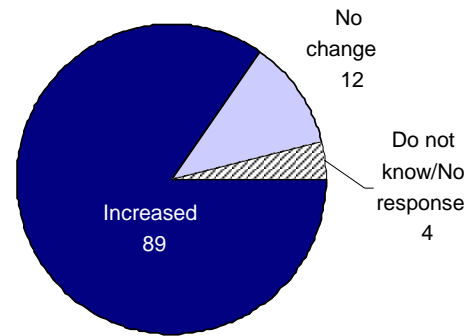
Q.9. Has the total cost of filing a patent (staff time, patent application costs, attorney fees etc) changed with respect to 10 years ago?



Q.10. Has the average value of a patent (be it from exploiting the patented invention or from licensing it) changed with respect to 10 years ago?

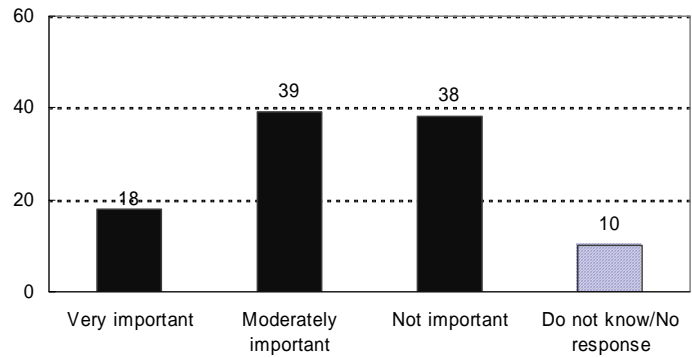


Q.11. Have the business risks of not patenting an individual invention (in terms of being imitated, in terms of another company filing a patent on the same invention, etc) changed with respect to 10 years ago?

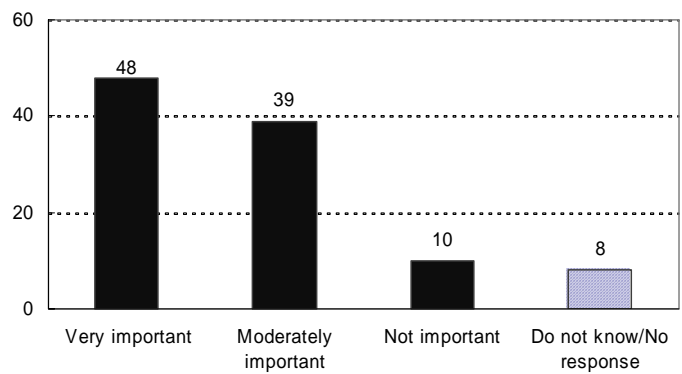


Q.12. What has been the relative importance of the following factors for your company's patenting strategy in the past 10 years?

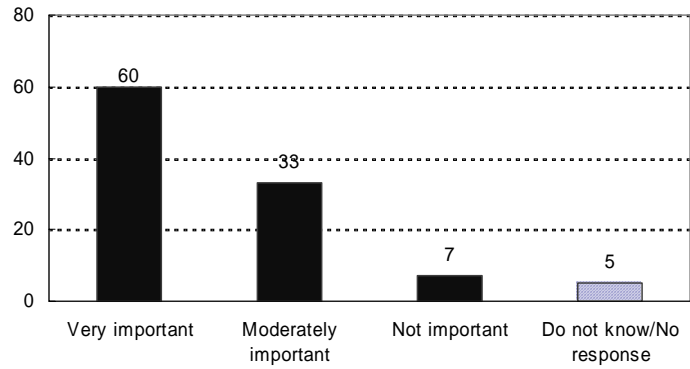
Q.12.1. Effect of your company's patent portfolio on the stock price of your company / on investor ratings



