INDUSTRY, SCIENCE AND TECHNOLOGY CANADA
CONSUMER AND CORPORATE AFFAIRS CANADA
SCIENCE COUNCIL OF CANADA

SURVEY OF INTELLECTUAL PROPERTY RIGHTS IN CANADA FINAL REPORT

MARCH, 1989

Price Waterhouse

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EXECUTIVE SUMMARY

To examine Canadian industry attitudes, practices and interests with respect to intellectual property rights, the federal government established a Steering Committee, consisting of representatives from the Departments of Industry, Science and Technology Canada and Consumer and Corporate Affairs Canada and the Science Council of Canada. Intellectual property rights (IPRs) include patents, trade marks, copyrights, trade secrets/know how agreements, industrial designs, integrated circuit designs and plant breeders' rights.

Price Waterhouse was contracted by the Steering Committee in August, 1988 to conduct a survey that would provide information on the impact of IPRs on the economic and trade performance of specific Canadian industries and on investment and other business decisions of Canadian companies. The specific objectives of the study were to:

- gather information on industry experience with and attitudes towards intellectual property protection;
- determine the adequacy of Canada's current intellectual property system and identify possible gaps in the range and type of intellectual property protection provided to Canadian industry;
- identify where the IPR system has encouraged or discouraged Canadian firms from carrying out research or developing new technologies;
- identify where Canadian firms have encountered problems or disincentives in domestic sales in the export of goods or services because of laws or practices related to intellectual property protection in Canada and other countries;

- identify where Canadian firms have encountered difficulties in gaining access to foreign technologies, particularly as a result of the protection of intellectual property rights or as a result of technological protectionism; and
- assess how intellectual property rights and practices are likely to evolve in relation to new technologies and the trading environment.

The primary data collection method used was a telephone survey of 900 firms, involving firms in high, medium and low technology industries as well as major users of copyrights. The Steering Committee proposed that a quota sample of 900 firms be broken down into the following groups:

Top R&D Performers	100
High Technology	300*
Medium and Low Technology	400
Major Copyright Users	100

Six key findings from the study are discussed below.

1. **There is Variation in Satisfaction With Canadian Intellectual Property Rights by Sector and Size of Firms**

   Generally, interviewees are satisfied with Canadian IPRs. Of those dissatisfied, there is variance by sector and size of the firm. Firms in the software development and biotechnology sectors as well as smaller firms, in general, expressed the most dissatisfaction with Canadian IPRs.

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* The sample of high technology firms was selected randomly. In our initial selection, 20 firms from the Top R&D Performers were selected. An additional 20 firms were selected to ensure 400 firms were contacted from both groups. As a result, 320 firms from the High Technology group were surveyed.

The dissatisfaction indicated by software developers must be considered in the proper context. In June 1988, the Copyright Act was amended to improve copyright protection for software. Firms responding to the full survey are likely to have different levels of awareness and exposure to the amended Act. For example, some firms may in fact be commenting on the nature of protection prior to the amendment, others may only partially appreciate the impact of the new Act, while others may be fully aware and still have concerns.

Firms involved in biotechnology indicated high levels of dissatisfaction over the fact that Canadian legislation for plant breeders' rights and biotechnological materials has not yet been enacted. Several biotechnology firms indicated they have had to adopt serious measures because of the lack of Canadian legislation, such as registering their intellectual properties in another country and then licensing them in Canada to ensure protection, not using intellectual property in Canada because of their perceived inability to discourage infringement/counterfeiting or decreasing the amount of R&D they conduct in Canada. These firms stated that Canadian IPRs do not provide sufficient protection nor have they kept pace with technological development in this field.

Smaller firms (with sales under $5 million) tend to make less use of IPRs and to indicate lower satisfaction levels. This is partly explained by the fact that software developers tend to be small and, as indicated above, are dissatisfied with Canadian IPRs.

2. A Large Percentage of Firms Have Difficulties with Counterfeiting/Infringements in Canada

A second major finding of the study is that a high percentage of firms reported difficulties with counterfeiting/displacement. Between 31 and

40 percent of the firms in the four groups felt that their IPRs had been infringed upon or violated in the last four years in Canada. To some extent this was felt to be caused by insufficient/incomplete protection and/or poor enforcement. For example, some firms indicated that because their intellectual property was not completely protected under current legislation it could be easily copied. Other firms felt that insufficient enforcement enabled firms to infringe upon their rights.

In the High Technology group, the highest percentage of firms had their IPRs infringed upon or violated in the communication and other electronic equipment sector (63 percent), primary resource industries (50 percent), and software development sector (40 percent). These findings were fairly consistent with the results of the Top R&D Performers survey. The distinction between these two groups, as discussed below, was their satisfaction with the courts to either stop, or compensate for, infringements.

A large percentage of furniture manufacturers and firms from the cultural/entertainment sector indicated they had been infringed upon.

While almost 200 firms stated they had been infringed upon, only fifty-four firms indicated how much revenue/income they had lost domestically in 1987. Those able to estimate their losses indicated that they had lost $104 million in total.

3. A Large Percentage of Firms Are Dissatisfied With Litigation Concerning Intellectual Property Rights

Many firms, especially smaller ones, indicated dissatisfaction with the remedies/penalties for infringements of IPRs. Litigation was stated to be too expensive and time consuming to be an effective deterrent

against infringements/violations. Some respondents stated that larger firms used the courts as a tool for achieving their desired results because they could stall the process until the harm was done and/or exhaust the resources of smaller firms.

There were many proposed solutions, including more criminal sanctions, increased compensation and disputes arbitrated or submitted to experts or bureaucrats.

4. **Foreign Intellectual Property Rights Are Not Felt to be Impediments to Conducting Business Abroad**

Interestingly, the study indicates that a small number of firms encountered IP-related impediments in conducting their business outside Canada. Between 8 and 21 percent of the firms in each of the four groups have encountered problems or disincentives in the export of goods or services. Firms in the Top R & D Performers group and the High Technology group (21 percent and 17 percent respectively), which hold IPRs abroad, have encountered the most problems. The losses, estimated by sixteen firms able to provide data, totalled $27 million in 1987.

The country mentioned the most frequently for problems/disincentives abroad is the United States. It received 15 of 63 mentions. The fact that such a large percentage of Canadian exports go to the United States explains why Canadian firms do not regard foreign IPRs as a serious impediment to doing business. Infringements of IPRs is not a serious problem in the United States and the volume that Canadian firms export to other countries may not be sizeable enough to indicate whether there are major impediments.

5. Several Firms Have Insufficient Knowledge/Expertise on Intellectual Property Rights and Require More Information

A significant number of respondent firms stated that they have insufficient knowledge or expertise with respect to IPRs. Not surprisingly, most of the Top R&D Performers, with substantive R&D capabilities, feel they have adequate resources with respect to IPRs. However, 22 to 35 percent of the firms in the other groups feel they do not have sufficient expertise, considering both internal and external resources. In fact, many firms are interested in receiving information on the appropriateness of various IPRs for their businesses. Firms with smaller sales were more likely to state they had insufficient expertise.

6. Several Firms Have Had Difficulty Registering Intellectual Property Rights

Firms from all sectors, with the exception of Major Copyright Users, have difficulty with the registering of IPRs. Common difficulties are the cost and time associated with registering/obtaining an IPR. Patents and trade marks were identified most often as being expensive or time consuming to register. There were only a few firms in the Major Copyright Users group expressing problems with the registry of IPRs. This is the anticipated result since copyrights do not need to be registered to be protected and there is little effort involved in registering them.

A related finding was that a large percentage of firms were using informal sources to acquire information on IPRs rather than use the Canadian registries. A few firms, particularly small- and medium-sized, suggested that literature should be more readily available.

INTRODUCTION

This report presents the findings of an industry survey of intellectual property rights (IPRs) in Canada. The survey was conducted by Price Waterhouse on behalf of Industry, Science and Technology Canada, Consumer and Corporate Affairs Canada and the Science Council of Canada.

The report is organized into seven chapters. The remainder of this chapter presents background information on the study, the study objectives and outlines our approach to the work. Key findings from the study are presented in Chapter II. The detailed findings for each of the four categories examined, the Top 100 Research and Development (R&D) firms in Canada, High Technology firms, Medium and Low Technology firms and Major Copyright Users, are presented in Chapters III to VI. A summary of the major findings is provided in Chapter VII.

1. Background

Originally, intellectual property referred to the rights given to an individual/business through copyright (for example, in a book, artistic performance, and/or musical recording). Now, it refers to a much broader range of rights defined as "industrial property". The three primary forms of IPRs currently in use are patents, trade marks and copyrights. Other forms of intellectual property include trade secrets/know how agreements, industrial designs, integrated circuit designs and plant breeders' rights. This study examines all IPRs, which are described briefly in Appendix A.

IPRs help provide a balance to the innovation process. They are used to protect the works of a creator or innovator as well as to diffuse knowledge throughout society. On the one hand, IPRs ensure that creators or innovators receive adequate returns on their investments by preventing works from being easily copied. If the intellectual property could be easily

copied it could be marketed at a lower price, since the initial costs involved in investing or creating the work would not be incurred. This would prevent the creator or inventor from receiving the full benefit of innovation. In such an environment, innovation would be discouraged since there would be a reduced economic incentive to create or invent. On the other hand, it is necessary that intellectual property protection not be so stringent that it impedes the diffusion of knowledge or technology within the society. New technology is one of the key forces in sustaining economic growth. The spreading of technical information resulting from innovation or creations helps promote the development of new ideas and new products and processes.

2. Study Objectives

The federal government has established a Steering Committee to examine Canadian industry's attitudes, practices and interests with respect to IPR. The committee consists of representatives from the Department of Industry, Science and Technology Canada, Consumer and Corporate Affairs Canada and the Science Council of Canada.

Price Waterhouse was contracted by the Steering Committee in August, 1988 to conduct a survey to identify the impact of intellectual property on the economic and trade performance of specific Canadian industries and on the investment and other business decisions of Canadian companies. The specific objectives of the study, as stated in the Terms of Reference, were to:

- construct a profile of how Canadian industry uses intellectual property rights in its activities;
- gather information on industry experience with and attitudes to intellectual property protection;
- gather details on the problems encountered by high, medium and low technology firms;

- determine the adequacy of Canada's current intellectual property system and identify possible gaps in the range and type of intellectual property protection provided to Canadian industry;
- identify domestic IP laws, practices or administrative procedures which create difficulties for Canadian firms during the innovation, transfer of technology or production stages;
- identify where the IPR system has encouraged or discouraged Canadian firms from carrying out research or developing new technologies;
- identify where Canadian firms have encountered problems or disincentives in domestic sales because of laws or practices related to intellectual property protection in Canada and other countries;
- identify where Canadian firms have encountered problems or disincentives in the export of goods or services because of laws or practices related to intellectual property protection;
- identify where Canadian firms have encountered difficulties in gaining access to foreign technologies, particularly as a result of the protection of intellectual property rights or as a result of technological protectionism;
- assess how intellectual property rights and practices are likely to evolve in relation to new technologies and the trading environment.

3. Approach

The approach to the study on intellectual property included the following:

- a review of the current literature on IPRs in Canada and abroad identified by the Steering Committee, industry associations, experts in the field and a literature search;
- interviews with relevant individuals from Consumer and Corporate Affairs Canada and Industry, Science and Technology Canada; and

- a telephone survey of 900 firms in selected sectors of the Canadian economy.

The primary data collection approach was the telephone survey of selected sectors of the Canadian economy. The questionnaire, which is presented in Appendix B, was administered to firms in high, medium and low technology industries as well as major users of copyrights. The Steering Committee proposed that the sample of 900 firms be allocated to the selected groups as follows:

Top R&D Performers	100
High Technology	300*
Medium and Low Technology	400
Major Copyright Users	100

Price Waterhouse surveyed 100 firms reported as the Top R&D Performers in Canada. The list of firms was compiled using the following sources: the results of a survey conducted annually by the Financial Post; the Statistics Canada "Directory of Industrial Research and Development Facilities in Canada, 1986"; the Advanced Industrial Materials 1988 Canadian Sourcebook and the 1988 Canadian Biotechnology Industry Sourcebook. The list of the Top 100 R&D Performers which were interviewed is presented in Appendix C.

Also surveyed was a sample of firms from the High Technology, Medium and Low Technology, and Major Copyright Users groups. The 320 firms in the High Technology group were randomly sampled from a population of 1,850 firms. This sample size ensures that the findings are statistically reliable, within two percentage points, 99 percent of the time.

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* The sample of high technology firms was selected randomly. In our initial selection 20 firms from the Top 100 R&D Performers were selected. An additional 20 firms were selected to ensure 400 firms were contacted from both groups. As a result, 320 firms from the High Technology group were surveyed.

EXHIBIT 1.3.1

SECTORS INCLUDED IN THE SURVEYS OF MEDIUM AND LOW TECHNOLOGY FIRMS AND MAJOR USERS OF COPYRIGHT

Medium and Low Technology

- clothing;
- food processing;
- breweries, wineries and distilleries;
- dairy industry;
- furniture;
- metal fabrication;
- agricultural implements;
- motor vehicles and parts;
- jewellery manufacturers; and
- sporting goods and toys.

Major Copyright Users

Entertainment/cultural sectors

- sound recording and music publishers;
- film producers; and
- book publisher.

Business services sectors

- architects;
- advertising; and
- consulting engineers.

The survey of the Medium and Low Technology group and the Major Copyright Users group included firms from several sectors, as indicated in Exhibit 1.3.1, on the opposite page. The sectors included in these groups were determined based on discussions with the Steering Committee and interviews with Consumer and Corporate Affairs Canada. Sectors were included if it was felt that they use or had significant potential for using IPRs. The sample size selected allowed the identification of issues and major trends in particular sectors. The sample size was not sufficient to provide statistically significant quantitative information.

Appendix D provides the detailed methodology for the study, which includes the bibliography used during the study and the analysis plan.

OVERVIEW OF FINDINGS

1. Introduction

The findings have been organized into five chapters. This first chapter provides key findings and similarities between groups, including the overall response rate for the survey. The remaining four chapters present more detailed findings on each of the groups examined: the Top 100 R&D Performers, High Technology firms, Medium and Low Technology firms and Major Copyright Users.

Each chapter provides information on the following:

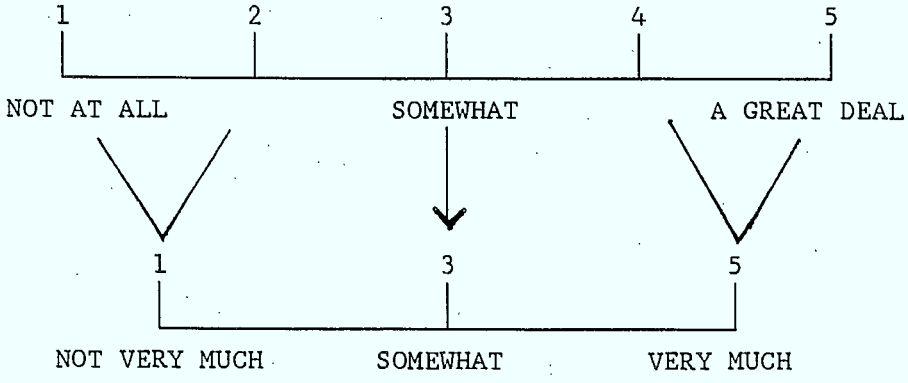
- profile of responding firms;
- use of Canadian intellectual property rights;
- satisfaction with Canadian intellectual property rights;
- use of and satisfaction with licensing agreements;
- effects of foreign intellectual property rights on Canadian firms' external interests;
- problems with counterfeiting/displacement in Canada;
- involvement with litigation concerning IPRs;
- use of and problems concerning the importation of IPRs.

As indicated in the approach section, the objectives related to the four groups of firms were different. The objective of the Top 100 R&D survey was to obtain information on the firms conducting a large percentage of R&D in Canada. For High Technology, a sufficiently large random sample of High Technology firms was drawn in order that the findings could be extrapolated to all High Technology firms in Canada. On the other hand, the number of Medium and Low Technology and Major Copyright Users surveyed were primarily for issue identification. Given the diversity in the study's objectives and the variance in the percentage of the population surveyed for each group, the findings cannot be reported for all firms. As a result, this chapter will not attempt to draw overall conclusions but to demonstrate similarities and differences among the groups.

For ease in reading the findings, we have sometimes substituted the following words for the actual percentages:

very few	1 - 10%
a minority	11 - 40%
about half	41 - 60%
a large number	61 - 80%
most	81 -100%

In addition, the 5-point Likert scale used in the questionnaire was collapsed into a 3-point scale. This was done in order to conduct analyses that would provide meaningful and statistically significant results. The following diagram displays the way in which the scale was collapsed:

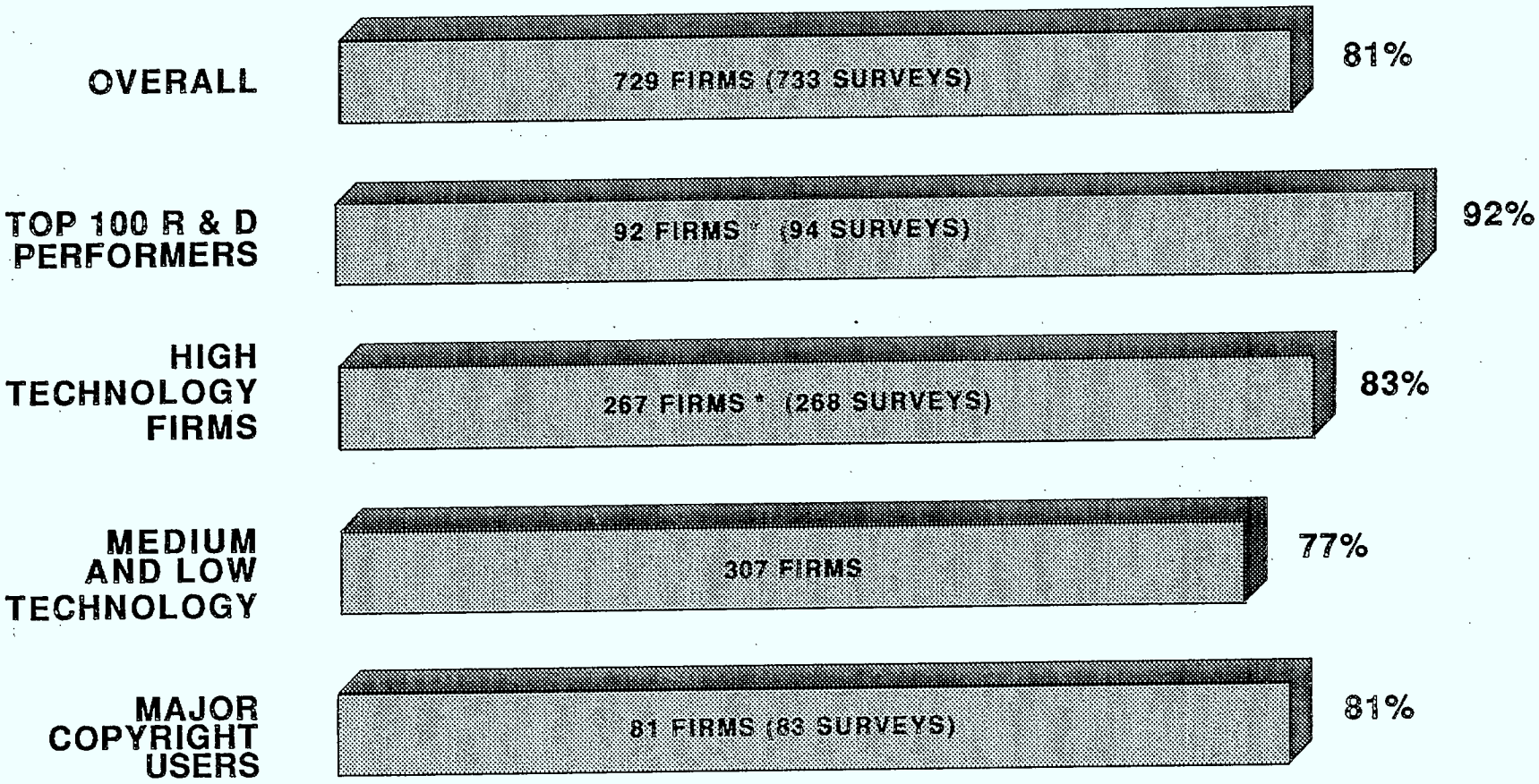


2. Profile of Responding Firms

By December 5, 1988, 733 questionnaires had been completed, for a response rate of 81 percent, as indicated in Exhibit 3.2.1. Only 729 firms actually responded to the survey, but three firms had their divisions respond separately to the survey. Of the 900 firms selected for the survey, 22 firms were not applicable (i.e., they were not a manufacturer or a service provider) and 3 firms had moved or closed. While attempts were made to

EXHIBIT 3.2.2

SURVEY RESPONSE RATE



* 18 Firms (19 questionnaires) counted both in R & D 100 and High Technology

replace respondents outside the scope of the study, time did not permit the selection of alternate firms. Excluding these 25 firms, the response rate was 83 percent as indicated below.

