The Commercial Printing Industry in Canada

Industry, Trade and Commerce
Industrie et Commerce

THE COMMERCIAL PRINTING INDUSTRY IN CANADA

A Statistical & Economic Analysis

Prepared by

Stevenson & Kellogg, Ltd.
in association with
CGGL, Conseillers en Gestion Inc.

for the

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ABREVIATIONS AND ACRONYMS

GAIA	-	Graphic Arts Industries Association
SIC	-	Standard Industrial Classification
CRT	-	Cathode Ray Tube
COM	-	Computer-Output-Microfilm
GNP	-	Gross National Product
S & K	-	Stevenson & Kellogg, Ltd.
GNE	-	Gross National Expenditure
ROI	-	Return on Investment
ACM	-	Apparent Canadian Market
U.K.	-	United Kingdom
U.S.A.	-	United States of America
NES	-	Not Elsewhere Specified
E & M	-	Equipment and Machinery
D & B	-	Dun & Bradstreet
R & D	-	Research and Development
CNTU	-	Confederation of National Trade Unions
GATF	-	Graphic Arts Technical Foundation
CPI	-	Council of Printing Industries
NAPL	-	National Association of Printers & Lithographers
BMI	-	Book Manufacturers Institute
PIA	-	Printing Industries of America
ITCA	-	International Typographic Composition Association
IRDIA	-	Industrial Research and Development Incentives Act
PAIT	-	Program for the Advancement of Industrial Technology
PEP	-	Program to Enhance Productivity
MACH	-	Machinery Program
CASE	-	Counselling Assistance to Small Enterprises
DREE	-	Department of Regional Economic Expansion
COX	-	Computer-Output-Xerography
FT	-	Facsimile Transmission
MIT	-	Massachusetts Institute of Technology
OCR	-	Optical Character Recognition
UV	-	Ultraviolet (ink)
AGI	-	Annual Growth Index
UPC	-	Universal Product Code
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ORACLE	-	Optical Reception of Announcements by Coded Line Electronics

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I

INTRODUCTION

This report in four related volumes presents the results of an in-depth study of the commercial printing industry in Canada.

The objective of the study was to obtain a detailed analysis of the present structures of the industry and to identify alternative structures that could improve its efficiency and profitability and ensure its long-run health and growth. This analysis and evaluation was to take into account anticipated technological developments in printing production, market trends and demands for commercial printed products and competitive pressures.

In this summary volume, we briefly describe the scope of the study and methodology. This is followed by a summary of our findings concerning present structures, future technological developments and the growth of the industry during the next decade.

II

SCOPE AND METHODOLOGY

A. SCOPE OF THE STUDY

The major topics of the study were: present structures of the industry, technological developments, potential markets in 1985 and alternative structures that could improve the health and profitability of the industry in 1985 and beyond.

Within each of these major topics were a number of individual elements. Together they defined the full scope of this project. This is illustrated in the following summary:

1. Present Structures of the Industry

Within this heading the consultant analyzed every significant dimension of the industry in its present form. It included:

(a) The role and importance of the industry within the economy: the number of establishments, their location, employment, capacity, value of shipments, range of products, types of process, nature and location of markets, and the patterns of foreign trade.

(b) Ownership and organization, including: the capital structure, trends towards mergers, acquisitions and integration, the extent of non-resident ownership, barriers to entry, and sources of financing.

(c) An analysis of the factors of production and profitability in relation to size, volume of purchases, payroll, value and degree of obsolescence of equipment and machinery, and the degree of ownership of buildings and facilities.

(d) Human resources, both managerial and employees: the availability and use of specific skills, recruitment techniques, training programs, the extent of unionization and the nature of labour relations.

(e) The impact of technology: the extent of research and development in Canada and the degree of acceptance of innovation in the industry.

(f) The extent of competition with special reference to in-plant and instant printing.

(g) The impact of external influences and agencies such as tariffs, legislation and government programs.

2. Technological Development

The project included a review and analysis of anticipated technological developments in the next decade. Especially important was the probable impact of these developments on composition, colour separation, plate processing methods, printing, press capability, paper and ink and binding and finishing methods.

3. The Market in 1985

A key to the development of the industry is the size and characteristics of the market in 1985, and the scope of competition.