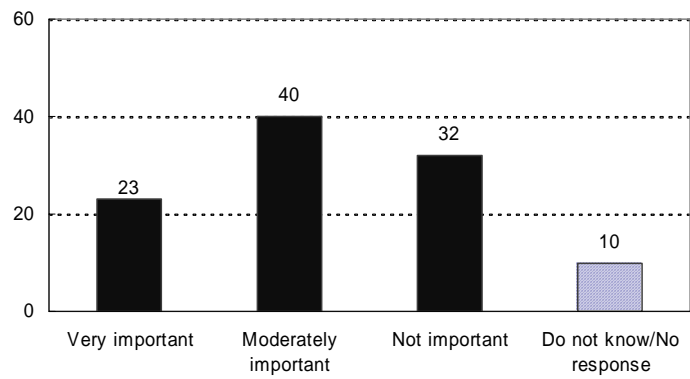
Q.12.2. Effect of your company's patent portfolio on its bargaining power when negotiating alliances with other companies



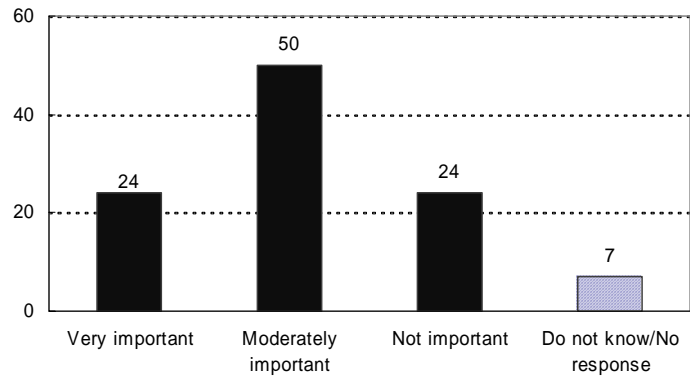
Q.12.3. More intense product market competition



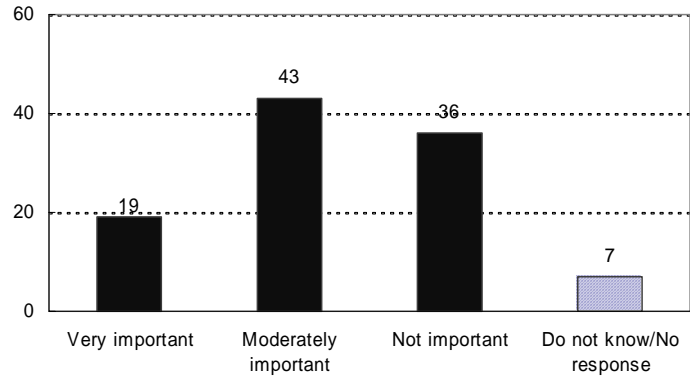
Q.12.4. Reduced entry barriers into your business (e.g. access to distribution networks, access to production facilities)



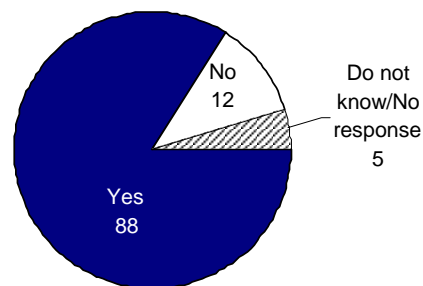
Q.12.5. Potential revenues from licensing patented inventions



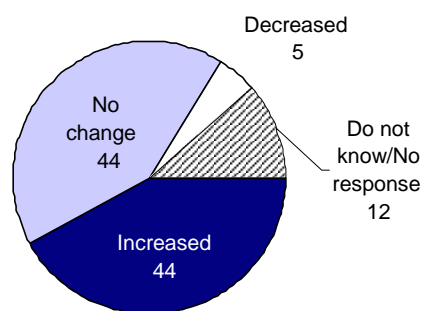
Q.12.6. Changes in the cost or administrative procedures for patenting



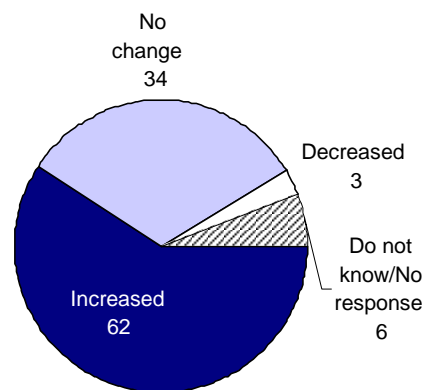
Q.13. Is the information disclosed in other firms' patents useful for designing and implementing your company's R&D strategy?



