INFLATION, INVESTMENT AND INNOVATION

by Gordon R. Sharwood

(A report prepared for the Industry Branch of the Ministry of State for Science and Technology)

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G.R. Sharwood

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PREFACE

This report, commissioned by the Ministry of State for Science and Technology, is an update on "Investment for Innovation" done by this author for the Ministry of State for Science and Technology in 1976/77.

That report indicated that the investment climate for innovation in Canada was not healthy and that measures could be taken which might contribute to changing the climate. Many of the recommendations that were made in that report were implemented shortly thereafter, in one form or another. In addition, since that time, the investment climate has changed. At the time of the last report, Canada was emerging from a recession and the general corporate atmosphere was pessimistic. While wage and price controls were over, inflation had re-emerged as a major problem and was causing great difficulties in managing corporate cash flow. At the present time, we are again emerging from a recession, but there are some differences. Inflation is well embedded

into the economy and corporations are learning to operate in an environment of continuous inflation. In addition, while projections over the medium term for the Gross National Product show a rather moderate rate of growth, certain sectors of the economy are showing rapid growth, particularly of course, in the oil and gas sector, and also to some extent in the electronics area.

Therefore it appeared to be appropriate to review the current situation with regard to research and development, to ascertain whether the measures which have been put in place are sufficient to overcome the barriers which were reviewed in the earlier report, to see if any new barriers have emerged in the process of investing for innovation, and finally, to make recommendations to the government for further stimulating research and development and investment for innovation in the private sector.

CHAPTER I - The Current Situation

This report does not intend to further review the proposition that innovation is the key to a dynamic economy. The evidence is well set out in a MOSST research paper issued in July 1978, entitled, "Industrial Research and Development in Canada". That report indicates that annual rates of growth in employment, real output and productivity are higher

in the most research-intensive industries than in industries which are less research-intensive. In addition, the price performance of the research-intensive industries was superior to all others. The evidence can be clearly summarized by the table below extracted from that report.

TABLE 1

AVERAGE ANNUAL RATES OF GROWTH
1961 - 1974
PER CENT

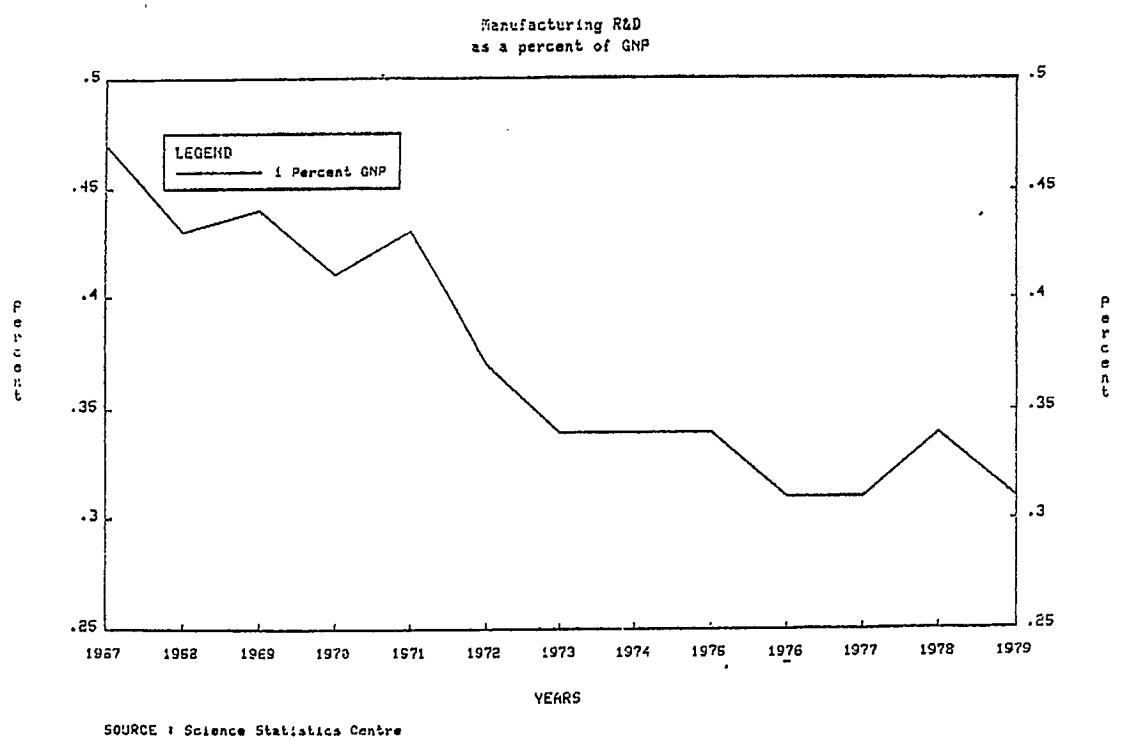
	Employment	Real[1] Output	Productivity[2]	Prices[3]
Research-Intensive Industries	2.42	6.41	4.49	1.39
Medium-Research-Intensive Industries	2.75	6.60	3.95	1.64
Low-Research-Intensive Industries	1.61	5.19	3.47	3.13
No Research Industries	0.73	3.85	3.14	3.25
Total Manufacturing	1.87	5.79	3.82	2.37

[1] 1971 Dollars
[2] Real Output Per Person
[3] Value-added implicit price index

Source: MOSST studies based on data from Statistics Canada

This evidence is supported by work done elsewhere in the world along the same lines.

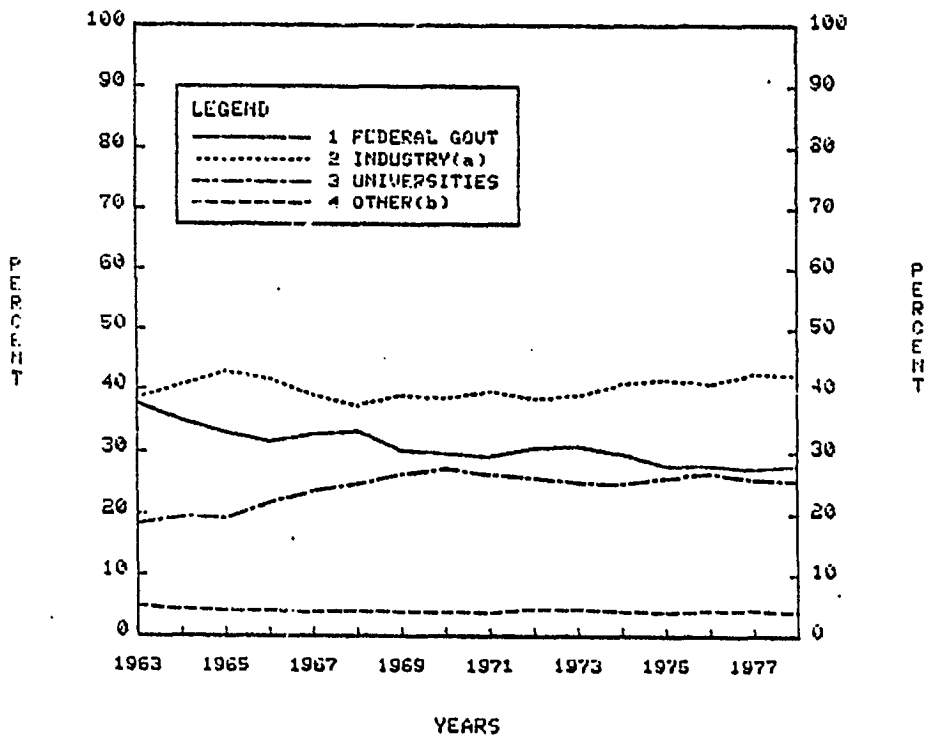
It becomes important, therefore, to ascertain the status of R&D in Canada. The following chart shows gross expenditure in manufacturing R&D as a percentage of GNP.



SOURCE : Science Statistics Centre

The three major sectors which comprise GERD (Gross Expenditure on R&D) have been declining and the industry sector has not declined as much as governments and universities.

GROSS EXPENDITURE ON R&D (GERD)
(PERCENTAGE DISTRIBUTION)



SOURCE : BASED ON DATA FROM SCIENCE STATISTICS CENTRE, JANUARY 1979

a . PRIVATE AND PUBLIC ENTERPRISES
b . INCLUDES PROVINCES, PROVINCIAL RESEARCH ORGANIZATIONS, AND PRIVATE NON-PROFIT ORGANIZATIONS

The federal government has set as its objective that GERD rise to 1½% of GNP. In fact, this is a low percentage compared to other countries. The following table shows a sampling of other countries.

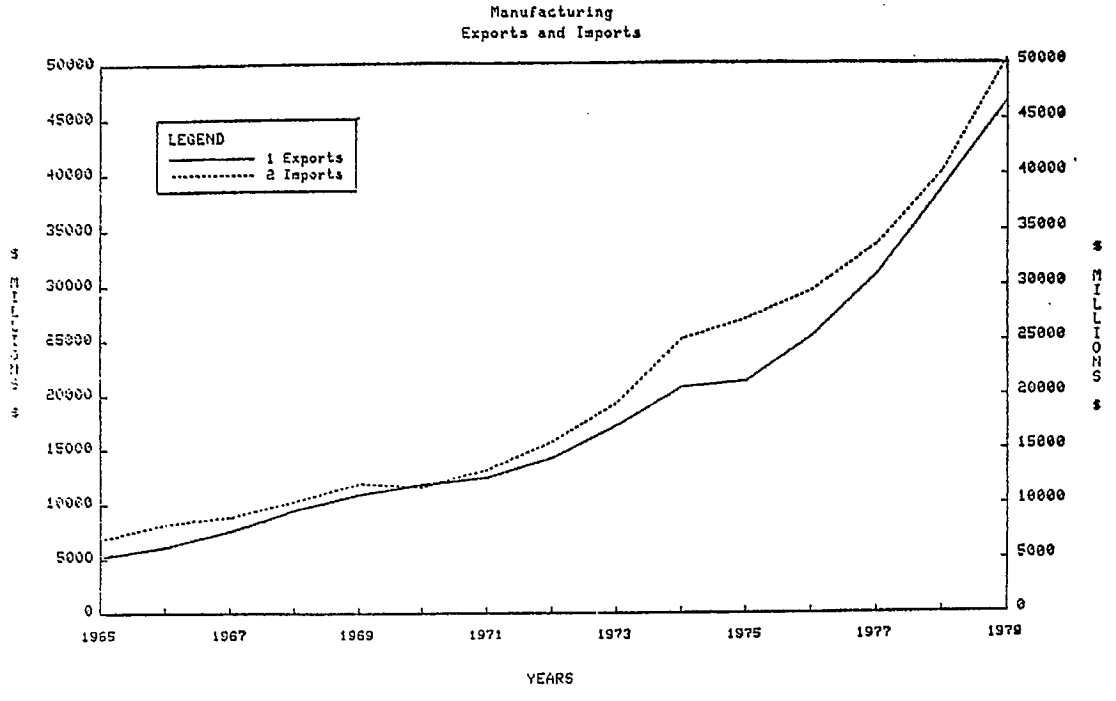
United States	2.4%
Germany	2.1%
Netherlands	2.0%
France	1.8%

The lower level of R&D to GNP in Canada is largely attributable to the R&D performance of the business sector. The ratio of industrial R&D to GNP in Canada is about .4%, while in almost all other OECD countries it is at least 1%. Moreover, R&D expenditures in manufacturing represent less than 1.5% of value added which again contrasts sharply with other OECD countries where it is typically between 2 and 5 percent. In 1979, industrial R&D amounted to $1 billion. In order to achieve the objective set out by the government, industrial R&D should have amounted to about $2 billion.

The basic questions raised in this paper are: "Why is the industrial sector not doing better?" and "What measures could be taken to improve the performance and to stimulate the private sector to improve its relative performance?"

Before turning to a more detailed analysis of the problem, it is appropriate to review the export performance of Canada. Fundamentally, Canada remains a raw material supplier to the world economy and, in spite of much discussion of import replacement, the impact of world demand

for energy has kept our balance of payments energy-oriented. As one looks out ahead, one can see mineral shortages and food shortages looming as problems of the 80's, which suggests that our surpluses will also be drawn upon by other countries. Below is shown a chart of the balance of payments in manufactured exports. It continues to show an unfavorable trend, in spite of a devalued dollar.



SOURCE Economic Review - April 1980. Dept. of Finance. Reference table S4.

The development of a strategy in this respect has important implications for the Canadian economy. Appendix 1

shows a table drawn from a study done by the University of Toronto for the Department of Transport. It will be seen that, though the GNP growth is roughly similar to the year 2000, the structure of the Canadian economy is entirely different when it is resource-based than when it is manufacturing-based.

It is likely that, in our Canadian way, we will follow somewhere down the middle of the two opposing scenarios described in the Appendix. Therefore it is appropriate to focus on the R&D performance of our manufacturing as a proxy for total R&D. In the following analysis and prescription, we have placed our primary emphasis on manufacturing R&D. In doing this, we do not wish to downgrade the importance of R&D in the service sector. Increasingly, contributions to GNP and exports come from, say, consulting or computer software. We have limited ourselves, in the interest of brevity, to the manufacturing sector. We are aware that R&D-oriented exports take place in the service industries, but they are much affected by the manufacturing sector and follow similar lines. The chart above suggests continued deficits in our manufactured goods balance of payments unless major thrusts are taken in innovative investments to improve our competitive manufactured exports.

One of the major objectives of Canadian manufacturers in recent years has been to make investments in the U.S. This will eventually help the Canadian dividend account, but for the time being worsens the picture shown above.

Some analyses, notably those carried on by the advocates of the "conserver society", suggest that there is a limit to the amount that Canada can live on the export of its resource industries. Accordingly, it is important to place as much emphasis on exports of the mind as on those of the mine and well.

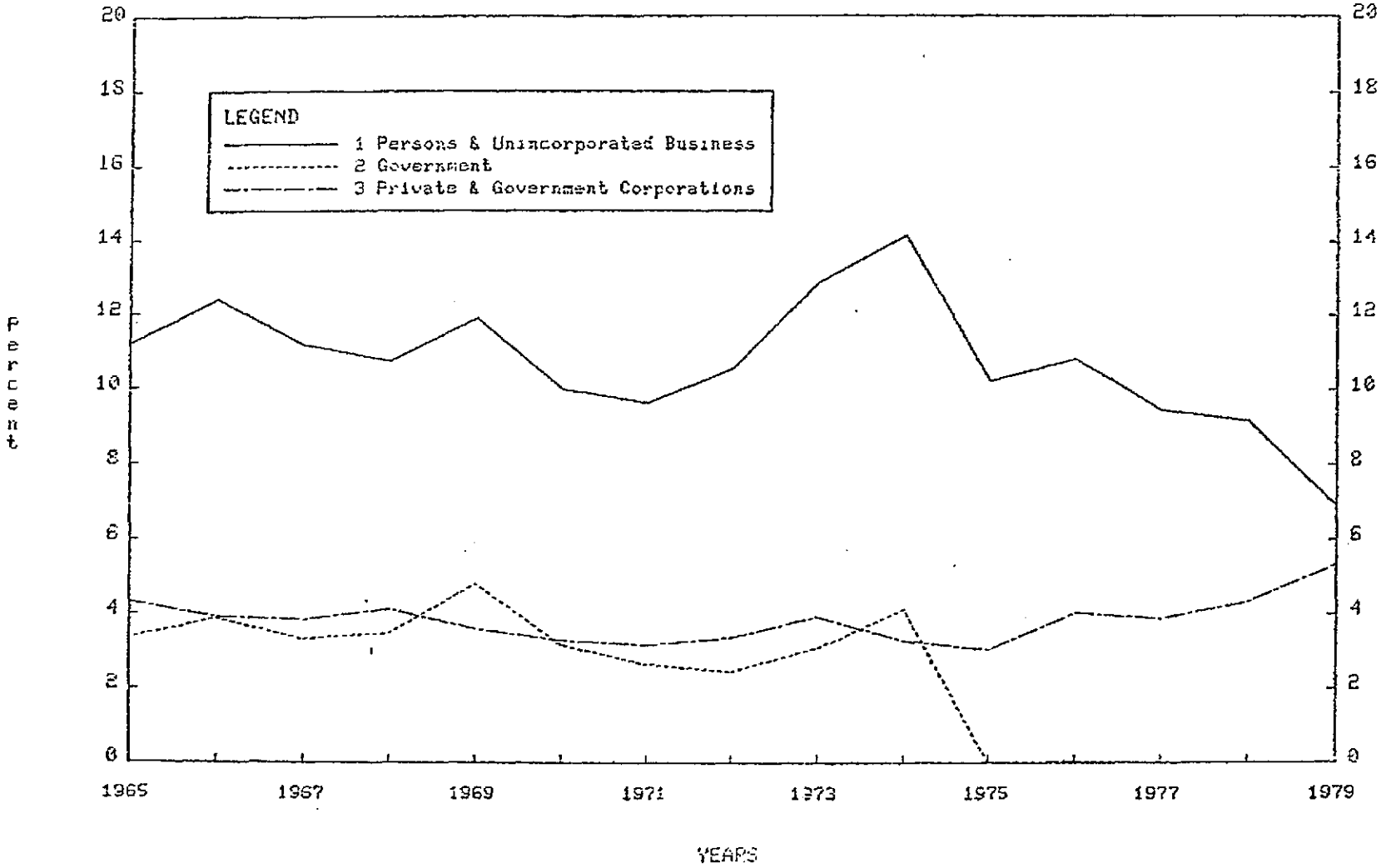
CHAPTER II - The Financial Health of the Corporate Sector

In "Investment for Innovation", the basic thesis was that, at the time of the report, the manufacturing sector was starved for cash and because inflation and taxes were placing such a squeeze on cash flow, manufacturing companies did not have any funds available for R&D. Accordingly, the measures recommended in that report were less directed to specifically stimulating the R&D process itself than to increasing cash flow. It is appropriate, therefore, in this chapter, to review what has happened since 1975 in the corporate sector.

Supply of Funds

In the middle 70's there were some questions that were appropriately raised about the supply of funds. We will not review that evidence here. Savings of Canadians remain high relative to the world. As a practical matter, funds available from pension funds and life insurance companies are expected to rise, in the immediate future at least, more rapidly than demand. New capital formation continues to rise and net new issues of Canadian stocks also continue to rise. Money is generally considered to be readily available, particularly for new oil and gas ventures, but also for new technology and there have been a number of new technology issues of capital stock for the first time for many years. Venture capital is in better supply than it has been. We will return to this subject in detail later, but in general, it can be said, in contrast to five years ago, that any shortages of money available for R&D are not purely related to supply of funds external to corporations. This is clearly seen by the chart on the next page which indicates a declining portion of net savings in the Personal sector and a rising share in the Corporate sector.

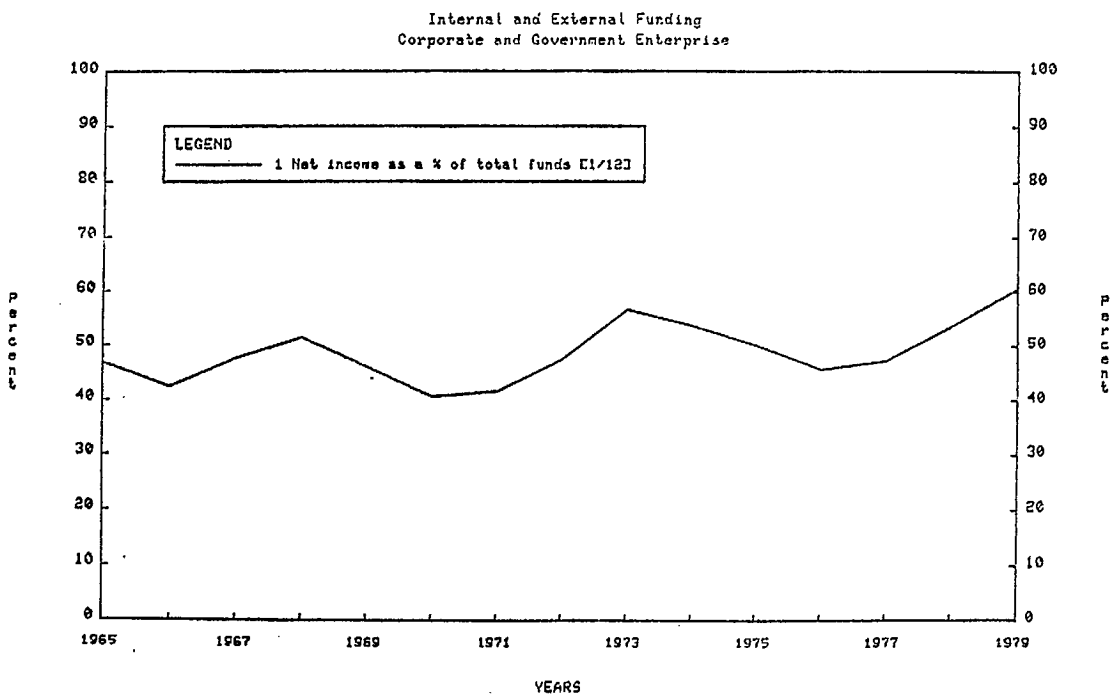
Trends in Savings
Canada 1965 - 1979



SOURCE : National Income and Expenditure Accounts. Statistics Canada Cat. 13-531

Internal Funds

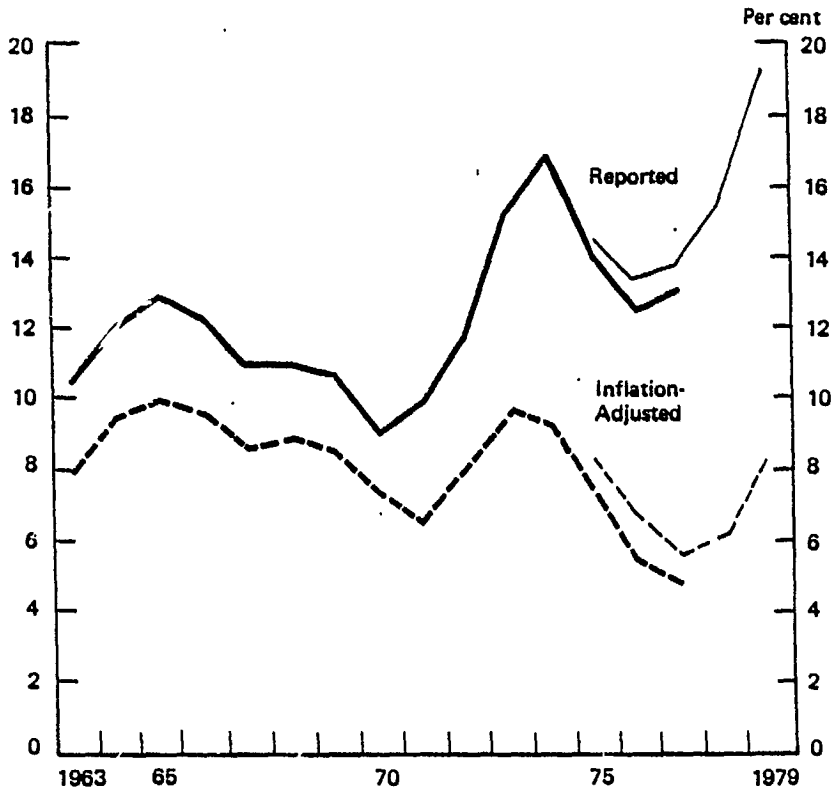
The chart below shows external and internal fund flows in the corporate sector.