EXHIBIT 3.2.1.

	Number	Percentage *
Completed	729	83 %
Refused	74	8 %
No Response	72	8 %
TOTAL	875	100 %

* Does Not Add Up Due to Rounding

The response rate for each of the study areas is reported in Exhibit 3.2.2., on the opposite page. There were 19 completed questionnaires (18 firms) appearing in both the survey of the Top R&D Performers and the High Technology group due to the random selection of 20 firms from the Top 100 R&D list.

Reported sales for firms in the four groups varies tremendously, as indicated in Exhibit 3.2.3. The Top R&D Performers have the highest sales (almost 70 percent have sales over $100 million), followed by High Technology, Medium and Low Technology and Major Copyright Users. As expected, there is a correlation between the sales of firms and the number of employees.

EXHIBIT 3.2.3

SALES (IN MILLION $s)	1987 SALES OF RESPONDENTS: Top R & D Performers	High Technology	Medium & Low Technology*	Major Copyright Users*	TOTAL
$1 or Less	2%	29%	30%	53%	29%
$1.1 to $5	2%	22%	31%	28%	25%
$5.1 to $2.5	9%	22%	25%	12%	20%
$25.1 to $100	18%	15%	8%	6%	11%
$100.1 to $500	34%	7%	4%	-	8%
Over $500	35%	5%	3%	-	7%

* Does Not Add Up Due to Rounding

The R&D expenditures of the four groups also varies significantly. The Top R&D firms have the highest R&D expenditures per firm. Nineteen percent of the firms in the Top R&D Performers group conducted over $25 million in R&D in 1987.

Firms' ratings on whether they have sufficient expertise or knowledge (considering both internal and external resources) with respect to IPRs also varies significantly. Not surprisingly, most of the Top R&D Performers, with substantive R&D capabilities, feel they have adequate resources with respect to IPRs. However, between 20 and 35 percent of the firms in the other groups feel that the necessary expertise is not available to them. With respect to firms in the High Technology group, the smaller firms were more likely to state that they do not have sufficient expertise or knowledge.

3. Use of Canadian Intellectual Property Rights

The use of IPRs among the four groups varies significantly, as indicated in Exhibit 3.3.1. Only 3 percent of the Top R&D Performers group do not use any IPRs compared to 29 percent of Medium and Low Technology firms.

EXHIBIT 3.3.1

	PERCENTAGE DISTRIBUTION OF INTELLECTUAL PROPERTY RIGHTS				
NUMBER OF IPRs USED	Top R & D Performers (n = 93)	High Technology* (n = 269)	Medium & Low Technology (n = 307)	Major Copyright Users (n = 83)	TOTAL (n = 733)
None	3%	17%	29%	24%	21%
One	3%	15%	37%	46%	26%
Two	10%	26%	14%	21%	19%
Three	30%	26%	13%	6%	19%
Four	30%	14%	5%	2%	10%
Five	24%	3%	2%	1%	5%

* Does Not Add Up Due to Rounding

Not only is there variation among the four groups in the percentage of firms using a particular type of IPR, there is also variation between sectors. For example, firms in software development, in both the Top R&D Performers and High Technology groups, differ from other firms where the most frequently used IPR is trade marks. Firms in software development favour copyrights, as do firms in the Major Copyright Users group. In almost all instances, sectors in the Top R&D Performers group have a higher

percentage of firms using IPRs than sectors in the High Technology group, which is not surprising given the size of these firms.

Both registered and unregistered trade marks and copyrights are included in the study data. With respect to these IPRs, protection is not dependent on registration and, hence, many firms do not register their trade marks or copyrights. While efforts were made to indicate whether firms had registered or unregistered IPRs, this information was not always reported by firms. Firms often knew they had a trade mark but were not certain whether it was actually registered. As a result, we have combined our data on both registered and unregistered IPRs. In a similar vein, we have combined information on trade secrets with data on confidentiality agreements and non-disclosure agreements, since they relate to the same set of statutes.

The four groups spent differing amounts, considering government, legal and administrative costs, on registering/obtaining an IPR. In all groups that indicated both the number and cost of registering/obtaining IPRs, the average amount spent was $1,500 for copyrights, $4,200 for patents, $3,100 for industrial designs and $1,800 for trade marks.

The average expenditure for a patent ranged from a high of $7,200 in the Medium and Low Technology group to a low of $3,600 in the Top R&D Performers group. One would expect unit costs to be higher for firms that use IPRs the least often and feel that they do not have sufficient expertise or knowledge available on IPRs, such as those in the Medium and Low Technology group. Similarly, it is not surprising that the per unit cost for a patent is the lowest for the Top R&D Performers that use IPRs extensively. The findings indicated decreasing marginal costs for all groups as firms obtained more than one patent.

The average expenditures for a copyright or industrial design appear high. Registration of copyright in Canada is optional, not compulsory.

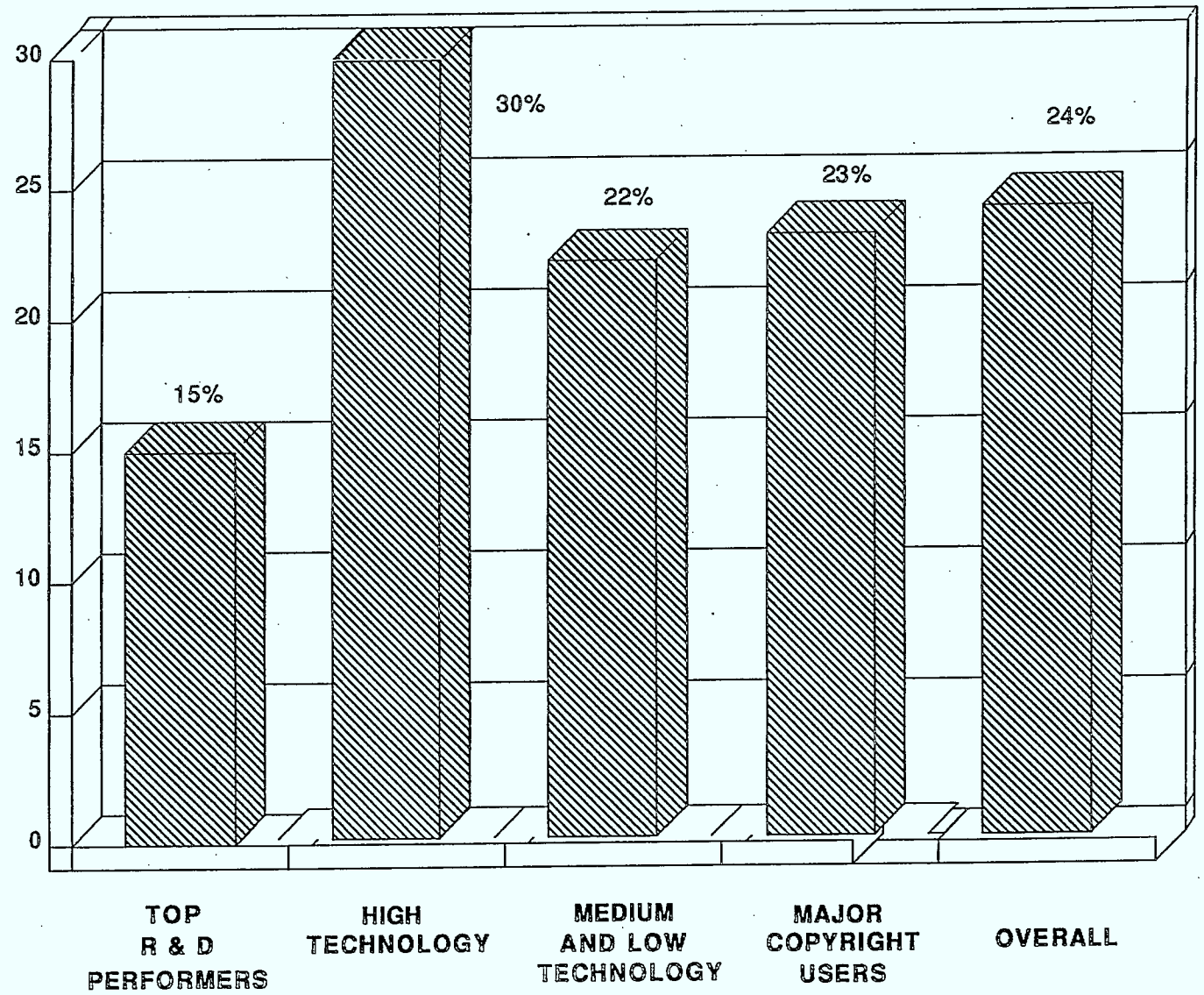
Essentially a person can register a copyright for approximately $100 and requests for registration are not opposed in any way. The only requirement is a one page submission in standard format, as per the Copyright Rules, available at no charge from the Canadian Government Publishing Centre. Similarly, the average cost of industrial designs is quite high considering the work required. Because of the apparent discrepancy, these numbers were double checked for accuracy. A possible explanation could be that negotiation costs were included.

Interestingly, the percentage of firms using IPRs to acquire information also varies. Information on other firms' IPRs is useful for improving or enhancing products/services/technologies, accelerating research, decreasing costs, etc. The Top R&D Performers (79 percent) compared to the other three groups (between 26 and 55 percent) are much more likely to use IPRs to acquire information. This is probably because they have the resources and are aware of the advantages of using IPRs for this purpose.

For all groups, informal discussion with other firms is the technique used most frequently to acquire information. It is not surprising that firms prefer informal methods to acquire information rather than examining registries/systems. The Canadian patent system, while in theory a public system available to everyone to look for and obtain copies of patents, is not extremely accessible. The Patent Office publication, which is published several times a year, only contains the title of patents granted and the name of the owner. It does not include a description of the patent. While this information can be made available, it must be pursued by interested parties. The Industrial Design Office has no publication at all. The Trade Marks Office has a fairly informative publication but this really only relates to trade marks that are being applied for and cannot readily be used as a source for technological information. The Intellectual Property Directorate of CCAC is planning to fully automate its three offices in an effort to address these concerns.

EXHIBIT 3.4.1

PERCENTAGE DISSATISFIED WITH PROTECTION OF CANADIAN INTELLECTUAL PROPERTY RIGHTS



At least half of firm in the Top R&D Performers group and the High Technology group, who had the following corporate goals, indicated the Canadian IPRs had somewhat or a great deal facilitated the achievement of their goals:

- acquiring exclusivity in a product or service;
- acquiring domestic technologies from other companies;
- encouraging in-house creative and/or innovate activity;
- maintaining/increasing domestic market shares;
- establishing joint ventures in Canada; and
- obtaining adequate return on investments.

4. Satisfaction with Canadian Intellectual Property Rights

Satisfaction with the protection given by Canadian intellectual property laws is comparable for all groups (between 39 and 42 percent of the firms are very satisfied), except High Technology where only 27 percent of the firms are satisfied. The dissatisfaction rates among the four groups, shown in Exhibit 3.4.1. on the opposite page, ranged from a high of 30 percent for High Technology firms to a low of 15 percent for the Top R & D Performers.

One possible explanation for the higher dissatisfaction levels by the High Technology group could be that these firms, which indicate more use of IPRs than Medium and Low Technology and Major Copyright Users, are more aware of problems with Canadian intellectual property laws that especially confront small businesses. Over fifty percent of firms in the High Technology group have sales under $5 millon. As discussed in more detail below, it is not surprising that the Top R&D Performers, which have large sales, indicate

high satisfaction levels. The study indicates that larger firms (i.e., with higher sales) are more inclined to be satisfied with IPRs and smaller firms are more inclined to be dissatisfied. Smaller firms believe they are caught in a system that protects larger firms, but offers insufficient protection for smaller firms that cannot afford the costs to register and enforce their rights.

Within the High Technology group, firms in software development have the highest dissatisfaction levels (45 percent). Software developers in the Top R&D Performers group also have high dissatisfaction levels, although the levels are lower than firms in the High Technology group. The difference in these two groups may be partially explained by the fact that smaller firms tend to be more dissatisfied and that firms in the High Technology group on average are smaller. The dissatisfaction levels of software developers were not reflected in the findings for other Major Copyright Users, such as book publishers, film producers and sound recorders.

It should be noted that the findings from software development should be viewed with some caution. Since the Copyright Act was only recently amended in June 1988 to improve copyright protection for software, firms indicating dissatisfaction may reflect three different perspectives:

- those firms commenting on the inadequate protection for software based on their knowledge of the Act before it was amended;
- those firms commenting on the new Act but without fully appreciating its impact on the protection of software; and
- those firms commenting that while they are aware of the new Act, they still have concerns about the level of protection it provides.

High levels of dissatisfaction were also expressed by firms in biotechnology (both in the Top R&D Performers and in the High Technology

EXHIBIT 3.4.2

REASONS FIRMS ARE DISSATISFIED WITH CANADIAN INTELLECTUAL PROPERTY RIGHTS

	PERCENTAGE OF TOTAL MENTIONS BY SURVEY				
	Top R & D Performers (n=68)	High Technology (n=149)**	Medium and Low (n=100)	Major Copyright Users (n=24)	TOTAL* (n=323)**
Insufficent/Incomplete Protection	22 %	24 %	28 %	38 %	26 %
Protection Is Too Long/ Expensive/Tedious to Acquire	19 %	13 %	13 %	4 %	14 %
Legislation is Needed	13 %	9 %	-	-	6 %
Enforcement is Not Sufficient	12 %	14 %	14 %	29 %	15 %
International Registry/ Protection is Needed	6 %	3 %	-	-	1 %
Courts/Lawyers Are Expensive	6 %	10 %	25 %	17 %	14 %
Length of Protection is Not Sufficient	4 %	4 %	-	-	2 %
Information Required Too Detailed	-	6 %	2 %	4 %	4 %
More Information Needed on IPRs	-	4 %	1 %	-	2 %
Other	18 %	11 %	17 %	8 %	15 %

* Totals do not match the totals of the four groups because of firms in both the Top R&D Group and the High Technology Group.

** Does Not Add Up Due to Rounding.

groups). It is their contention that IPRs have not kept pace with changes in technology.

Exhibit 3.4.2., on the opposite page, indicates the major reasons why firms in each group are dissatisfied. As illustrated, the greatest number of firms refer to insufficient/incomplete protection. Almost fifty percent of the comments on insufficient/incomplete protection refer to copyrights, many of these by software developers and Major Copyright Users. Firms in the Medium and Low Technology group, especially firms involved in the manufacture of clothing, furniture and jewellery, state that protection is not sufficient because their competitors could make only the slightest change and steal their designs.

Dissatisfaction related to the enforcement of IPRs was primarily directed at copyrights and patents. This concern was mentioned the most often by Major Copyright Users. Over half of these firms were dissatisfied with the widespread photocopying of copyrighted materials.

Several firms expressed dissatisfaction with registering/obtaining IPRs. Concerns included the length of time it took to get intellectual property registered, the cost of registration and the paperwork. Most firms were dissatisfied with the registering of patents. One firm remarked that the costs are excessive - 4 to 5,000 dollars for registering a patent as well as maintenance costs. A few firms felt the Canadian Patent Office was too slow in processing. Concerns were also expressed over registering/obtaining other IPRs. One firm stated it was faster to license other firms to use their trade mark than obtaining the trade mark.

Most firms feel that Canadian IPRs have a neutral or positive impact on the level of R&D they conduct in Canada. Firms from the High Technology group are the most inclined (14 percent) to feel that Canadian IPRs discourage the amount of R&D they conduct in Canada. Within the High Technology Group,

biotechnology firms, in particular, feel that Canadian IPRs discourage their Canadian R&D (39 percent). This finding is consistent with other concerns expressed by biotechnology firms. Although Canadian legislation has been proposed from time to time for plant breeders' rights and biotechnological materials, interviewees indicated that the absence of such legislation in Canada has caused them to take measures to avoid infringement or counterfeiting. For example, firms reported that they have decreased their R&D in Canada, registered their intellectual property in other countries and then licensed it in Canada and/or have decreased or stopped using their intellectual property in Canada.

5. Use of and Satisfaction with Licensing Agreements

A total of 139 firms reported high earnings ($287 million) from licensing agreements with other firms in Canada and the United States. Firms in the Top R&D Performers group accounted for 73 percent of the royalty payments. A higher percentage of firms reported earnings from licensing agreements with firms outside Canada.

There are more firms entering into licensing agreements as the licensee than as the licensor. Interestingly, the Top R&D Performers and the High Technology firms were obtaining much more revenue for licenses then they were paying for licenses. There were few firms that were both the licensee and the licensor.

Substantial revenues are being paid to acquire licensing agreements. The amount spent on royalty payments for licensing agreements varies among the groups, from a high of $129 million in total (average of $3 million per firm) for the Top R&D Performers to a low of $20 million in total (average of $346,000 per firm) for the Medium and Low Technology group. This is not surprising since Canada has always been a net importer of technology and consequently a net exporter of Canadian dollars for that technology.

The majority of firms are satisfied or neutral about the conditions of their licensing agreements. Dissatisfaction ranged from a high of 13 percent with Medium and Low Technology firms to a low of 4 percent for Major Copyright Users. These numbers, although not large, are surprising given the fact that the firms entered into the agreements. Successful licensing agreements are a matter of negotiation followed by the proper drafting of the contract. The numbers may mean that the skills of the negotiators are inadequate and/or that the professional support is not up to standard in this specialty in Canada.

Firms dissatisfied with their licensing agreements are mostly dissatisfied with the conditions of the agreements, the cost, or the protection given. Firms indicated that restrictive conditions on their licensing agreements include restricting their territory, giving a short time frame and preventing them from sub-licensing. Costs refer to the royalty payments as well as whether the firms received value for their money.

6. Problems with Counterfeiting/Displacement in Canada

Between 31 and 40 percent of the firms in all of the four groups feel that their IPRs have been infringed upon or violated in the last three years in Canada. The degree of seriousness of the infringement/violation varies among firms and by IPR as shown in Exhibit 3.6.1.

EXHIBIT 3.6.1

	PERCENTAGE OF FIRMS THAT INDICATED INFRINGEMENTS/VIOLATIONS WERE QUITE SERIOUS				
INTELLECTUAL PROPERTY RIGHTS	Top R & D Performers	High Technology	Medium & Low Technology	Major Copyright Users	TOTAL
Copyrights	36%	48%	70%	33%	49%
Patents	53%	64%	43%	-	54%
Industrial Designs	20%	43%	46%	-	41%
Trade Secrets	17%	50%	29%	-	35%
Trade Marks	29%	23%	46%	33%	37%

It is interesting to note that the Top R&D firms consider infringement of their patents more serious than violation of their trade secrets. These are the firms that have the resources to enforce their rights. It may be that they feel the courts are not pro-patent. It is, however, consistent with the trend to favour trade secrets over patents for technology protection in some areas.

While the percentage of firms in the Medium and Low Technology group consider infringements on copyrights to be quite high, only ten firms responded to the question.

In the High Technology group, the largest percentage of firms that have been infringed upon or violated are in communication and other electronic industries equipment (63 percent), primary resource industries (50 percent) and software development (40 percent). These findings are similar to the findings by sector of the Top R&D Performers. In the Top R&D group, a large

percentage of pharmaceutical manufacturers (50 percent) were also infringed upon.

A large percentage of furniture manufacturers, in the Medium and Low Technology group, and firms from the cultural/entertainment sector, in the Major Copyright Users Group, indicated they had been infringed upon.

Of 54 firms responding, the total losses in revenue/income domestically in 1987 due to counterfeiting were $104 million. The distribution of the losses between the four groups was as follows:

- Top R&D Performers $57 million
- High Technology $10 million
- Medium and Low Technology $32 million
- Major Copyright Users $ 5 million

The large losses reported by the Medium and Low Technology group are primarily from one firm.