4. A Strategy for Growth

In the light of the expected technological changes and market development, the study called for the evaluation of a number of structures that would improve the efficiency and profitability of the industry and ensure its long-run health and growth.

B. METHODOLOGY

The findings presented in this and the other volumes of the report, and the analyses of alternative structures are based on information collected from four sources:

- Statistics Canada.
- A questionnaire survey, mailed to some 2,500 commercial printers, resulted in 434 responses useable for analytical purposes. These respondents accounted for about 37% of total industry sales.
- Personal interviews with over 120 commercial printing firms provided reactions and attitudes to the problems of the industry. These interviews covered all ten provinces.
- Ratio studies prepared by the Graphic Arts Industries Association from the annual survey of member firms. These studies identify many meaningful characteristics of the commercial printing industry.

This systematic collection and analysis of information provided the background for a comprehensive understanding of the industry and for the evaluation of the impact of a number of alternative strategies and structures.

III

SUMMARY OF FINDINGS

The findings of the study are presented under three headings: contemporary structures, technological developments and growth strategy. These sections correspond to Volumes II, III and IV respectively.

A. CONTEMPORARY STRUCTURES

1. Relative Importance of the Commercial Printing Industry

- The value of shipments of the commercial printing industry has grown from $389 million in 1962 (0.96% of GNP) to about $945 million in 1973 (0.79% of GNP). This represents a growth rate of about 8.5% during the last decade.

- The industry employed 40,600 people in 1971, about 2½% of total employment in manufacturing. In terms of employment, commercial printing is the 8th largest of Canadian manufacturing industries.

- The industry comprises about 2,140 establishments. Of these, 1,960 (92%) employ 50 people or fewer. One thousand employ fewer than 5 people. At the other end of the scale, some 65 large firms employ 100 people or more and account for over 42% of the industry's total shipments.

- The industry is concentrated in Ontario and Quebec. These two provinces account for 55% and 30% respectively of total industry sales. However, British Columbia, Alberta, Quebec

and Saskatchewan have enjoyed the greatest growth in the last decade.

- The commercial printing industry is an important consumer of a wide range of materials, supplies and services. In 1971 it bought:

  - $139 million of fine paper
  - $20 million of newsprint
  - $14 million of ink
  - $27 million of imported machinery and equipment

- The industry is located close to its markets: 81% of commercial printing establishments ship the bulk of their output within a 50 mile radius. Only 2% serve markets beyond a 500 mile radius.

- Commercial printers are located relatively close to their suppliers of raw materials, supplies and services. More than 50% of the printers buy paper from a source within a 25 mile radius. Typesetting, engraving and binding suppliers are similarly found less than 25 miles from the majority of printers.

- The three major product categories are: specialty printing (which includes advertising material), business forms and publications. Together they accounted for 84% of the industry's shipments (in terms of value) in 1973.

- Offset is the dominant process, accounting for about 79% of the value of shipments. Letterpress is the only other process to account for a significant volume of business. The gravure process is of considerable importance in the printing of catalogues where it represents about $20 million of shipments.

2. Competition and International Trade

- The value of in-plant printing, one of the major sources of competition to the commercial printing industry, is estimated to be about $110 million. It represents a market of about $50 million for paper and a payroll of some $37 million in 1973. Growth has averaged 10% since 1969.

- Instant printing is growing at a rate of 15% annually. It currently accounts for about $70 million of the commercial printing market.

- Imports of printed material have grown from $123 million in 1964 to $258 million in 1971, equivalent to an increase of 10% annually. The U.S.A. accounts for 83% of imports. The United Kingdom and France are sources of a further 6.5% each.

- Books and pamphlets are the largest single category of imports. Their share of the Canadian market has grown from $46 million (65% of the apparent Canadian market) in 1964 to $133 million (75%) in 1971.

- Newspaper, magazines and periodicals amounting to $71 million (20% of the apparent Canadian market for these products) and advertising matter valued at $16 million (10%) are the only other categories in which imports have made significant inroads.

- Exports of the printing, publishing and allied industries reached $32 million in 1971, out of total shipments of $1,653 million. In the period from 1964 to 1971, they had grown at a rate of 17% per year. The U.S.A. is the only significant export market.