SOURCE : National Income and Expenditure Accounts: Industrial Corporations Quarterly 1965 - 1979

It illustrates the general proposition that the supply of internal funds is considerably improved since four years ago. Accelerated depreciation and inventory tax credits have done their part, but the main reason is greater concentration on increasing rates of return by private corporations. The following chart, taken from a study done by the Department of Finance, shows rate of return trends from 1963 to 1979.

After-Tax Rates of Return on Equity,
Private Non-Financial Corporate Sector, All Industries, Canada, 1963-1979(1, 2)



(1) 1979 data are seasonally-adjusted data referring to the first three quarters only.
(2) After adjustments to remove foreign assets and related income, eliminate double-counting of intercorporate shareholdings, and count deferred tax liabilities as equity.

Source: Statistics Canada, *Industrial Corporations: Financial Statistics*, Cat. 61-003; and Long Range and Structural Analysis Division, Department of Finance

During the post-war period, when inflation rates were low, rates of return on equity in the corporate sector were in the 10-12 percent range. This was generally considered to be an appropriate rate of return. During the middle 70's, it became quite apparent that inflation was here to stay and accordingly "hurdle rates" were substantially raised. (The "hurdle rate" is the internal rate of return set by a corporation which has to be exceeded for a major capital investment to be approved.) As a generalization, it is probably true that manufacturing companies are still looking at between 10 and 12 percent rate of return as a target, but they are now looking at real rates of return on equity rather than at nominal rates of return, i.e., 10-12 percent plus the inflation rate. With the present inflation rate running at about 10 percent, it will be seen that a 20-22 percent hurdle rate is appropriate. It would appear from the chart shown that corporate profit objectives will continue to move upwards until they reach that level. To be sure, the chart by the Department of Finance shows inflation adjusted real rates of return declining, on a long term basis, but in fact, they would have declined more rapidly had not the corporate sector altered its sights, and my view is that the trend will be reversed.

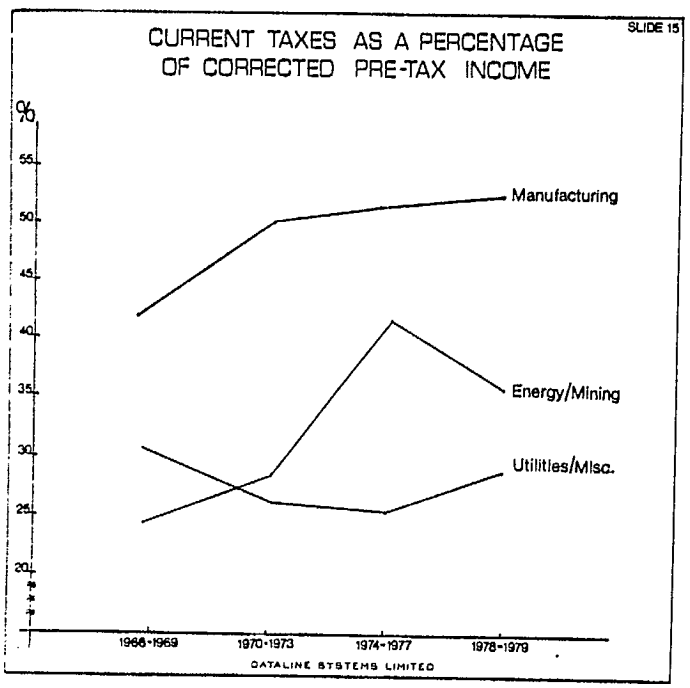
Overall, corporate cash flows appear to be healthy even in the manufacturing sector. However, there are two specific

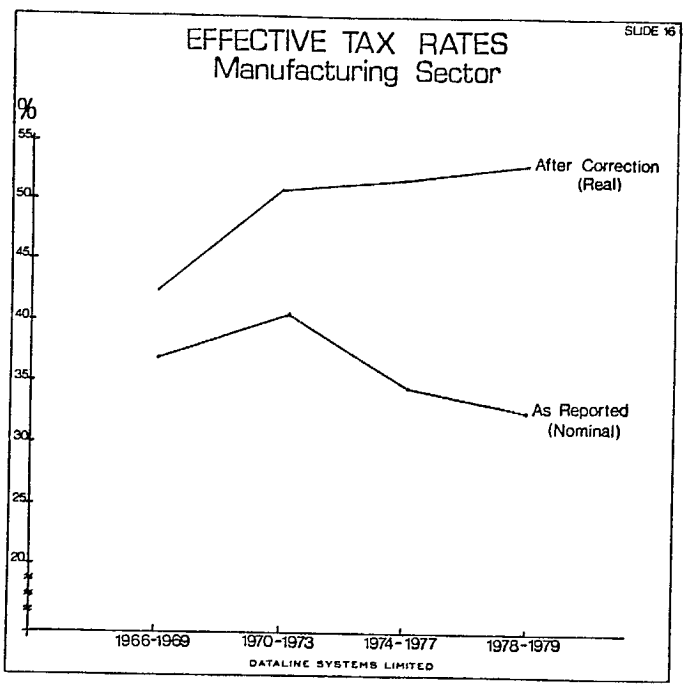
caveats to this general proposition. First of all, the manufacturing industry remains discriminated against by tax policies relative to other sectors. One of the reasons why there are so many very large firms in Canada in the real estate area, such as Cadillac Fairview and Olympia and York, is that they paid no income taxes during their growing period. The same thing can be said of the large Canadian-owned oil companies that are now beginning to emerge on the scene out west, such as Nova, Dome, Nu-West, Chieftain, and so forth. In spite of the measures introduced during the past five years, such as accelerated depreciation and the 3% inventory allowance, "the bias of the tax system against firms in the manufacturing sector has existed throughout the decade"*. The table below and the two charts illustrate this fact.

CASH FLOW EFFECT OF INCREASES IN REAL EFFECTIVE TAX RATES SINCE 1966-69

Companies with total assets over $10 million	Estimated effect on 1978-79 Tax Revenues ($ million)	Percentage Increase
Energy/Mining sector	592	44.92
Manufacturing sector	568	26.60
Utilities/Misc sector	-39	-6.48
All non-financial companies	1,121	27.65
Companies with assets less than $10 million	502	28.23
TOTAL	**1,623**	**27,83**

Source: Dataline Systems Limited for *Hartle presentation to Ontario Economic Council December 19, 1980.





Overall it would appear that the Ministry should continue to direct the attention of the Department of Finance towards increasing the manufacturing sector's cash flows generally. The area which appears to have the most rewarding affect on cash flow and which now seems to be the most unjust is the fact that the cost of replacing inventory creates an enormous strain on cash flow. Thus an increase of the three percent inventory tax credit to a higher level in the light of subsequent inflation appears to be a good idea if the Department of Finance will not accept Lifo accounting. The major negative in the inventory tax credit method of dealing with the affects of inflation is that it favours the inventory-heavy retailers as much as, if not more so, than manufacturing.

The second factor is that there appears to be wide variation in cash availability between different sectors as there has been a substantial structural change taking place in the Canadian economy. Some sectors have been much more profitable than others and accordingly, the generalities of the statistics given above conceal some wide differences between various sectors of the corporate economy. This may or may not have effects on their proclivity to spend on R&D. We return to this point later in this report.

In looking at corporate fund flows, it is important to distinguish between secular growth trends, structural changes and cyclical movements. Cash flow is in the middle of showing a very pronounced cyclical movement. The following chart shows percentage changes in corporations' net cash flow from 1976 projected through to 1983.

Disposition of Corporate Profits
(seasonally adjusted at annual rates)
(million of dollars)

	1976	1977	1978	1979	1980	1981	1982	1983
Corporate net cash flow	27,173	29,299	32,934	41,845	45,228	48,326	54,689	61,805
% change	15.5	7.8	12.4	27.1	8.1	6.8	13.2	13.0
After tax profits	12,907	13,910	16,907	24,142	25,573	24,919	28,049	31,832
% change	5.8	7.8	21.5	42.8	5.9	-2.6	12.6	13.5

SOURCE: Wood-Gundy Limited "forecast-1980".

It will be seen that the growth rate drops for the next two years, but shows substantial growth in 1982 and 1983. The chart also shows improvements in percentage changes for after tax profits. These projections are made by Wood Gundy Limited. It is our view that these numbers may be exceeded. Corporate executives are moving their profit targets substantially upward to take into account their view of the perpetuation of inflation and we suspect rates of return will rise accordingly as soon as the business cycle permits industry selling prices to rise. It is appropriate to quote here from Wood-Gundy's latest forecast, dated November 1980: "At the best of times, businesses operate on a small profit margin, therefore fairly small changes in the difference between selling prices and input costs or a small change in capacity utilization give rise to considerably larger percentage changes in profits." It would be our view that industry selling prices will be maintained as high as possible in order to keep internal cash-flow adequate.

External Funds

The following table "Supply and Demand in the Bond Market" supplied from Wood-Gundy's latest forecast, shows a substantial reduction in foreign borrowing as a percentage of total marketable bonds. This is usually the key figure which indicates where excess demand for financing in the Canadian economy comes.

	1979	1980	1981	1982	1983
Total Domestic Demand	11,693	15,077	18,961	19,703	22,426
Rest of the World	3,703	4,100	3,000	2,800	2,100
Foreign as a % of Total marketable bonds	24.0	21.3	13.6	12.4	8.6

In the same forecast, Wood-Gundy suggests that demands on the mortgage market will be low and both trusteed pension funds and life insurance companies will have strong growth in financial assets. They are also indicating good supply in the equity market since "the effective cost of common equity is now reasonable in comparison to the cost of long-term debt."

The above general comments mask considerable structural changes in the Canadian economy. Our last report emphasized heavily a substantial shift in the post-war period of resources to the residential housing sector and to real estate generally. This has now slowed up except in the West. While sharp increases in values in real estate are going on, these are more related to the use of land as an inflation hedge and to land shortages in some places of Canada, rather than excess demand in that particular sector. Both housing starts and construction of shopping centres have and will slow down and the major shift of resources to this sector of the economy has ended.

This means, of course, that manufacturing industries related to growth in housing will also suffer from reduced rates of growth. Indeed this is happening, with continuous difficulties being shown in the durable goods manufacturing companies in Ontario as they adjust to these lower growth rates.

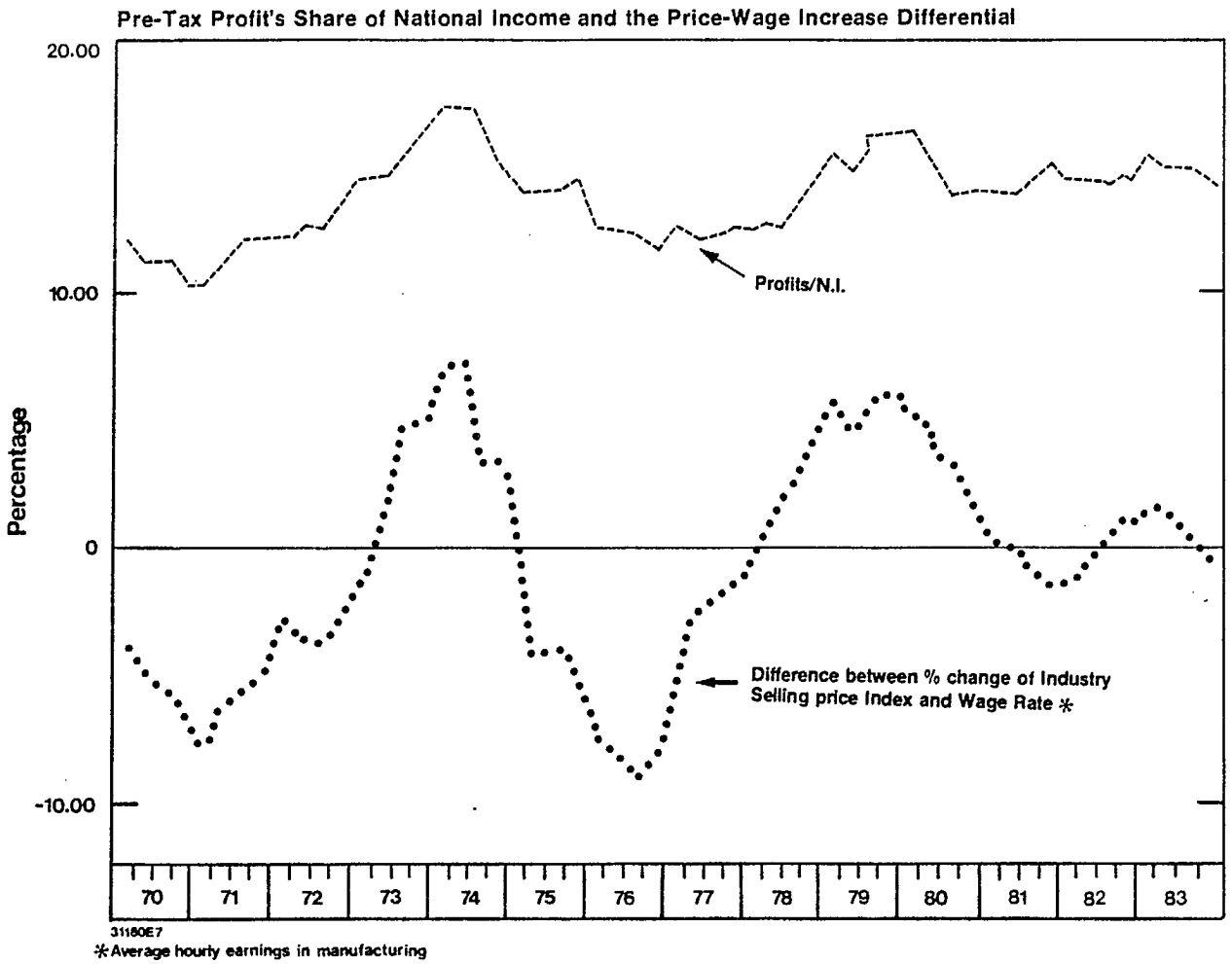
In addition, the substantial difficulties in the North American automotive industry are reflected in substantially weakened performance in the automotive parts industries in Ontario together with its related metal and machinery suppliers. The difficulties of Massey-Ferguson are also having their effect on the farm implement industry.

On the other hand, the overall statistics, while showing some cyclical decline, do not fall off as much as might have been expected. The aggregates contained in the Wood-Gundy forecast outlined above mask substantial increases in profitability and values in certain other sectors of the Canadian economy. Forecasts for the Canadian steel industry range up to nothing short of phenomenal. There is expected to be good demand in pulp and paper, minerals, and metals, and increases in values are also taking place in the electronics and communications industries. Value changes in the shares of public companies listed on the Toronto Stock Exchange in various industries indicate shifts in values for

all companies in those industries. It will be seen that, if one looks at various sectors of the Canadian economy, industries can be clearly divided into "slow growers" and "fast growers". It is interesting to see how much equity values reflect these changes.

We are entering a period in which equity values are seen much more favourably than they were some four years ago and in fact, parts of the stock market are showing a return to the kind of euphoria we saw in the late 60's. Companies such as Mitel are trading at incredible multiples of earnings and other stocks are showing such strength that equity is emerging as a viable financing alternative relative to the bond market. This has not happened for nearly 15 years.

The evidence in this chapter indicates a substantial secular change in the environment for equity investment and for corporate funds over the period since my last report. The following chart shows pre-tax profits' share in national income and the wage price increase differential since 1970.



SOURCE: Wood Gundy Ltd "forecast 1980".

It will be seen that, at the time of my last report in 1976-77, profits as a percentage of national income were at a low point. They have now climbed up to a more reasonable level and, if one ignores the cyclical drop in 1980-81, one can see corporate profitability remaining at relatively high levels. As we mentioned earlier, we are inclined to take a more sanguine view of corporate profit than Wood Gundy because of the attitudes of corporate executives towards maintaining their prices. Therefore we think the forecast will come out even higher than is shown in the chart above.

In summary, therefore, in contrast to the period reviewed before, while the Canadian corporate economy is mixed, it is generally operating in a much easier state than four years ago and from the point of view of fundsflow there would seem to be no reason why corporations should not be investing money in research and development. The following chapter reviews the actual performance of the corporate sector in this respect.

CHAPTER III - Recent Trends in Industrial R&D

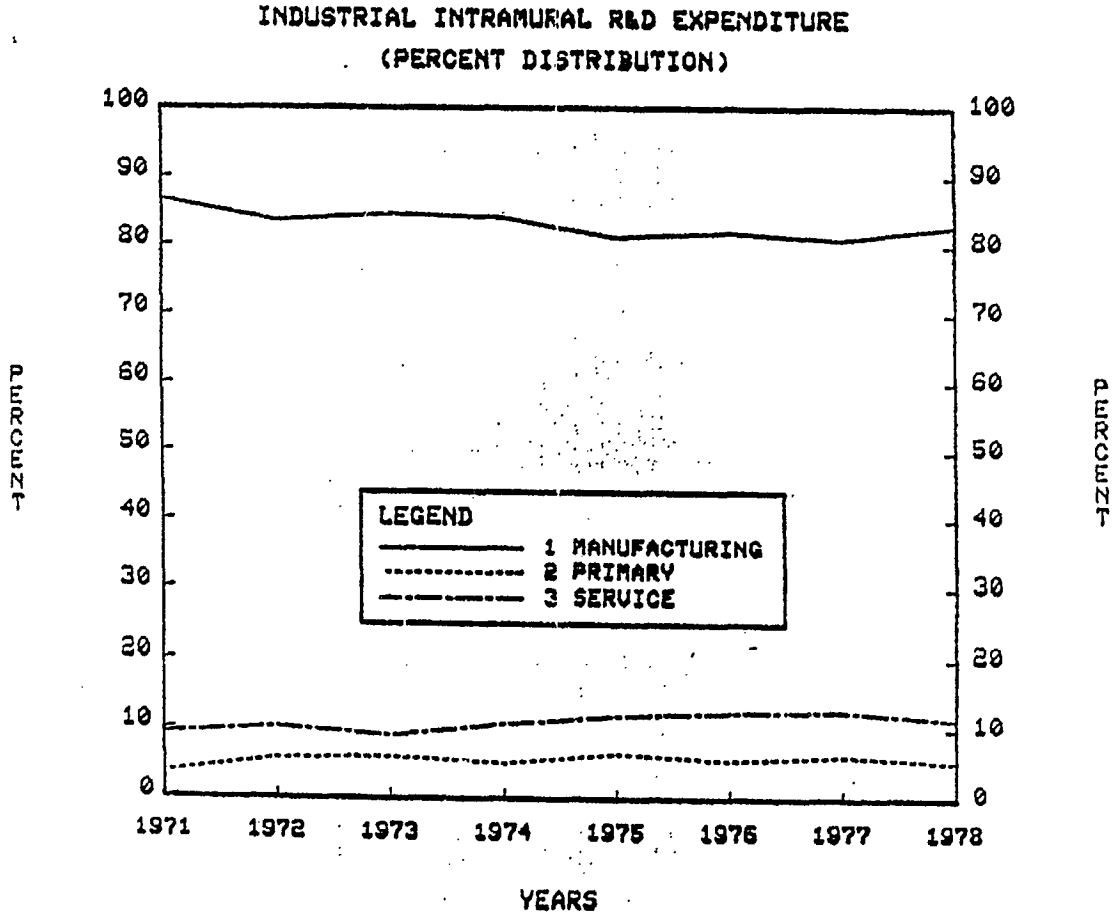
The following table shows funding shares for GERD for the five major funders, together with a projected growth rate to 1985.

Funding Shares for GERD

Funder	% Share 1979	% Share 1985	Approx. Annual Growth Rate (with infl.)	Approx. Annual Real Growth (excl. infl.)
Federal	38.9	33.3	17	8
Provincial	6.9	6.6	19	9
Industry	35.8	50.0	27	17
University	13.9	7.6	9	0
Other	4.4	2.5	9	0
TOTAL	100.0	100.0	22	12

The numbers in this table suggest that the government's target of 1.5% of GNP by 1985 will be difficult to reach and that industry will have to shoulder a major proportion of the burden. In the light of this, it is appropriate to run quickly through the current situation.

Over 80% of industrial intramural R&D expenditures are performed by the manufacturing industries as can be seen by the chart below.