7. Effects of Foreign Intellectual Property Rights on Canadian Firms' External Interests

The percentage of firms holding IPRs abroad varies among the groups, as indicated on the following page.

- Top R&D Performers 73 percent
- High Technology 42 percent
- Medium and Low Technology 33 percent
- Major Copyright Users 34 percent

In the High Technology group the sectors least likely to have IPRs abroad are pharmaceutical companies (23 percent) and software developers (32

EXHIBIT 3.7.1

PROBLEMS OR DISINCENTIVES ENCOUNTERED ABROAD BY SURVEY

REASONS	PERCENTAGE OF TOTAL MENTIONS FOR ALL GROUPS									
	Top R & D Performers (n=26)*		High Technology (n=37)		Medium and Low (n=20)		Major Copyright Users (n=5)		TOTAL** (n=79)	
	#	%*	#	%	#	%	#	%	#	%
Infringements/Piracy Counterfeiting	5	23 %	19	51 %	4	20 %	2	40 %	28	35 %
Lack of Penalties/ Remedies	5	23 %	4	11 %	4	20 %	-	-	11	14 %
Restrictions or Practices of Foreign Governments	6	27 %	3	8 %	1	5 %	-	-	10	13 %
Expense/Length of Time To Register IP	2	9 %	3	8 %	9	45 %	1	20 %	15	19 %
Difficult to Learn International Laws/ Procedures	1	5 %	3	8 %	1	5 %	-	-	5	6 %
Countries Refusing to Pay Royalties	1	5 %	1	3 %	-	-	1	20 %	2	3 %
Other	2	9 %	4	11 %	1	5 %	1	20 %	8	10 %

* Does Not Add Up Due to Rounding

** Totals do not match the totals of the four groups because of firms in both the Top R&D Group and the High Technology Group.

percent). There is a significant relationship between the size of the firm and whether it holds IPRs abroad. Firms with large sales are the most likely to hold IPRs abroad.

The Top R&D Performers have the largest percentage of firms exporting (over 90 percent), while Major Copyright Users group have the fewest firms exporting (25 percent). The extensive amount of exporting by the Top R&D firms is not surprising given the established linkage between R&D performance and exports.

As indicated previously, 139 firms reported earning of $287 million from licensing agreements with other firms in Canada and abroad. Firms in the Top R&D group accounted for 73 percent of the royalty payments.

Between 8 and 21 percent of the firms across the four groups have encountered problems or disincentives in exporting. Firms in the Top R&D Performers group, which hold the most IPRs abroad, have encountered the most problems (21 percent).

Sixteen firms estimated their total losses in revenue in 1987 at $27 million because of problems or disincentives faced abroad. Twelve of these firms are in the Top R&D or High Technology group. Four of the firms in the Top R&D Performers accounted for $14 million in lost revenue and 8 firms in the High Technology group accounted for $12 million in losses.

Problems or disincentives encountered abroad are listed in Exhibit 3.7.1, on the opposite page. As indicated, a major difficulty listed by all sectors is infringements, counterfeiting and piracy (35 percent of the total mentions).

In the High Technology group, over fifty percent of software developers stated that infringements are a problem abroad. Many countries were

identified by firms as areas where infringements occur. The area mentioned most often was Asia/Far East (7 mentions). The countries mentioned in Asia/Far East include Japan (2), newly-industrialized countries (1) and the remainder of Asia (4). The areas where firms stated they had problems/disincentives related to IPRs include:

Asia/Far East	7 mentions
United States	3 mentions
Central/Latin/South America	3 mentions
All countries, many countries	10 mentions

Asia/Far East, followed by Central/Latin/South America, were also the areas identified the most often for other problems or disincentives encountered abroad. The country mentioned most frequently for problems/disincentives was the United States (15 mentions). This is accounted for by the large amount of Canadian exports going to the U.S. Indeed, the fact that most Canadian exports go to the U.S. probably explains why Canadian firms do not regard foreign IPRs as a serious impediment to doing business. Their volume of exports is not sizeable enough in other countries to determine whether there are major impediments for doing business.

8. Use of and Problems with the Importation of IPRs

Few firms in each of the four groups have been hindered or prevented from importing components/materials, machinery/equipment or technologies that embodied IPRs.

The types of difficulties that have been encountered by the firms included problems with re-exports and foreign and Canadian customs practices/policies. The country mentioned most frequently is the United States.

9. Involvement with Litigation Concerning IPRs

Most firms have not to-date been involved in a court case related to IPRs, with the exception of the Top R&D Performers, where approximately 50 percent of the firms have been involved in litigation. With respect to the other groups, between 31 to 40 percent have considered launching or have been threatened with legal action. Larger firms are much more likely than smaller firms to be involved in a court case.

For those firms involved in a court case, the IPRs involved vary among groups. The Top R&D group and the High Technology group are more likely to have a case revolve around patents, while the court cases of the Medium and Low Technology firms are more likely to focus on trade marks. Not surprisingly, the cases of the Major Copyright Users involve copyrights.

The cost of the litigation varies tremendously within each group, from a low of one thousand dollars to a high of $1 to 3 million. Altogether, 106 firms estimated their court costs to total $22 million.

Of the firms involved in a court case, the percentage dissatisfied with the court process ranges between 30 and 56 percent across the groups. Major Copyright Users and High Technology (both over 50 percent) have the largest percentage of dissatisfied firms. While firms from the Top R&D group tend to list the outcome/result of the litigation as their major reason for dissatisfaction, the other groups point to the cost of the court case.

Smaller firms were only slightly more dissatisfied with the court case. This is partly explained by the fact that smaller firms were much less likely to use litigation. Smaller firms especially complain that litigation is expensive and often a tool to be used by the powerful firms that have the resources to dissuade newcomers or smaller firms, or to delay the proceedings to exhaust the smaller firms' resources.

TOP 100 RESEARCH AND DEVELOPMENT PERFORMERS IN CANADA

This section reports the findings from the survey conducted with the Top 100 R&D Performers in Canada. The list of R&D performers was derived using published lists of firms' R&D expenditures such as the Financial Post survey and government directories on R&D.

The major findings related to the Top 100 R&D Performers are provided below.

- Most firms are using Canadian and foreign IPRs. The type of Canadian IPRs which the largest percentage of firms indicated they are using are trade marks, patents and trade secrets. In terms of the number registered, the most popular IPR is patents.

- Most firms stated that they are neutral or very satisfied with Canadian IPRs. Firms from the biotechnology sector tended to be the most dissatisfied. The two major reasons given by firms for dissatisfaction with Canadian IPRs are 1) that they provided insufficient/incomplete protection or 2) that it takes too long/is too costly to register IPRs. A larger percentage of firms in the semi-refined materials and primary resources, software development and electrical and electronic products industries indicated reasons for dissatisfaction.

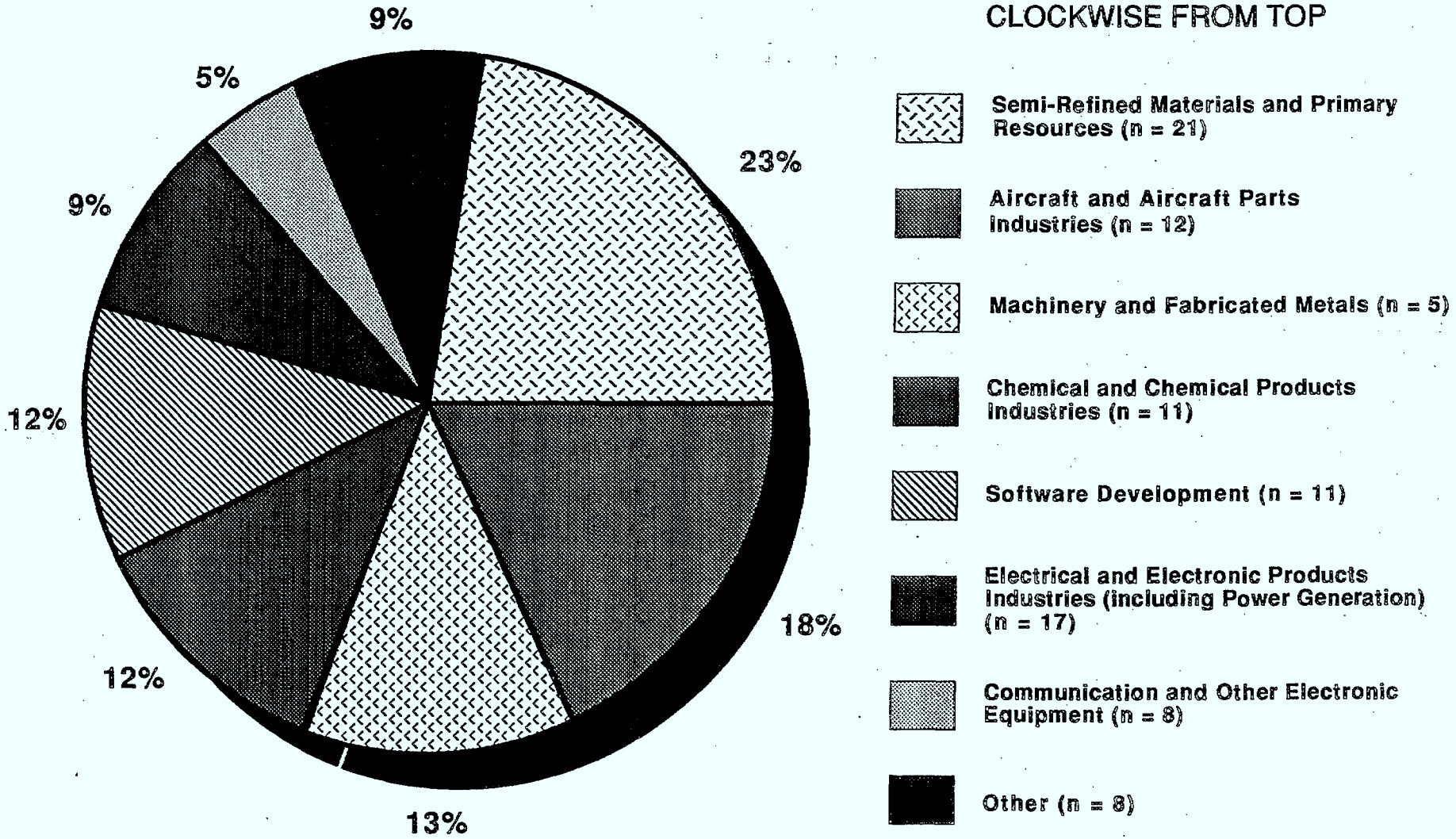
- Only a handful of firms stated that they have encountered problems or disincentives related to intellectual property protection abroad.

- Forty percent of the firms stated that their IPRs have been infringed upon or violated in the past three years. Infringements/violations on patents were identified as the most serious. Six firms indicated that they lost approximately $57 million in total income/revenue in 1987 due to counterfeiting.

- Approximately half of the firms surveyed have been involved in a court case and half of the remaining firms have considered launching or have been threatened with legal action regarding IPRs. Almost 40 percent were dissatisfied with the court case, primarily because of the outcome/result.

EXHIBIT 4.1.1

DISTRIBUTION OF THE TOP R & D PERFORMERS' RESPONSES BY THE SECTOR IN WHICH INTELLECTUAL PROPERTY RIGHTS ARE THE MOST SIGNIFICANT*



* Does Not Add Up Due to Rounding

More detailed findings are reported under the following:

- profile of responding firms;
- use of Canadian intellectual property rights;
- satisfaction with Canadian intellectual property rights;
- use of and satisfaction with licensing agreements;
- problems with counterfeiting/displacement in Canada;
- effects of foreign intellectual property rights on Canadian firms' external interests;
- use of and problems concerning the importation of IPRs;
- involvement with litigation concerning IPRs.

1. Profile of Responding Firms

Ninety-two firms, out of the 100 contacted, completed a questionnaire. One firm completed two questionnaires, in order to adequately cover two distinct sectors. We have included both of these questionnaires in the results.

Firms were asked to restrict their responses to the sector in which they feel IPRs are the most significant. Generally, the sector that firms identified as being the most significant in terms of IPRs is also the sector in which they obtained the majority of their sales. Exhibit 4.1.1., on the opposite page, indicates the responses of firms by sector. Firms' responses have been categorized based on the Standard Industrial Classification (SIC), with the exception of software development, which has been kept separate for analysis purposes. Biotechnology was also kept separate for analysis but is often collapsed into the "other" category to ensure confidentiality of responses.

The largest percentage of firms restricted their responses to semi-refined materials and primary resources (23 percent). This group consists of the following industries: crude petroleum and natural gas; refined petroleum and coal products; plastic products; ceramics, paper and allied products; and primary metals and mining. Electrical and electronic products,

including power generation, represented 18 percent of the responding firms.

Exhibit 4.1.2. indicates the total worldwide sales of responding firms for 1987 by sector. Sixty-two firms (69 percent) indicated that their sales were above $100 million in 1987. Only 12 firms (13 percent) had sales below $25 million.

EXHIBIT 4.1.2

SECTORS	1987 SALES OF TOP R&D PERFORMERS BY SECTOR			
	Under $25 Million (n = 12)	$25.1 To 100 Million (n = 16)	$100.1 To 500 Million (n = 31)	Over $500 Million (n =31)
Communication & Other Electronic Equipment Industries*	-	25%	38%	38%
Electrical & Electronic Products Industries	31%	13%	25%	31%
Software Development	18%	27%	46%	9%
Chemical and Chemical Products Industries	-	30%	40%	30%
Aircraft and Aircraft Parts Industry	9%	46%	36%	9%
Semi-Refined Materials and Primary Resources*	10%	-	29%	62%
Machinery and Fabricated Metals	20%	-	60%	20%
Other*	13%	13%	25%	50%
Total*	13%	18%	34%	34%

* Does Not Add up Due to Rounding

Missing: 3

Consistent with their sales, most of the firms interviewed are large, with over 500 employees (77 percent), as indicated in Exhibit 4.1.3.

EXHIBIT 4.1.3

NUMBER OF EMPLOYEES	NUMBER (n = 91)	PERCENTAGE OF RESPONDING FIRMS
Under 100	3	3 %
101 to 250	7	8 %
251 to 500	11	12 %
500 or more	70	77 %

Missing: 2

There were 77 firms that disclosed their R&D expenditures for 1987. Only 5 percent of the firms had R&D expenditures under $1 million, while 19 percent had expenditures over $25 million. The breakdown of R&D expenditures by size of expenditure is presented in Exhibit 4.1.4 (Appendix E). The average R&D expenditure was approximately $42 million in 1987. The average R&D expenditures based on the size of the firm is indicated in Exhibit 4.1.5.

EXHIBIT 4.1.5

1987 SALES	R & D AVERAGE EXPENDITURE ($000s)
Under $25 million	$5,695
$25.1 to 100 million	$10,309
$100.1 to 500 million	$22,332
over $500 million	$70,962

The majority of firms feel that Canadian intellectual property laws either have had no effect or have had a positive impact on the amount of R&D they conduct in Canada. Only two percent feel the laws, or lack of them, discourage the amount of R&D they conduct in Canada. There is no statistically significant relationship between firms' ratings of the effect of Canadian IPRs on the amount of R&D their firms conduct in Canada and the sector of the firm nor on the amount of R&D the firms conducted in Canada in 1987.

Over half (57 percent) of the firms surveyed are over fifty percent Canadian-owned. Of the firms that are not Canadian-owned, as expected, a large number (64 percent) have their parent company located in the United States. Analysis of firms' responses with respect to ownership did not indicate any significant differences.

Most firms feel there is sufficient expertise or knowledge available to their firm (considering internal and external resources) on IPRs. Only two percent of the firms surveyed feel that they have insufficient expertise.

2. Use of Canadian Intellectual Property Rights

Most firms responding to the Top R&D Performers survey are using Canadian IPRs. Eighty-four percent of the firms indicate they are using three or more types of IPRs (i.e., patents, copyrights, trade marks, etc.) to protect their innovations/creations. Only three firms indicated they are not using any IPRs.

The percentage of firms in each sector using particular IPRs is indicated in Exhibit 4.2.1. Firms were not questioned on the degree of their use (e.g.,

whether they have 1 or 20 patents) but only if they use that particular IPR. The largest number of firms indicated they use trade marks (66 percent), trade secrets (51 percent) and patents (43 percent). Software developers are most likely to use copyrights, trade marks and trade secrets.

EXHIBIT 4.2.1

	INTELLECTUAL PROPERTY RIGHTS USED BY THE TOP R&D PERFORMERS				
SECTOR	Copyrights (n=58)	Patents (n=81)	Industrial Designs (n=36)	Trade Secrets (n=73)	Trade Marks (n=79)
Communication and Other Electronic Equipment Industries	88 %	100 %	71 %	88 %	88 %
Electrical and Electronic Products Industries	53 %	88 %	29 %	71 %	94 %
Software Development	91 %	55 %	18 %	82 %	90 %
Chemical and Chemical Products Industries	64 %	85 %	73 %	60 %	82 %
Aircraft and Aircraft Parts Industry	75 %	100 %	17 %	67 %	67 %
Semi-Refined Materials and Primary Resources	48 %	95 %	29 %	95 %	95 %
Machinery and Fabricated Metals	20 %	80 %	80 %	60 %	60 %
Other	63 %	88 %	50 %	100 %	88%

Firms were also asked how many IPRs they have registered over the last three years. Several firms were not able to provide us with the number of IPRs registered over the last three years in Canada and, most firms did not have

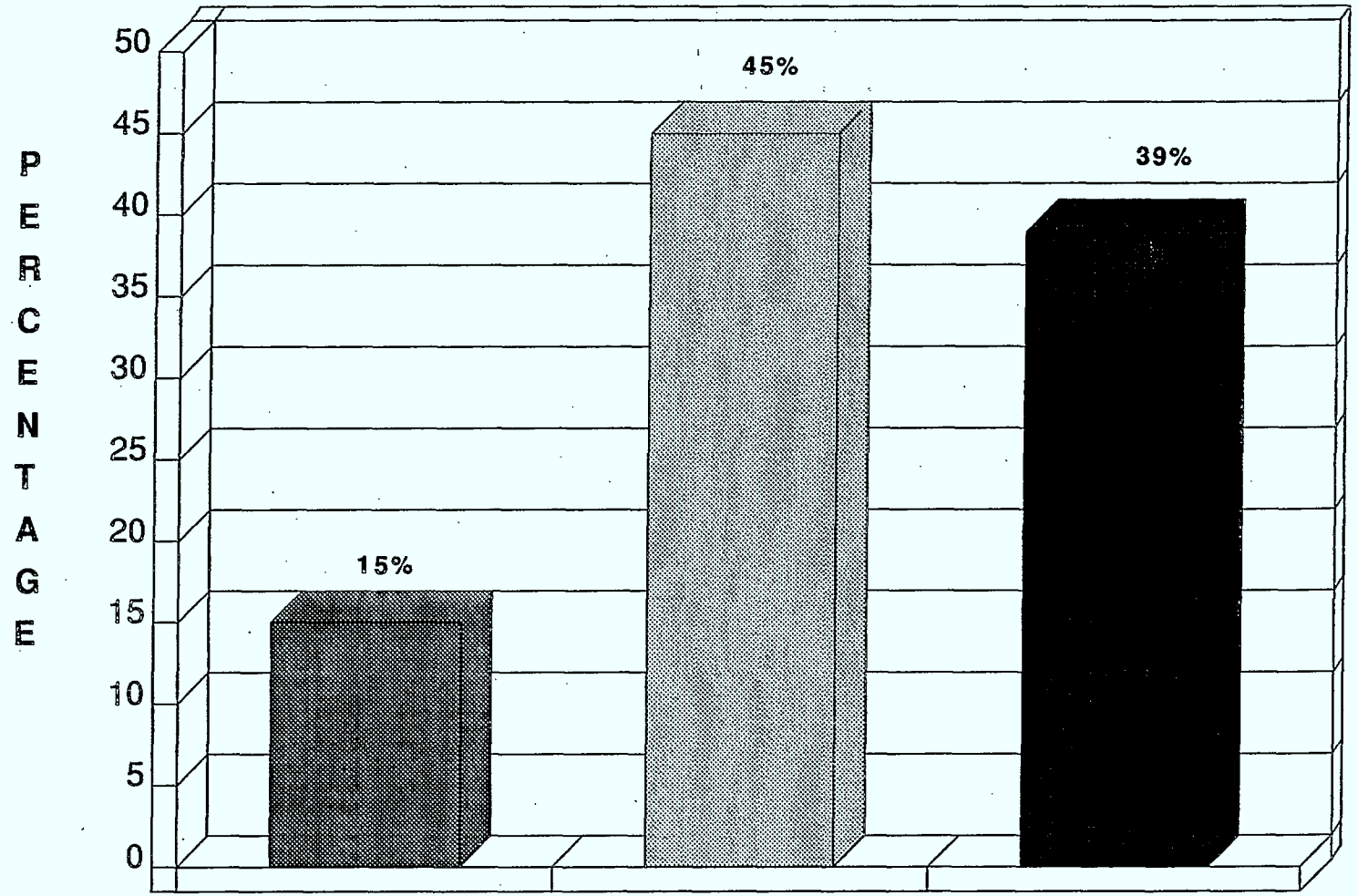
readily available information on, the government, legal and administrative costs of registering the IPRs. The responses of the firms that indicated they did register an IPR is indicated in Exhibit 4.2.2. (Appendix E). There is a tremendous range in the number of IPRs registered by firms. For example, with respect to patents, 6 firms stated that they had each obtained one patent in the past three years, while 3 firms stated that they had obtained over 500 patents each. There were 9 firms that indicated they use patents but had not obtained any over the last three years.