3. Factory Costs, Productivity and Profitability

- Profits before taxes in the commercial printing industry were 4.8% of sales in 1973. This represents a drop from almost 7% in 1971. The small and large firms are most profitable. Firms having sales of less than $100,000 earn 6.8% on sales. Firms with sales in excess of $5 million earn 6.4%. The industry average is only 4.8%, with medium-sized firms in the $500,000 to $5 million category earning only 4%.

- The major cost elements averaged across the industry are (expressed in percentage of the value of shipments):

- payroll	32.6%
- paper	24.8%
- other supplies	13.5%
- administrative expense	6.5%
- factory expense	10.7%
- selling expense	7.2%

- Return on equity (after tax) in the industry in 1973 was 7.94%. Small and large firms enjoy higher returns averaging 9%. Medium-size firms with sales between $500,000 and $5 million average slightly less than 7%.

- Productivity per employee in the commercial printing industry in the U.S.A. appears to be about 9% higher than in Canada. Productivity of capital is also higher -- about 14% -- but the difference has been decreasing in recent years. Contrary to widely-held beliefs, there is no evidence to support the hypothesis that larger firms make more efficient use of investment in plant and equipment. Quite the contrary, sales per dollar of gross fixed in-

vestment are highest in the smaller firms with sales of less than $500,000.

4. Ownership, Management and Human Resources

- The industry is characterized by a large number of small firms. Most of the small firms and many medium-sized firms are closely held; the owners are actively involved in the business. In Quebec and the Atlantic Provinces, almost 40% of the firms are individual proprietorships. In the rest of Canada, it is less than 30%. However, incorporated companies and cooperatives account for over 95% of sales.

- The commercial printing industry is owned largely by Canadians. We estimate that only about 2% of the companies, accounting for no more than 20% of industry sales, are owned by non-residents.

- The degree of management ability increases directly with the size of the firm. The larger firms are operated by well-educated managers who are using proven management techniques of planning and control. In smaller and many medium-size firms, there is a notable lack of management skills, especially in marketing and finance.

- The industry is extensively unionized. About 40% of the employees in the printing, publishing and allied industries are members of a union. And, the majority of these are members of an international union.

- Labour-management relations in the industry are relatively good.

- A potential threat to the growth of the industry is a shortage of skilled personnel, especially in the smaller urban communities.

B. TECHNOLOGICAL DEVELOPMENTS

The assessment of the technological developments which will influence the commercial industry in the next decade is based on a number of sources, including: research institutes, industry publications, equipment suppliers and leading printers. From this array of sources the following pattern emerges:

- Research and development by suppliers to the industry is directed towards enabling printers to achieve increased output per hour, improved quality and lower production costs.

- Microforms and computer-output-microfilming are the only areas of technology which will significantly erode the market for the commercial printing industry.

- Microfilming will replace printed matter in record-keeping and short-life publications. In-plant printing will be similarly affected by the use of microfilming for parts lists and customer catalogues (for internal use within the organization).

- The changes in graphic arts technology largely are evolutionary:

  - phototypesetting is gaining a dominant share of the market for new composition equipment;

  - the price of cathode ray tube typesetting equipment is now competitive with other composition equipment;

  - computers are being used in the composition of periodically revised material;

  - scanners will become increasingly important for colour separation;

  - recently advances in platemaking such as the use of photopolymer plates for letterpress and

electronic engraving for gravure are gaining wide acceptance. Laser engraving for newspaper plates is imminent.

- developments in printing presses have centred on better quality, greater productivity and reduced costs.

- ultra-violet inks should gain a dominant share of the market in the next decade in those applications where fast drying is essential.

▶ Automation, mini-computers and industrial robots will be well accepted in the commercial printing industry by 1985. Their acceptance will be limited primarily by the vision of management and availability of technical skills.

C. GROWTH STRATEGY

The volume dealing with growth strategy contains two principal sections. The first is a projection of the commercial printing industry into 1985. The second is a discussion of those factors that will affect the ability of the industry to take full advantage of the opportunities that the next decade will provide.

1. The Industry in 1985

▶ The commercial printing industry can expect to ship between $3 and $4 billion of printing in 1985 (in current dollars). The actual value will hinge on the degree of inflation in the next decade.

▶ Employment in the industry should be about 50,000 in 1980 and 57,000 in 1985.

▶ The number of commercial printing establishments will change little. By 1980 they will number just over 2,300 and by 1985, 2,450.