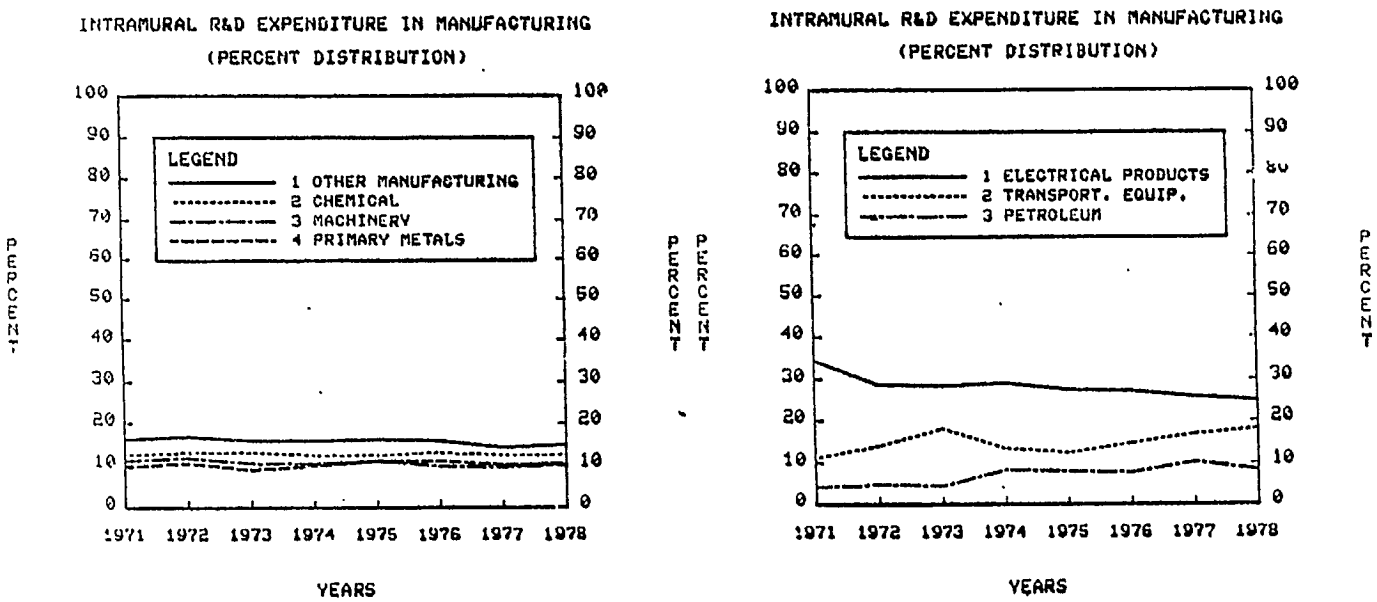
SOURCE : BASED ON DATA FROM STATISTICS CANADA CAT. 13-212 (1977 & 1978)

The table below puts it in another way:

	MANUFACTURING	PRIMARY	SERVICE	TOTAL	GNP
1971	0.43	0.02	0.05	0.49	100.0
1972	0.37	0.03	0.05	0.44	100.0
1973	0.34	0.02	0.04	0.41	100.0
1974	0.34	0.02	0.04	0.41	100.0
1975	0.34	0.03	0.05	0.42	100.0
1976	0.31	0.02	0.05	0.38	100.0
1977	0.33	0.03	0.05	0.41	100.0
1978	0.33	0.02	0.05	0.40	100.0

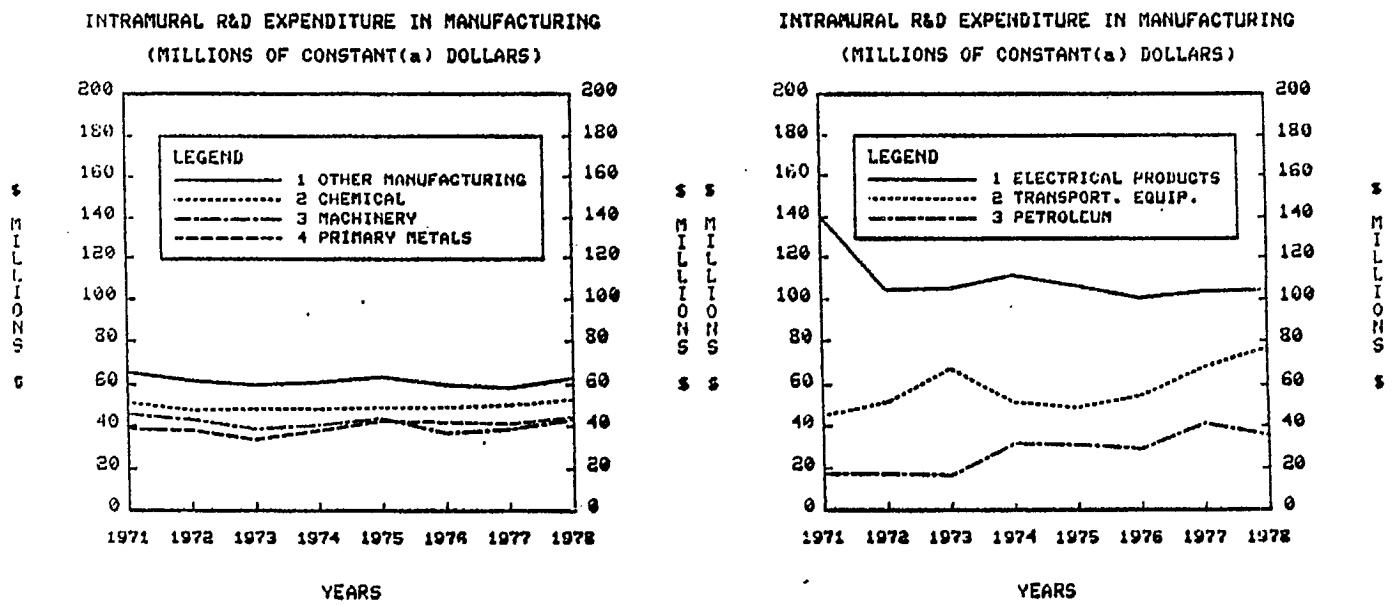
SOURCE: BASED ON DATA FROM STATISTICS CANADA CAT. 13-212 (1977 & 1978)

Within the manufacturing sector, six industries account for the bulk of intramural R&D expenditures in manufacturing. These six industries are shown in the charts below.



SOURCE : BASED ON DATA FROM STATISTICS CANADA CAT. 13-212 (1977 & 1978)

Trends in these major industries can be seen from the two charts below.

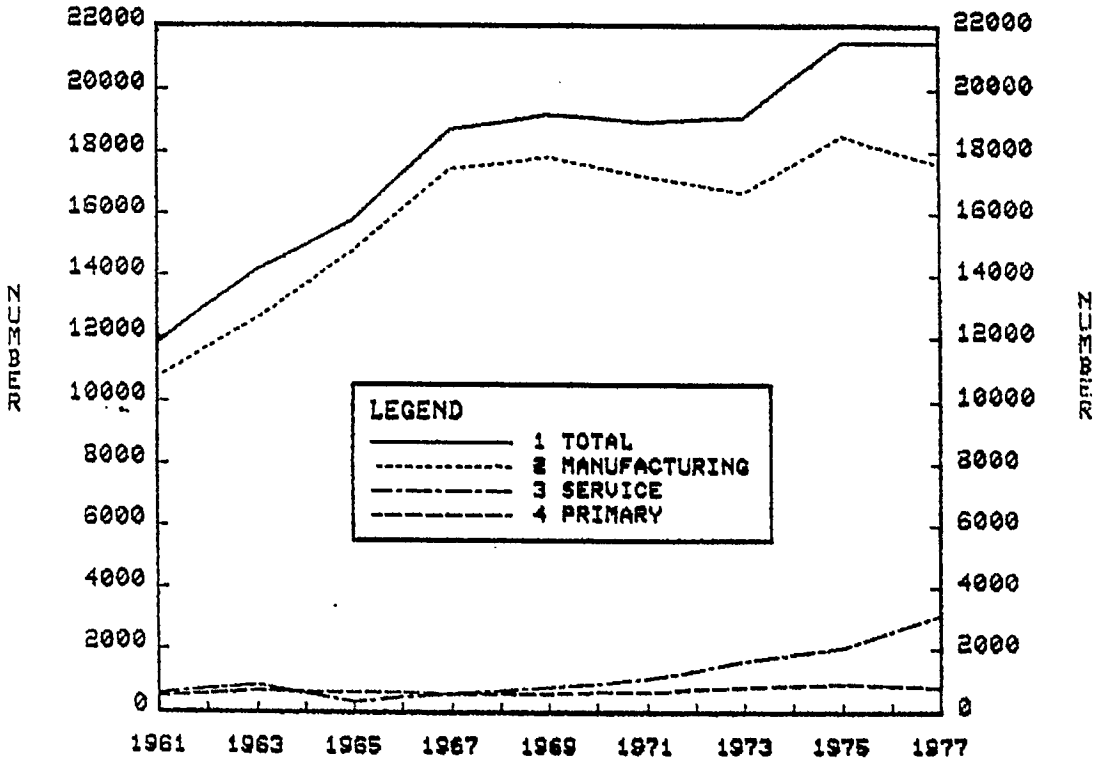


SOURCE : BASED ON DATA FROM STATISTICS CANADA CAT. 13-212 (1977 & 1978)

a . 1971=100

Similar trends can be seen in the number of persons engaged in R&D as can be seen from the following charts.

NUMBER OF PERSONS ENGAGED IN R&D

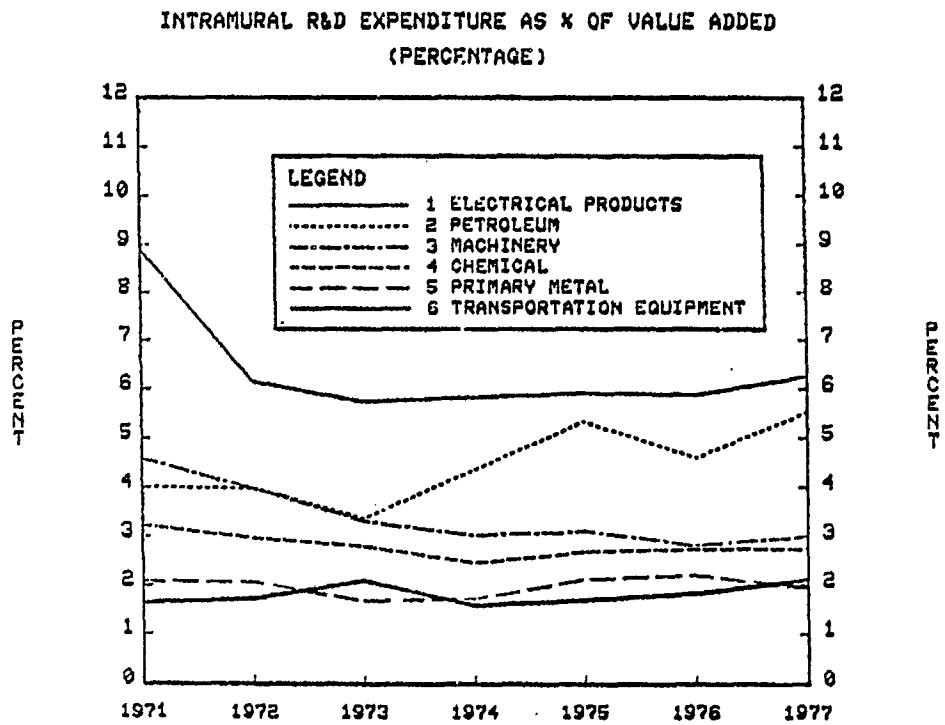


SOURCE : BASED ON DATA FROM SCIENCE STATISTICS CENTRE

	MANUFACTURING	PRIMARY	SERVICE	TOTAL	TOTAL EMPL.
1961	0.177	0.009	0.010	0.195	100.0
1963	0.197	0.011	0.014	0.222	100.0
1965	0.215	0.010	0.005	0.230	100.0
1967	0.235	0.008	0.008	0.251	100.0
1969	0.227	0.008	0.010	0.245	100.0
1971	0.212	0.008	0.013	0.234	100.0
1973	0.190	0.009	0.019	0.218	100.0
1975	0.199	0.010	0.022	0.232	100.0
1977	0.183	0.008	0.032	0.223	100.0

SOURCE: BASED ON DATA FROM SCIENCE STATISTICS CENTRE

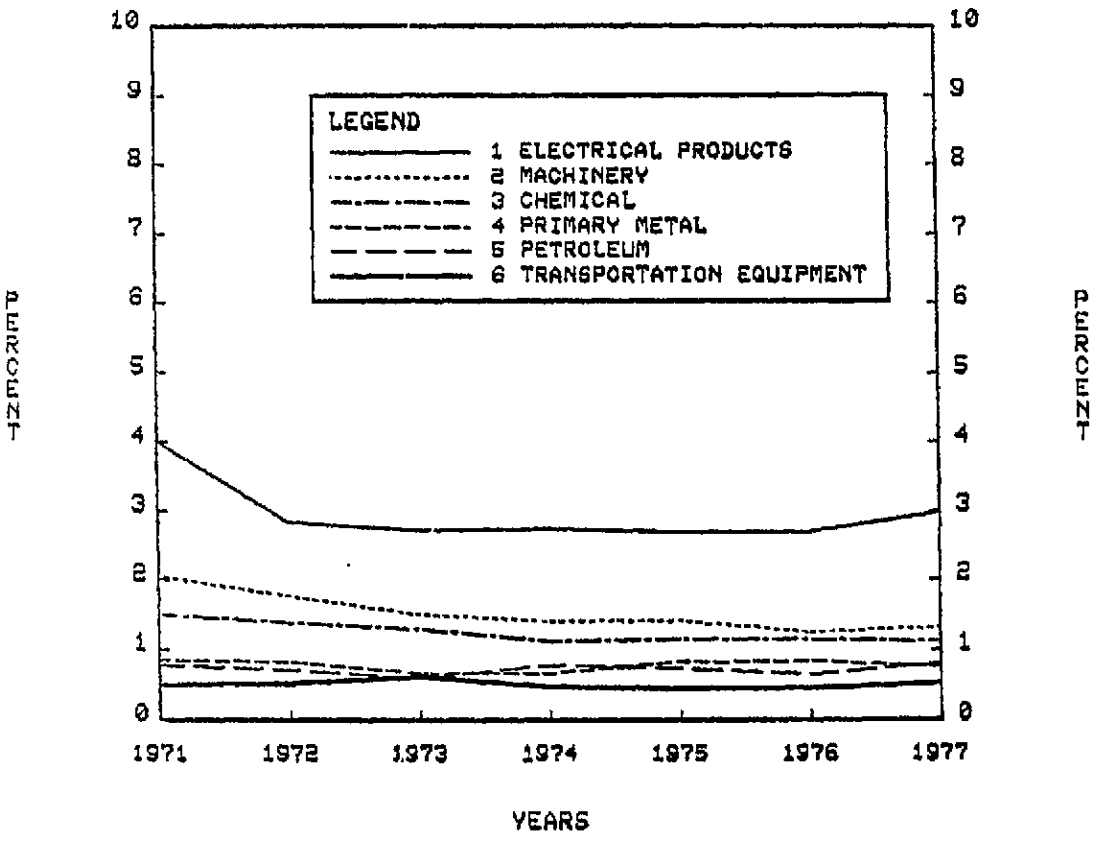
A brief review of investment intensity is important here and the following are some charts which indicate this.



SOURCE : BASED ON DATA FROM STATISTICS CANADA CAT. 13-212 (1977 & 1978) AND MAPID

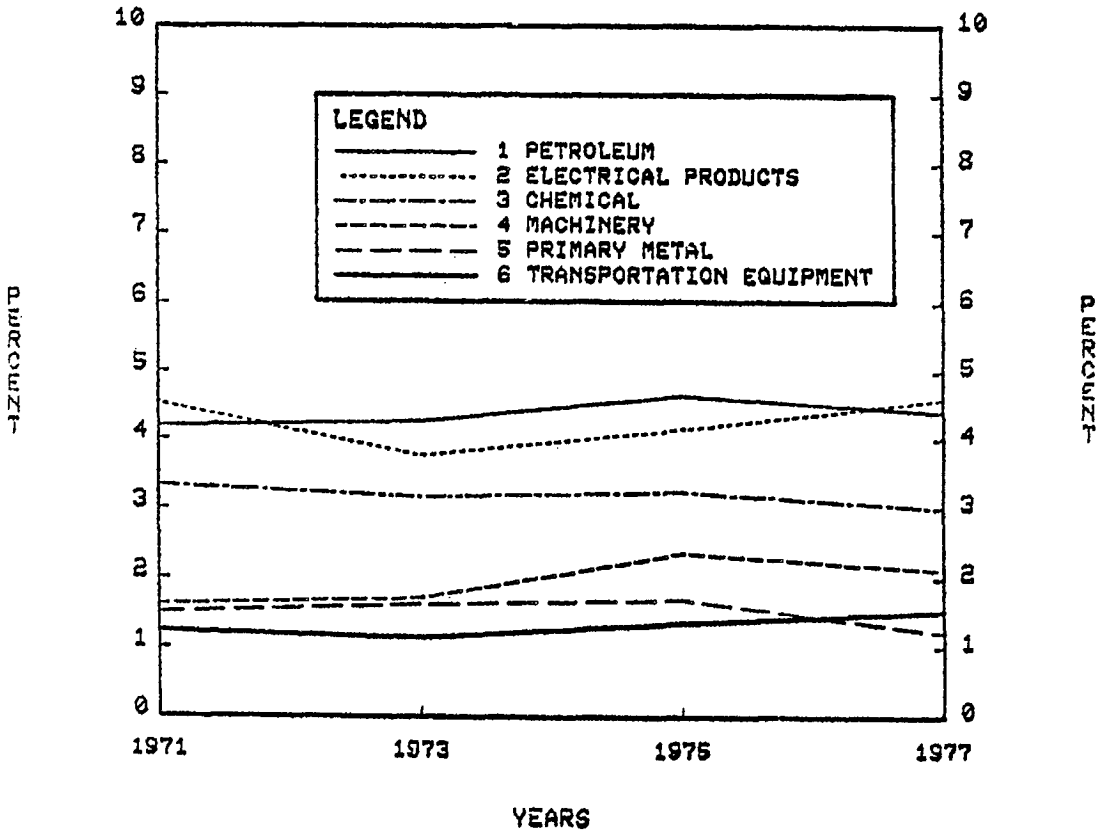
INTRAMURAL R&D EXPENDITURE AS % OF TOTAL SHIPMENTS

(PERCENTAGE)



SOURCE : BASED ON DATA FROM STATISTICS CANADA CAT. 13-212 (1977 & 1978) AND MAPID

R&D PERSONNEL AS % OF TOTAL EMPLOYMENT
(PERCENTAGE)



SOURCE : BASED ON DATA FROM STATISTICS CANADA CAT. 13-212 (1977 & 1978) AND MAPID

INTRAMURAL R&D EXPENDITURE AS % OF VALUE ADDED IN 1977
(PERCENTAGE)

	R&D/VA
Electrical Products	6.28
Petroleum	5.56
Machinery	3.00
Chemical	2.77
Transportation Equipment	2.14
Primary metals	1.95
Miscellaneous	1.01
Rubber and Plastic	0.53
Wood Based	0.49
Textile	0.41
Food, Beverage, and Tobacco	0.39
Metal Fabric	0.30
Non-Metal Minerals	0.28
TOTAL Manufacturing(a)	1.43

Source: Based on data from Statistics Canada Cat. 13-212 (1978) and MAPID

(a) Industries with no R&D include leather, knitting mills, clothing, and printing

Ownership has a considerable affect on the situation and the following table shows relative R&D performance in selected Canadian-controlled and foreign-controlled manufacturing industries.

Relative R&D Performance: Canadian-Controlled and Foreign-Controlled Manufacturing Industries

	Canadian-Controlled		Foreign-Controlled	
Industry	% Sales	% R&D	% Sales	% R&D
Paper & Allied Pds.	54.7	67.2	45.3	32.8
Primary Metals	81.1	86.0	18.9	14.0
Machinery Inds.	30.7	31.4	69.7	68.6
Transportation Equipment	11.1	45.1	88.9	54.9
Electrical Products	34.6	59.2	65.4	40.8
Chemical & Chemical Pds.	17.3	31.7	82.7	68.8

In summary, when actual expenditures are adjusted for inflation, outlays on industrial R&D grew in Canada at an average annual rate of less than two per cent during the 1970s. The pattern of growth was very uneven, with R&D in the primary and service sectors increasing at better than five per cent each year while manufacturing R&D grew at just one per cent annually. As a percentage of total industrial R&D, the share of the primary and service sectors grew over 50% from 13.2% in 1971 to 21% in 1979.

All of the R&D growth in the primary sector is related to oil and gas exploration while the growth in the service sector is principally a reflection of the R&D activities of public utilities. In fact, most of the R&D growth even in manufacturing has depended critically on energy-related projects. For example, the petroleum refining industry increased its R&D expenditures between 1973 and 1979 at an average annual rate of 15% in constant dollars, as its share of total manufacturing R&D rose from 4.7% to 11.4%. Overall, the combined R&D expenditures of the petroleum and oil and gas industries and the service sector grew in constant dollars from $141.6 millions in 1973 to $281.7 million in 1979, while levels of spending activity in the rest of industry went from $717.5 million in 1973 to just $742.9 million six years later. In brief, except for the sectors affected by developments in the energy field, R&D remained relatively stagnant in Canadian industry during the 1970s.

Despite these significant changes in the sectoral and industrial distribution of R&D, the pattern of expenditures by firm size and ownership group has remained relatively stable over time. Canadian-controlled firms' share of R&D has increased about 10 percentage points during the 1970s but this change is more apparent than real, being due largely to the statistical reclassification of a number of companies from the foreign to the Canadian category (for example, Alcan

and Inco). At present, Canadian-controlled firms perform about 55% of total industrial R&D and 50% of manufacturing R&D.