There is also a great deal of variability in the expenditures of firms, considering government, legal and administrative costs, in obtaining IPRs. For example, three firms spent $1,000 to register their copyrights while one firm spent $75,000. Since firms vary in the number of IPRs they have, it is useful to examine the average amount firms spent to register an IPR (listed in Exhibit 4.2.3). The average cost for obtaining an IPR ranged from approximately $3,600, per firm for a patent to $800 per firm for a copyright.

The percentage of firms that licensed other firms to use their IPRs over the last three years ranged from a high of 50 percent for patents (38 firms) to 11 percent for industrial designs (4 firms). The number of licenses firms have in Canada and abroad is fairly evenly split. Sixty-three firms indicated how much they had earned, during the last three years, from licensing agreements. Altogether, $209 million was earned from 43 firms (13 firms stated they did not earn any money). Based on the firms that provided a breakdown of their earnings, a slightly higher percentage was earned from licensing technology abroad than from domestic licensing. Interestingly, while more firms had obtained a license (licensee) than the number that had licensed other firms (licensor), the average amount obtained for the license was greater then the average amount spent ($4.9 million compared to $2.8 million). Few firms were both a licensee and licensor.

EXHIBIT 4.3.1

TOP R & D FIRMS' SATISFACTION WITH THE PROTECTION GIVEN BY CANADIAN INTELLECTUAL PROPERTY RIGHTS



* Does Not Add Up Due to Rounding

A large number of firms (79 percent) indicated that they use IPRs to acquire information. The percentage of these firms that indicated they use a particular source "quite a bit" to obtain information is presented in Exhibit 4.2.4. (Appendix E). Of the questions asked directly to firms, the highest percentage (47 percent) acquire information through discussions with other firms. Thirty-eight percent of the firms examine patents "quite a bit" to obtain information.

Three-quarters of the firms that had "acquiring exclusivity in a product or service" as a corporate goal, indicated that Canadian IPRs had either somewhat or a great deal facilitated the achievement of the goal. Sixty-nine percent indicated that IPRs encouraged in-house creative and/or innovative activity and 68 percent stated IPRs helped them acquire domestic technologies from other companies.

3. Satisfaction with Canadian Intellectual Property Rights

Exhibit 4.3.1., on the opposite page, indicates firms' satisfaction with the protection given by Canadian intellectual property laws. Approximately forty percent of the firms indicated they are satisfied. Firms in the biotechnology sector (67 percent) are the most dissatisfied with the protection given by Canadian IPRs. Firms in Ontario tended to be more dissatisfied than firms in other regions. There is no difference in satisfaction levels by type of IPR used.

Firms that are satisfied with Canadian IPRs were asked to rate their satisfaction with the terms of protection given, the subject matter, manner of enforcement and remedies/penalties. As indicated in Exhibit 4.3.2., a large number of firms are very satisfied with the term of protection provided by the IPR. These firms are most dissatisfied with the enforcement of and remedies/penalties relating to Canadian IPRs.

EXHIBIT 4.3.2

	TOP R&D PERFORMERS' SATISFACTION WITH CANADIAN INTELLECTUAL PROPERTY RIGHTS		
	Not Very Satisfied	Somewhat Satisfied	Very Satisfied
Term of Protection Given (n=31)*	7 %	29 %	65 %
Subject Matter (n=31)	16 %	29 %	55 %
Manner of Enforcement (n=24)*	21 %	38 %	42 %
Remedies/Penalties (n=23)	22 %	35 %	43 %

* Does Not Add Up Due to Rounding

Firms that ranked their satisfaction between 1 and 3 on the 5-point scale, were asked to indicate why they were dissatisfied. Exhibit 4.3.3. (Appendix E) summarizes their responses. Firms were allowed to mention up to three IPRs and up to three reasons per IPR. As indicated, the two reasons cited most often by firms are that the IPR gives insufficient/incomplete protection and that it takes too long, costs too much money or is tedious to acquire protection. Patents and copyrights are the IPRs with which firms are the most dissatisfied. Of the 15 mentions by firms of insufficient/incomplete protection, 9 of these are directed at copyrights. Moreover, over half of the mentions of the long, costly process of registering an IPR refer to patents.

Compared to other sectors, a larger percentage of firms in the semi-refined materials and primary resources, software development and electrical and electronic products industries indicated reasons for dissatisfaction. While there is no statistically significant relationship between reason given for dissatisfaction and sector, 35 percent of the reasons given by the semi-

refined materials and primary resources sector concern the length of time and cost associated with obtaining an IPR.

To further pursue their satisfaction with Canadian IPRs, firms were asked if there were IPRs they would like to use to protect their innovations/creations but do no use for some reason (i.e. not aware of IPRs, laws needed currently do not exist, current laws not sufficient, etc.).

Seventeen firms (19 percent) indicated that there are IPRs that they would like to use to protect their innovations/creations. Firms involved with software development were the most likely to state there are IPRs they would like to use.

The IPR mentioned most often by firms as the IPR they would like to use is patents (over 60 percent of the total mentions). The reasons given for not currently using the desired IPR are listed in Exhibit 4.3.4. (Appendix E). The most frequently mentioned reason is that the intellectual property protection is not available in Canada. This answer was primarily given by firms involved in software protection, plant breeders' rights and chemical and chemical products (pharmaceuticals).

Over half of the firms (54 percent) do not believe measures are needed to facilitate freer movement of products protected by IPRs in international trade, while 33 percent feel there is such a need and 13 percent indicated they do not know. The majority of firms feel that the adoption of any measures would have no impact on their sales/revenue. Approximately 30 percent of the firms indicated that any measures would have a positive impact on their sales.

4. Use of and Satisfaction With Licensing Agreements

Three-quarters of the firms (68) surveyed stated they had obtained a license from another firm over the last three years. Exhibit 4.4.1 indicates the number of licensing agreements firms entered over the last three years. For those firms able and willing to give the number of agreements, the highest number of agreements (195) were for trade secrets/know how agreements. Although it varied for some IPRs, firms generally acquired licenses for foreign technology and foreign products/services.

EXHIBIT 4.4.1

INTELLECTUAL PROPERTY RIGHTS	NUMBER OF LICENCING AGREEMENTS HELD BY THE TOP R&D PERFORMERS IN THE LAST THREE YEARS	NUMBER OF FIRMS
Copyrights	148	11
Patents	112	44
Industrial Designs	22	5
Trade Secrets/Know How Agreements	195	19
Integrated Circuit Designs	6	2
Plant Breeders' Rights	-	-

Expenditures pertaining to royalty payments, by the 46 firms that reported an amount, totalled $129 million over the last three years. The range was immense: one firm indicated it spent $9,000, while another spent $15 million

(6 firms indicated they did not spend anything). Over 90 percent of the royalty payments were for licensing agreements with firms abroad.

A large number of the firms (66 percent) reported they are satisfied with the conditions of their licensing agreements. Eleven firms (16 percent) stated that licensing agreements in which they are the licensee have imposed excessive restrictions or created difficulties. Five of these firms feel that the restrictions or difficulties have affected the profitability of their firm somewhat or a great deal.

Firms responding that they were dissatisfied, as well as those indicating they were neither satisfied nor dissatisfied with the conditions of their licensing agreement, were asked to state reasons. Their responses are indicated in Exhibit 4.4.2. (Appendix E). The cost of the agreements and the fact that the terms of the agreements are too rigid were the most frequently mentioned.

Firms that stated their licensing agreements imposed excessive restrictions or created difficulties were asked to specify the type of problem. These are presented in Exhibit 4.4.3. (Appendix E). Four firms stated that the conditions of their agreements were too restrictive. Canadian and foreign firms (14 mentions), as opposed to governments (6 mentions), were largely identified as the source of the restriction or difficulty.

Only one firm had obtained a compulsory license.

5. Problems With Counterfeiting/Displacement in Canada

Forty percent of the firms stated that their IPRs had been infringed upon or violated in Canada in the past three years. The result does not vary significantly by sector.

Firms indicating that IPRs had been infringed upon were asked to rate the seriousness of the infringement/violation for the particular IPRs in use, as indicated in Exhibit 4.5.1. It is interesting to note that firms feel that infringements/violations are the most serious for patents and the least serious for trade secrets. These are the firms that have the resources to enforce their rights. It may be that they believe the courts are not pro-patents. The percentage of firms very dissatisfied with their court case was 50 percent for firms using patents and 25 percent for firms using trade secrets.

EXHIBIT 4.5.1

INTELLECTUAL PROPERTY RIGHTS	TOP R&D PERFORMERS' RATINGS ON THE SEVERITY OF INFRINGEMENTS		
	Not Very Serious	Somewhat Serious	Serious
Copyrights (n = 11)	36%	27%	36%*
Patents (n = 15)	33%	13%	53%*
Industrial Designs (n = 5)	80%	-	20%
Trade Secrets (n = 12)	42%	42%	17%*
Trade Marks (n = 17)	59%	12%	29%

* Does Not Add Up Due to Rounding

Ten of 36 firms (28 percent) state that their Canadian sales have decreased due to counterfeiting or other infringements. A smaller number (11 percent) feel that counterfeiting or other infringements have depressed the domestic price for their product. Six firms indicated that they lost approximately $57 million in total income/revenue domestically in 1987 due to counterfeiting.

6. Effects of Foreign Intellectual Property Rights on Canadian Firms' External Interests

Most firms had foreign links. Over 91 percent of the firms exported. Indeed of the 75 firms that exported, 56 percent stated that exports accounted for at least half of their worldwide sales in 1987. As expected, the United States was identified by most firms as their largest market.

As indicated previously, the percentage of firms that licensed other firms to use their IPRs over the last three year ranged from a high of 50 percent for patents to 11 percent for industrial designs.

A large number of firms (73 percent) hold IPRs abroad. Firms in the aircraft and aircraft parts sector are the most likely to hold IPRs and firms in the chemical and chemical products industries (pharmaceuticals) are the least likely.

The responses of the firms able to identify the number of IPRs registered over the last three years, are indicated in Exhibit 4.6.1. (Appendix E). The number of IPRs registered by firms ranged from 1 to 1100. Fifty firms registered 4,508 patents in the last three years.

Variability in firms' expenditures in obtaining IPRs abroad, considering government, legal and administrative costs was high. For example, although cost is expected to be influenced by the number of IPRs held, one firm spent $2,000 to obtain its patents while another firm spent $5 million on obtaining its patents. The average amount firms spent to register an IPR is listed in Exhibit 4.6.2. (Appendix E). This amount ranged from approximately $4,100 to obtain a patent to $500 to register a copyright.

Of the firms exporting, a large number (79 percent) stated they have not encountered problems or disincentives related to intellectual property protection abroad. Of the 17 firms that have encountered difficulties, 11

firms (65 percent) indicated that foreign markets or sales have been lost. Four firms indicated that they had lost revenue of $14 million in 1987 because of problems with respect to intellectual property protection.

Firms also specified the type of problem or disincentive they are encountering abroad. The 22 problems or disincentives mentioned are presented in Exhibit 4.6.3. The restrictions or practices of foreign governments is the most frequently given response (27 percent of total mentions). Almost fifty percent of the reasons given refer to patents.

EXHIBIT 4.6.3

PROBLEMS OR DISINCENTIVES ENCOUNTERED ABROAD BY THE TOP R&D PERFORMERS *	PERCENTAGE OF TOTAL MENTIONS** (n=26)
Restrictions or Practices of Foreign Governments	27 %
Infringements/Piracy/Counterfeiting	23 %
Lack of Penalties/Remedies	23 %
Expense of/Length of Time to Register IPRs	9 %
Difficult to Learn International Laws/Procedures	5 %
Countries Refusing To Pay Royalties	5 %
Other	9 %

* Firms were able to list three IPRs and three reasons for each. The above are the total reasons given.

** Does not add up due to rounding.

Thirty-one percent of the problems or disincentives stated were attributed to "other countries" generally. The area of the world mentioned the most is Central/Latin/South America (33 percent). Three of the 6 firms' stating that problems or disincentives have been incurred in this area of the world point to the restrictions or practices of the government. Three problems have been encountered in Western Europe and two problems in the United States.

7. Use of and Problems Concerning the Importation of IPRs

Approximately 60-65 percent of the firms stated that their imports embody IPRs. Most of the these firms, when asked if their imports had been hindered or prevented, indicated no difficulties, as shown in Exhibit 4.7.1. (Appendix E). Of firms indicating they had been hindered, the largest percentage (12 percent) indicated they had been hindered in importing components/materials because of IPRs.

The firms that stated they experienced difficulties were asked to elaborate on the reasons. The five responding firms indicated problems related to patents, trade secrets, copyrights and all IPRs generally. The difficulties indicated by these firms are presented in Exhibit 4.7.2. (Appendix E). There were several references to difficulties with respect to conditions on re-exports. These were mostly made by one firm that had the same problems on re-exporting for different types of IPRs. The problem was encountered with the United States Government.

8. Involvement With Litigation Concerning IPRs

Approximately half of the firms surveyed (45 percent) had been related to in a court case involving IPRs. Moreover, of the 49 firms that had not been involved in a court case, 26 firms (53 percent) had considered launching, or had been threatened with, legal action regarding IPRs.

For those firms involved in a court case, the IPR involved in the most recent case is indicated in Exhibit 4.8.1. For almost 60 percent of the firms that had been in a court case concerning IPRs, the most recent case had related to patents.

EXHIBIT 4.8.1

INTELLECTUAL PROPERTY RIGHTS	DISTRIBUTION OF COURT CASES OF THE TOP R&D PERFORMERS
Copyrights (n=39)	15 %
Patents (n=39)	59 %
Industrial Designs (n=40)	-
Trade Secrets (n=39)	10 %
Trade Marks (n=39)	21 %
Other (n=39)	3 %

The majority of the court cases had been in Canada, followed by the United States, Japan and then Western Europe.

A larger percentage of firms (64 percent) indicated that they claimed to own or control the IPR in question compared to firms (36 percent) alleged to have infringed. Most firms (81 percent) stated that their most recent case was a civil matter dealing with an infringement suit.

Of the 35 firms able to provide the total expenses of their most recent litigation, costs ranged from $4,000 to $3 million. The total costs for the 35 firms were $13 million.

Firms are fairly evenly split over the satisfaction with the court case. A slightly higher percentage of firms are dissatisfied (39 percent) than those that are quite satisfied (32 percent). There was no relationship between satisfaction and type of case, expense of litigation, type of IPR involved or whether firms were claimants or defendants.

Of the 21 indicating a reason for why they were dissatisfied, the major reason given was the outcome/result of the litigation.

Of those firms that had considered legal action over the last ten years, the majority were concerned with patents, primarily in Canada and the United States. The high cost of litigation and the fact that threatening legal action helped firms stop infringement were the major answers for why action was not taken. Nine firms were threatened with legal action concerning patents, primarily by other Canadian firms.

HIGH TECHNOLOGY FIRMS

This section presents the findings from the survey conducted with 320 high technology firms. While the preceding section examined the findings from interviews with the top 100 R&D firms, this section highlights the findings of a sample of all high technology firms. Because random sampling was used on a well-defined population of firm and the results reported are statistically significant, extrapolations can be made to all high technology firms.

Major findings from the interviews with high technology firms are summarized in the following paragraphs. More detailed findings follow.

- Most firms are using Canadian IPRs either to protect their creations/innovations or to obtain information. Almost 30 percent of the firms are dissatisfied with Canadian IPRs. Dissatisfaction is higher among smaller firms.

- Approximately twenty percent of the firms do not believe they have sufficient expertise or available knowledge, considering internal and external resources, on IPRs. This percentage rises to 34 percent when smaller firms are examined.

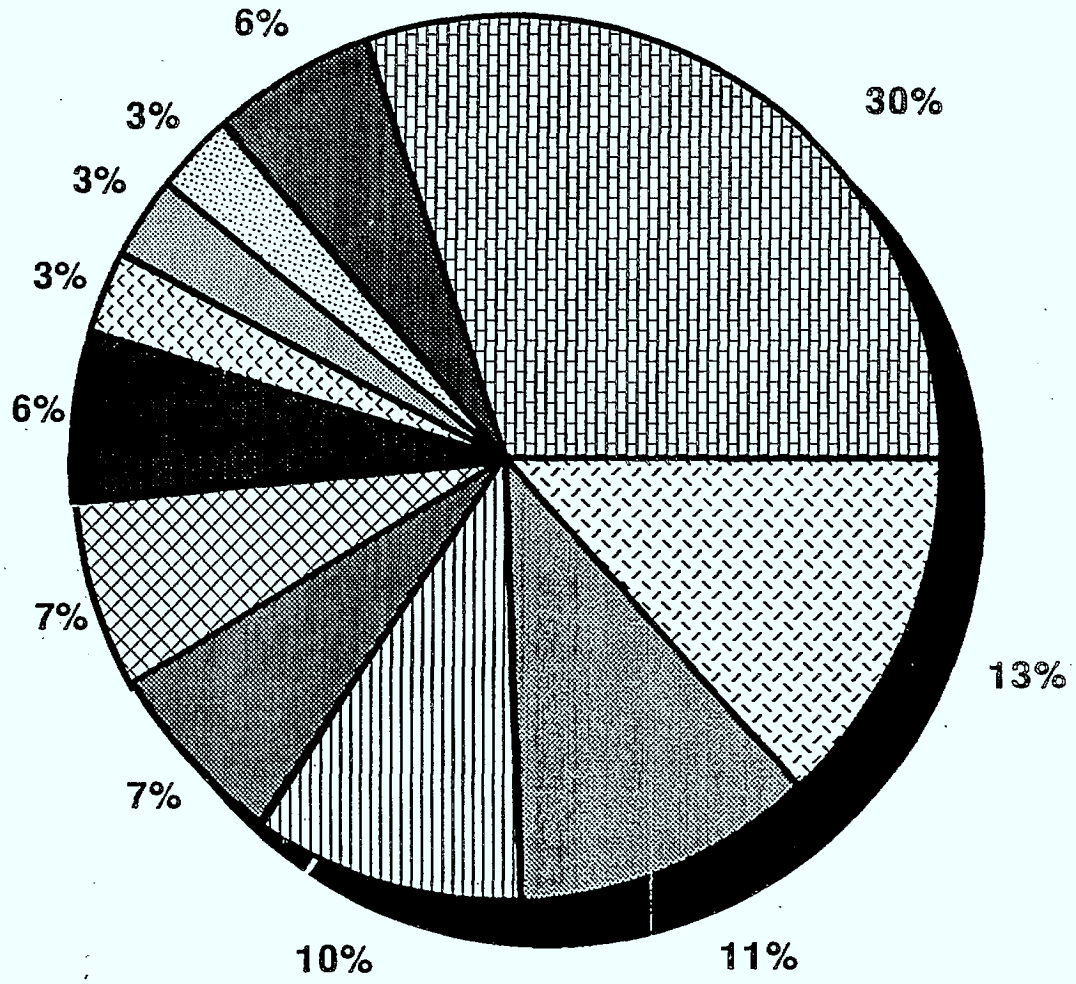
- The survey indicated that 14 percent of the firms, the majority of which are biotechnology firms, feel that Canadian IPRs discourage the amount of R&D they conduct in Canada.

- Of the firms exporting, less than 20 percent have encountered problems or disincentives related to intellectual property protection. Total losses in 1987 estimated by 8 firms were over $12 million.