Q.13.1. In your opinion, has the usefulness of information disclosed in patents changed with respect to 10 years ago

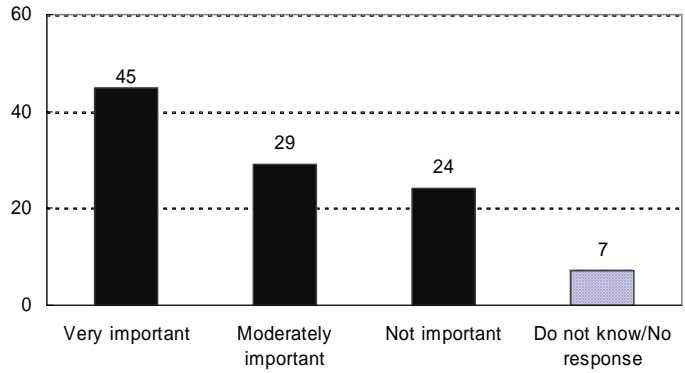


Q.14. Has the number of licenses your company acquires from other companies changed with respect to 10 years ago?

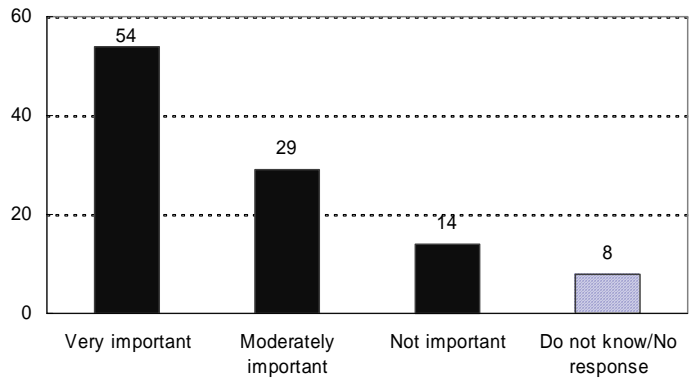


Q.15. How important have the following objectives been in motivating changes to your company's strategy as regards licensing patents from other firms in the past 10 years?

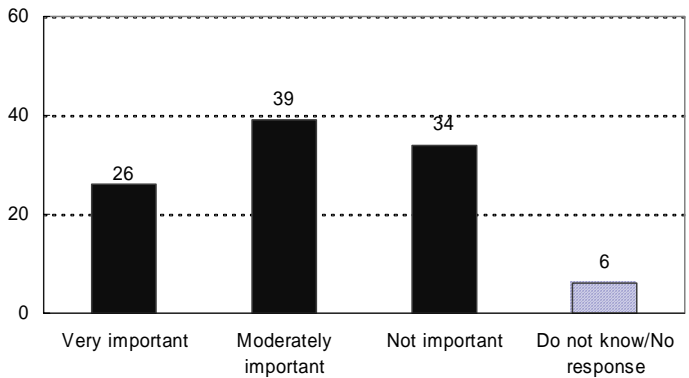
Q.15.1. To accelerate innovation processes and shorten time-to-market



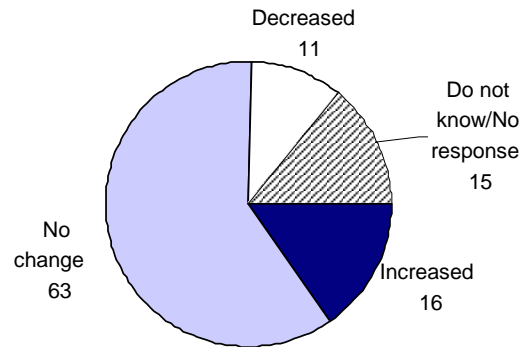
Q.15.2. To gain access to complementary expertise or technology