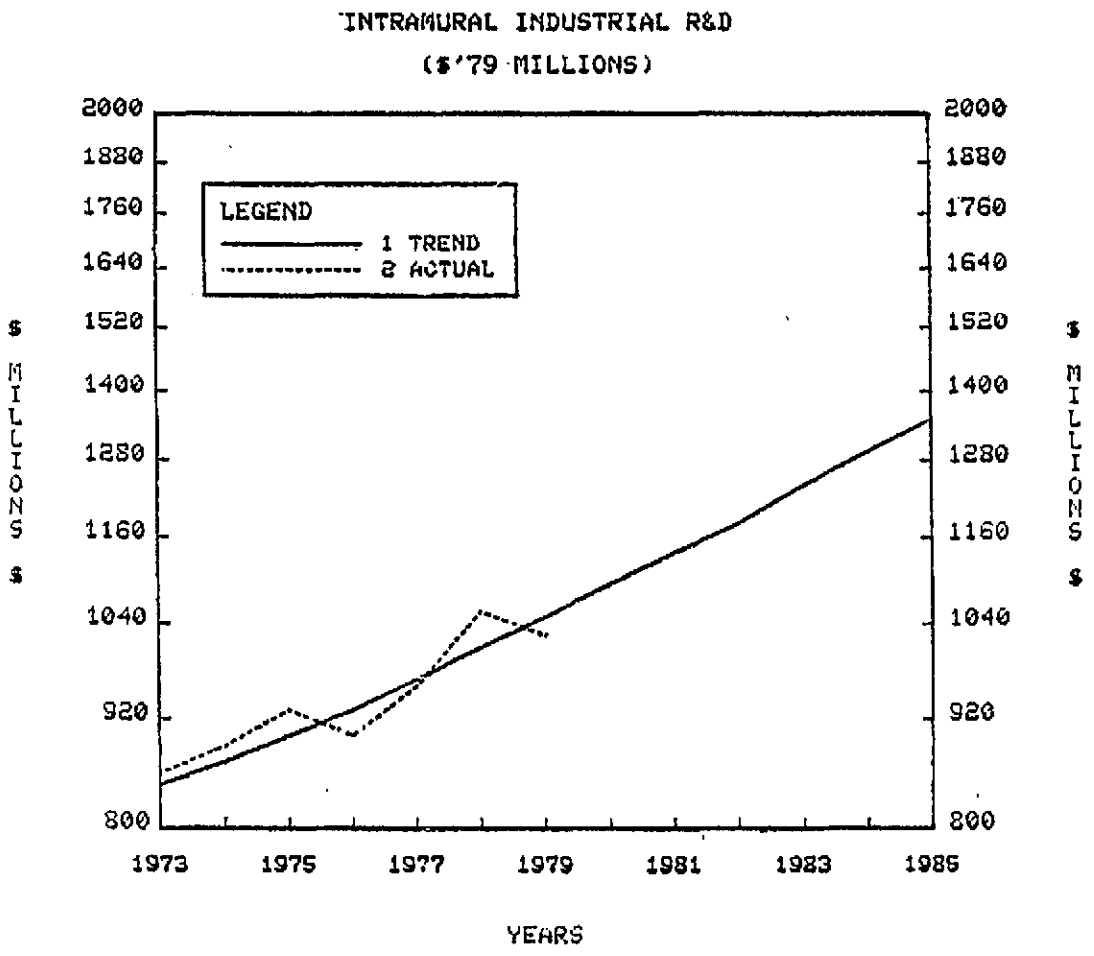
With respect to size, firms with less than 200 employees have generally accounted for about 15% of R&D expenditures, with medium-sized firms (200 to 1,000 employees) making up another 15 per cent. Thus, approximately 70% of industrial R&D is accounted for by large firms. Viewed from a different perspective, the top 100 R&D performing firms, all of which spent more than one million dollars on R&D in 1979 and most of which had sales in excess of $100 million, account for roughly 75% of total industrial R&D.

Based on historical trends, no major shifts should be expected in the pattern of R&D expenditures by either firm size or ownership. At least, any changes in these areas are likely to be much less significant than what would be observed when R&D is examined by industry sector. In light of these trends, it is worthwhile when projecting industrial R&D to 1985 to distinguish among five major industry groups. These include the two high growth areas (the petroleum and oil/gas industries and the service sector), the aircraft and parts industry, where R&D trends have been extremely volatile, other research-intensive manufacturing industries and, finally, all other R&D performers.

It is worthwhile looking at actual projected trends through the most important sectors of R&D and the charts on the next few pages indicate the trend. The first chart shows trends for total industry and the next charts show trends for Petroleum and Gas, Services, Aircraft and Parts, Electrical Products, Business Machinery, Pharmaceuticals and Chemicals, Primary Metals, and All Other Industries. From these charts some possible action programs begin to emerge. It is quite evident that in some of the areas good growth trends are under way, but one would think that one could increase the trend line of Electrical products and shift Pharmaceuticals and Chemicals, Primary Metals and Other Industries upward.

Actual and Projected Trends

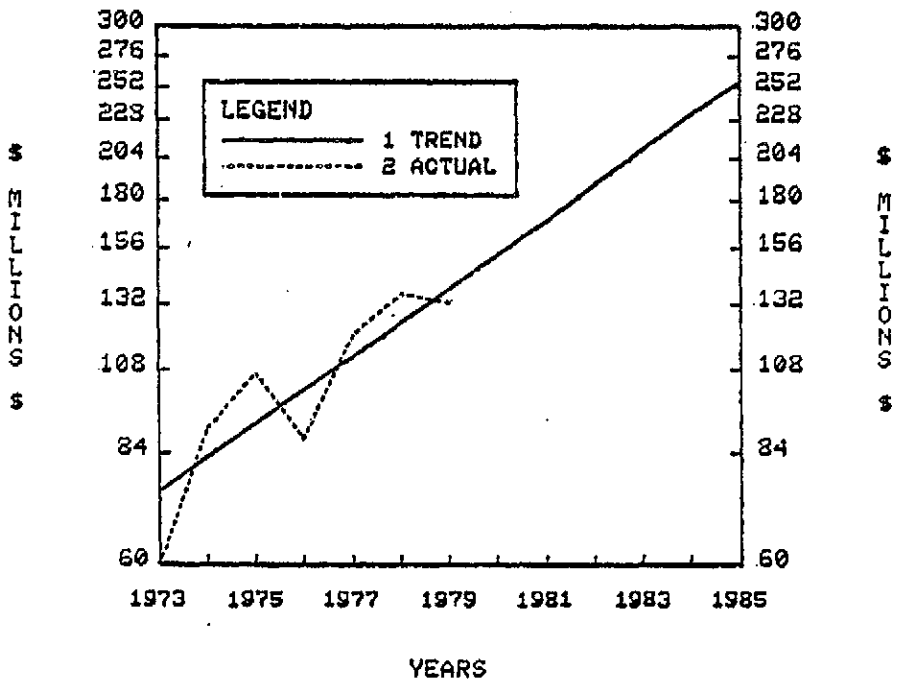
In Industrial R&D, 1979-1985



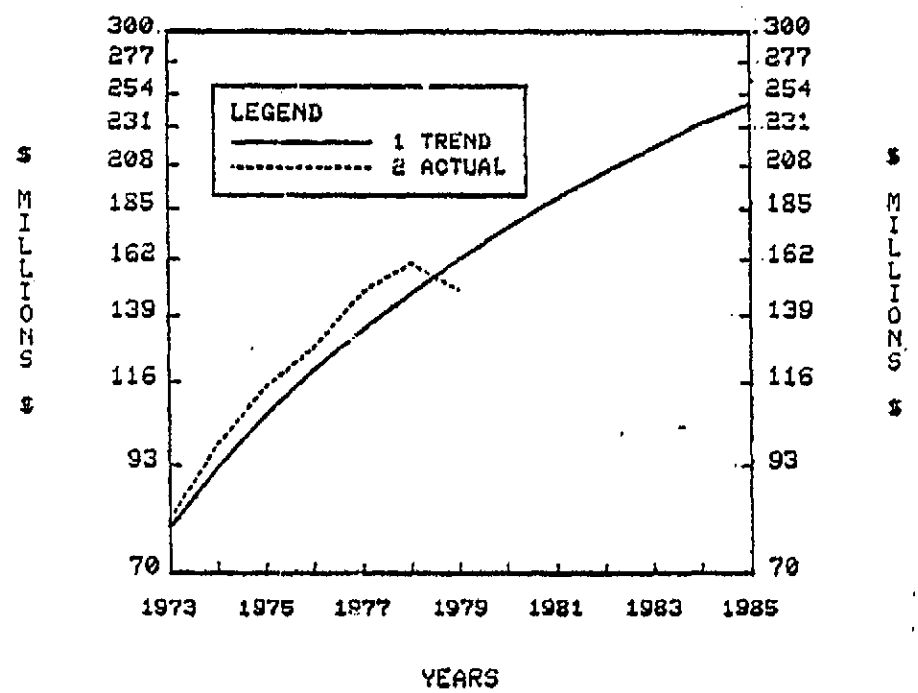
TOTAL INDUSTRY

INTRAMURAL INDUSTRIAL R&D

($'79 MILLIONS)



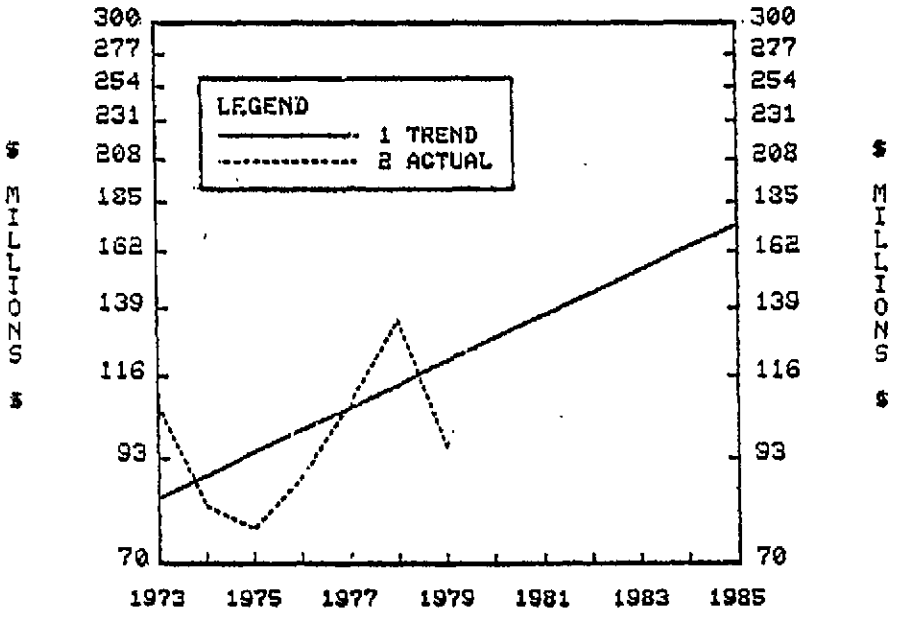
PETROLEUM, OIL/GAS



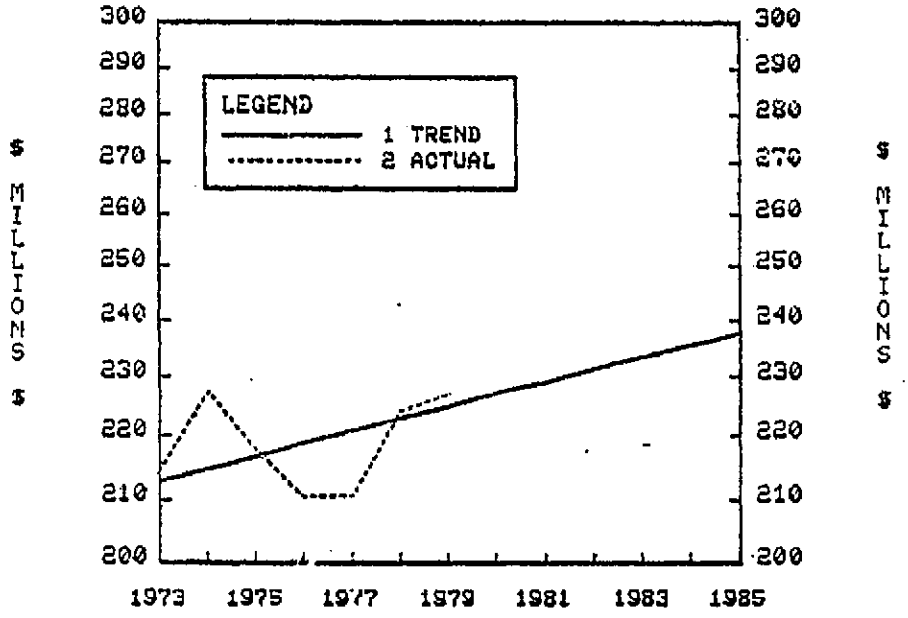
SERVICES

INTRAMURAL INDUSTRIAL R&D

($'79 MILLIONS)



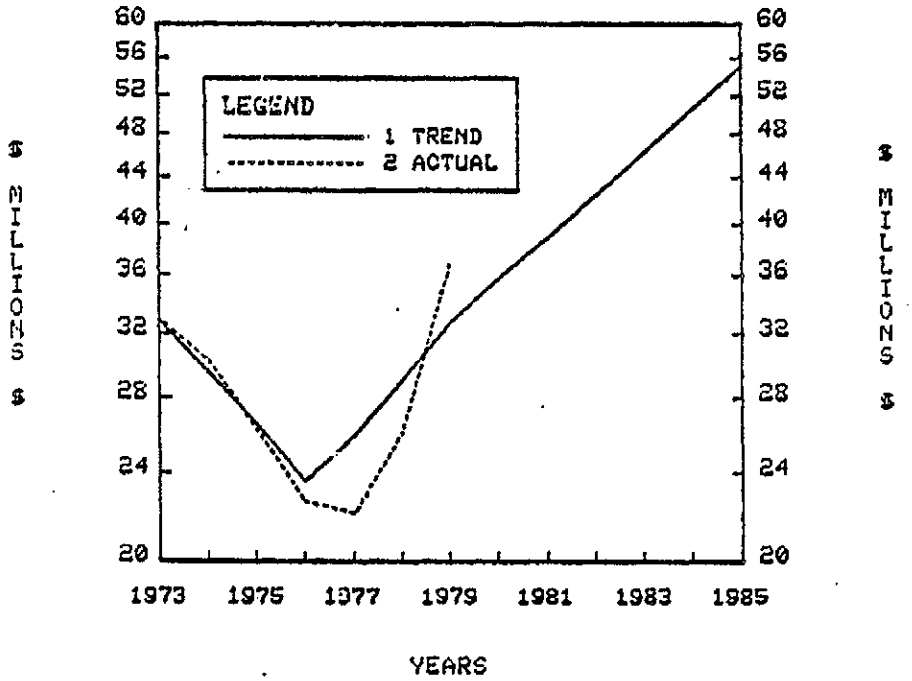
AIRCRAFT AND PARTS



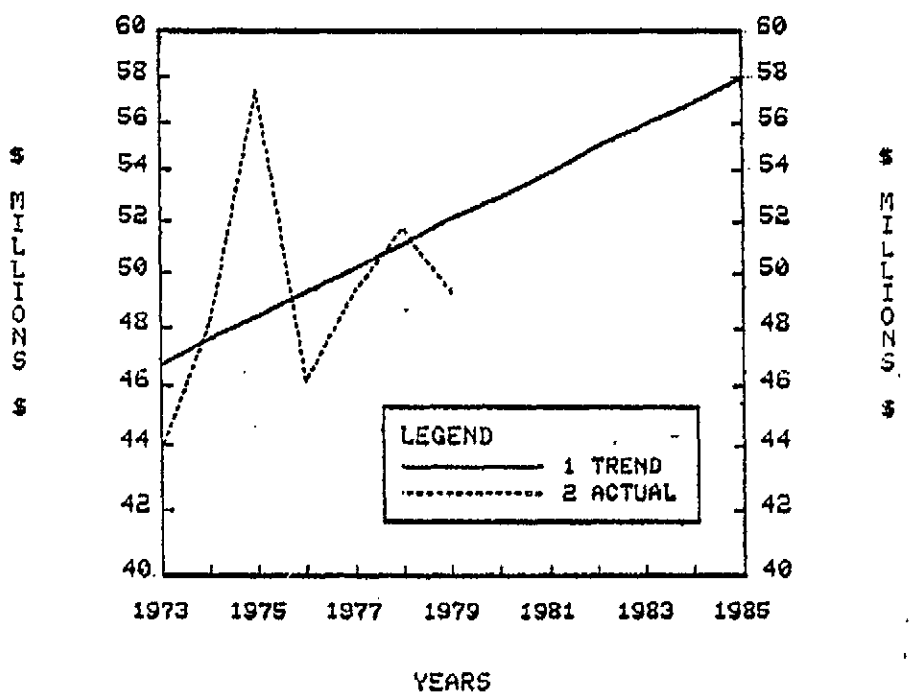
ELECTRICAL PRODUCTS

PROJECTED R&D EXPENDITURE

($'79 MILLIONS)



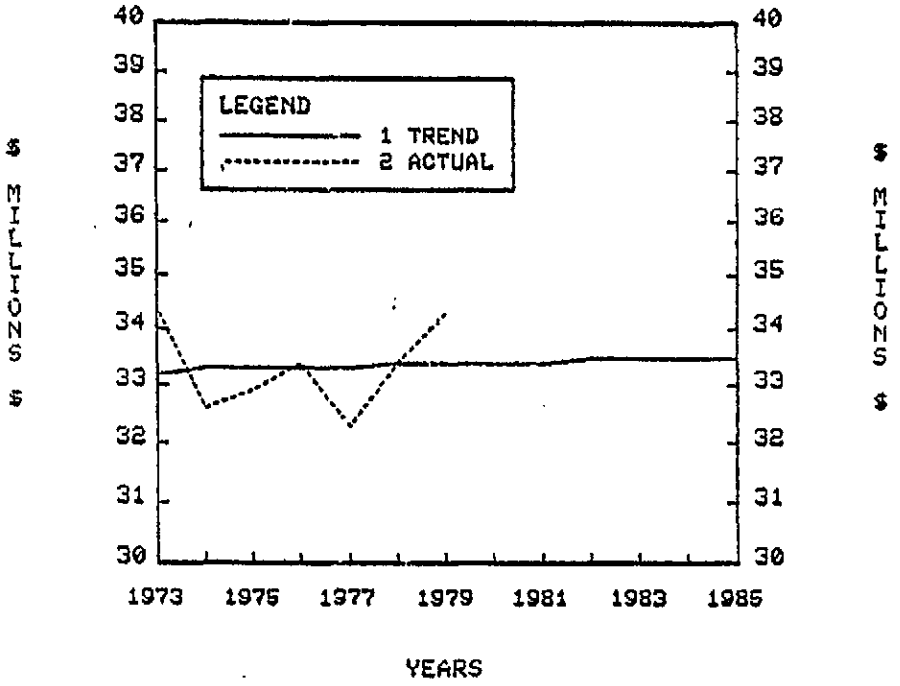
BUSINESS MACHINERY



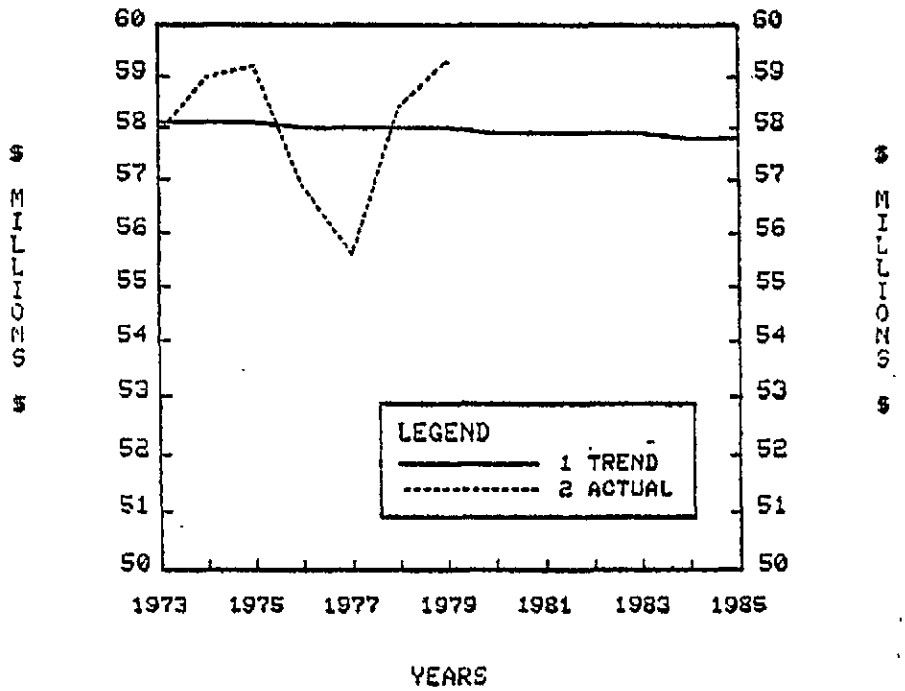
MACHINERY

INTRAMURAL INDUSTRIAL R&D

($'79 MILLIONS)



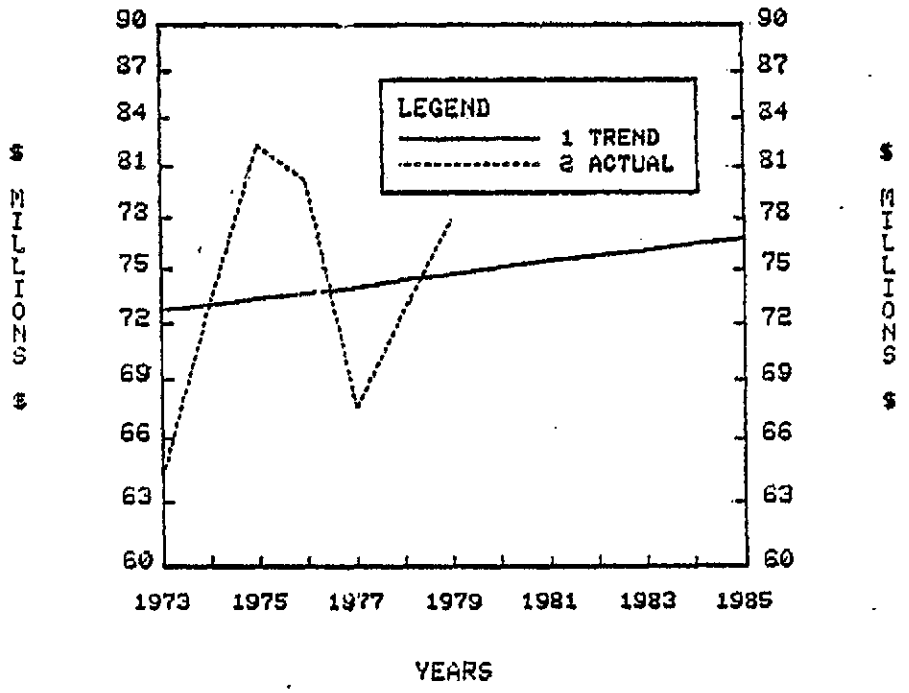
PHARMACEUTICALS



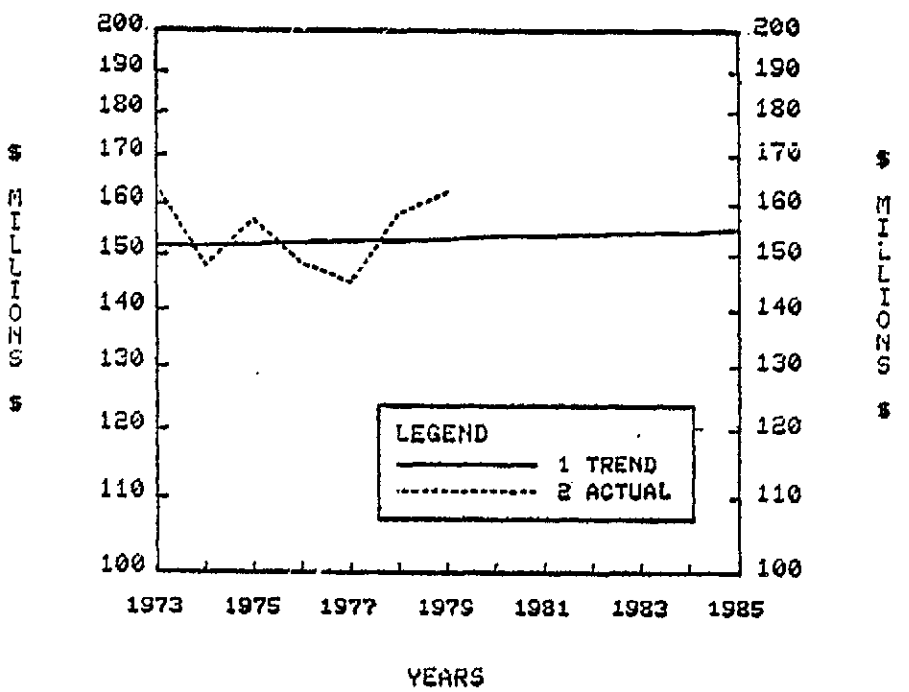
CHEMICALS

INTRAMURAL INDUSTRIAL R&D

($'79 MILLIONS)



PRIMARY METALS



OTHER INDUSTRIES

From this brief review one can see that, in order to make much of a major change in the current spending patterns, the marked improvements in dollar terms will have to come from the larger companies. Spending by the larger companies has two major payoffs. First of all the results are fairly immediate in terms of moving from R&D to development as the facilities are usually there in the larger firms to transmit R&D ideas to production. Secondly, the spending by the larger firm usually has spin-offs in that contracts are awarded both to universities and to smaller firms. Thus, if the government wishes to move R&D up by 100% by 1985, the major immediate thrust and effort should be directed towards the larger firm. (This has the drawback of being purely a quantitative approach and implies no qualitative distinction between the dollars spent.)