- Over 30 percent of the firms indicated that their IPRs had been infringed upon or violated in the past three years in Canada. Twenty-eight firms reported that counterfeiting had caused total losses in income/revenue of approximately $10 million in 1987.

EXHIBIT 5.1.1

FIRMS' RESPONSES BY SECTOR FOR THE HIGH TECHNOLOGY CATEGORY



CLOCKWISE FROM TOP

- Software Development (n=81)
- Electrical and Electronic Products Industries (n=34)
- Chemical and Chemical Products Industries (n=29)
- Machinery and Fabricated Metals (n=26)
- Biotechnology (n=19)
- Aircraft and Aircraft Parts Industries (n=19)
- Semi-Refined Materials (n=16)
- Communication and Other Electronic Equipment (n=10)
- Power Generation (n=10)
- Primary Resource Industries (n=10)
- Other (n=15)

- Larger firms were more likely to have been involved in a court case than smaller ones. Smaller firms expressed greater dissatisfaction with the remedies available to them. They view the courts as a vehicle for the larger, stronger firms that have the resources to win or delay the proceedings to their advantage.

1. Profile of Responding Firms

Of the 320 firms surveyed, 269 questionnaires were completed, for a response rate of 84 percent. One firm responded twice, for two different sectors. Both these questionnaires have been included in the findings.

The sectors, on which firms based their responses, are presented in Exhibit 5.1.1., on the opposite page. The largest percentage of firms (30 percent) are in software development, followed by the electrical and electronic products industry (excluding software) and the chemical and chemical products industry (including pharmaceuticals). Firms in the semi-refined materials sectors are largely involved in the manufacture of advanced materials. Firms in primary resource industries include firms conducting large amounts of R&D.

The majority of the firms responding to the survey are located in Ontario (64 percent), followed by Quebec (20 percent) and British Columbia and the Territories (10 percent).

Exhibit 5.1.2. indicates the total worldwide sales of the responding firms for 1987. The largest number of firms have sales under $1 million.

EXHIBIT 5.1.2

SALES (in million $s)	1987 SALES OF HIGH TECHNOLOGY FIRMS BY SECTOR	
	Number (n=252)	Percentage of Responding Firms
Under $1	74	29%
$1 to 5	56	22%
$5.1 to 25	55	22%
$25.1 to 100	38	15%
Over $100	29	12%

Missing: 17

Over half of the high technology firms responding have less than fifty employees, as indicated in Exhibit 5.1.3. (Appendix E). Software developers are more likely to have under fifty employees (83 percent) than firms in the other high technology sectors. Firms in primary resource industries and transportation equipment industries (56 percent and 53 percent) have the highest number of employees.

Three-quarters of the firms spent under $1 million on R&D in 1987, as indicated in Exhibit 5.1.4.

EXHIBIT 5.1.4

HIGH TECHNOLOGY FIRMS' EXPENDITURES ON RESEARCH AND DEVELOPMENT	PERCENTAGE OF RESPONDING FIRMS (n = 192)
Under $100,000	31%
$101,000 to $1 million	44%
$1.1 to $5.0 million	17%
$5.1 to $25 million	6%
Over $25.1 million	3%

Missing: 14
Do not know: 63

The average R&D expenditure in 1987 was approximately $3 million. The average R&D expenditures based on firm's sales is indicated in Exhibit 5.1.5.

EXHIBIT 5.1.5

1985 SALES (IN MILLION $s)	AVERAGE R & D EXPENDITURES ($000s)
Under $1	$862
$1 to 5	$771
$5.1 to 25	$758
$25.1 to 100	$4,740
Over $100	$18,805

Over 70 percent of the firms feel that Canadian intellectual property laws have no effect on the amount of R&D performed in Canada. An equal number of firms feel that Canadian IPRs encourage and discourage R&D in Canada. Biotechnology firms are the most likely to state that Canadian intellectual property laws discourage their Canadian R&D efforts (39 percent). Firms in this sector indicated that they are severely hindered by Canada not having an IPR for plant breeders' rights.

Three-quarters of the surveyed firms are over 50 percent Canadian-owned. Of the 67 firms that are not, most of their parent companies are in the United States.

Approximately three-quarters of the firms export their products or services. There is a direct positive relationship between sales and exports. The higher the firms' sales the more likely it is to export. For approximately 25 percent of exporting firms, exports account for over 75 percent of total worldwide sales. The United States is the most important international market for over 80 percent of the firms.

Twenty-two percent of the firms do not believe they have sufficient expertise or available knowledge, in terms of internal and external resources, on IPRs. Over half of the firms feel they have sufficient expertise. The larger the firms' sales the more likely they are to feel they have sufficient expertise.

2. Use of Canadian Intellectual Property Rights

The survey findings indicated that Canadian IPRs are being used by high technology firms. Most firms (83 percent) stated they are using one or more types of IPRs to protect their creations or innovations. Indeed, over 40 percent are using 3 or more IPRs. The highest percentage of firms reported they use trade marks, trade secrets and patents for protecting

EXHIBIT 5.2.1

INTELLECTUAL PROPERTY RIGHTS USED
BY HIGH TECHNOLOGY SECTORS

SECTORS	INTELLECTUAL PROPERTY RIGHTS				
	Copyrights (n = 108)	Patents (n = 116)	Industrials Designs (n = 38)	Trade Secrets (n = 138)	Trade Marks (n = 178)
Communication & Other Electronic Equipment	30%	50%	-	50%	50%
Biotechnology	26%	42%	21%	68%	63%
Electrical & Electronic Products Industries	36%	53%	19%	61%	79%
Software Development	68%	12%	5%	44%	61%
Power Generation	40%	90%	11%	60%	70%
Chemical and Chemical Products Industries	28%	66%	14%	50%	69%
Aircraft and Aircraft Parts Industries	37%	53%	21%	58%	58%
Semi-Refined Materials	33%	47%	27%	53%	80%
Primary Resource Industries	13%	50%	6%	44%	63%
Metal Manufacturing	19%	50%	31%	12%	62%
Other	20%	90%	20%	80%	90%
Total	40%	43%	14%	52%	66%
Significance Level	.0000	.0000	.0513	.3616	.4417

Statistical Test: Chi-Square

their innovations. The degree to which particular IPRs are used by the various high technology sectors is illustrated in Exhibit 5.2.1., on the opposite page. As shown, software developers are the most likely to use 1 or more copyrights and firms involved with power generation are the most likely to use 1 or more patents. There is a direct positive relationship between number of employees and the percentage of firms using patents. The larger the firm, in terms of employees, the more likely it is to use patents.

Exhibit 5.2.2. (Appendix E) indicates, for those firms responding, the number of IPRs registered over the last three years in Canada and the cost per firm, considering government, legal and administrative costs. The highest cost was for obtaining a patent, which averaged approximately $5,200 per patent.

The percentage of firms that licensed other firms to use their IPRs over the last three years ranged from a high of 23 percent for copyrights to 16 percent for industrial designs. Responding firms had granted slightly more licenses abroad than in Canada. Over the past three years, approximately $71 million was earned from 58 firms, although 18 of these firms had not earned anything during this period. Most of the revenue was obtained from licensing agreements with firms abroad.

Similar to the Top R&D Performers, the average amount obtained for a license was greater than the average amount spent ($1.2 million compared to $650,000).

Over fifty percent of the firms are using IPRs to acquire information. Larger firms are more likely than smaller firms to use IPRs to acquire information.

EXHIBIT 5.3.1

HIGH TECHNOLOGY FIRMS' SATISFACTION WITH THE PROTECTION GIVEN BY CANADIAN INTELLECTUAL PROPERTY RIGHTS

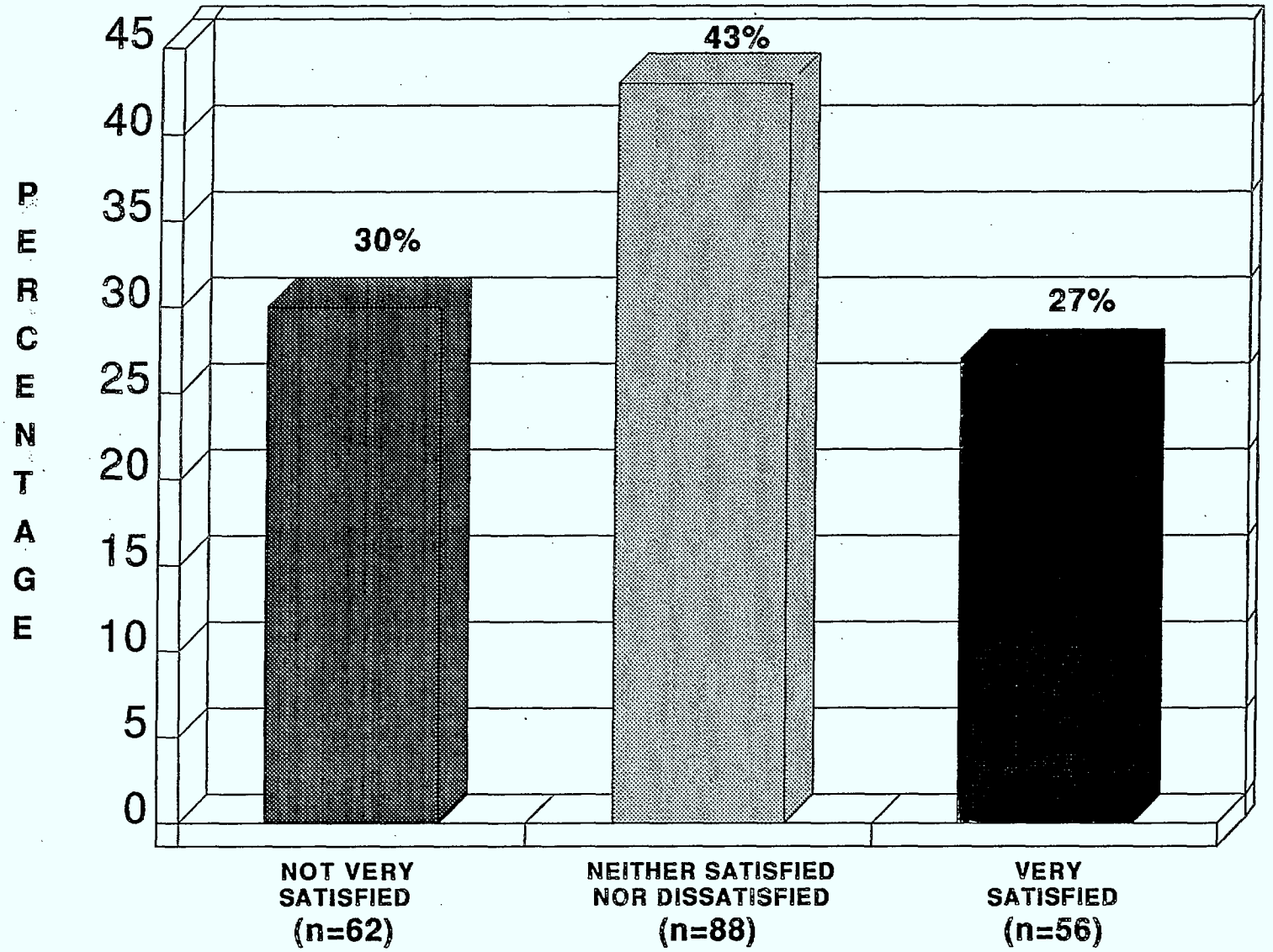


Exhibit 5.2.3. (Appendix E) indicates the percentage of firms that stated they use a particular source "quite a bit" to obtain information. The largest percentage of firms stated that they discuss information with other firms and examine copyrighted materials (47 and 40 respectively) in order to derive information. When asked if there are other sources of information, a large number also use literature, trade shows and information from their parent or subsidiary.

Sixty-five percent of the firms that had "acquiring exclusivity in a product or service" as a corporate goal indicated that existing Canadian IPRs had somewhat or a great deal helped to facilitate the goal. Sixty-four percent indicated that Canadian IPRs had helped them maintain or increase their domestic market share. The smallest percentage (39 percent) stated that IPRs had either somewhat or greatly helped them to hire highly qualified personnel.

3. Satisfaction With Canadian Intellectual Property Rights

Exhibit 5.3.1., on the opposite page, indicates firms' satisfaction with the protection given by Canadian intellectual property laws. A higher percentage of firms (30 percent) are dissatisfied than satisfied (27 percent). The percentage of firms dissatisfied with Canadian intellectual property laws by sector is indicated in Exhibit 5.3.2. As indicated, firms in the aircraft and aircraft parts industry sector tended to be the most satisfied.

EXHIBIT 5.3.2

SECTORS	PERCENTAGE OF HIGH TECHNOLOGY FIRMS DISSATISFIED WITH CANADIAN IPRs
Communication and Other Electronic Equipment (n = 7)	14%
Biotechnology (n = 13)	39%
Electrical & Electronic Products Industries (n = 29)	24%
Software Development (n = 60)	45%
Power Generation (n = 10)	26%
Chemical and Chemical Products Industries (n = 24)	38%
Aircraft and Aircraft Parts Industries (n = 15)	7%
Semi-Refined Materials (n=11)	-
Primary Resource Industries (n = 11)	10%
Metal Manufacturing (n = 16)	25%
Other (n = 12)	46%

Statistical Test: Chi-Square
Significance Level: .0281

Smaller firms (sales under $5 million) are more dissatisfied with Canadian IPRs than firms with sales over $100 million (39 percent compared to 15 percent). One explanation for the dissatisfaction levels is that many small firms are in the software development and biotechnology sectors, which had high levels of dissatisfaction.

EXHIBIT 5.3.4

REASONS HIGH TECHNOLOGY FIRMS ARE DISSATISFIED WITH CANADIAN INTELLECTUAL PROPERTY RIGHTS

REASONS	NUMBER OF TIMES MENTIONED*						
	Copy-right	Patents	Indus-trial Designs	Trade Secrets	Trade Marks	Other	Percentage of Total Mentions** n = 149)
Insufficient/Incomplete Protection	18	7	2	1	2	6	24 %
Enforcement is Not Sufficient	10	5	-	1	1	4	14 %
Protection Is Too Long/ Expensive/Tedious to Acquire	2	9	1	-	6	2	13 %
Courts/Lawyers Are Expensive	4	7	-	-	2	2	10 %
Legislation is needed	4	2	-	3	-	4	9 %
Information Required Too Detailed	-	8	-	-	-	1	6 %
Length of Protection is Not Sufficient	-	6	-	-	-	-	4 %
Information is Needed on IPRs	1	2	-	-	-	3	4 %
Compensation is Not Sufficient	4	1	-	-	-	-	3 %
International Registry/ Protection is Needed	1	1	-	-	2	-	3 %
Protection Given is Too Broad	-	1	-	-	-	1	1 %
Other	3	2	-	3	-	3	7 %

* Firms were able to list three IPRs they were dissatisfied with and three reasons related to each IPR. The above are the total reasons listed.

** Does Not Add Up Due to Rounding.

Firms using copyrights are the most dissatisfied with the protection given by Canadian IPRs. Almost 45 percent of the firms using copyrights are dissatisfied compared to 22 to 32 percent of the firms using other IPRs. A large portion of this dissatisfaction is attributable to firms in software development.

Firms stating they had sufficient expertise on IPRs were more likely to be satisfied with Canada IPRs.

A higher percentage of the firms satisfied with Canadian IPRs are satisfied with the terms of protection given and the subject matter than with the remedies/penalties or the enforcement of the IPRs. This is shown in Exhibit 5.3.3.

EXHIBIT 5.3.3.

	HIGH TECHNOLOGY FIRMS' SATISFACTION WITH CANADIAN INTELLECTUAL PROPERTY RIGHTS		
	Not Very Satisfied	Somewhat Satisfied	Very Satisfied
Term of Protection Given (n=50)	4 %	20 %	76 %
Subject Matter (n=418)	6 %	25 %	69 %
Manner of Enforcement (n=40)*	13 %	38 %	50 %
Remedies/Penalties (n=34)	11 %	36 %	53 %

* Does Not Add Up Due to Rounding

Firms that ranked their satisfaction between 1 and 3 on the 5-point scale were asked to indicate any reasons why they are dissatisfied with Canadian intellectual property laws. Exhibit 5.3.4., on the opposite page, indicates

that the major reasons cited by high technology firms are incomplete or insufficient protection given by the current IPRs, insufficient enforcement and the delays/expense/tedium in acquiring protection.
The IPRs that firms are the most dissatisfied with are patents (34 percent of total mentions) and copyrights (32 percent). Forty-two percent of the responses were made from firms in software development, primarily stating their is insufficient/incomplete protection and insufficient enforcement of IPRs. Firms in the biotechnology sector are more inclined to state that legislation is required.

One-third of the respondents (85 firms) indicated that there are IPRs that their firm would like to use but are not currently using. Firms in the communication and other electronic industries and software development sectors were the most likely to indicate that there are IPRs they would like to use (50 percent and 48 percent respectively).

The reasons given by the firms for not using IPRs are listed in Exhibit 5.3.5. (Appendix E). Insufficient or incomplete protection from IPRs received the highest percentage of total mentions (34 percent). Most responses referred to copyrights (37 percent) and patents (33 percent).

Twelve of the 19 firms indicating that more information is required are from the software development sector. Thirty-seven percent of software development firms stated that the protection given by IPRs is insufficient or incomplete. Five of the 15 references to the need for an IPR in a particular area came from biotechnology firms.

A little less than fifty percent of the firms (45 percent) feel that measures are needed to facilitate freer movement of products protected by

IPRs in international trade. Thirty-five percent feel measures are not needed and 20 stated they do not know. Approximately half of the firms feel such measures would have no impact on their sales and 47 percent indicated they would have a positive impact.

4. Use of and Satisfaction with Licensing Agreements

Approximately half of the firms (46 percent) had obtained a licensing agreement from another firm over the last three years. There is a significant positive relationship between the size of firms and whether they have licensing agreements. Almost 68 percent of firms with large sales (over $100 million) have licensing agreements compared to 39 percent of firms with small sales of under $1 million.
The number of licensing agreements that firms entered into during the last three years is indicated in Exhibit 5.4.1. (Appendix E), for those firms able to provide data. The highest number of firms entered into licensing agreements dealing with patents (58 entered into 267 agreements). Most licensing agreements dealt with foreign products/services and technologies.

Of those firms able to provide information, the total expenditures on royalty payments for licensing agreements was $64 million, or an average of $860,000 per firm. The range that firms spent on royalty payments was $1,000 to $12 million (19 firms stated they did not spend anything). Most of the royalty payments were made outside Canada.

A large number of firms (63 percent) are satisfied with the conditions of the licensing agreements. Only 7 percent of the firms are not satisfied. There is no significant relationship between satisfaction with the licensing agreements and sector or size of firms.

Reasons given by firms on why they are not satisfied are listed in Exhibit 5.4.2. (Appendix E). The major response given by firms is that the

conditions of the licensing agreement are too rigid (8 responses). As well, six firms stated that the protection given is incomplete or insufficient. Most of the dissatisfaction is directed at patents (12 responses) and copyrights (8 responses).

Ten firms (8 percent) stated that their licensing agreements have imposed excessive restrictions or created difficulties. Half of these firms (5 firms) feel that the restrictions have substantially affected their profitability.

Eight firms that do not have a licensing agreement but have attempted to enter into one stated they have encountered difficulties. These firms, as well as the ten firms that have had excessive conditions placed on their licensing agreements, were asked to specify the type of restriction(s) or difficulty(ies). Their remarks are indicated in Exhibit 5.4.3. (Appendix E). Firms were able to list up to three IPRs and up to three restrictions/difficulties for each IPR. The major reason given is the high costs associated with securing the licensing agreement (i.e., from royalties, legal fees). While restrictions/difficulties are encountered with all IPRs, copyrights and patents are identified as being restricted or involved in a difficulty the most often. The source of the difficulties is predominantly foreign firms.

Interestingly, few responding firms have compulsory licenses. Only seven firms surveyed had a compulsory license over the last ten years. Three of these firms were not satisfied with the license, primarily because the procedures to secure the license took too long and the royalty rate was too high.

5. Problems with Counterfeiting/Displacement in Canada

Thirty-one percent of the firms stated that their IPRs have been infringed upon or violated in the past three years in Canada. Exhibit 5.5.1. indicates the percentage of firms in the high technology sectors that had their IPRs infringed. As illustrated, firms in the communication and other electronic equipment sector were more likely to identify problems. Firms in the aircraft and aircraft part sector stated they had not been infringed.