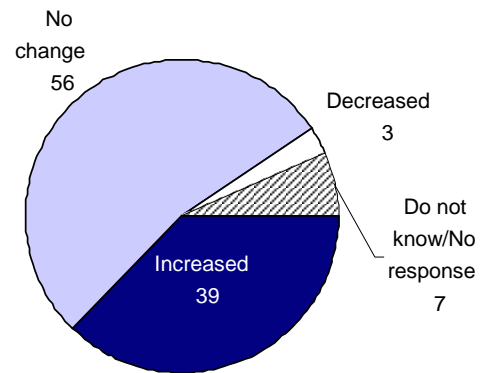
Q.15.3. To substitute for internal R&D



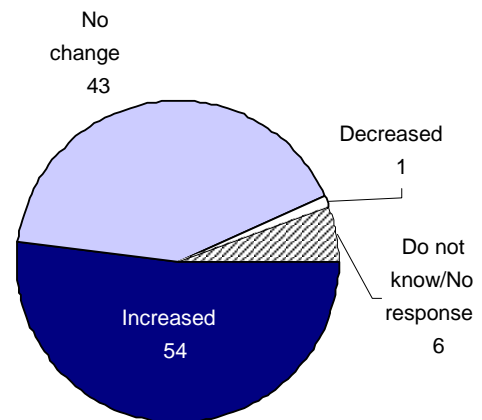
Q.16. Has the likelihood of your company facing refusals to license from other firms changed with respect to 10 years ago?



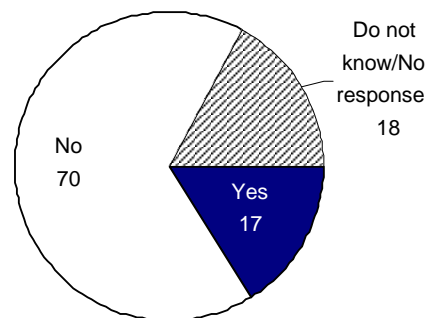
Q.17. Has the number of cross-licensing agreements your company has entered into with other companies in order to gain access to their inventions changed with respect to 10 years ago?



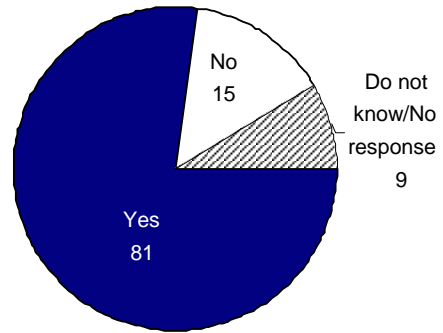
Q.18. Has the number of licenses your company has granted to others on its patented inventions changed with respect to 10 years ago?



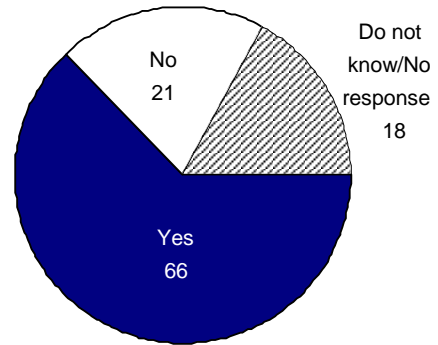
Q.19. Does your company face significant obstacles to licensing compared to 10 years ago?



Q.20. Do you expect patents to become a more important form of intellectual property protection to your company in the next five years?



Q.21. Do you expect outward licensing of your company's patented inventions to become more important to your company in the next five years?



Q.22. Do you expect inward licensing of patented inventions from other companies to become more important to your company in the next five years?

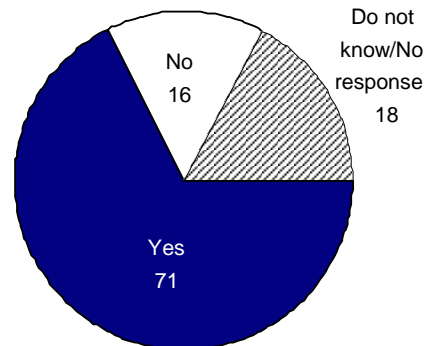
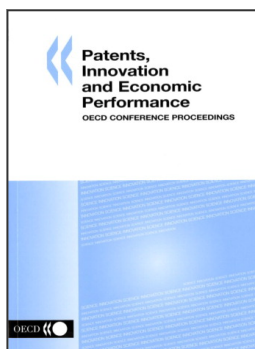


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