Medium size firms have some means to move dollars around from R&D to production but usually their R&D has either immediate payoff, because they are trying to stay alive, or long-term payoff. Many of the medium-size Canadian companies are foreign-owned, and are the traditional truncated branch plants of many less than giant U.S. companies. Accordingly they would not be expected to do much R&D and it would be difficult to move the figures up much by incentives to the medium size companies in the short term at least. On the other hand, some of the Canadian-owned medium-sized companies

are the giants of the 1990's and efforts are important to nurture their R&D efforts.

The smaller firms are usually the major sources of innovative ideas but R&D intensive small companies usually have payoff sometime way out in the future. There are very few Mitels around. That is an example of a company which has moved from inception to a very high R&D capability within a relatively short period of time but it takes about 10 years to 15 years in most cases. Policies are needed to sustain the supply of these small companies, in order to build for the future.

Before we turn to an examination of what is being done to stimulate R&D and what should be done, it is appropriate to look more specifically at where R&D is being done. The following table shows R&D in Canadian manufacturing industries in 1975.

Table 1 Research and Development in Canadian Manufacturing Industries, 1975

	R&D Expenditures as a % of Value Added	Total R&D Expenditures ($ million)	% of R&D Financed by Industry
Food, Beverages & Tobacco Products	0.53	24.6	90.2
Rubber & Plastic Products	0.63	5.6	80.4
Leather Industries	•	•	•
Textile Industries	0.37	5.3	94.3
Knitting Mills	•	•	•
Clothing Industries	•	•	•
Food Industries	0.11	2.8	39.3
Furniture & Fixtures	0.12	0.6	83.3
Paper & Allied Industries	1.04	27.1	89.6
Printing, Publishing Industries	•	•	•
Primary Metal Industries	2.01	63.0	93.3
Metal Fabricating	0.30	9.9	88.9
Machinery Industries	4.26	73.6	64.0
Transportation Equipment	2.18	64.0	57.0
Electrical Products	7.37	158.7	80.0
Non-Metallic Minerals	0.54	4.9	89.8
Petroleum & Coal Products	6.48	45.5	95.2
Chemical & Chemical Products	3.55	72.4	89.0
Miscellaneous Manufacturing Industries[1]	-	13.6	79.4
Total		571.6	80.5

[1] The numbers in this row are residual figures and do not correspond to the miscellaneous manufacturing industries category of the Standard Industrial Classification.
• Industries which perform no research and development.
Source: Statistics Canada.

Unfortunately there are no more recent figures than this but it probably gives as good insight into where R&D is and is not performed as anything else and it is doubtful whether the current figures whould have changed very much. It will be seen that the electrical products industry accounts for about 30% of industrial R&D expenditures and six industries account for 85% of all industrial R&D spending.

In order to look in more detail at the R&D performing companies, the following table is relevant:

— Manufacturing Firms Performing R&D as a Percentage of Total Manufacturing Enterprise, 1975
(By industry)

Industry Groups	Number of R&D Firms	Number of Enterprises	R&D Firms/ Manu-facturing Enterprises (Percentage)	R&D Expenditures ($ million)	Average R&D Expenditures ($'000)
Chemical-Based					
Food, Beverage & Tobacco	75	4,021	1.9	24.6	328
Rubber & Plastic Products	14	641	2.2	5.6	400
Textiles	15	807	1.9	5.3	353
Petroleum Products	9	40	22.5	45.4	5,044
Pharmaceuticals	31	107	28.9	28.0	903
Other Chemicals	96	536	17.9	44.4	463
Wood-Based					
Pulp & Paper	35	368	9.5	27.1	774
Other Wood	13	4,905	0.3	3.4	262
Machinery & Transportation Equipment					
Business Machines	9	32	28.1	28.0	3,111
Other Machinery	101	893	11.3	45.6	451
Aircraft & Parts	14	81	17.3	49.3	3,521
Other Transportation Equipment	30	748	4.0	14.7	490
Electrical					
Electrical Products	120	542	22.1	158.7	1,323
Scientific & Professional Equipment	29	798	3.6	7.4	255
Metal-Based					
Primary Metals (Ferrous)	10	113	8.8	13.4	1,340
Primary Metals (Non-Ferrous)	14	133	10.5	49.6	3,543
Metal Fabricating	50	3,598	1.4	9.9	198
Other Manufacturing	62	8,506	0.7	11.2	181
Total Manufacturing	**727**	**26,869**	**2.7**	**571.6**	**786**

Source: Statistics Canada.

As can be seen, the overall average R&D expenditure for all 727 R&D performing firms in Canadian manufacturing in 1975 was about $800,000. Forty-five firms which have R&D programs of over $2,000,000 representing about 7% of the total number of R&D performing firms accounted for two thirds of the total R&D performed in Canadian manufacturing. The following table indicates R&D performance by size.

Table — R&D-Performing Firms in Canadian Manufacturing, 1975
(By size of firm and by R&D expenditures)

	Small[1]	Medium[2]	Large[3]	Total
R&D-Performing Firms				
Number	337	207	183	727
Percentage	46.3	28.4	25.2	100
R&D Expenditures				
$ million	59.4	110.9	401.3	571.6
Percentage	10.4	19.4	70.2	100
Average R&D Expenditures				
$'000	176	536	2,193	786

[1] Sales of less than $10 million.
[2] Sales of $10 to $50 million.
[3] Sales of over $50 million.

Source: Statistics Canada.

Small firms use more federal aid, but they are more research-intensive than the larger firms. However, the larger firms do by far the largest amount of business, as can be seen from the following tables:

Table — Sources of Funds for R&D-Performing Manufacturing Firms, 1975
(Percentage distribution)

	Small[1]	Medium[2]	Large[3]	Total
Reporting Company	69.5	69.3	80.0	76.2
Federal Government	21.7	13.5	10.9	12.5
Other[4]	8.8	17.2	9.1	11.3
Total				
Percentage	100.0	100.0	100.0	100.0
$ million	59.4	110.9	401.3	571.6

[1] Sales of less than $10 million.
[2] Sales of $10 – $50 million.
[3] Sales of over $50 million.
[4] Includes other Canadian and foreign sources.

Source: Statistics Canada.

Table — Company-Funded R&D in Canadian R&D-Performing Manufacturing Companies, 1975
(Per $100 sales; by industry and by size of company)

Industry	Small[1]	Medium[2]	Large[3]	Total
Food, Beverage & Tobacco	5.02	0.80	0.17	0.25
Rubber & Plastic Products	2.88	0.96	0.41	0.51
Textiles	1.41	2.48	x	0.70
Wood-Based	3.09	0.89	0.29	0.33
Primary Metals	x	1.15	0.65	0.66
Metal Fabricating	3.17	0.60	0.24	0.47
Machinery	4.05	2.54	0.50	1.03
Transportation Equipment	4.89	1.94	0.36	0.49
Electrical Products[4]	4.28	2.50	2.32	2.48
Non-Metallic Mineral Products	3.36	x	0.26	0.31
Chemical Products	3.06	2.37	0.97	1.37
Other Manufacturing	2.73	0.88	0.12	1.12
Total Manufacturing	3.65	1.74	0.55	0.71

[1] Sales of less than $10 million.
[2] Sales of $10 – $50 million.
[3] Sales of over $50 million.
[4] Includes scientific and professional equipment.
x — *confidential.*

Source: Statistics Canada.

In summary then, in order to move expenditures up to 1.5% of GNP by 1985, it is the larger firm in certain selected industries that has to be the main area of concentration. Money spent in medium size firms will have its payoff between 1985 and 1990, and in the smaller firms between 1990 to 1995 but will not substantially affect the figures in the next five years.

A survey of large companies done by MOSST in 1977 indicated that the smaller the company, the more they wanted government aid. The larger companies wanted climatic changes rather than specific incentives.

This suggests that different solutions may be appropriate for different size companies and we return to this in the next chapter.

CHAPTER IV - Present Incentive Programs

It is appropriate to review the various incentive programs. They fall into the following categories: 1) tax incentives; 2) grant programs; 3) procurement; 4) regulations, including FIRA; 5) moral suasion, i.e., persuading large companies to adopt the global product mandate and other methods of talking to companies to move their R&D up. We will review these briefly in turn.

1) **Tax Incentives**

R&D tax incentives are as follows: 1) a 5-10% tax credit for expenditures made on or after April 1, 1977; 2) a 50% Special Allowance for incremental expenditures made on or after January 1, 1978; 3) a 10-20% tax credit for expenditures made on or after November 17, 1978.

These appear to have had some effect. Figures are only available up to 1978. Comparisons between 1977 and 1978 show that a) the number of claimants has more than quintupled; b) the number of tax credit claims has almost tripled; c) the percentage of total R&D accounted for by the claimants has increased 75.2% from 45.5%; d) the total benefits by way of dollars provided to industry has risen by a factor of almost six times. The total cost to the government in 1978 was estimated to be $34.6 million on a tax expenditure basis.

The Ministry of State for Science and Technology has analyzed the claimants and the study shows that 54% claimed incentives. Of the remainder, 21% did not claim because they had no taxable income, and 10% were unaware of the incentives. So that it appears that the tax credits have created a behavioural change in many firms.

There are indications that Canadian-owned firms are taking greater advantage of the incentives then foreign-owned firms.

and that the companies in the electrical and electronics industries are availing themselves of the incentives to a considerably greater degree than those in other sectors. It would appear that the incentives do have at least some effect on the total dollars spent.

However, it is questionable whether or not, in spite of what many industry spokesmen say, additional tax incentives would result in a major increase in industrial R&D. 80% of the companies that are eligible for tax incentives are claiming them now. Many of these would be large firms with substantial cash flow. It seems doubtful whether additional cash flow would have that much of an effect on stimulating R&D, particularly in the areas of electronics and aerospace which are already very R&D intensive.

2) **R&D Grants**

The main government programs are DIP, IRAP and STEP, as well as the Enterprise Development Program (EDP).

a) EDP

The table on the following page shows the grants broken down by industry group.

RECIPIENTS OF EDP CONTRIBUTIONS FOR INNOVATION PROJECT

	77/78	78/79	79/80	80/81 (6 mos.)
Chemical Based				
Food, Beverage, Tobacco	1.9	2.4	1.8	3.8
Rubber & Plastic	-	0.7	34.7	1.4
Textiles	2.3	0.1	0.2	0.2
Petroleum Products	-	-	0.2	-
Pharmaceuticals	0.3	-	2.2	0.4
Other Chemicals	0.4	3.0	3.8	2.9
Wood Based				
Pulp and Paper	-	-	-	0.6
Other Wood	-	0.9	0.4	0.4
Machinery & Transportation Equipment				
Machinery	14.7	30.7	18.4	10.7
Aircraft Parts	-	-	1.7	-
Other Transportation Equipment	5.8	3.5	5.0	55.2
Electrical				
Electrical Products	57.5	27.2	24.9	13.9
Scientific Instruments	6.6	7.4	1.4	3.9
Metal Based				
Primary Metals	1.2	2.7	2.1	-
Metals Fabricating	5.7	2.6	1.9	2.3
Metal Products	.7	1.6	.2	0.8
Other Manufacturing	2.1	4.3	0.7	0.7
Non Manufacturing	0.7	12.8	0.3	0.2
	100.0 ($16.4M)	100.0 ($37.3M)	100.0 ($58.1M)	100.0 ($53.1M)

In addition, there was a Special Electronics Fund which put out $21 million in 1979/80. In all, over the years, EDP has put out approximately $164.8 million. Internal analysis indicates that these amounts seem to be well spent with good leverage.

b) DIP

DIP has put out also a considerable amount of money over the years. In 1981-82, it will amount to $111.6 million (a further $63.0 million has been asked for). Most of these have been in major projects with Canadair, de Havilland, CAE, MacDonald-Douglas and Canadian Marconi. DIP appears to be very efficient in terms of leverage, but most of its projects can be specifically directed to defence where markets are assured.

c) IRAP, etc.

IRAP appears to have good leverage and puts out about $22 million per annum. NTEP has a budget of $9 million for 1981-82.

In total, all these NRC projects put out relatively small amounts of money. Other grant programs (with budgets in brackets) include TIS ($3.4M), SESP ($.8M), PILP ($9M) and COPI ($2M).

3) Government Procurement

Government procurement has been rising in an R&D sense. The Science Centre of DSS has awarded contracts rising from $10M worth in 1971/72 to $170M worth by 1980/81. It is evident that this has been an important trend, but there is much yet to be done. The Ontario government has set up a special procurement office since it is quite clear that many quasi-government bodies still are not as organized about their procurement activities as that of DSS. This activity is analyzed further later.

4) Regulation

The main regulatory approach has been FIRA. Quantifiable commitments to do R&D given to FIRA amount to $130 million over the years.

This is a relatively small amount. There has been little work done in analyzing the regulations, but it is doubtful whether they have had much effect on increasing R&D substantially.

5) Global Product Mandate (GPM)

In a study done for the Ministry, staff has calculated that moving foreign-owned companies to global product mandates could increase R&D by at least $330 million. If large companies moved their R&D up to the percentage level of sales

as their parent, the additional R&D would amount to $840 million. This is obviously an important trend. Recently the Niagara Institute held a work session on GPM with senior officials from MSED and the Ontario government, based on Westinghouse's experience. Participants (see Appendix 2) felt that this initiative could be followed up by other companies.

We will return to the subject of moral suasion in our recommendation section. Ministers in both the federal and provincial governments have been making speeches on the subject and this no doubt has its effect in setting the climate.

Provincial Efforts

Partially as a result of climatic changes and also as a result of MOSST encouragement, provincial efforts are in the process of showing a marked shift in favour of R&D. Up to now, in real dollar terms, provincial expenditures have not been significant in contrast to the federal government.

Summary

The chart below summarizes the impact of current federal activities. Total annual expenditures are running at about

$440 million, including $170 million for R&D-oriented procurement.

FEDERAL COSTS OF R&D SUPPORT
$ Millions

Tax expenditures	S 34.6	(1978)
EDP	61.1	(1981-81)
Special Electronics Fund	14.4	(1981-82)
DIP	111.6	(1981-82)
Government Procurement	170*	
IRAP	22	
NTEP	9	
TIS	3.4	
SESP	.8	
PILP	9.0	
COPI	2.0	

* (Science Centre contracts only)

CHAPTER V - What should be done?

As we have demonstrated in this paper, R&D is still not adequate in spite of all these incentives. It doesn't seem to have responded in any rewarding way, except in certain very selected industries, such as the computer based business machinery, electronics and the aerospace industries. Otherwise the projections are flat. This is in spite of an increased cash flow and an improved corporate position as we have reviewed in Chapter 3 and in spite of the tax incentives as reviewed in Chapter 5.

While it is now my intention to review the different means of increasing R&D, it should be pointed out that there are some arguments for sitting tight. There is a certain follow-the-leader effect in R&D and it could be argued that corporate cash flow is still not adequate. While it may be adequate on a secular basis as we have pointed out in Chapter 2, the state of the current business cycle will no doubt be putting downward pressure on those companies whose long-term thinking is oriented towards R&D. 1980 has been a difficult year and 1981 certainly doesn't look to be any Garden of Eden! Under these circumstances, caution would be the watchword in many corporations, yet a recent survey by the Financial Post suggests that there may be some upward movement in at least some of the industries which normally do R&D and one can take some comfort in this.

On the other hand, in spite of some recent improvements, the outlook for increasing R&D remains rather dismal. It would appear that more effort needs to be done to move the figures in the way that the government would like to see.

In considering an action program to stimulate R&D, the government is, in fact, dealing with the guts of industrial development policy. In effect, industries of any country may be divided at any one time into three main categories: -

a) declining industries or industries needing adjustment assistance. Examples include textiles, footwear, automotive and Massey-Ferguson.

b) sustaining industries, needing no particular government action. Examples include the food, beverages, tobacco and printing industries.

c) industries of the future, needing assistance and stimulation to meet the future.

Too much of the federal government's time has been devoted to the first of these. By focussing on the third set of industries, the Ministry of State for Science and Technology has an opportunity to be at the cutting edge of Canada's industrial policy and to exercise leadership where it is surely lacking.

Before turning to specific recommendations, it is appropriate to look at the sectors of the economy where R&D is now thriving to see whether it is possible to ascertain why this is so. There is certainly a change from four years ago, where there was no particular sector of the economy

heavily into R&D. Now the electronics, business machine and aerospace sectors are growing rapidly, and investing heavily in R&D.

One important thing to remember is that, by and large, R&D is not created in a vacuum. It usually arises out of a market need, either real or perceived; thus, it may be important to stimulate demand or direct demand rather than try to stimulate it by other incentives. A tax incentive is really a push-out, whereas procurement, as an example, has a pull-through effect.

When one looks at the business machines, electronics and aerospace industries, one can see tremendous shifts of markets. One perceives companies like Canadair seeing a niche in the general aviation market and seeking out a product to fit it. Similarly, Mitel saw opportunities for its products. It is significant that many of the companies in these particular industries are heavily export-oriented. I do not think that this is a coincidence, and yet many of the companies, particularly in the electronics area, have benefited by strong support from government in their early days, either by way of government purchasing contracts or grants or other kinds of support. But the successful companies, who are continuing to devote a lot of time to R&D, definitely have a strong export orientation.

It is important to remember that the creation of markets is a key factor because I will turn later on to some psychological measures to stimulate R&D and, while these may have some effect, ultimately a market must be created for the products of the R&D process. Canadians are poor marketers however, and therefore it may be appropriate to embark on some push-out measures, rather than pull-through measures.

In looking at the industries where R&D is going on, I would say that the following are the mechanisms:

1) Market pull, both through government procurement and exports,

2) "copycatism". There are industries where, in the U.S. and other parts of the world, there is a strong R&D element. Therefore, there are general industry habits of mind in that respect;

3) strong moral support by government;

4) tax incentives;

5) grants.

Rather than examining individually the different forms of leverage and their strengths and weaknesses, I propose to look at the problem in terms of size of company, in terms of ownership and in terms of sector.

The incentive schemes can be described by way of a matrix such as is in Appendix 3. In the following discussion, we will divide policies on the basis of size of company.

Large Companies

Seventy percent of the R&D is done by the larger companies. It is quite evident that, if the government wishes the dollar amount put into R&D to be increased in the near term, then they must look to the large companies to do it. Appendix 4 contains a list of the larger companies in Canada divided by sector together with their R&D spending insofar as it can be obtained. The Ministry does not still have sufficient information on individual companies, but looking at the sparse information that is available, it would appear that there is room for improvement in several companies. It is my recommendation that the government focus specifically on large companies in certain industries to bring about changes in corporate behaviour. Under these circumstances, increases in generalized tax measures are not appropriate.

However, there is a widespread mythology that more tax incentives will improve the situation. An analysis done by the Ministry staff at my request is included as Appendix 5 to the report. It indicates that, contrary to much of what is said, current tax incentives are equal to, or better than, both the pre-IRDIA tax schemes and IRDIA itself, for the larger corporation. Current tax breaks are not as good as IRDIA for the corporation which is taxed at less than the full rate and it is evident that other solutions should be found for these companies, such as an expansion of the grant program for specific sectors as described below.

Since there is widespread misapprehension about the effects of tax breaks, we believe that the Ministry should publicize the work in Appendix 5.

Another reason for being unenthusiastic about general tax measures is that, compared to other countries, Canada's tax breaks for R&D are among the most generous in the world.

While economic textbooks do not deal with it very much, within corporations who are running at a good profit, the Maslow effect takes place, and the senior corporate executives look for satisfactions other than the bottom line in their corporation. Accordingly, they can be induced to change the behaviour of their corporation by way of

psychological incentives as much as economic incentives such as tax measures. There is no question in my mind that the corporate atmosphere is a very important part of this whole problem. In 1976, it was depressed and while in 1981 the economy seems to the economists more depressed than it did at that time, businessmen are not as "down" as one might expect. Accordingly, one can use psychological devices to reinforce corporate behaviour. Speeches by the Minister are certainly a factor and, if the Prime Minister and other members of Cabinet put importance on R&D in their speeches, it will have an effect on the total dollar amount.