EXHIBIT 5.5.1

	PERCENTAGE OF HIGH TECHNOLOGY FIRMS THAT HAVE BEEN INFRINGED BY SECTOR	
SECTOR	Yes	No
Communication and Other Electronic Equipment	63%	38%
Biotechnology	13%	88%
Electrical and Electronic Products Industries	28%	72%
Software Development	40%	60%
Power Generation	20%	80%
Chemical and Chemical Products Industries	23%	77%
Aircraft and Aircraft Parts Industry	-	100%
Semi-Refined Materials	25%	75%
Primary Resource Industries	50%	50%
Metal Manufacturing	40%	60%
Other	33%	67%

Firms that had been infringed or violated, rated the seriousness of the violations. This appears in Exhibit 5.5.2. (Appendix E). Firms feel that infringements/violations are the most serious (64 percent) for their patents and the least serious for trade marks (23 percent).

A large number of firms (65 percent) that had been infringed upon believe that their sales have decreased because of the violation. Approximately half of the firms believe that the violation has decreased the domestic price of the product. Twenty-eight firms reported that counterfeiting had caused losses in income/revenue of approximately $10 million in 1987. Extrapolating this to the entire High Technology population reveals that between $45 and 71 million was lost in total in 1987 due to counterfeiting.

6. Effects of Foreign Intellectual Property Rights on Canadian Firms' External Interests

Approximately 40 percent of the firms hold IPRs abroad. Exhibit 5.6.1. (Appendix E) indicates the number of IPRs registered abroad, for those firms able to provide data. The most variation is with patents, where nine firms have obtained 1 over the last three years and one firm has obtained 1,500 patents.

The average cost per firm for registering or obtaining an IPR abroad, considering government, legal and administrative costs, ranged from a high of approximately $7,700 for patents to a low of about $1,320 for trade marks.

Of the firms exporting, 17 percent have encountered problems or disincentives related to intellectual property protection. Twenty of these thirty firms stated that foreign markets have been lost or sales affected

because of the problems. The 1987 estimated total losses by the 8 firms able to provide numbers were estimated to be over $12 million.

In addition to the above twenty firms, three firms, not currently exporting, indicated that they had attempted or considered exporting but do not currently export because of problems or disincentives with respect to IPRs. The problems specified by these firms are listed in Exhibit 5.6.2. Infringements, piracy and counterfeiting are listed the most frequently. Over fifty percent of software developers stated that infringements are a problem abroad. Most problems are associated with patents and copyrights (together they accounted for 70 percent).

EXHIBIT 5.6.2

PROBLEMS OR DISINCENTIVES ENCOUNTERED ABROAD BY HIGH TECHNOLOGY FIRMS*	PERCENTAGE OF TOTAL MENTIONS** (n = 37)
Infringements/Piracy/Counterfeiting	51 %
Lack of Penalties/Remedies	11 %
Difficult to Learn International Laws/Procedures	8 %
Restrictions or Practices of Foreign Governments	8 %
Expense/Length of Time to Register IP	8 %
Countries Refusing to Pay Royalties	3 %
Other	11 %

* Firms were able to list three IPRs they were dissatisfied with and three reasons related to each IPR. The above are the total reasons listed.

Approximately 35 percent of the responses did not specify a country where the problem or disincentive was encountered. Twenty-eight percent of the problems occurred in the United States.

Half of the firms indicating they encountered problems or disincentives related to IPRs also indicated that their IPRs had been infringed or violated in the past three years in Canada.

7. Use of and Problems Concerning the Importation of IPRs

Between 35 and 50 percent of the firms stated that their imports embody IPRs. Most of these firms indicated that the IPR has not hindered or prevented them from importing (Exhibit 5.7.1. in Appendix E).

The types of difficulties that firms are experiencing are indicated in Exhibit 5.7.2. (Appendix E). Most problems are with patents and trade secrets in the United States. Four firms referred to difficulties with respect to re-exporting. Only one of the seven firms stated that the difficulties have affected their profitability.

8. Involvement With Litigation Concerning IPRs

Most firms (82 percent) had not been involved in a court case concerning IPRs. However, 68 firms (36 percent) that have not been involved in a court case had considered launching, or had been threatened with, legal action.

Larger firms (with sales over $25 million) are more likely to have been involved in a court case (34 percent) as opposed to smaller firms (8 percent with sales under $1 million).

Of those firms previously involved in a court case, the IPR involved in the most recent case was largely patents (51 percent), as indicated in Exhibit

5.8.1. (Appendix E). The firms' most recent case predominantly took place in Canada and the United States.

Most firms stated their most recent case was a civil matter dealing with an infringement suit.

Of the 35 firms able to provide the cost of their most recent litigation, the range was from $3,000 to $1 million. The total cost for these 35 firms was $7 million.

Over half of the firms stated they are not satisfied with the court case, while 33 percent are quite satisfied. There is no relationship between satisfaction and sector or size of firm. The high costs and the outcome/result of the litigation are the major reasons given by firms for not being satisfied with the court process.

Of those firms that had considered legal action over the last ten years, but had not launched action, the majority involve patents and copyrights in Canada and the United States. Most firms did not proceed because they settled out of court. Other frequently mentioned reasons for not taking action were the high costs incurred and uncertainty as to who would win.

Twenty-seven firms had been threatened with legal action over the last ten years, primarily with respect to patents and by other Canadian firms.

MEDIUM AND LOW TECHNOLOGY FIRMS

In this section the findings from the survey of medium and low technology firms are presented. Major findings are summarized in the following paragraphs and more detailed findings follow.

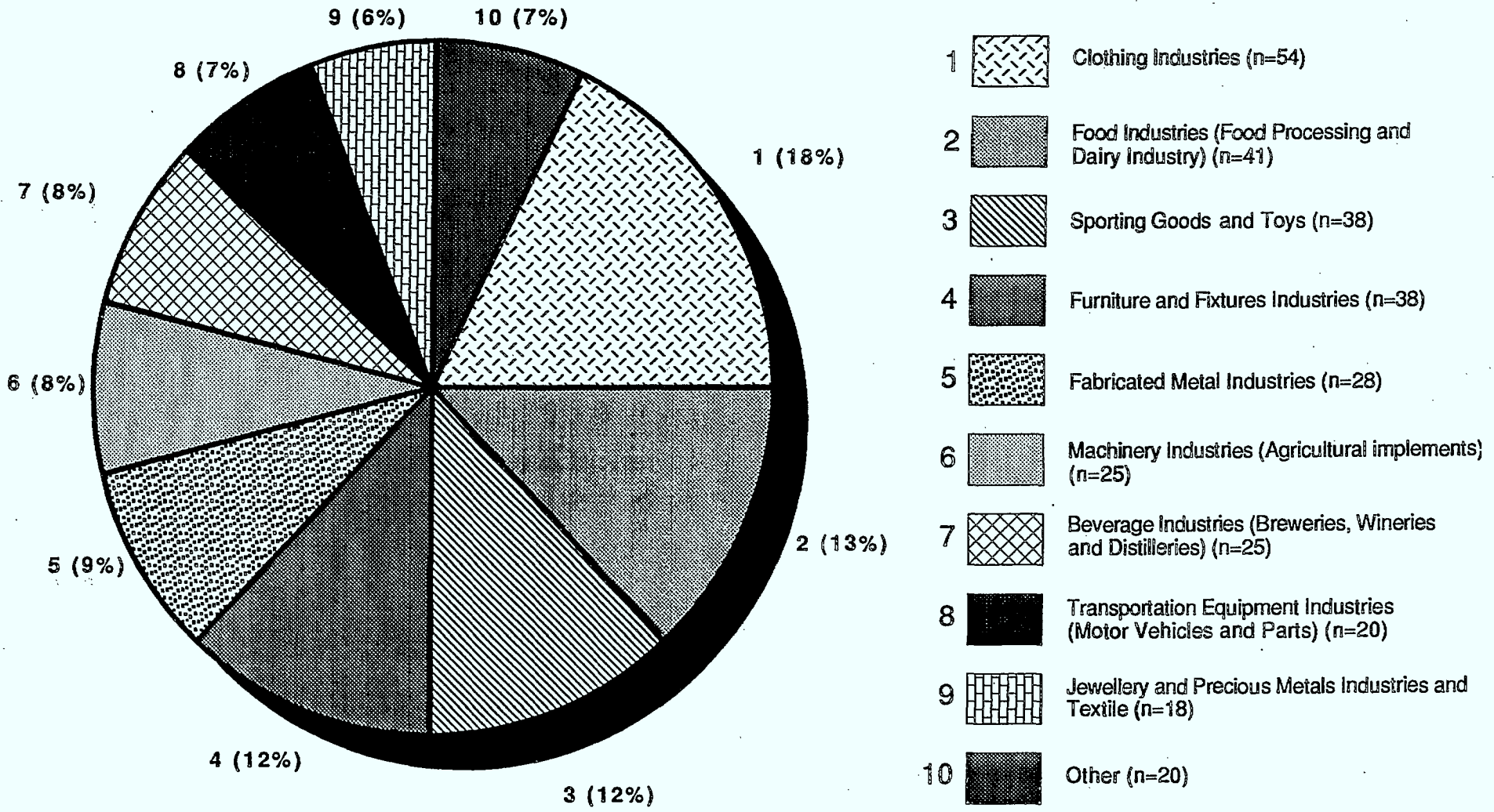
- **Firms in the Medium and Low Technology group are using IPRs but to a lesser degree than high technology firms. The most popular type of IPR for protecting innovations/creations is trade marks although the type of IPR used varies between sectors.**
- **Thirty-five percent of the firms stated they do not have sufficient expertise or knowledge available on IPRs.**
- **Most firms are satisfied with Canadian IPRs. Dissatisfaction levels vary among the sectors. Most firms are dissatisfied with the protection offered by IPRs and expense and time involved with the court system.**
- **Most firms exporting stated they have not encountered difficulties related to IPRs.**
- **Over 30 percent of the firms indicated that their IPRs had been infringed upon or violated during the past three years. Infringements related to copyrights were more likely to be seen as very serious.**

The detailed findings are organized under the following:

- profile of responding firms;
- use of Canadian intellectual property rights;
- satisfaction with Canadian intellectual property rights;
- use of and satisfaction with licensing agreements;
- problems with counterfeiting/displacement in Canada;
- effects of foreign intellectual property rights on Canadian firms' external interests;
- use of and problems concerning the importation of IPRs;
- involvement with litigation concerning IPRs.

EXHIBIT 6.1.2

MEDIUM AND LOW TECHNOLOGY
RESPONSE RATE BY SECTOR



1. Profile of Responding Firms

Three hundred and seven of the 400 firms sampled completed the survey for a response rate of 77 percent. The response rate for each of the sectors sampled within medium and low technology is presented in Exhibit 6.1.1. (Appendix E).

The sectors that firms operated in and were seen as being the most significant with respect to IPRs are presented in Exhibit 6.1.2., on the opposite page. Firms were asked to restrict their responses to these sectors.

Approximately half of the firms responding to the survey are from Ontario (52 percent), followed by Quebec (21 percent) and Manitoba, Saskatchewan and Alberta (18 percent).

Approximately 61 percent of firms in this group have sales under $5 million, as indicated in Exhibit 6.1.3. Jewellery and precious metals and sporting goods and toys sectors tend to have the smaller firms (over 80 percent have sales below $5 million).

EXHIBIT 6.1.3

SECTORS	1987 SALES OF MEDIUM AND LOW TECHNOLOGY FIRMS BY SECTOR (IN MILLIONS $)				
	Under $1	$1.1 to 5	$5.1 to 25	$25.1 to 100	$100 or more
Beverage Industries	29 %	42 %	8 %	13 %	8 %
Food Industries	11 %	18 %	21 %	13 %	37 %
Jewellery and Precious Metals Industries*	59 %	24 %	6 %	12 %	-
Clothing and Textile Industries	27 %	40 %	31 %	2 %	-
Fabricated Metal Industries	18 %	32 %	32 %	18 %	-
Furniture and Fixture Industries*	16 %	53 %	22 %	8 %	-
Transportation Equipment Industries	5 %	26 %	53 %	5 %	11 %
Sporting Goods and Toys*	65 %	15 %	18 %	3 %	-
Machinery Industries	42 %	29 %	25 %	-	4 %
Other	35 %	25 %	30 %	10 %	-
TOTAL*	30 %	31 %	25 %	8 %	7 %

* Does Not Add Up Due To Rounding

Missing : 8
Do not know : 16

Sixty percent of the responding firms have less than fifty employees. There are 37 firms with over 250 employees. Jewellery manufacturers have the smallest percentage of employees (78 percent) and food industries have the largest (43 percent).

Over sixty percent of the firms spent under $100,000 in R & D in 1987 as indicated in Exhibit 6.1.4. (Appendix E).

The average R & D expenditures in 1987 was $361,000. The average R & D expenditures based on firm's sales as indicated in Exhibit 6.1.5.

EXHIBIT 6.1.5

1987 SALES (IN MILLION $s)	AVERAGE R & D EXPENDITURES ($000s)
Under $1	$344
$1.1 to 5.0	$90
$5.1 to 25	$331
$25 to 100	$649
Over $100	$967

Approximately 80 percent of the firms feel that Canadian intellectual property laws have had no effect on the amount of R&D their firms conduct in Canada. Twelve percent of the firms feel that Canadian IPRs discouraged R&D in Canada. Twenty-two percent of furniture and fixture manufacturers as well as sporting goods and toys manufacturers feel that Canadian IPRs discourage Canadian R&D.

Ninety percent of the firms are over 50 percent Canadian-owned. Of the 31 firms that are not Canadian-owned, most of their parent companies are in the United States.

Approximately two-thirds of the firms surveyed export their products or services. Firms in the fabricated metals, machinery and transportation equipment sectors (86%, 83% and 75% respectively) are more likely to export than firms in the other sectors. For most firms (88 percent), exports accounted for less than 50 percent of their total worldwide sales.

Thirty-five percent of the firms stated they do not have sufficient expertise or knowledge available on IPRs, considering both internal and external resources. As indicated in Exhibit 6.1.6., firms in the jewellery and precious metals sector and clothing and textile sector were the most likely to state that they do not have sufficient expertise.

EXHIBIT 6.1.6

SECTORS	PERCENTAGE OF FIRMS IN MEDIUM AND LOW TECHNOLOGY INDICATING THEY DO NOT HAVE SUFFICIENT EXPERTISE (n = 289)
Beverage Industries	33 %
Food Industries	23 %
Jewellery and Precious Metals	56 %
Clothing and Textile Industries	55 %
Fabricated Metal Products	29 %
Furniture and Fixtures Industries	42 %
Transportation Equipment Industries	30 %
Sporting Goods and Toys	29 %
Machinery Industries	25 %
Other	30 %
TOTAL	35 %

Missing: 18

2. Use of Canadian Intellectual Property Rights

Medium and low technology firms use intellectual property laws but to a lesser extent than high technology firms. Seventy-one percent of the firms stated they are using one or more types of IPRs to protect their creations or innovations. The most popular IPR for protecting works is trade marks, as indicated in Exhibit 6.2.1. (Appendix E). It should be noted, however, that there was some confusion by firms over the term trade mark. The number recorded in trade marks may include items that firms mistakenly thought were trade marks, such as trade names, product names, product lines, etc.

Some sectors are more likely to use a particular type of IPR than other sectors, as shown in Exhibit 6.2.2. For example, machinery and fabricated metal industries are more likely to use patents than other sectors, while food industries were the largest users of trade secrets.

EXHIBIT 6.2.2

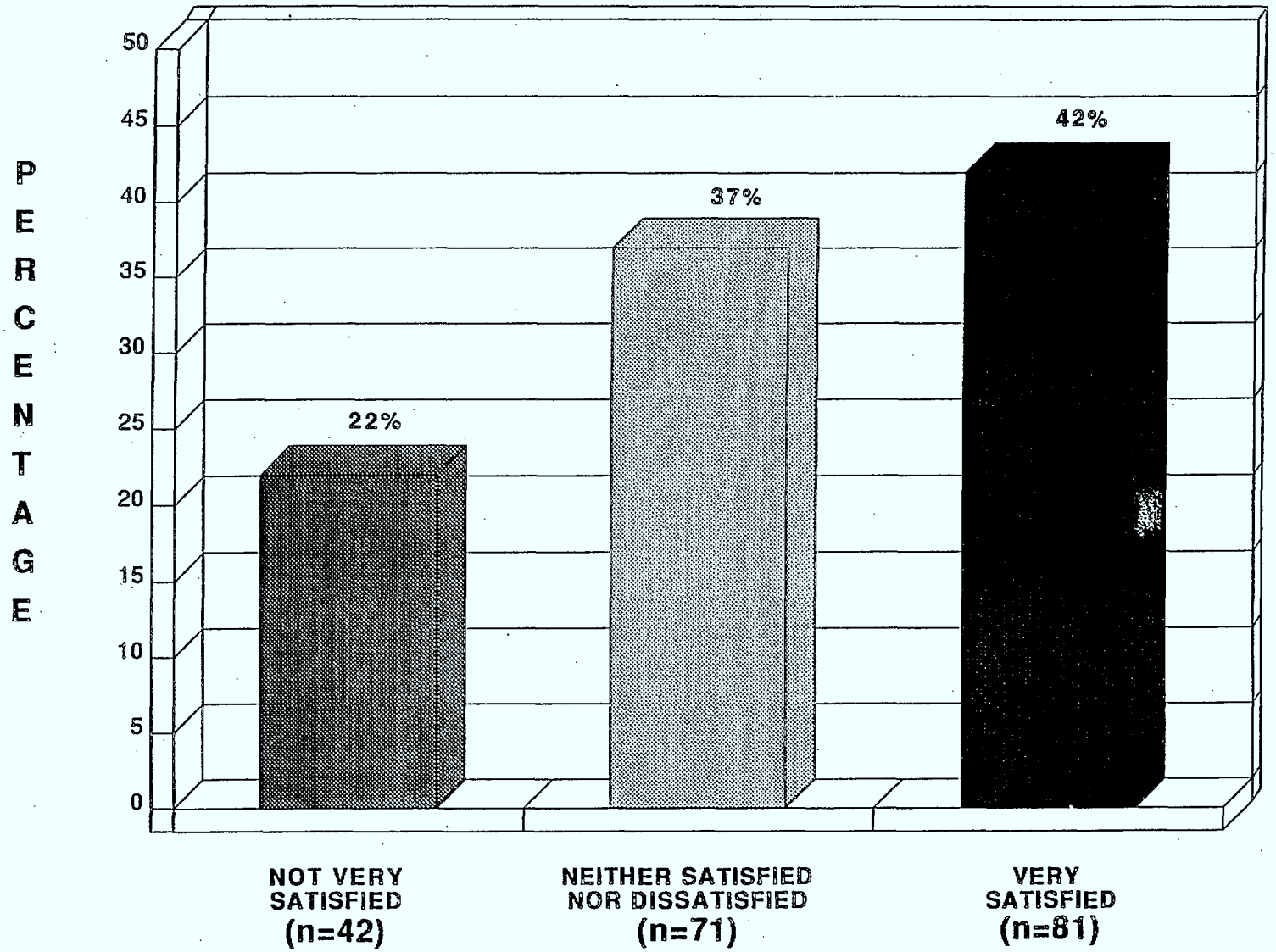
	INTELLECTUAL PROPERTY RIGHTS USED BY MEDIUM AND LOW TECHNOLOGY FIRMS BY SECTOR				
SECTORS	Copyrights (n =51)	Patents (n = 71)	Industrial Designs (n = 37)	Trade Secrets (n = 53)	Trade Marks (n =195)
Beverage Industries	28 %	16 %	21 %	13 %	84 %
Food Industries	27 %	20 %	10 %	43 %	85 %
Jewellery and Precious Metals Industries	6 %	-	6 %	17 %	78 %
Clothing and Textile Industries	9 %	4 %	4 %	9 %	57 %
Fabricated Metal Industries	14 %	56 %	14 %	18 %	61 %
Furniture and Fixture Industries	-	16 %	11 %	11 %	29 %
Transportation Equipment Industries	20 %	15 %	5 %	10 %	50 %
Sporting Goods and Toys	32 %	27 %	24 %	16 %	66 %
Machinery Industries	20 %	64 %	12 %	24 %	72 %
Other	10 %	35 %	21 %	25 %	65%

Exhibit 6.2.3. (Appendix E) indicates, for those firms responding, the number of IPRs registered over the last three years in Canada and the average cost per firm considering government, legal and administrative costs. As indicated, 873 trade marks were registered by 104 firms. The average cost per trade mark was approximately $2,400. Obtaining a patent was the most expensive, at an average cost of approximately $7,200.