More than that, with large corporations, it is possible to effect behaviour more directly. We would think that the following moral suasive devices could be used to induce changes in Canadian corporate behaviour:

1) In certain specific sectors to be discussed further, stimulate the concept of the global product mandate. This has been very successfully achieved by CIL, Black & Decker, and Westinghouse among others. A recent meeting sponsored by the Niagara Institute was held with senior government officials and executives of CIL and Westinghouse companies at Niagara on the

Lake (see details in Appendix 2). We recommend that the Ministry of State for Science and Technology pick up the lead of the Niagara Institute and put Search Conferences together which would include those companies who have successfully moved to a global product mandate together with those who are thinking about it or who the Ministry thinks should be thinking about it. This would appear to be the most effective way of changing corporate behaviour. A list of such corporations would arise from the sector discussions later in this chapter.

2) Appendix 4 consists of a list of the larger corporations in Canada broken down by industry groups. That list includes the R&D budgets for the companies, where known. Much of the material comes from a Financial Post survey which was published in November of 1980. Other information was gathered from annual reports and other sources. It will be seen that the list is largely incomplete. We believe that this list should be completed and published each

year. We would suggest that the Minister of State for Science and Technology should write to all the companies on the list, enclosing a copy of the sector breakdown, and saying that he would appreciate if the companies would cooperate and furnish the appropriate number so that comparisons could be made of R&D spending on a company-by-company basis within each sector.

3) Following this, it is my view that the Minister should announce an award for

(a) the highest dollar amount of research within each sector;

(b) an award to the company with the greatest percentage increase in each sector.

There would be an annual R&D dinner and a presentation should be made by the Minister or the Prime Minister to the leading companies in research and possibly to leading scientists who have further enhanced Canadian technology.

Recognition is a very important psychological factor in our society, too often ignored by government in motivating behaviour change in the corporate sector. It is my belief that substantial benefits could be gained by the kind of process described above. If insufficient information is obtainable on a voluntary basis, the Ministry should consider legislation to make disclosure compulsory. However we do not believe that this will be necessary.

4) In examining the subject of R&D, I was struck by the marked differences between analysts' reports from Bay Street and those analysts' reports from Wall Street in covering those companies where R&D is a factor. Almost invariably the Wall Street analysts will give great prominence to the amount of individual company spending on R&D. He will question the president or other corporate officers about it and it will be an important part of his report. This subject is virtually ignored in Bay Street analysts' reports on R&D oriented

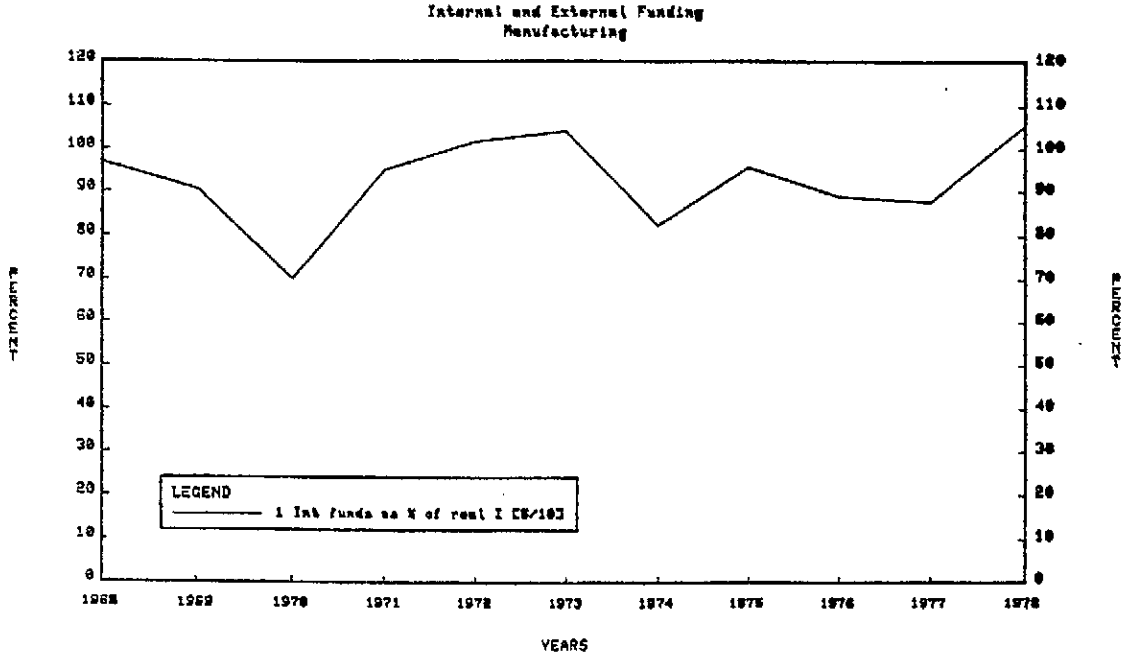
companies. These analysts' reports are widely read and do have an effect on corporate behaviour. In addition the 10-K report submitted annually to the SEC normally shows the amount spent on R&D. Accordingly, I would suggest that the Minister of State give a half-day seminar in Toronto for the Canadian Society of Financial Analysts. It would feature the importance of R&D and productivity and focus the analysts' attention on this aspect of corporate life. I would suspect that we would see considerable amount of attention moving to the R&D sector. This may assist those corporations who do R&D to raise money since it may have an upward effect on their stock.

While the above recommendations are not the normal kind of leverage recommendations, it is well known by analysts of organizational behaviour that psychological devices have an enormous effect on corporate behaviour. Therefore we think that these kinds of devices are too important to ignore in our overall battery of recommendations.

The breakdown by sector of large corporations in Appendix 4 is a useful analytical instrument to focus on appropriate devices to affect corporate behaviour. As we have said earlier, we do not believe that further generalized tax benefits are the answer. A sector-by-sector analysis assists not only looking at the make-up of the industry, but it helps to devise policies to increase R&D appropriate to the sector and to the profile of the sector by corporation, size, and by ownership. Accordingly, we will now move to a sector-by-sector analysis with specific recommendations for either further study or for specific action.

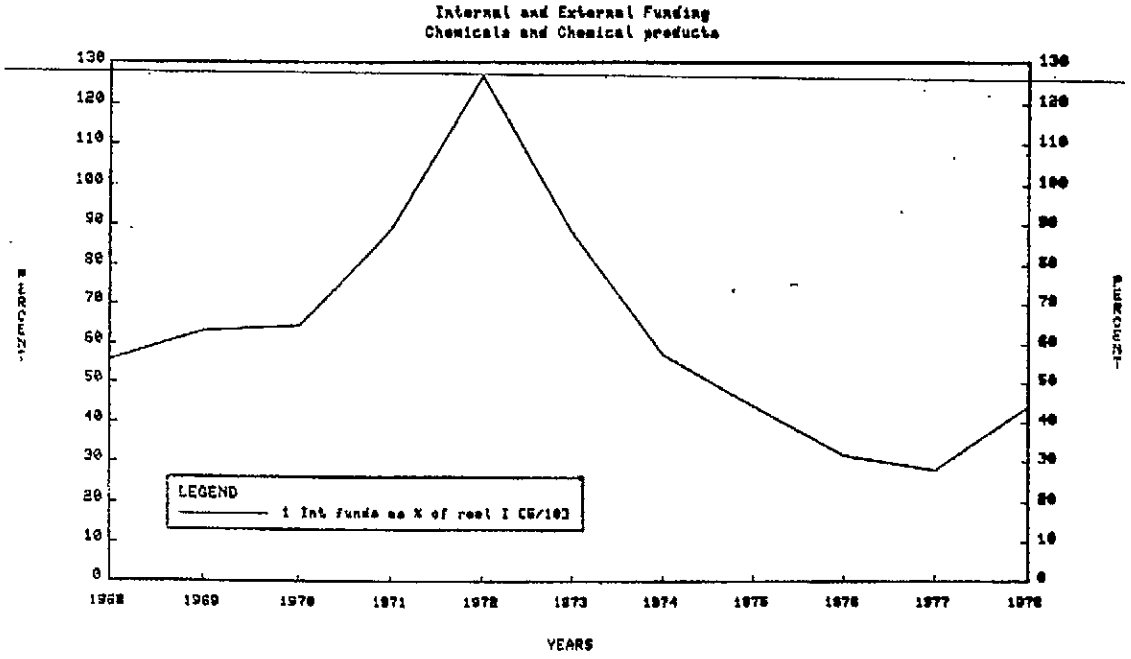
Before doing so, however, we would like to review a brief analysis that we have carried out of cash flow in two specific areas.

Next is a chart showing internal and external funding of manufacturing as a whole.



SOURCE : Business finance statistics division, Statistics Canada, Unpublished CONFIDENTIAL data.

The next chart shows internal and external funding of the chemical sector.

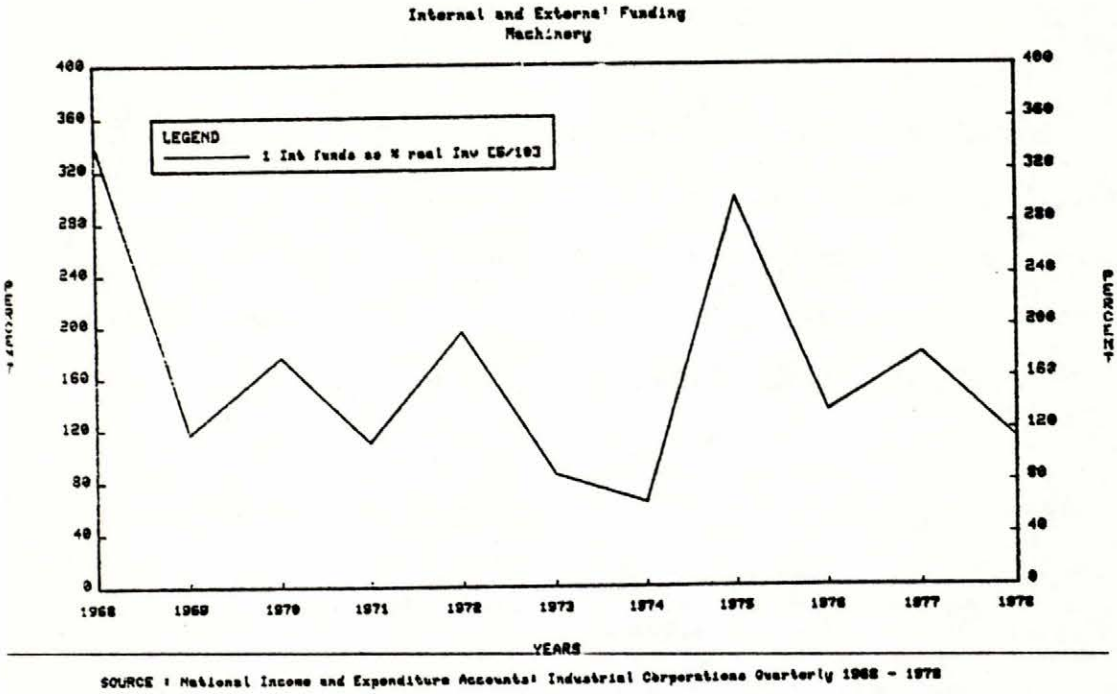


SOURCE : Business finance statistics division, Statistics Canada, Unpublished CONFIDENTIAL data.

A very different picture emerges here since it indicates a substantial shortage of internally generated cash. Since a small number of companies account for such a large part of the sector, it was easy to examine individual annual reports and, when we did so, we found that the difference was accounted for by some substantial projects by a couple of the companies in the sector.

This kind of detailed analysis is important. If one looks at the cash flow of manufacturing as a whole, one would be inclined to say that cash flow is not a problem. A sector analysis of the chemical industry at first glance would suggest that, within the manufacturing sector, the chemical industries do have a problem. Accordingly, a prescription might be to recommend a special tax break for the chemical industry to improve cash flow. However, the further analysis indicated that a small number of companies accounted for most of the problem and, therefore, if any actions were appropriate, it culd be on a company-by-company basis.

The next chart, in contrast, indicates the cash flow of the machinery industry.



SOURCE : National Income and Expenditure Accounts: Industrial Corporations Quarterly 1968 - 1978

It appears to be in good shape, although we know the figures include Massey Ferguson. The question that arises is why is not more R&D going on in the machinery sector when the cash position is so strong? We return to this problem later.

This section suggests the importance of MOSST analysis moving to a sector-by-sector and company-by-company approach rather than on a general basis where the activities have been so far. They should certainly carry on this type of cash-flow analysis in other sectors.

Chemicals

The 11 companies listed in this sector in Appendix 4 account for approximately 50 percent of industry shipments. Accordingly, improvements in R&D in the sector can be negotiated directly with the companies concerned. We would think that many of them could be induced to re-look at the Global Product Mandate through the device of the Niagara Institute conference mentioned earlier. In addition, dealing with these companies is often like negotiating with a nation state and individual discussions may result in changes in incentive systems which are not normally covered under analyses of R&D stimulants. For instance, one chemical company may, in return for small change in tariff regulations or environmental regulations, agree to commit additional dollars to R&D. Accordingly, in this particular sector, we would recommend that the Ministry embark on a pro-active attitude led by the Minister. He could call the group of companies together or discuss the matter with them individually to see whether a Niagara Institute search conference is appropriate for some of them and which ones have to be dealt with directly.

Pulp and Paper

Again, this is an industry dominated by large companies but there are more of them than there are in the chemical industry. It would seem to me that this particular sector could be dealt with by obtaining more information about the current levels of R&D. For instance, two major players Abitibi and Consolidated Bathurst, have not submitted their R&D numbers. If total R&D numbers are available, then the companies can be individually addressed. It would appear from the figures that CIP is under-investing relative to its size and individual negotiations with the company may produce benefits as described in the section under the Chemical industry above. There is probably not much scope here for the global product mandate due to market conditions.

In this sector, the government has made available substantial grants to modernize equipment and on the whole, we are of the view without the benefit of further investigation that the competitive stimulus of publishing R&D information on a company-by-company basis is the best way of handling this particular industry.

Farm Implement Industry

Here again we need information on Case and John Deere, but the companies recording R&D numbers indicate substantial increases. We think that this can be dealt with on a case-by-case basis similar to the chemical and forest industries sectors.

Food and Food Products

We think that this can be dealt generally by obtaining more specific information from companies. I am sure a lot more of them are doing R&D than is shown here and psychological stimulants will probably work better than any other in this particular area.

Pharmaceuticals

We believe that the pharmaceutical industry can be dealt with very similarly to the chemical industry. Here, six companies probably amount to approximately 60 percent of the total shipments. Wanner-Lambert has volunteered to lead a session similar to the Niagara Institute Search conference on the global product mandate. We think that this should be financed if necessary by the Ministry of State for Science and Technology.

Petroleum and Natural Gas

The Ministry should work with the Ministry of Energy, Mines and Resources in this area, but the record looks good and we really think that for the time being, more industry information is the only imperative.

Mining and Metal Working

Here again, we think more information is necessary. The figures that we have show relatively good increases with the exception perhaps of Inco where an individual discussion would be appropriate.

In the metal working area, it seems that we have two contrasts. The major steel companies appear to be prospering, but metal working and fabricating do not appear to be growing rapidly (see also the comments on the machinery industry). We should first of all obtain more information from the companies listed and I would withhold recommendations until more information is obtained. Here, special grants or tax concessions are probably appropriate when a better analysis of the sector's problems is available.

Other Companies

These are mainly holding companies and we should obtain as much information as we can from these through the process described earlier.

Government Utilities

The Ministry may wish to embark on interchanging information with provincial governments about this particular problem and with the Crown corporations concerned.

Printing

This is not an area of industrial policy and more information is needed before any action is taken.

Aerospace

Here, good increases seem to be in prospect. We should complete the lists through the information request procedure outlined earlier. Overall, we are of the view that "takeoff" is being reached in aerospace and that no other government stimulants are necessary at the present time.

Electrical

Here we should obtain more information. By and large, this area has been showing relatively good increases, but it seems that there are still some problems. The Electronics sector is growing rapidly with good R&D, but the electrical area is not showing such growth. Without more information, it is difficult to make recommendations specifically. Again there may be a role for special grants when more is known about the problems of this particular sub-sector.

Office Equipment

Here we need more information, but what is shown indicates very rapid growth in R&D and on the whole, a satisfactory situation. No action necessary at the present time.

Building Products

We suggest information should be obtained before any further recommendations are made.

Household Goods

Here again, more information is needed. It is an important sector since it is an innovative area in the market-place, but we do not know enough about the problems to make any specific recommendations.

Utilities - Publicly Owned

Here again, we believe that more information should be obtained before any recommendations are made.

Automotive and Parts

As can be seen, we have virtually no information on the R&D of this particular sector. We know that the automotive parts industry has difficulties, but their recommendations through their Association do not appeal to us very much. Specific requests have been made of the big three automotive companies to do more R&D in Canada. Some of the automotive parts companies are large and foreign-owned and very few are Canadian-owned. Without further information, it is difficult to make recommendations.

Transportation

Here more information is needed, but on the whole the current situation appears to be satisfactory.

Machinery and Equipment

This is one of the more interesting sectors. It is very different from most of the other sectors outlined above in that there are a very small number of large companies. A list of these is attached in Appendix 6 together with a note on the industry. Basically, the machinery and equipment business and metal fabricating business with which it is intertwined, consist of a very large number of smaller companies and we think that this is of such importance that it should be dealt with specially and researched specially. It may be appropriate to invite the 400 largest companies in the business to an R&D conference, but we need to know more about the industry.

There is some scope for global profit mandating in this area and the largest companies concerned have experimented with it. The Ministry of State for Science and Technology should look closely at the relationship between the MACH Program versus the global product mandate. If the objective

is to increase global product mandating then in fact a duty remission program is better than MACH.

By and large, the comments in the following section about medium-sized companies apply very much to this particular sector. One suggestion that has come up and which might be considered is to work on market demand in this particular area, i.e., to give an incentive to those companies who buy a Canadian-made machine. Added to this could be an additional incentive for those companies who buy from a Canadian-owned company. This is a matter that could be further studied by the Ministry. It would have the effect of creating a market demand so that some consolidation effect might take place in the industry which consists of a lot of medium-sized companies.

In all the discussions with the companies, effort should be made to find out the barriers to research. What is actually preventing companies from doing more? This question does not seem to be asked often enough. It may be an appropriate thing to do a survey of the middle-sized companies in this respect, or of the smaller companies which cannot be talked to directly by the Ministry of State for Science and Technology.

Medium-sized Companies

Psychological stimulants may have their effect on large companies, but they will not have nearly the same effect on medium-sized companies in the Canadian economy. In the medium to longer term, these could be the most important sources of growth of innovation in the Canadian economy. Some of these are the companies that have grown through the early innovative stage and are now in a position to market their results of their R&D (see Appendix 7).

Medium-sized companies are divided into two categories. There are a large number of foreign-owned medium-sized companies in Canada. These are the traditional truncated branch plants and many of these will be too small to respond to such things as the global product mandate. Tax incentives will have little or no effect on them and they really can only be got at by FIRA rules. I do not hold up much hope of changing the behaviour of these particular establishments. They are branch plants serving a market and the product development largely goes on outside the country. The Canadian market is too small for them to develop any real clout of their own and the Canadian market is not such as to excite the parent company into altering its behaviour. We have not been able to come up with any kind of device to change things very much in this particular area.

Medium-sized Canadian-owned companies are an entirely different problem and the major problem is there are far too few of them. A study recently completed by Sharwood and Company for the Ministry of Industry and Tourism of Ontario indicates that there are only approximately 156 private Canadian-owned manufacturing companies in Ontario with sales of over $20 million. This indicates what a very small corporate middle class we have in this country.

It is my view that, because of the small numbers, major programs are really not appropriate and R&D policy is better improved by working on an individual basis with the companies concerned. Ontario is of course the heartland of manufacturing. Following is an estimated breakdown of the size of company in Ontario by major industry category.

Ontario privately owned manufacturers of over 50 employees

Sales $Million	Estimated Number
over 20	156
10 - 20	245
5 - 10	397
2 - 5	607
	1395

The 156 can be broken down roughly as follows:

10 Printing

20 Food, beverage and tobacco

18 Textile and clothing

27 Wood, furniture and Paper Products

10 Automotive

70 All other

It will be seen that there are not many companies in the categories which might interest the government in terms of R&D. Given that, say, 40 percent of manufacturing is in Ontario and that the above numbers might represent 40 percent of the total number of companies in Canada, it will be seen that direct contact with these companies is not a difficult task.

While this might be a generalization, it is largely the case that companies in the manufacturing sector with sales of under $10 million are largely one-man operations with "help". They are barely on the edge of being able to do R&D unless they are in a particular industry where this is important. They very rarely can afford to export. It may be that the threshold of $10 is a bit too high and one could probably drop it to $5-$6 million in sales, but below some figure in that area the companies are still rather embryonic and

struggling and will find it difficult to respond to very large amounts of R&D initiatives coming from the government.

However, it is in this general area where grant programs such as IRAP and the Enterprise Development Board come in, but I think the emphasis could be shifted somewhat. With the assistance of the provincial Ministries of Industry and Tourism, together with Industry, Trade and Commerce, it should not be difficult to select those Canadian-owned companies where something could be done by way of direct funding. Studies done by the Ministry of State for Science and Technology indicates that innovation responds directly to government funding. The problem is to find the appropriate "winners" to fund. The numbers shown above indicate that these should not be too difficult to find. This approach should help to overcome the traditional complaint of the medium-sized company about the bureaucracy and paperwork involved in seeking federal government grants.

Venture Capital and Small Companies

The final area of leverage we should examine contains the future investment opportunities of the 1990's, i.e., small innovative companies which are the cutting edge of societal changes. It is vital that these new companies continue to be born and that the driving ambition of inventors be sustained.

The major problem in this respect is the supply of venture capitalists who understand the high tech business, as it is coming to be called. We have had a shortage of venture capitalists for some years, but it appears recently that there are more available.

In order to assist analysis of this particular sector of the economy, Appendix 7 describes the anatomy of the growth of a small firm to a large medium-sized firm with both the management problems and financing problems described. Let us start at the beginning. First of all, in terms of supply, I believe that never before has there been so much supply of venture capital available in the Canadian economy (see Appendix 8). Many of the traditional companies are starting in business again that have been dormant for a number of years and some of the traditional venture capitalists like George Fells of S.B. Capital have obtained new sources of funding which are oriented towards high technology. The presence of Inco in Fell's fund will assist the analysis of high tech businesses. In addition, the Canada Development Corporation, through CDC Ventures Inc., is doubling the number of venture capital funds that they are funding, starting with Merchant Bancorp. Others are in the wings.