Over the last three years, the number of firms that granted a license to another firm to use their IPRs ranged from 22 for trade marks to

EXHIBIT 6.3.1

MEDIUM AND LOW TECHNOLOGY FIRMS' SATISFACTION WITH THE PROTECTION GIVEN BY CANADIAN INTELLECTUAL PROPERTY RIGHTS*



* Does Not Add up Due to Rounding

1 for industrial designs. Firms had granted more licenses in Canada than abroad. Over the past three years, approximately $4 million was earned by 27 firms from licenses; however, 9 of these firms did not earn anything. More revenue was earned from licenses in Canada than abroad, as more licenses were signed in Canada.

Only 26 percent of the firms surveyed are using IPRs to acquire information. Firms in the food industries sector are the most likely to use IPRs for information while firms in the jewellery and precious metal industries are the least likely (40 percent versus 6 percent).

The percentage of firms that indicated they use a particular source "quite a bit" to obtain information is presented in Exhibit 6.2.4. (Appendix E). The most frequently identified sources of information are discussions with other firms and the examination of patents.

3. Satisfaction with Canadian Intellectual Property Rights

Firms are generally satisfied with the protection given by Canadian IPRs, as indicated in Exhibit 6.3.1., on the opposite page. Firms from the clothing and furniture sectors (32 and 31 percent respectively) are the most dissatisfied, while firms from fabricated metals, transportation equipment and food processing (19, 18 and 17 percent respectively) are the most satisfied.

Of the firms satisfied with Canadian IPRs, more firms are satisfied with the term of protection given and the subject matter than the remedies/penalties or the manner of enforcement, as indicated in Exhibit 6.3.2. (Appendix E). There is no statistical relationship between satisfaction and sector.

Reasons firms gave for being dissatisfied with Canadian IPRs are listed in Exhibit 6.3.3. As indicated, the highest number of firms are dissatisfied with the protection offered by Canadian IPRs, which they feel is insufficient or incomplete, and the courts and lawyers, which they feel are expensive and time consuming. Firms are mostly dissatisfied with trade marks (33 percent of total mentions) and patents (30 percent).

EXHIBIT 6.3.3

REASONS WHY THE MEDIUM AND LOW TECHNOLOGY FIRMS ARE DISSATISFIED WITH CANADIAN INTELLECTUAL PROPERTY RIGHTS	PERCENTAGE OF TOTAL MENTIONS* (n = 100)
Insufficient/Incomplete Protection	28 %
Courts/Lawyers Were Expensive/Lengthy	25 %
Enforcement Is Not Sufficient	14 %
Protection Was Too Long/Expensive/ Tedious to Get	13 %
Compensation Given Not Sufficient	3 %
Information Required Too Detailed	2 %
Hard to Prove Have Been Copied	2 %
Information Needed on IPRs	1 %
Other	12 %

* Firms were able to list three IPRs they were dissatisfied with and three reasons related to each IPR. The above are the total reasons listed.

Of firms not using IPRs, almost thirty percent of the firms stated that there are IPRs they would like to use to protect their innovations/creations. Firms from the jewellery sector and the sporting goods and toys sector (44 and 43 percent) are the most likely to state

there are IPRs they would like to use, while firms in the beverage industries sector (17 percent) are the least likely.

The reasons given for not using the IPR are listed in Exhibit 6.3.4. (Appendix E). The most common reasons stated were:

- that it takes too much time or expense to register (30 percent of total mentions);
- that the protection given is incomplete or insufficient (23 percent); and
- that more information is needed on IPRs (12 percent).

The IPR mentioned most often is patents (39 percent of total mentions), followed by industrial designs (18 percent) and copyrights (14 percent).

On the question of whether measures are needed to facilitate freer movement of products protected by IPRs in international trade, the respondents are evenly split between indicating measures are needed (35 percent), not needed (33 percent) or not sure (32 percent). There is no significant relationship between sector and support for freer movement of products.

4. Use of and Satisfaction with Licensing Agreements

Three-quarters of the firms had not obtained a licensing agreement from another firm over the last three years. Firms in the food industries sector were the most likely to obtain a licensing agreement (39 percent), while firms in the furniture sector were the least likely (11 percent).

The highest number of agreements were for trade secrets (134) and the least for industrial designs (7). With the exception of trade secrets, which were primarily for foreign technology, most agreements were for foreign products/services and some were for Canadian products/services. Exhibit

6.4.1. (Appendix E) indicates the number of agreements for firms that had entered into an agreement and were able to provide information on the number of agreements.

Fifty-seven firms reported their total expenditures on royalty payments. Most of the payments were made outside Canada and totalled approximately $20 million over the last three years.

A large number of firms (75 percent) are satisfied with the conditions of the licensing agreements. Thirteen percent are not very satisfied. A higher percentage of firms in the furniture sector and the transportation equipment sector are dissatisfied (25 percent each), while firms in the food industries are the less likely to be dissatisfied (7 percent).

The reasons given by firms for being dissatisfied are indicated in Exhibit 6.4.2. (Appendix E). The reason stated most frequently was that the license did not provide the firm with what they were expecting or hoped. Most of the concerns were related to patents or trade marks.

Eight firms (thirteen percent) stated that their licensing agreements had imposed excessive restrictions or created difficulties. Six of these firms feel that the restrictions/difficulties have somewhat or greatly affected their profitability.

Seven firms that do not have a licensing agreement but had attempted to obtain one, stated that they had encountered restrictions/difficulties. These firms, as well as the eight firms that had excessive conditions placed on their licensing agreements, specified the type of difficulties they encountered. The most frequently mentioned reasons involved the condition of the licensing agreement and the lack of communication or cooperation with the licensor. Exhibit 6.4.3. (Appendix E) indicates which IPR was mentioned for which reason. The IPRs mentioned the most were trade marks and

copyrights. The source of the restriction appearing the most was foreign firms.

5. Problems with Counterfeiting/Displacement in Canada

Over 30 percent of the firms indicated that their IPRs had been infringed upon or violated in the past three years. The largest number of firms that believed their rights had been infringed upon were in the furniture industry (52 percent), while the smallest number was in the beverage industry (15 percent).

The seriousness of the violations, according to the firms that had been infringed upon or violated, is indicated in Exhibit 6.5.1. Firms felt that infringements on their copyrights were the most serious (70 percent) and the least serious infringements regarding trade secrets (29 percent).

EXHIBIT 6.5.1

INTELLECTUAL PROPERTY RIGHTS	DEGREE TO WHICH THE INFRINGEMENTS ARE SERIOUS		
	Not Very Serious	Somewhat Serious	Quite Serious
Copyrights (n=10)	10 %	20 %	70 %
Patents (n=14)	14 %	43 %	43 %
Industrial Design (n=11)	27 %	27 %	46 %
Trade Secrets (n=7)	43 %	29 %	29 %
Trade Marks (n=35)	20 %	34 %	46 %

* Does Not Add Up Due to Rounding

A large number of firms (43 percent) that had been infringed upon believed that their sales had decreased as a result. Approximately 30 percent stated that counterfeiting or other infringements had depressed the domestic price for their product. Eleven firms indicated that they lost approximately $32 million in 1987 due to counterfeiting. Most of this amount was indicated by one firm. Twenty firms were not able to estimate their lost income/revenue.

6. Effects of Foreign Intellectual Property Rights on Canadian Firms' External Interests

One-third of the firms hold IPRs abroad. Firms are more likely to hold IPRs abroad if they are in the beverage, food or sporting goods sectors (50, 42 and 48 percent, respectively) while firms in the jewellery and precious metals sector are the least likely.

The forty-three firms that were able/willing to provide information indicated that they had registered a total of 453 trade marks. The average cost per firm for registering or obtaining an IPR abroad, considering government, legal and administrative costs, ranged from approximately $9,900 for patents to $2,500 for industrial designs. Exhibit 6.6.1. (Appendix E) indicates the number of IPRs registered abroad.

Most firms (92 percent) exporting had not encountered difficulties related to IPRs. Half of the firms encountering difficulties (6 firms) stated that foreign markets had been lost or sales affected because of the difficulties. The total losses estimated in 1987 by four of these firms was $305,000.

Three firms, not currently exporting, indicated that they had attempted or considered exporting but did not because of problems or disincentives they had encountered. The problems specified by 13 firms, which included firms attempting to export as well as those that encountered difficulties while exporting, are listed in Exhibit 6.6.2. (Appendix E). As shown, the major response was the length of time or expense of registering IPRs, of which

two-thirds concerned trade marks. The three countries cited most often as the locations of the difficulties are the United States, Western Europe and Japan.

7. Use of and Problems Concerning the Importation of IPRs

Between 18 and 34 percent of the responding firms indicated that their imports embody IPRs. Most of these firms (over 94 percent) stated that the IPR has not hindered or prevented them from importing.

The firms that stated they experienced difficulties were asked to elaborate on the difficulty. There were seven difficulties mentioned by five firms. Five difficulties concerned Canadian customs (paperwork and time) and two concerned the condition of the IPR or licensing agreement. The difficulties were mentioned in relation to industrial designs, patents and trade secrets. Most problems were with imports from the United States.

8. Involvement With Litigation Concerning IPRs

Most firms (85 percent) had not been involved in a court case involving IPRs. However, almost forty percent of these firms had considered, or been threatened with, legal action concerning IPRs.

Of those firms previously involved in a court case, the IPR involved in the most recent case is indicated in Exhibit 6.8.1. Most of the court cases were in Canada and the United States.

EXHIBIT 6.8.1

INTELLECTUAL PROPERTY RIGHTS	PERCENTAGE DISTRIBUTION OF COURT CASES OF MEDIUM AND LOW TECHNOLOGY FIRMS THAT INVOLVED THE FOLLOWING IPRs
Copyrights (n=35)	17 %
Patents (n=35)	29 %
Industrial Designs (n=35)	14 %
Trade Secrets (n=35)	-
Trade Marks (n=35)	46 %
Other (n=35)	3 %

More firms (60 percent) stated they owned or controlled the IPR involved in the court case while 40 percent stated they were alleged to have infringed the IPR. Most firms indicated their most recent case was a civil matter dealing with an infringement suit.

Of the 27 firms able to provide the total expenses of their most recent litigation, the costs ranged from $1,000 to $1 million. The total cost for the 27 firms was $2 million. Approximately 30 percent of the respondents are not satisfied with their court case. The high cost is the major reason cited by firms.

Of the firms that had considered, but had not taken, legal action over the last ten years, the majority involved trade marks (23 mentions), patents (13 mentions) and copyrights (11 mentions). Canada, the United States and Western Europe were the countries most frequently mentioned as areas where

legal action was considered. Most firms did not proceed with litigation because settlement was reached out of court.

Thirty-five firms had been threatened with legal action, primarily for trade marks (16 firms) and patents (13 firms), and largely by other Canadian firms.

EXHIBIT 7.1.1

SURVEY RESPONSE RATE FOR FOR MAJOR COPYRIGHT USERS

	Number of Firms Responding	*Sample Size*	*Response Rate*
CULTURAL/ENTERTAINMENT			
Music/Sound Recording	7	8	86%
Film Production	20	25	80%
Book Publishing	16*	17	94%
Sub Total	43	50	86%
BUSINESS SERVICES			
Advertising	8	9	89%
Consulting Engineers	12	16	75%
Architects	18	25	72%
Sub Total	38	50	76%
Total	81	100	81%

* (18 surveys)

MAJOR COPYRIGHTS USERS

This section presents the findings from the survey with major copyright users in Canada. As reported previously, the focus of the 100 interviews was with business services (such as advertising, consulting engineers, architects) and cultural/entertainment industries (such as motion picture, audio and video production and distribution and printing, publishing and allied industries).

The major findings are highlighted below with the detailed findings following:

- Most major copyright users surveyed are using Canadian IPRs. As anticipated, the IPR used the most by firms in this group is copyrights. Only 23 percent of the firms are dissatisfied with Canadian IPRs.

- There is much variation between sectors on the number of IPRs held abroad. Firms in printing, publishing and allied industries are the most likely to have IPRs abroad (59 percent) and firms in the business services are the least likely (12 percent).

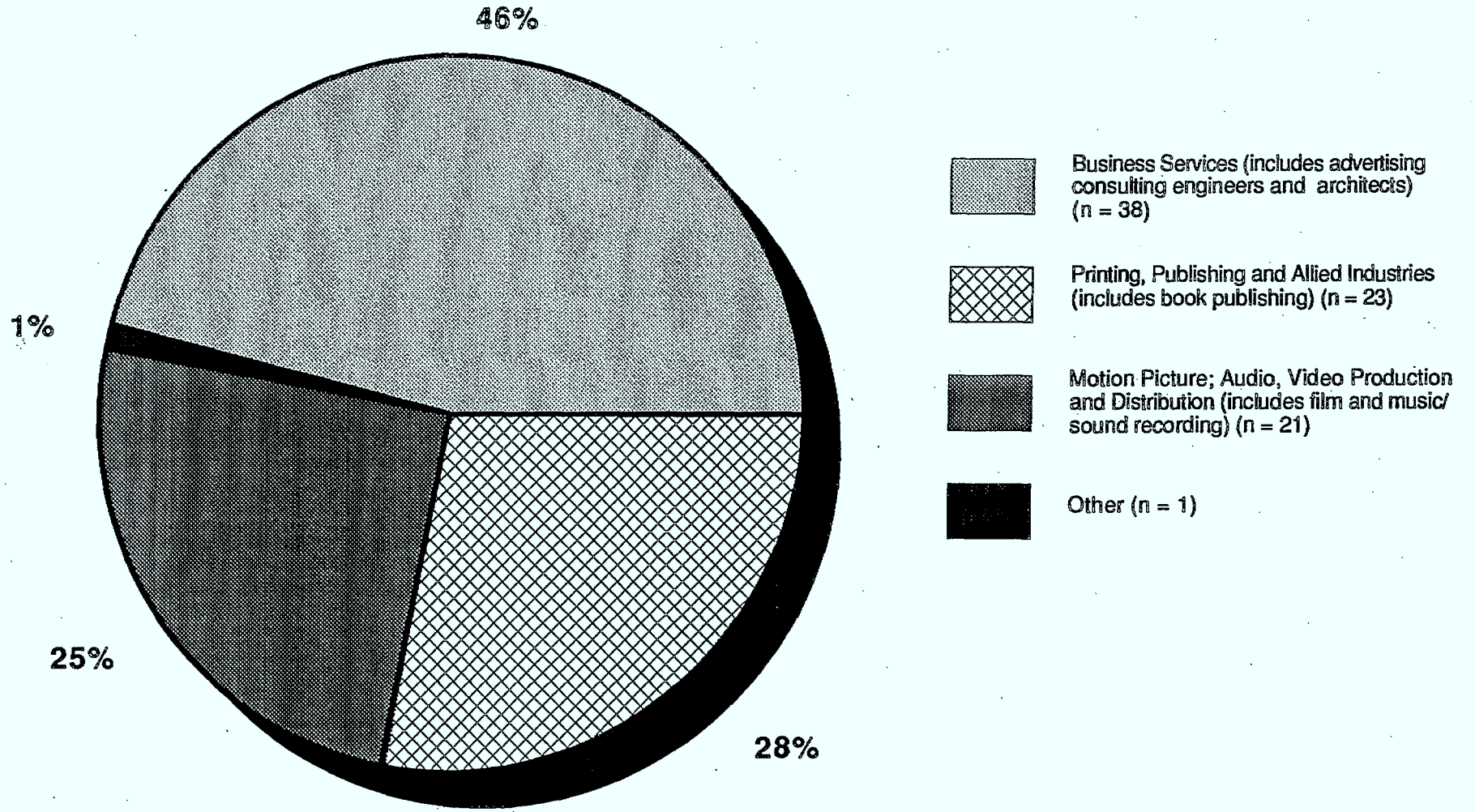
- Thirty-five firms stated that their IPRs had been infringed upon or violated in the past three years. Firms in the cultural/entertainment sector were more inclined to indicate they had been infringed upon than firms in the businesses services sectors.

1. Profile of Responding Firms

Eighty-three of 100 firms contacted completed a questionnaire, for a response rate of 83 percent. The response rate by sector is indicated in Exhibit 7.1.1., on the opposite page.

EXHIBIT 7.1.2

MAJOR COPYRIGHT USERS' RESPONSE RATE BY SECTOR



Firms were asked to restrict their responses to the sector where IPRs are the most significant. The sectors to which firms responded is indicated in Exhibit 7.1.2., on the opposite page. To correspond to SICs, film production and music/sound recording are placed under motion picture: audio, video production and distribution and book publishing are placed under printing, publishing and allied industries.

Over half of the firms surveyed have sales under $1 million. Firms from the motion picture, audio and video sector are more likely to have sales under $1 million (70 percent) than from business services (47 percent) or printing and publishing (46 percent) as indicated in Exhibit 7.1.3.

EXHIBIT 7.1.3

SALES (in Million $s)	1987 SALES OF MAJOR COPYRIGHT USERS BY SECTOR			
	Printing, Publishing and Allied Industries* (n = 23)	Business Services* (n = 38)	Motion Picture, Audio, Video Production and Distribution (n = 21)	TOTAL* (n = 82)
Under $1	46 %	47 %	70 %	53 %
$1 to 5	14 %	40 %	25 %	28 %
$5.1 to 25	23 %	11 %	5 %	12 %
$25.1 to 100	18 %	3 %	-	6 %

* Does Not Add Up Due to Rounding

Missing : 1

Most of the firms have under 50 employees (84 percent). Only six percent of the firms have over 250 employees. (Exhibit 7.1.4. - Appendix E).

There were 29 firms that disclosed their expenditures on R&D. Approximately 70 percent of these firms spent under $100,000 on R&D in 1987. The amount spent by firms ranged from $2,000 to $5 million and averaged $359,000 per firm. The R&D expenditures by firm's sales is indicated in Exhibit 7.1.5.

EXHIBIT 7.1.5

1987 SALES (In Million $s)	AVERAGE R & D EXPENDITURES ($000s)
Under $1	$71
$1.1 to 5.0	$100
$5.1 to 25	$176
$25.1 to 100	$2,013

Most firms believe that Canadian intellectual property laws either have no effect or encourage the amount of R&D they conduct in Canada. Only 6 percent of the firms feel that Canadian IPRs discourage their Canadian R&D. A greater percentage of firms from printing and publishing feel that Canadian IPRs encourage R&D in Canada (53 percent compared to 30 percent for motion picture, audio and video and 7 percent for business services).

Over half of the firms export their products and services. Firms from the cultural/entertainment group are much more inclined to export than firms in the business services category (76 percent compared to 23 percent). Approximately 70 percent of exporting firms stated that exports account for under 25 percent of their total worldwide sales in 1987. As expected, the United States was identified as the firms' most important market.

Most firms (96 percent) are over fifty percent Canadian-owned. The remaining firms' parent companies are located in the United States.

Almost thirty percent of the firms do not feel they have sufficient expertise on the IPRs which are available, either through internal or external resources. Firms from the business services group are most inclined to feel that they have insufficient expertise.

2. Use of Canadian Intellectual Property Rights

Most firms responding are using Canadian intellectual property laws. Seventy-six percent of the firms indicated they are using at least one type of IPR to protect their innovation/creation. As expected, the largest number of firms use copyrights for protection (61 firms). As indicated in Exhibit 7.2.1., most of the firms in the cultural/entertainment sectors use copyrights, compared to just over fifty percent of the firms in the business services sectors.

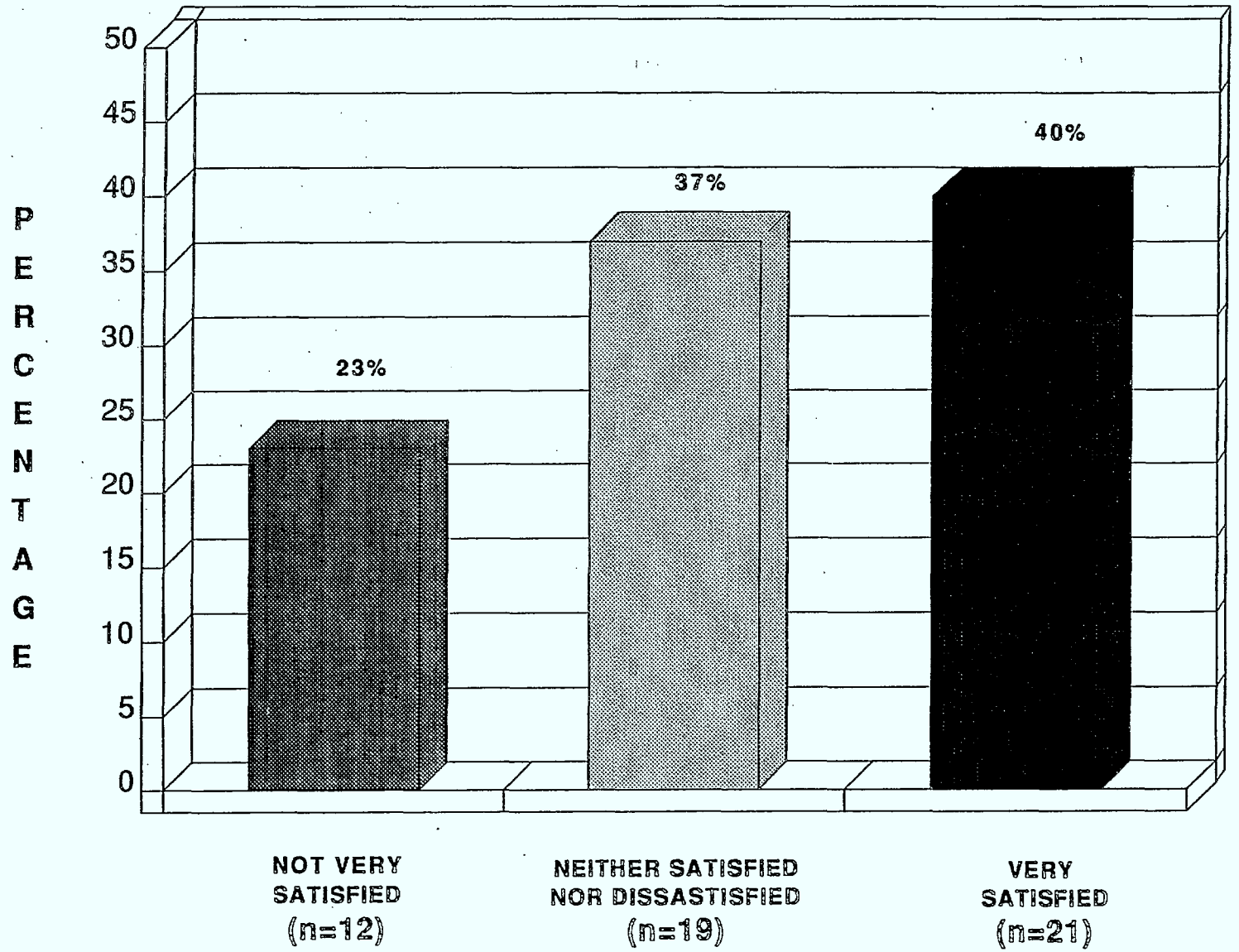
EXHIBIT 7.2.1

RESPONSE	INTELLECTUAL PROPERTY RIGHTS USED BY SECTORS OF THE MAJOR COPYRIGHT USERS			
	Printing, Publishing and Allied Industries (n = 23)	Business Services (n = 38)	Motion Picture, Audio, Video Production and Distribution (n = 21)	TOTAL (n = 82)
Yes	100 %	55 %	81 %	74 %
No	-	45 %	19 %	26 %

Missing : 1

EXHIBIT 7.3.1

MAJOR COPYRIGHT USERS' SATISFACTION WITH THE PROTECTION GIVEN BY CANADIAN INTELLECTUAL PROPERTY RIGHTS



Based on the 53 firms able/willing to provide numbers, of the 1,450 IPRs registered or obtained over the past three years, 1,400 are copyrights. Of the firms able to provide information on the cost of registering/obtaining their IPRs, considering government, legal and administrative costs, the average cost per firm for registering a copyright was approximately $1,300 per firm.

One-third of the firms with copyrights (16 firms) allowed other firms to obtain a license. Over the past three years, 137 copyright licenses were granted in Canada and 97 abroad. Licensing firms who responded have earned $16 million over the last three years. Approximately two-thirds of these revenues were earned in Canada.

Over a third of the firms (35 percent) indicated that they use IPRs to acquire information. There is no relationship between the sector and whether IPRs are used to acquire information. Of the firms that do use IPRs to acquire information, eleven stated that they discuss information with other firms (42 percent), and examine copyrighted materials (41 percent) "quite a bit". Firms in the business services sectors are more likely than other firms to discuss information with other firms. Six firms also mentioned that they examine literature and magazines. Both Canadian and foreign sources tend to be used by firms.

3. Satisfaction with Canadian Intellectual Property Rights

Exhibit 7.3.1., on the opposite page, indicates firms' satisfaction with the protection given by Canadian intellectual property laws. Twenty-three percent indicated that they are dissatisfied. By sector, the printing, publishing and allied products industry is the most dissatisfied while the motion picture, audio, video production and distribution section is the least dissatisfied.

Firms that are satisfied with Canadian IPRs were asked to rate their satisfaction in various areas. As indicated in Exhibit 7.3.2., firms are the most satisfied with the terms of the protection. There is no significant relationship between sector and firms' level of satisfaction.

EXHIBIT 7.3.2

THE MAJOR COPYRIGHT USERS' SATISFACTION WITH CANADIAN INTELLECTUAL PROPERTY RIGHTS	Not Very Satisfied	Somewhat Satisfied	Very Satisfied
Term of Protection Given (n=18)	-	17 %	83 %
Subject Matter (n=18)	6 %	44 %	50 %
Manner of Enforcement (n=15)	20 %	47 %	33 %
Remedies/Penalties (n=12)	25 %	50 %	25 %

Firms were asked to indicate why they are dissatisfied with Canadian IPRs. Exhibit 7.3.3., summarizes firms' responses, and illustrates that the major responses are related to concerns about insufficient/incomplete protection offered by some IPRs and insufficient enforcement. Copyright was the IPR mentioned the most often (approximately 80 percent).

EXHIBIT 7.3.3

REASONS MAJOR COPYRIGHT USERS ARE DISSATISFIED WITH CANADIAN INTELLECTUAL PROPERTY RIGHTS	NUMBER OF TIMES MENTIONS* (n = 24)
Insufficient/Incomplete Protection	38 %
Enforcement Is Not Sufficient	29 %
Courts/Lawyers Are Expensive/Costly	17 %
Information Required Too Detailed	4 %
Protection Is Too Long/Expensive/ Tedious to Get	4 %
Other	8 %

* Firms were able to list three IPRs they were dissatisfied with and three reasons related to each IPR. The above are the total reasons listed.

Fourteen firms (17 percent) indicated that there are IPRs that they would like to use to protect their innovations/creations. Of these firms, 7 mentioned copyrights and 5 referred to all IPRs. The reasons given for not using the desired IPRs are listed in Exhibit 7.3.4. (Appendix E). The most frequently mentioned reason (38 percent of total mentions) is that the intellectual property protection available is insufficient or incomplete. There is no significant relationship between the sectors and the reason for dissatisfaction.

There is an equal split between firms that believe measures are needed to facilitate freer movement of products protected by IPRs in international trade and those that do not (36 percent answered in the affirmative, 40 percent in the negative and 24 percent do not know). Approximately half of

the firms feel that adopting measures to facilitate freer movement of products would have no impact on their sales/revenue, while 18 percent feel they would have a negative or extremely negative impact.

4. Use of and Satisfaction with Licensing Agreements

Approximately one-third of the firms (25) indicated that they had obtained a license from another firm over the last three years. Firms in the printing and publishing sector (65 percent) were more likely to have obtained a licensing agreement than firms in the motion picture, audio and video sector (29 percent), and the businesses services sector (8 percent).

Exhibit 7.4.1. (Appendix E) indicates the number of licensing agreements firms entered into over the last three years, according to those firms able to provide data. The largest number of licensing agreements were for copyrighted materials (490 of the 502 negotiated). The agreements were split approximately 50/50 between Canadian products/services and foreign products/services.

Royalty payments for licensing agreements, according to the 20 firms that reported, totalled $36 million over the last three years. For those firms that could break down their expenditures almost all of the payments were made in Canada.

Most firms are satisfied with their licensing agreements. A large number of the firms (76 percent) stated they are satisfied with the conditions of the licensing agreements. Only one firm stated it is not satisfied. Moreover, 2 out of 23 firms (8 percent) indicated that their licensing agreements have imposed excessive restrictions or created difficulties. Both firms feel that the restrictions had greatly affected their profitability.

5. Problems with Counterfeiting/Displacement in Canada

Thirty-five percent of the firms stated that their IPRs had been infringed upon or violated in the past three years. Firms in the cultural/entertainment sectors were more inclined to indicate their IPRs had been infringed (41 percent), than firms in the business services sectors (26 percent).

Firms indicating that their IPRs had been infringed upon were asked to rate the seriousness of the infringement/violation for the particular IPRs they used. Of the 15 firms responding from the Major Copyright Users group, two-thirds felt the infringement was between somewhat and extremely serious. There was no relationship between sector and firms' ratings on the seriousness of the infringement.

Two-thirds of the firms that indicated their IPRs had been infringed believe their Canadian sales have decreased as a result. The firms in the cultural/entertainment sectors (76 percent) were more likely to feel the infringement had affected their sales than firms in the business services sector (43 percent). Only four firms feel that counterfeiting or other infringements has depressed the domestic price for their product.

Eleven firms indicated that they had together lost approximately $5 million in income/revenue domestically in 1987 due to counterfeiting and other infringements.

6. Effects of Foreign Intellectual Property Rights on Canadian Firms' External Interests

Only 34 percent of the firms surveyed hold IPRs abroad. As indicated in Exhibit 7.6.1. firms in printing, publishing and allied industries are more likely to have IPRs abroad (59 percent) than firms in motion picture, audio

and video industries (29 percent) and those in the business services sector (12 percent).

EXHIBIT 7.6.1

RESPONSE	NUMBER OF INTELLECTUAL PROPERTY RIGHTS REGISTERED ABROAD OVER THE LAST THREE YEARS BY MAJOR COPYRIGHT USERS			
	Motion Picture, Audio, Video Production and Distribution	Printing, Publishing and Allied Industries	Business Services	TOTAL
Yes	27 %	59 %	12 %	34 %
No	63 %	45 %	89 %	66 %

Missing : 16

Of the firms able to provide the data, there were in total 821 copyrights, patents, industrial designs and trade marks registered/obtained over the last three years. The majority (94 percent) involved copyrights. The cost for registering a copyright, considering government, legal and administrative charges, averaged approximately $1,900 per firm.

Of the firms exporting, most (83 percent) stated they have not encountered problems or disincentives related to intellectual property protection abroad. Of the firms that did encounter difficulties, all indicated that their foreign markets had been lost or foreign sales affected.

Four firms indicated their problems with copyrights and specified the country where the problem was encountered. Two firms were infringed in Asia. This is indicated in Exhibit 7.6.2. (Appendix E).

7. Use of and Problems Concerning the Importation of IPRs

Approximately 9 to 22 percent of the firms indicated that their imports embody IPRs. Of these firms, only one firm indicated its imports have been hindered or prevented. This firm stated that it has experienced difficulties with export restrictions in Japanese and Canadian customs.

8. Involvement with Litigation Concerning IPRs

Most firms (84 percent) had not been involved in a court case involving IPRs. However, a third of these firms (18 firms) had considered launching legal action or had been threatened with legal action in the last ten years.

Firms from the printing and publishing sector were more likely to have been involved in a court case than firms from the other sectors (30 percent compared to a total of 14 percent for all sectors). Of the firms previously involved in a court case, the majority had their most recent case involving copyrights. Seven of the cases were in Canada and two in the United States. Seven of the cases were civil matters - six dealing with infringement suits and one with a contractual matter. One of the cases involved a criminal proceeding.

Five of the nine firms were dissatisfied with the court case. The major reason for firms' dissatisfaction was the high cost of the litigation (57 percent). The firms' expenses ranged from $8,000 to $120,000 for a total cost of $248,000 for the nine firms. Other reasons identified are listed in Exhibit 7.8.1.

EXHIBIT 7.8.1

REASONS MAJOR COPYRIGHT USERS ARE DISSATISFIED WITH LITIGATION	PERCENTAGE OF RESPONDING FIRMS
High Cost	57 %
Time Involved	43 %
Complex or Onerous Requirements to Bring Evidence Before the Court	29 %
Outcome/Result of the Litigation	29 %
Ability to Enforce the Ruling	14 %

Of the firms that had considered legal action over the last ten years, the majority involved copyrights, primarily in Canada. The major reasons why action was not taken were because the matter was settled out of court and the cost of litigation was high.

Five firms had been threatened with legal action concerning copyrights, primarily by other Canadian firms.

SUMMARY OF KEY FINDINGS

The purpose of this study is to identify the impact of intellectual property on the economic and trade performance of specific Canadian industries and on the investment and other business decisions of Canadian companies. The findings, based on the specific objective of the study, are summarized below.

Construct a Profile of How Canadian Industry Uses Intellectual Property Rights in its Activities

- IPRs are widely used by many firms in Canada to protect their innovations/creations.

- Within the four groups examined, namely Top R&D Performers, High Technology, Medium and Low Technology and Major Copyright Users, there is tremendous variation in the level of use and type of IPR used to protect innovations/creations. Firms in the Top R&D Performer group are the largest users of IPRs, with 97 percent using at least one type of IPR in the last three years. The lowest use appears in the Medium and Low Technology group of firms. Twenty-nine percent of Medium and Low Technology firms have not used any IPRs to protect their innovations/creations during the last three years.

- There is also significant variation among sectors on the extent and type of IPR used. As would be expected, copyrights are predominantly used by firms in software development and the Major Copyright Users group. The highest percentage of firms used trade marks. In the Top R&D Performers and High Technology firms, most firms used trade marks, particularly the semi-refined materials sector and the electrical and electronic products industries. In the medium and low technology group, the food and beverage industries were the most likely to use trade marks. Trade secrets and patents followed trade marks as the IPRs used the most by firms in the Top R&D and in the high technology group. In the Top R&D group, all firms telecommunications and in the aircraft and aircraft parts industry used patents. Biotechnology firms were more likely to use trade secrets and firms involved in power generation were more likely to use patents.

- IPRs are also used by firms, in varying degrees, to acquire information. Not surprisingly given the size and nature of their work, the highest number of firms using IPRs to acquire information are in the Top R&D Performers group. All groups use informal discussions with other firms the most often to acquire information.

Gather Information on Industry Experience With and Attitudes Towards Intellectual Property Protection

- A significant number of firms believe they have insufficient knowledge or expertise with respect to IPRs. Twenty to thirty-five percent of the firms in the High Technology, Medium and Low Technology and Major Copyright Users indicated that their expertise (considering both internal and external resources) is insufficient. Only the firms in the Top R&D group generally feel that have sufficient expertise. Lack of IP expertise was particularly a concern of smaller firms.

- Many firms asked for information on the appropriateness of various IPRs for their business. A few firms, especially those small- and medium-sized businesses, suggested that literature should be more readily available.

Determine the Adequacy of Canada's Current Intellectual Property System and Identify Possible Gaps in the Range and Type of Intellectual Property Protection Provided to Canadian Industry. Gather Details on the Problems Encountered by High, Medium and Low Technology Firms

- Firms' satisfaction with intellectual property rights, both domestically and abroad, was generally positive. Between 72 and 85 percent of the firms in the four groups stated that they are satisfied with the protection given by Canadian intellectual property laws.

- Firms tend to be most satisfied with the term of protection and the subject matter and the least

satisfied with the manner of enforcement and the remedies/penalties.

- The group most dissatisfied with Canadian IPRs is High Technology. Sectors particularly dissatisfied within this group are software developers and biotechnology firms.

- Several firms in the biotechnology sector indicated that information retained was being registered in other countries and licensed in Canada to ensure protection or was not being used in Canada for fear of infringement/counterfeiting.

- Dissatisfaction expressed by firms in software must be viewed in light of recent changes to the Copyright Act. Firms will have different levels of awareness with respect to the impact of the new Act. Comments may reflect three different perspectives: those commenting on the Copyright Act before it was revised to improve protection for software; those commenting on the new Act but without fully appreciating its impact; and those firms dissatisfied with the new Act.

Domestic Intellectual Property Laws, Practices or Procedures Which Create Difficulties For Canadian Firms

- Firms from all sectors indicated difficulty with the registry of IPRs. Common difficulties mentioned are the cost and time associated with registering/obtaining an intellectual property right. A few firms also expressed concern over the lack of thoroughness and accuracy of the registration office in accepting applications.

- Several firms also expressed an unwillingness to register an IPR because of the detailed information required. It was stated that such information could help their competitors by diffusing the firms' technology.

- Many firms, especially smaller ones, indicated that, because of the cost and time involved, they do not find

the court system a useful vehicle for stopping or rectifying infringements/violations. The courts are seen as a vehicle to be used by the larger, stronger firms that have the resources to win their case.

Identify Where the IPR System Has Encouraged or Discouraged Canadian Firms From Carrying Out Research or Developing New Technologies

- Most firms feel that Canadian IPRs have a neutral or positive impact on the level of R&D conducted in Canada.
- Firms in the biotechnology sector are more inclined to indicate that the lack of plants breeders' rights has affected the amount of R&D they conduct.

Identify Where Canadian Firms Have Encountered Problems or Disincentives in Domestic Sales Because of Laws or Practices Related to Intellectual Property Protection in Canada and Other Countries

- Many difficulties with counterfeiting/displacement were reported. Between 31 percent and 40 percent of the firms in the four groups believe their IPRs have been infringed upon or violated in the last three years in Canada. Some respondents reported those problems were caused by insufficient/incomplete protection, especially in areas such as software and biotechnology. However, to a large degree, firms attribute the infringements to poor enforcement and a lack of remedies/penalties.
- Two hundred firms indicated they had been infringed upon; however, only 54 were able to indicate the revenue/income lost domestically in 1987. Of the 54 firms able to estimate losses, the total amount reported was $104 million. In the High Technology category, 30 firms estimated total losses of $10 million in 1987. When extrapolated to the total population this represents losses of between $45 and $70 million for all High Technology firms in Canada.

- Of the 31 firms that stated the licensing agreements they had signed imposed excessive restrictions or created difficulties, 58 percent indicated that the restrictions had affected the profitability of their firm somewhat or a great deal.

Identify Where Canadian Firms Have Encountered Problems or Disincentives in the Export of Goods and Services Because of Laws or Practices Related to Intellectual Property Protection

- Between 8 and 21 percent of the firms in the four groups have encountered problems or disincentives in the export of goods or services.
- The losses, estimated by sixteen firms able to provide data, totalled $27 million in 1987. Four firms in the Top R&D Performers reported losses of $14 million and 10 firms in the High Technology group indicated losses of $12 million.
- The small number of firms that feel foreign IPRs are serious impediments to conducting business abroad may be explained by the fact that such a large percentage of Canadian exports go to the United States, which has generally adequate IP laws.

Identify Where Canadian Firms Have Encountered Difficulties in Gaining Access to Foreign Technologies

- Few firms identified problems in gaining access to foreign technologies. One reason reported for difficulty in acquiring IPRs was due to the question of re-exports, especially to communist countries.

Evolution of IPRs in Relation to New Technologies and the Trading Environment

- Several firms indicated that IP statutes have not kept pace with new technologies. Many interviewees pointed out the length of time required recently to overhaul some of the Canadian legislation. Several others referred to the insufficient protection for software and lack of Canadian protection for biotechnology.

- A number of interviewees feel there should be more emphasis on international standards and international registries in order to ensure better protection and less burden on firms' resources.

- The findings indicate that many firms have licensing agreements from other firms. This is not surprising since Canada is a net importer of this technology. Surprisingly, substantial revenue is obtained from many Top R&D and High Technology firms for licenses. With the implementation of free trade with the United States, the number of licensing agreement, between Canada and U.S. companies will likely increase.

In conclusion, this study examined Canadian firms' use and satisfaction with Canadian IPRs. While firms reported they are generally satisfied, several problem areas were identified. Primarily, these are the lack of Canadian protection for plant breeders' rights; the large number of infringements/violations in Canada; and the lack of suitable penalties or remedies for firms, difficulties encountered in registering IPRs and problems acquiring information on Canadian IPRs.