It is often the case that successful entrepreneurs will put some of their money into funding new enterprises of a new

generation of entrepreneurs. Once this happens, a self-generating process is at work. It seems to us that this has now happened in the electronics and office equipment area through Michael Cowpland's Bitech. When the supply of capital becomes easy to obtain, executives will split away from some of the older companies and more mature companies to start out on their own. This has been happening in the oil and drilling business out West and we think it is beginning to happen in the computer-based office equipment business. If so, this will be a very favourable turn of events and we should strive to achieve this in other important innovative areas of the economy.

The following are ways in which the Ministry of State for Science and Technology could assist this process:

1) Continue to examine the Wood-Gundy proposal or Midland Doherty proposal for the "promotion of capital for Canadian innovation", i.e. tax shelter provisions for R&D. In this respect an examination of the scope of the provisions of S. 174 of the U.S. Income Tax Act is appropriate. Appendix 9 includes an analysis of a U.S. Income Tax break for "start ups" which could be examined.

2) examine ways in which large companies could be encouraged by some tax incentive to invest in small start-up companies;

3) encourage the FBDB to become a merchant bank in acting more as a packager of equity capital for small companies. In fact the "road show" on R&D which might be put on for FIRA officials and the Society of Financial Analysts might be given to the FBDB Officials across the country.

Having discussed the situation by size and section, we will turn to various general measures which might assist the situation.

1) <u>Measures to Improve Corporate Cash Flow</u>

In Chapter 2 we pointed that manufacturing industry cash flow is still suffering as a result of higher levels of taxation than in other sectors of the economy. Continued inflation places a strain on inventory acummulation and on capital expenditures. It may be that the Ministry should consider recommending tax measures which would improve cash flow in the particular

industries which interest them rather than general measures. As mentioned earlier, the major deficiency in the 3% inventory tax credit in terms of cash flow is that it benefits the retailers far more than the manufacturers. Perhaps an increased inventory tax credit would be beneficial in the chemical industry and in the pharmaceutical industry and perhaps these could be legislated for Canadian-owned companies only similar to the provisions in the National Energy Policy.

2) **Tax Incentives**

The current tax incentives are quite generous. Appendix 5 contains an example of what happens under the total scheme and how beneficial it is to a company that is wholly taxable. The table also compares what might have happened under IRDIA or under the former tax program which was ceased in 1962. It will be seen that there is not a great deal of difference. It would appear, therefore, that a generalized tax credit on a wider basis than the present would not seem to be

extraordinarily beneficial and would probably account for diminishing returns, particularly since preliminary research indicate that there are still a number of major companies who are at low tax rates and cannot take full advantage of the tax incentives. It is unfortunate that the analysis of utilization of tax incentives is not broken down by size of company.

3) Grants

The Enterprise Development Board and other grant methods seem to be appropriate for specific projects in specific industries and they should be increased and perhaps enhanced. Other research indicates that there is a relatively small number of medium-sized Canadian-owned companies and also a relatively small number of industries where grants can easily be made, along the lines of the Office Equipment Grant program and the Special Electronics Fund. It is a selective kind of granting that is appropriate. We know that NRC and the Ontario government are now looking hard at the small number of firms in the

biotechnical industries. It would seem to us that the way ahead is to pick out the small number of firms involved and to go after them with specific grants.

4. Procurement

As we have mentioned earlier, market demand is an important factor and, while governments have various special procedures, such as R&D-oriented contracting-out, they can also be quite innovative in supporting new and growing companies in their ordinary purchasing procedures. The Ontario government has perceived this and has set up an Office of Procurement Policy which is going to take vigorous action to promote Canadian ownership and innovation in government purchasing in the province both directly and through quasi-government operations such as hospitals and municipalities and utilities. We expect this to have a fundamental effect on purchasing policies in Ontario. We believe that the Ministry of State for Science and Technology could be much more vigorous than

they have been in encouraging the federal government to do this both directly and through its Crown agencies. For instance, the use by PetroCan of an American agency for their corporate image is a blatant example of something that went fundamentally wrong in this respect and there are a number of other examples.

Further, the Ministry of State could encourage other provinces to emulate the province of Ontario in taking a vigorous approach to the purchasing policies of their agencies.

One of the reasons for the growth of the office equipment area is that the government is a large buyer of office equipment. It is not such a large buyer of ordinary machinery, except in the utilities area and Crown corporations and this is an area that could be tackled more directly. Also, the area of hospitals and educational requirements is also an area where not enough has been done. We also know that the CBC is notoriously foreign-sourced in

its buying and that this is a constant source of complaint to people in the electrical industry. Why should this be allowed to go on?

Regulation

The most important regulator in respect of R&D is FIRA. The Ministry is attempting to come to grips with FIRA, but we suggest that it might be useful to hold a one-day briefing of the FIRA officials on the subject of R&D, particularly with an analysis of the sector breakdown as outlined in the early part of this chapter, to bring them up to date on the latest developments in various parts of the economy in R&D. This raising of their consciousness will no doubt have an effect on the way they administer the regulations.

Other regulatory effects of government do have an effect on R&D, but they are so indirect that we have not spent a good deal of time examining this area.

Conclusion

In this chapter, we have described a number of ways in which the Ministry of State for Science and Technology can stimulate R&D in Canada. Many of them are not the

traditional ways, but we have sought around for the more unconventional ways as well as the more effective ways. There is no question that, without strong government support, the R&D effort will de diminished. Many of the grant programs, such as DIP, and IRAP are under-funded and the Ministry should add its weight to those requesting proportionately more funds to be granted to these particular R&D stimulating areas. Grants have their place. To pass over them as lightly as we have in this particular chapter is not to downgrade their importance. We have sought out more unconventional methods because unconventional ways are necessary to sharply increase the proportion of funds flows directed at R&D in the economy.

However, as we have said earlier, this shortage of R&D provides an extraordinary opportunity to the Ministry of State for Science and Technology. Its initiatives along the lines outlined in this report could form the basis of a new foundation for the industrial strategy for Canada. At the moment, such strategy appears to be stalled at dead centre and the Minister, by implementing the recommendations in this report, could begin to move Canada forward into the 1990's and into the next century.

APPENDIX I

DESCRIPTION OF SCENARIOS

ASSUMPTIONS AND CONSEQUENCES

	(1) ECONOMIC	(2) DEMOGRAPHIC	(3) GOV'T ACTION	(4) ENERGY	(5) TRUCK SUPPLY	(6) RAIL SUPPLY	(7) INTERMODAL	(8) PRIVATE TRUCK	(9) SHIPPER
Scenario I Base Case	Moderate growth economy - 3.5% to 4.0% p.a. on average. Exports at same relative levels as 1976. Exports of fuel to decline; imports to triple; grain exports remain constant.	Population to increase 1.0% per annum. Average pop. age to increase throughout period. Participation rates at current levels. Prairies, B.C. and Ontario to grow most--Quebec and Maritimes least.	Standard wt. & size limits at Ontario levels. Continued federal action consistent with recent policy statements.	World Price of oil to double in 1976$ by 2000. Canadian price at world level in '87 Large investment in heavy oil and electrical, some supply interruptions 1980-1985.	Numerous Minor technical improvements in fuel efficiency (35% by 2000). Labour skills need upgrading. Internal funding for freight consolidation terminals.	Labour productivity improvement fall to 1% p.a. by 1985. Net capacity increased by improved technology.	Increased investment in Intermodal terminals. Short TOFC trains will improve service.	Cost increases and fuel shortages hurt independent truckers and small private fleets. High cost of new equipment reduces number of independent & small fleets.	Service demands will increase because of distribution cost increases. High transport costs will change emphasis from service to cost by 1990.
Scenario 2 High Truck Profile (Differences from 1)	Increased exports of manufactured goods. Fuel import growth reduced after 1985.	Change in part. to have more women in workforce. Prairie population to grow more rapidly. Quebec to grow slower.	Increased size and weight limits in all provinces. Yellowhead Highway financed by Federal govt. Statutory grain rates phased out after 1985.	World price to remain constant in 1976$. Canadian price subsidized at current differential. Increased investment in expl. heavy oil plants and pipelines. No supply problems.	Freight funding consolidation terminals provided by municipal government fuel efficiency increased. Labour rates held down through training of female drivers.	Labour prod. falls to 1% by 1980 and 0% by 1985. Service for grain improved, but L.C.L. service falls. No electrification. Capacity problems by 1990.	Reduced service due to rail congestion. Capital not available for extensive terminal develop-	Labour costs rise due to unionization. Increases in equipment costs offset by low fuel prices.	Frequency of Service and speed become more important due to capital costs of holding inventory.
Scenario 3 High Rail Profile (Differences from 1)	Increased exports of grain. Increased export of resources Exports of fuel reduced after 1987. Imports grow quickly after 1985.	More growth in large urban areas.	Reduced highway investment. Increased licensing fees for trucks. Federal funding of rail electrification. Grain handling system improved by 1980. Rationing of fuel-rail priority.	World Price to increase by 230% by 2000. Canadian price at par by 1982. Decreased investment level in 1980-1990.	Capital costs slow new tech. Improvements. No extensive investment in freight consolidation. Productivity improves at slower rate. P & D fleets become electrified.	Government support for system improvements and equipment replacement. Productivity improved by unit trains and electrification. No capacity problems encountered.	Increase investment by 1985 in intermodal terminals. Increased concentration in ownership of trucking leads to more TOFC movements.	Owner operators and small fleets are hit hard by fuel shortages. Private fleets are used only for short haul and P&D operations.	Emphasis on cost of transportation away from service factors in mode choice.

Explanatory Note: Scenario I (Economic) describes what would happen if current policies were continued. Scenario II indicates the results of a policy placing a high priority on manufacturing goods and Scenario III shows some of what happens when development policies are resource oriented. The following page indicates that some differences result in unemployment, inflation and real disposable income from following each of the different policies.

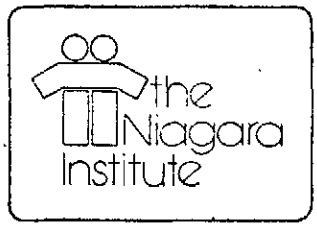
APPENDIX I (cont'd.)

Critical Macroeconomic Assumptions

(average annual percentage change)

	1980 - 1985	1985 - 1990
Gross National Product		
-Scenario 1	4.5	3.8
-Scenario 2	4.9	3.9
-Scenario 3	4.4	3.7
GNP Price Index		
-Scenario 1	6.7	6.1
-Scenario 2	8.2	10.3
-Scenario 3	7.6	6.9
Exports of Goods and Services		
-Scenario 1	3.7	3.6
-Scenario 2	4.2	3.8
-Scenario 3	3.8	3.6
Real Personal Disposable Income Per Capita		
-Scenario 1	2.2	2.1
-Scenario 2	3.2	2.7
-Scenario 3	2.1	1.7
Unemployment Rate (average level)		
-Scenario 1	7.2	5.1
-Scenario 2	6.5	4.2
-Scenario 3	7.4	5.5

Source: R.N. Wolff and C. Kuczer, o.p. p. 181



Search Conference:

Canada and the Multinational Corporation

October 5–7, 1980
Randwood, Niagara-on-the-Lake

Box 1041, Niagara on the Lake, Ontario, Canada, LOS 1JO (416) 468-2151
Toronto Callers Use 368-7973

SEARCH CONFERENCE

Canada and the Multinational Corporation

PURPOSE:

To examine the relationships between multinational corporations and their Canadian subsidiaries and to consider the relationships of multinationals with governments within Canada.

RATIONALE:

The company whose working relationship with its subsidiary takes into full account the social, political and economic environment and aspirations of the subsidiary's host country will improve both the performance of the subsidiary and be of significant benefit to the host country.

GUIDE TO DISCUSSION SESSIONS

(Note: The topic headings are suggestive.)

SESSION I

The objective is to come up with a collective picture of the external environment in which major multi-national corporations, such as Westinghouse, will be operating in the future within the context of the U.S./Canada relationship.

The basic question to be answered goes as follows: What are the key trends, issues, constraining or driving forces, over which we, the participants, have no control, which may or could effect the operations of major multi-nationals such as Westinghouse over the next 5, 10 or 20 years?

Key trends, issues, etc. might come under such topic headings as:

1) Economic
2) Political
3) Demographic
4) Nationalism
5) Technology and communication
6) Capital formation and needs
7) Energy and natural resources
8) Ecology and environmental protection
9) Work, the work ethic, attitudes of people towards work, authority and large organizations
10) Changing values, attitudes, beliefs
11) The geopolitical roles of the U.S. and Canada
12) Collectivism/interdependence vs. individualism/independence
13) The relationship between work, leisure and education
14) Trends in housing and transportation in relation to urban, suburban and rural living
15) Changing patterns of family structure, size and relationships
16) Women and careers

Each of the topics will need to be examined for evidence of differences between the U.S. and Canada.

SESSION II

The objective is to come up with a collective picture of the realities of the relationship between parent corporation and wholly-owned Canadian subsidiary.

The basic question to be answered goes as follows: What are the key trends and issues at work in terms of this relationship looked at from both sides? What are the constraining or driving forces at work now? What can we predict will happen if management makes no changes?

The purpose of this session is to map out the capabilities and the realities of the present relationship and situation so that we can match these capabilities and potential with the challenges, constraints and opportunities of the external environment, already discussed and prioritised in Session I.

Topic headings could include the following:

1) "Made in Canada" or "Independent Canada" issues, such as decision-making, product lines, R & D marketing, limitation, financing, dividends, re-investment, etc.
2) The subsidiary's Board of Directors - role, function, independence
3) Parent management's perception of subsidiary
4) Subsidiary management's perception of parent
5) Collectivism/interdependence vs individualism/independence
6) Productivity

SESSION III

The objective is for each group to define the most desirable characteristics of the relationship between U.S. parent and Canadian subsidiary within the foreseeable future, say 5-10 years from now. Given the realities of the present situation as we described it in Session II and given the key trends and issues, the constraining and driving forces that we agreed on in Session I, what is the most desirable future for the parent and subsidiary corporations?

SESSION IV

The objective is for the groups to decide on the action steps that can or should be taken by whom and when in order to implement any conclusions that might have been reached in Session III. If no conclusions were reached, Session IV's discussion should determine whether conclusions can or should be reached and what steps will be necessary to achieve such an objective.

the Niagara Institute

SEARCH CONFERENCE

Re: Canada and the Multi-National Corporation

Randwood, Niagara-on-the-Lake
October 5-7, 1980

TENTATIVE AGENDA

SUNDAY, October 5

5:30 p.m.	RECEPTION
6:30 p.m.	DINNER
7:30 p.m.	Introduction, description of seminar objectives, timetable and task for Discussion Session I.
8:30 - 10:00 p.m.	Discussion Groups - Session I.

MONDAY, October 6

8:30 - 10:00 a.m.	Discussion Groups continued.
10:00 - 10:30 a.m.	Coffee Break
10:30 - 12:30 p.m.	Plenary Session - feedback from groups, discussion and identification of key issues. Description of task for Discussion Session II.
12:30 - 2:00 p.m.	LUNCH
2:00 - 4:00 p.m.	Discussion Groups - Session II.
4:00 - 4:15 p.m.	Coffee Break
4:15 - 5:45 p.m.	Plenary Session - feedback from groups, discussion and identification of key issues. Description of task for Discussion Session III.
5:45 p.m.	ADJOURN
7:00 p.m.	DINNER

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TUESDAY, October 6

8:30 - 10:15 a.m.	Discussion Groups - Session III.
10:15 - 10:30 a.m.	Coffee Break
10:30 - 12:15 p.m.	Plenary Session - feedback from groups and discussion. Description of task for Session IV.
12:15 - 1:30 p.m.	LUNCH
1:30 - 2:30 p.m.	Discussion Groups - Session IV.
2:30 - 2:45 p.m.	Coffee Break
2:45 - 4:00 p.m.	Plenary Session - feedback from groups, discussion and conclusions.
4:00 p.m.	ADJOURN

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Associate Consultant, Warwick/Bradshaw Inc.

APPENDIX 3

MATRIX OF R&D LEVERAGE PROGRAMS

	GRANTS	TAX BREAKS	PROCUREMENT	MORAL SUASION
Large Companies				
Canadian Owned	Can be helpful in selective cases	Can be helpful	Not all that helpful except in defense area	Somewhat important
Foreign Owned	Can be helpful in selective cases	Can be helpful		Very important e.g. Global mandate mandate
Medium Companies				
Canadian Owned	Very helpful	Can be helpful	Helpful	Not important - too dispersed
Foreign Owned				
Small Companies	Very helpful	Not important taxable income low!	Very helpful	Not important - too dispersed

R&D EXPENDITURES FOR LARGE CANADIAN COMPANIES BY INDUSTRIAL SECTOR

	R&D Expenditures ($ millions)			Sales ($M)	
	1979	1980	% Change 1980/79	1979	1979 R&D as % Sales
CHEMICALS					
Foreign Owned					
C.I.L. (FP)	17(1)	18(1)			
Dow (FP)	8.4(1)	14.8(1)			
Dupont					
Monsanto					
Union Carbide					
Celanese					
Allied Chemical					
Cyanamid Canada					
Sherwin-Williams					
Canadian Owned					
Polysar					
Reichold Ltd.					

(1) FP - Special Report

(2) Company Annual Report

	R&D Expenditures ($ millions)			Sales ($M)	
	1979	1980	% Change 1980/79	1979	1979 R&D as % Sales
WOOD AND WOOD PRODUCTS					
Foreign Owned					
C.I.P. (FP)	4.0	4.1			
Reed Paper					
Crown Zellerbach					
Scott Paper					
Crestbrook Forest					
Weldwood					
Bowater					
Boise Cascade					
Ontario Paper					
Canadian Owned					
MacMillan Bloedel (FP)	8.2	10.0			
Domtar (FP)	4.3	4.8			
Abitibi					
Consolidated Bathurst					
Great Lakes Paper					
Canadian Cellulose					
MacLaren Power & Paper					
Canadian Forest Products					
B.C. Forest Products					
Whonnock Industries					
Kruger Pulp & Paper					
Rolland Paper					
Lawson & Jones					
Fraser Inc.					
Barbecon					
Donoghue					
Domar Industries					

	R&D Expenditures ($ millions)			Sales ($M)	
	1979	1980	% Change 1980/79	1979	1979 R&D as % Sales
FARM IMPLEMENT					
Foreign Owned					
International Harvester (FP)	3.2	3.4			
Case					
John Deere					
Canadian Owned					
Massey Ferguson (FP)	5.6	6.9			
Versatile-Cornat (FP)	2.0	4.0			

	R&D Expenditures ($ millions)			Sales ($M)	
	1979	1980	% Change 1980/79	1979	1979 R&D as % Sales
FOOD & FOOD PRODUCTS					
Foreign Owned					
General Foods (FP)	4.3	5.2			
Standard Brands					
General Mills					
Quaker Oats					
Procter & Gamble					
Kraft Foods					
Imasco					
Carling O'Keefe					
Rothmans					
Canadian Canners					
Lever Bros.					
Nabisco					
Campbell Soup					
Carnation					
Burns Canada					
Coca-Cola					
Pepsi Cola					
Brooke Bond					
Borden					
Heinz					
Ralston Purina					
Redpath Industries					
Dominion Dairies					

	R&D Expenditures ($ millions)			Sales ($M)	
	1979	1980	% Change 1980/79	1979	1979 R&D as % Sales
FOOD & FOOD PRODUCTS					
Canadian Owned					
Canada Packers (FP)	3.8	4.1			
Geo. Weston (FP)	3.0	3.5			
Burns Foods					
Heritage Corp. (Schneider)					
Gainor-Swift Canadian					
Maple Leaf Mills					
Molsons					
Labatts					
B.C. Sugar					
Horne & Pitfield Foods					
Seagrams					
Silverwood Industries					
National Sea Products					
Canada Malting					
Culinar					
Dover Industries					

	R&D Expenditures ($ millions)			Sales ($M)	
	1979	1980	% Change 1980/79	1979	1979 R&D as % Sales
PHARMACEUTICALS					
Foreign Owned					
Merck Frosst (FP)	4.3	4.9			
Bristol Myers					
Warner Lambert					
Ciba-Geigy					
Eli Lilly					

	R&D Expenditures ($ millions)			Sales ($M)	
	1979	1980	% Change 1980/79	1979	1979 R&D as % Sales
PETROLEUM					
Foreign Owned					
Imperial Oil (FP)	32.7	43.9			
Gulf	30.0	33.0			
Shell (FP)	10.0	13.0			
Syncrude (FP)	4.9	5.8			
Texaco					
Mobil					
Sun					
Petrofina					
Hudson's Bay Oil and Gas					
Chevron					
Asamera Oil					
Canadian Occidental Petroleum					
Amoco					
BP					
Golden Eagle					
Total Petroleum					
Murphy Oil					
Ultramar					
Canadian Owned					
Petro Canada (FP)	5.4	7.2			
Pan Canadian Petroleum					
Dome					
Nova					

	R&D Expenditures ($ millions)			Sales ($M)	
	1979	1980	% Change 1980/79	1979	1979 R&D as % Sales
MINES					
Foreign Owned					
Falconbridge (FP)					
Sherrit Gordon (FP)	4.0	5.5			
QIT Fer & Titane	3.6	5.2			
Hudson's Bay Mining & Smelting					
Rio Algom					
Iron Ore of Canada					
IMM (International Minerals & Metals)					
Asbestos Corp.					
Canadian Owned					
Alcan (FP)	3.3	3.6			
Inco (FP)	16.	16.1			
Noranda Mines (FP)	9.5	11.4			
Eldorado (FP)	2.9	3.1			
Denison Mines					
Copperfield Mining					
Cominco (annual report)	4.3				
Teck					
Hollinger Argus					
Texas Gulf					

	R&D Expenditures ($ millions)			Sales ($M)	
	1979	1980	% Change 1980/79	1979	1979 R&D as % Sales
METALS & METAL FABRICATING					
Foreign Owned					
Canadian Reynolds					
Stanton Pipes/Slater Steel					
Emco					
Indal					
Brown Boveri					
Ingersoll Rand					
Continental Can					
Canadian Owned					
Stelco (FP)	7.	7.7			
Algoma					
Dofasco					
Ivaco					
Sidbec					
Drummond McCall					
Dominion Bridge					
Canron Plastics					
York Russell					
Alcan					
Atco					
Bannister (Pipes)					
Intermetco					
TIW Industries					
Standard Industries					
Combustion Engineering					
Westburne International					

	R&D Expenditures ($ millions)			Sales ($M)	
	1979	1980	% Change 1980/79	1979	1979 R&D as % Sales
OTHER					
Foreign Owned					
Mitsubishi					
Mitsui					
Marubeni					
Kodak					
Canadian Owned					
CDC (FP)	35.5	45.0			
Hiram Walker Resources					
Jannock Corp.					
Brascan					
Federal Industries					
Neonex					
Canadian Corporate Mfg.					
Power Corp.					
BCRIC					
Canadian Liquidair					
Agra Industries					

	R&D Expenditures ($ millions)			Sales ($M)	
	1979	1980	% Change 1980/79	1979	1979 R&D as % Sales
GOVERNMENT UTILITIES					
Canadian Owned					
AECL (FP)	124.8	127.2			
Ontario Hydro (FP)	43.0	46.0			
Hydro Quebec (FP)	27.0	27.0			
CN Rail (FP)	4.5	5.0			
B.C. Hydro (FP)	3.5	4.5			
HSA Reactors (FP)	1.8	4.5			
PRINTING					
Southam					
McLean Hunter					
Thompson Newspaper					
Ronalds Federated					

	R&D Expenditures ($ millions)			Sales ($M)	
	1979	1980	% Change 1980/79	1979	1979 R&D as % Sales
AEROSPACE					
Foreign Owned					
Pratt & Whitney (FP)	47.0	64.0			
Garrett Manufacturers (FP)	4.2	4.7			
McDonnell Douglas Canada					
Hawker Siddeley					
Canadian Owned					
De Havilland	12.6	18.3			
CAE Electronics	12.5	14.0			
Spar Aerospace	4.4	6.0			
Canadair					
Leigh Instruments					

ELECTRICAL	R&D Expenditures ($ millions) 1979	1980	% Change 1980/79	Sales ($M) 1979	1979 R&D as % Sales
Foreign Owned					
CGE (FP)	16.2	16.3			
Cdn. Marconi (FP)	12.0	14.0			
Litton Systems (FP)	5.8	4.3			
Honeywell (FP)	2.0	2.5			
ITT Canada					
Sperry Inc.					
RCA Canada					
Westinghouse					
B.C. Tel					
Ferranti Packard					
Philips Cable					
Federal Pioneer					
GTE-Electric					
GTE-Sylvania					
Anglo Canadian Telephone					
Canadian Owned					
Bell Canada (FP)	183.7	205.3			
Electrohome					
Northern Telecom					

	R&D Expenditures ($ millions)			Sales ($M)	
	1979	1980	% Change 1980/79	1979	1979 R&D as % Sales
OFFICE EQUIPMENT					
Foreign Owned					
Control Data (FP)	18.5	21.5			
NCR (FP)	7.3	10.1			
Xerox (FP)	7.0	8.0			
IBM					
Burroughs					
Pitney Bowes					
3M					
Philipps					
Digital Equipment					
MAI Canada					
AEL Microtel (FP)	6.2	15.3			
Canadian Owned					
Mitel	5.3	11.5			
Comterm					
Systemshouse (FP)	5.3	4.4			
Gandalf (FP)	1.2	2.6			
Moore Corp.					
Digital Equipment					
Systems Dimension					
AES Data					

	R&D Expenditures ($ millions)			Sales ($M)	
	1979	1980	% Change 1980/79	1979	1979 R&D as % Sales
BUILDING PRODUCTS					
Foreign Owned					
Canada Cement					
St. Lawrence Cement					
Canadian Gypsum					
Asbestos Corp.					
Johns Manville					
PPG Industries					
Dresser Industries					
Fiberglass (FP)	4.2	4.8			
Genstar					
Canadian Owned					
Lake Ontario Cement					

	R&D Expenditures ($ millions)			Sales ($M)	
	1979	1980	% Change 1980/79	1979	1979 R&D as % Sales
CONSUMER GOODS					
Foreign Owned					
Black and Decker					
Pilkington Glass					
Canadian Owned					
Cochrane Dunlop					
Consumers Glass					
Canadian Admiral					
Inglis					
Dominion Textiles					
Harding Carpets					

	R&D Expenditures ($ millions)			Sales ($M)	
	1979	1980	% Change 1980/79	1979	1979 R&D as % Sales
UTILITIES					
Canadian Owned					
Trans Canada Pipeline					
West Coast Transmission					
Union Gas					
Norcen					
Calgary Power					
Intercity Gas					
International Pipelines					
Cessco Holdings					

	R&D Expenditures ($ millions)			Sales ($M)	
	1979	1980	% Change 1980/79	1979	1979 R&D as % Sales
AUTOMOTIVE AND PARTS					
Foreign Owned					
General Motors					
Ford					
Chrysler					
American Motors					
Volkswagon					
Toyota					
Volvo Canada					
Michelin Tire					
Uniroyal					
B.F. Goodrich					
Goodyear					
Firestone					
Bendix Automotive					
Budd Canada					
Hayes Dana					
Rockwell					
White Motor					
Kelsey Hayes					
Canadian Owned					
Magna International					

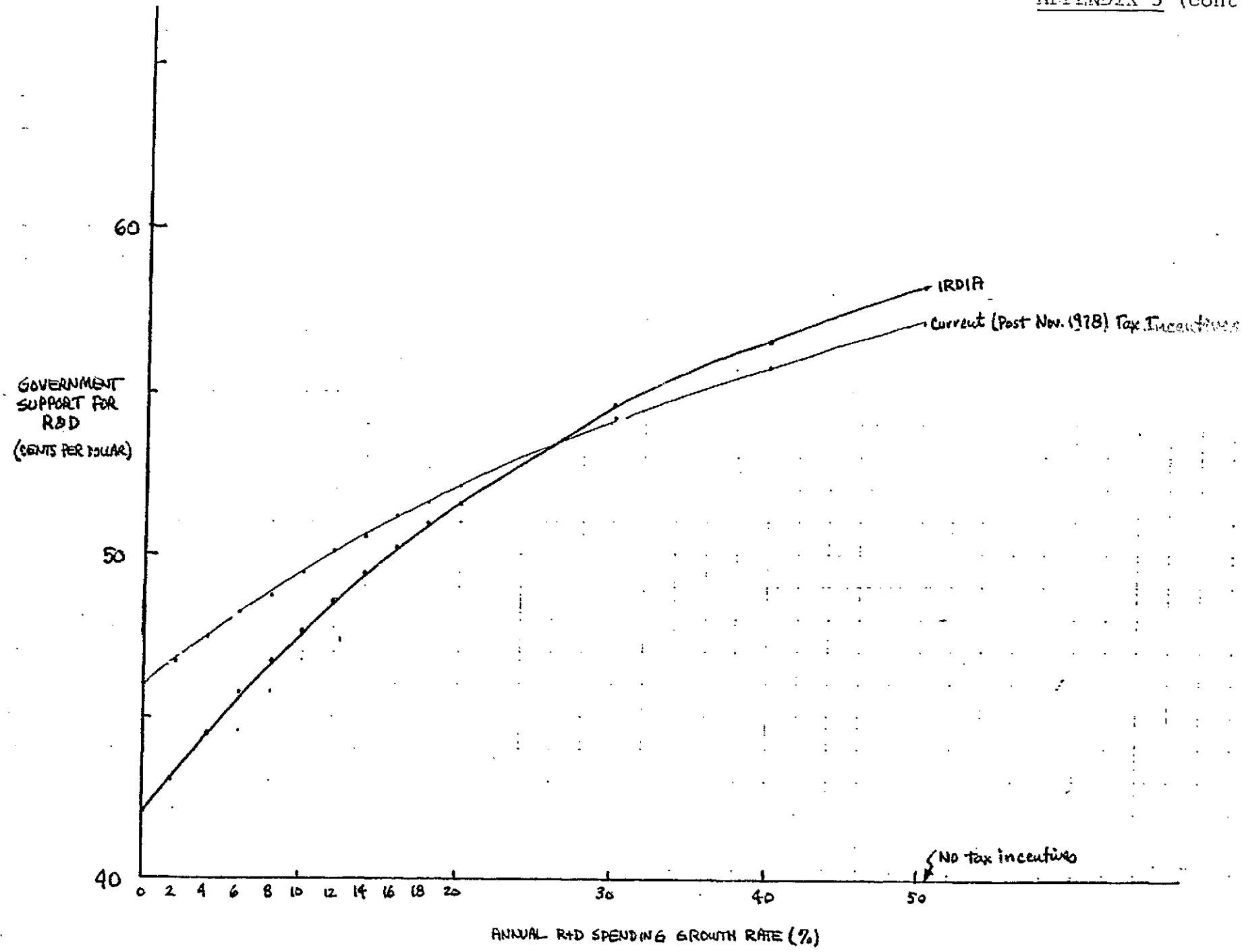
	R&D Expenditures ($ millions)			Sales ($M)	
	1979	1980	% Change 1980/79	1979	1979 R&D as % Sales
TRANSPORTATION					
Canadian Owned					
Bombardier					
Canadian Pacific					
Algoma Central					
Air Canada					

GOVERNMENT SUPPORT FOR COMPANIES' R&D

Assumptions: (1) Company is large, non-Atlantic based, thus eligible for 10% tax credit rate;
(2) Corporate tax rate is 46% (about the national average);
(3) Breakdown of total R&D expenditures is 8.7% capital, 91.3% current (the 1977 national average)

Annual R&D Growth Rate (%)	Government Support of[1] Company's R&D Dollar			Number of years needed under 1962 tax incentive to reach same generosity level as Current Incentives
	With No Incentives (¢)	Under IRDIA (¢)	Under Current Incentives (¢)	
0	40.0	42.1	46.0	
2	40.0	43.4	46.8	21.0
4	40.0	44.6	47.5	12.0
6	40.0	45.8	48.2	9.1
8	40.0	46.8	48.8	7.5
10	40.0	47.8	49.5	7.1
12	40.0	48.7	50.1	6.2
14	40.0	49.5	50.6	5.8
16	40.0	50.3	51.2	5.5
18	40.0	51.0	51.7	5.2
20	40.0	51.3	52.0	5.0
30	40.0	53.8	53.8	4.5
40	40.0	55.7	55.4	4.4
50	40.0	57.0	56.6	4.4
100	40.0	60.6	60.2	∞
∞ [2]	40.0	65.0	66.0	∞

1. Includes 100% write-off and all additional incentives.
2. Occurs when R&D base level is zero.


60
50
40
GOVERNMENT SUPPORT FOR R&D (CENTS PER DOLLAR)
IRDIA
Current (Post Nov. 1978) Tax Incentives
No tax incentives
0 2 4 6 8 10 12 14 16 18 20 30 40 50
ANNUAL R+D SPENDING GROWTH RATE (%)

DESCRIPTION OF THE THREE R&D TAX INCENTIVE PROGRAMS IN CANADA SINCE 1962

1. CURRENT TAX INCENTIVE PROGRAM

Special Allowance - Besides the current and capital expenditures deductible under the Income Tax Act, corporations carrying on business in Canada can, since 1978, deduct a further 50 percent of current and capital expenditures over and above the average of R&D expenditures incurred in the previous three years. This allowance will be in effect until the end of 1987.

Investment Tax Credit - Scientific research expenditures made after November 16, 1978 are also eligible for an investment tax credit. The basic credit is 10 percent of the taxpayers' expenditures on R&D, but for expenditures made in the Atlantic provinces and the Gaspé region, it is 20 percent, and for expenditures made by Canadian-controlled private corporations which qualify in the year in which the expenditure is made, for the small business deduction, it is 25 percent. The amount deductible from the tax otherwise payable in any one year is limited to a maximum of $15,000 plus one half of the federal tax otherwise payable in excess of $15,000. Any balance of the tax credit in the year may be carried forward for five years and deducted under the same rule.

2. IRDIA Under the Industrial Research and Development Incentives Act of 1967, the government will pay a grant equal to 25 percent of (a) capital research expenditures (excluding land), (b) current expenditures in excess of the average annual expenditures in the preceding five years. Such grants are tax free and do not reduce the depreciable base of any capital assets for tax purposes. To be eligible the corporation receiving the grant must be incorporated in Canada and the research must be performed in Canada to the country's benefit.

3. 1962-67 R&D INCOME TAX INCENTIVE PROVISIONS - This scheme allowed a company to deduct, over and above the standard 100 percent deduction for R&D expenditures, an additional 50 percent of the excess of current year's research expenditures over those in a base year. (Base year was latest fiscal taxation year before taxation scheme was announced.)

A note on the machinery industry -

Attached is a list of the major machinery companies. However there are 440 companies of over 100 employees in Canada in this industry. It is difficult sometimes to find where metal fabricating begins and machinery ends so that there is some blurring of the edges between this sector and metal fabricating. Also transportation companies are sometimes counted separately and sometimes in the machinery sector. Overall, the sector is in a relatively healthy position with good cash flow as can be seen by the chart elsewhere in this report. 50% of the companies export and in fact our trade balance is not losing ground but improving slightly. However, since 70% of the machinery used in Canada is imported, there is a long way to go. In addition as can be seen by the list attached the largest companies are foreign owned and are outlets for their parent companies.

Since this industry is so dispersed, we believe that an examination of their problems would be better done through a questionnaire and a specific suggestion in that regard has been made to the MOSST officials.

LARGE MACHINERY COMPANIES

	Foreign or Canadian owned	Sales 1979 -$B-
Ingersoll Rand	F	0.2
Eaton Yale	F	0.2
Clark Equipment	C	0.1
Black & Decker	F	0.1
Foster Wheeler	F	100
Combustion Engineering	F	100
Babcock Wilcox	F	100
Otis Elevator	F	100
Dominion Engineering	F	90
Canadian Allis Chalmers	F	90
Canadian Vickers	C	90
Brown Boveri Howden Inc.	F	90
Dorr Oliver Long	F	75
Joy Manufacturing	F	75
Jarvis Clark	C	60
Waltec	C	70
Champion Road Machinery	C	70
Gardner Denver Canada Ltd.	F	65
John T. Hepburn	C	55
Chromalox	C	50
American Standard	F	45
Lennox	F	45
Keeprite	C	40
Cooper Energy Services	C	40

APPENDIX 7

Anatomy of the Growth of an Entrepreneurial Company

1. **Start-up**

The entrepreneur with an idea puts up his own money, usually together with a group of friends, but sometimes with the aid of a few venture capitalists who specialize in start-ups, (Grieve, Horner & Associates, FBDB, Helix) starts the business off. It runs at a loss for the time being and sales build slowly.

2. **Stage 1**

Sales begin to develop and immediately the company runs short of money to finance working capital, sales and receivables. To some extent, the sources of capital are wider at this point and include S.B. Capital, Roymark, the CDC companies. Usually the amounts required are rather small, but they are beyond the reach of the entrepreneur and his fellow personal investors.

In terms of management, the entrepreneur, if he is an inventor, often does not have adequate financial controls nor a good financial officer or even a good accountant. It is still very much a one-man show.

3. Stage 2

The corporation is growing rapidly and needs much more capital, say around $1 million. Here Cavendish Investing, Canadian Enterprise Development Corporation and TD Capital enter the picture. FBDB could be also valuable in stages 1 and 2 in coordinating and bringing together the sources of venture capital.

Management changes occur frequently and sometimes in these cases the original entrepreneur loses control or should lose control of his company.

There is a stage which we call:

Aborted Stage 2 and Turn-arounds

That is when the company goes into bankruptcy because of its rapid sales growth and the entrepreneur not being able to manage. He is more interested in continuing his research and development than exploiting the market. Innocan is an associate of the Canada Development Corporation and is very good at turn-arounds of these kinds of companies. It has taken four companies through this stage. They

replace the entrepreneur with a professional manager who has a very large stake in the company.

4. Stage 3 - or Early Maturity

Here, more conventional sources of capital become available. Very often these companies are reliant on equity and bank debt and do not realize that they can arrange long-term money. While their debt-equity ratio by conventional measures is liberal, it is by no means high compared with Japan.

5. Mature middle sized companies

Here there are 3 or 4 managers as well as the chief executive officer and there is some ability to do R&D and to have an export component. Sales are running between $8-10 million and it is no longer a one man show. Often, however, while conventional sources are available, the companies do not manage the balance sheet well.

THE CURRENT STATUS OF VENTURE CAPITAL FIRMS IN CANADA

The following is an entirely unofficial listing of the current state of new venture capital firms in Canada.

The following have been formed or are in the process of being formed:

1) Teck-CDC formed Tech Development Corporation basically aimed at inventions. Current fund $14 million going up to $30 million. They currently have 8 projects.

2) George Fells - Inco Fund with additional funding from the pension funds of OMERS, Canada Packers, Molsons and Northern Telecom. Funding $20 million.

3) Equity Bancorp led by Burke Brown and an affiliate of CDC. Specializes in subordinated debentures. Second stage capital funded by CDC.

4) Alberta Venture Fund - Basically concentrates on energy technology. Funded at $13 million consisting of CDC, TD Bank, Inco, Starlaw, John Poole, Gerald Knowlton, Jack Gallagher.

5) Enertech - The energy technology fund in Winnipeg set up by Petrocan.

6) Bitech - A fund formed by Michael Cowpland.

7) Argus Corporation has under discussion a fund.

8) The Posluns family has a fund under discussion.

9) Newfoundland - A fund of $10 million is up for discussion with the CDC.

10) Quebec - A fund formed by CDC with Laurent Beaudoin et al.

11) Alberta Fund with Helix and Cavendish using Ed Clark.

12) A Communications Venture Fund with CDC and Bell Canada.

TAXES

Help for fledgling companies

The Miscellaneous Revenue Act lets new businesses write off their startup costs

A new law, buried in a jumble of legislation pushed through Congress last December, will help the cash flow of newly established businesses more than any single piece of legislation in years. Although the big impact will be on small business, it is now becoming clear to tax experts that in some cases large, expanding companies will benefit as well.

The Miscellaneous Revenue Act of 1980 lets companies write off, over a period of 60 months, new business "startup" costs that heretofore had to be capitalized. As capital items, they produced little or no tax advantage for a fledgling company. The new rule, retroactive to July 30, 1980, covers such startup items as market research, employee training, and the cost of setting up an office. This means that even a small, $100,000 enterprise could save thousands of tax dollars annually over the crucial first five years.

Until now, the Internal Revenue Service denied startup cost deductions on the ground that no trade or business existed when the costs were incurred. "The new rule not only upsets this and improves cash flow for a new business, it also eliminates the expense of negotiating with the IRS," notes Leon Nad, a tax director of Price Waterhouse & Co. In the past, says Nad, taxpayers often argued for startup cost deductions, usually to no avail.

'Ordinary and necessary.' In a key case involving a Richmond (Va.) television station, Nad says, "the preoperational costs ran to six figures, and the IRS held these to be 'startup' items subject to being capitalized. Now, under the new law, they could be written off over five years. The 60-month rule clears up much uncertainty."

To gain the new tax break, startup costs must be "ordinary and necessary" business expenses that would be deductible currently if they were paid by a going business. They must comprise either the costs of investigating a prospective business or of actually creating a business—that is, preoperating expenses. Investigatory items include an analysis of potential markets, products, labor force, suppliers, and transportation. Preoperating expenses include, among other things, the costs of finding and training employees for specific jobs, lining up distributors and suppliers, initial sales promotion, and installing accounting systems.

To be eligible for amortization under the new 60-month rule, an expense must relate to an "active" business. Thus, the cost of investigation and market research undertaken during the acquisition of an existing business will be subject to the 60-month write-off—but only in cases where the buyer actively participates in management of the business. What constitutes "participation," say tax experts, can be expected to raise questions by the IRS.

The startup tax savings for a new business will vary, depending on the industry and the type of operation involved. Nad describes a typical situation: Owners of a high-technology electronics company invest $150,000 in technical equipment to be used in a rented building. Startup costs include $50,000 for personnel training (50 people), $2,000 for personnel advertising, $25,000 for market research (including product research), $5,000 for an accounting and bookkeeping system, and $10,000 for securing distribution outlets. Amortization of the $92,000 startup total saves $8,464 in taxes annually for five years, or a total of more than $42,000—not counting year-to-year earnings on the money.

Contrasting examples are posed by Christopher A. Pitt, vice-president and commercial loan officer of United Bank & Trust Co. in Hartford. "In the case of a wholesaler in a small retail line of goods—such as hardware—the tax saving would be limited in relation to the whole investment," he says. "The cost of market research—assuming they did it properly—might be $20,000, or only 10% to 15% of the investment in inventory." The total startup expense, explains Pitt, probably would be no more than $30,000 because little would be spent on such items as personnel training. The tax saving would be a modest $2,700 a year, assuming the 46% corporate rate.

A new company breaking into a fairly new business might get a more substantial break because of the heavy market research needed. Thus a distributor of home security devices might save more in taxes in relation to the total investment in the business. "The startup costs could easily be as much as 75% of the basic investment," Pitt explains. In his example, the owner would lease needed floor space and invest $40,000 in inventory. "His market research might be $20,000 and total startup costs $30,000," he says—but here the $2,700 tax saving would mean more.

Indeed, market research looms as an important startup item under the 60-month tax write-off rule. Frank Stanton, president of Simmons Market Research Bureau Inc. in New York City, notes that the usual range of fees for such research for new businesses is about $12,000 to $30,000.

"You can get a barebones research job starting at about $12,000," notes Stanton. Thus, for market research alone, the tax-saving range is generally $5,520 to $13,800, assuming the 46% tax rate.

Strategy. An established company that expands into a new field might use 60-month amortization to its advantage—as against having to capitalize the startup costs. Usually, however, the tax strategy of a growing company is to show that its new operations are an expansion of its old business and not a new enterprise. If this can be shown, the "startup costs" become ordinary business expenses that can be written off fully in the current year. There would be no need for amortization. "The IRS can be expected to argue for five-year amortizations instead of one-year write-offs in many company expansions," according to Nad.

Other tax experts agree. From a tax viewpoint, they note, a growing company generally should now avoid expanding by forming a new subsidiary. The startup costs would be subject to 60-month amortization by the subsidiary, whereas the same costs probably would be currently deductible as expansion expenses by the original company. The one-year write-off would boost cash flow. ■

The new tax break for new businesses

XYZ Corp. is formed. It spends $150,000 on capital equipment and $92,000 in startup costs on training personnel, market research, building a distribution network, etc.

IRS treatment under old law	
Capital investment	$242,000
Amortized costs	0
Tax saving	0
IRS treatment under new law	
Capital investment	$150,000
Amortized costs (five years)	92,000
Tax saving via amortization, each year for five years*	8,464

*Assuming 46% corporate tax rate

Data: Price Waterhouse & Co., BW