- Growth will come largely from existing plants. Each of the largest 25 plants will ship an average of $32 million of printed material. Over 170 establishments will ship in excess of $5 million annually.

- Imports of books, magazines, periodicals and some advertising materials will continue to increase but at a decreasing rate as Canadians become more aware of their unique bi-cultural heritage.

- The industry faces the need to invest about $1,600 million between now and 1985. Much of this financing will be generated internally or will be realized from normal short-term sources such as trade accounts and notes. The net requirement for additional funds from outside the industry is estimated to be slightly over $500 million.

2. Capitalizing on the Opportunities of the Next Decade

Analysis of all the factors influencing the growth and profitability of the industry indicates little threat to its future well-being. Even if duties on the import of printed products were reduced (as might well occur under GATT negotiations), the industry could remain viable. Of course, the industry would need to be on the same competitive basis as its counterpart in the U.S.A.: tariffs on paper would need to be reduced, taxes equalized on production machinery and non-tariff barriers eliminated.

The only major threat to the industry is internal. Shortages of managerial ability and technical skills could jeopardise future growth and reduce the contribution of the industry to Canada's national goals.

Against these threats is the opportunity for significant penetration of the market in the U.S.A.:

- Average total costs in the Canadian printing industry are lower than in the U.S.A.

- A number of Canadian firms have shown that it is possible to compete profitably in markets more than 500 miles from the plant.

- Other Canadian commercial printing companies are already competing effectively in the U.S.A.

- The custom nature of most printing work eliminates the advantages normally enjoyed by United States firms in the mass-merchandising industries. It is possible for every firm in the printing industry to identify work specially suited to its equipment and capability.

This is the great opportunity for the Canadian commercial printing industry. This large market can be entered successfully and profitably. But it requires a change in management style and ability. Specifically, it will call for:

- Selective marketing: identifying opportunities uniquely suited to plant capability.

- Rationalization of production among plants, thereby eliminating duplication, encouraging specialization and leading to higher utilization of equipment and machinery.

- More sophisticated pricing based, in turn, on more accurate cost data.

- Centralized purchasing leading, in turn, to volume buying and lower total costs of paper and supplies.

- Close cooperation between the industry and governments to ensure adequate facilities and

programs to provide the trained staff implicit in such growth in a more competitive environment.

The commercial printing industry has adapted itself well in the past to the problems and opportunities of the Canadian market. It is now on the threshold of an even greater opportunity. Can the commercial printers respond to this new challenge? If they do, this industry could make a major contribution to our social and economic well-being.

VOLUME II

CONTEMPORARY INDUSTRY STRUCTURES

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PREFACE

ABREVIATIONS AND ACRONYMS

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I

INTRODUCTION

A. STATEMENT OF OBJECTIVES

This volume looks at the Canadian commercial printing industry in detail. Specifically, the study focuses on guidelines for future planning. It offers a complete bank of data on the industry. Such data enables the forward-looking executive to anticipate the effects of his decisions. Further, the study suggests a basis for formulating a healthy growth strategy within the industry.

B. SOURCES OF INFORMATION

1. Statistics Canada provided authentic figures for 1971, the most recent year for published data. The study also used unpublished data from Statistics Canada.

2. Questionnaire Survey, mailed to some 2,500 commercial printers, resulted in 434 responses usable for analytical purposes. This response represents a healthy cross-section of the industry for this reason: the combined 1973 sales of the respondents accounted for 37% of total industry sales. (Note: a copy of the questionnaire appears in Appendix A.)

3. Personal Interviews with over 120 commercial printing firms provided reactions and attitudes to the problems of the industry. These interviews covered all ten provinces but the majority (58%) were held in Ontario and Quebec where most commercial printing in Canada is concentrated.

4. GAIA Ratio Studies result from the annual survey of GAIA member firms. The Ratio Studies identify many meaningful characteristics of the commercial printing industry.

C. SCOPE OF THIS STUDY

The printing industry embraces many forms of communication. Figure 1 groups categories of communication under three headings: creative, graphic, and essential. Under the graphic heading appears the divisions with which this study is concerned: commercial printing, in-plant printing, instant printing, and packaging printing.

Note: throughout the study two terms occur repeatedly: commercial printing and the printing industry. The text refers to commercial printing as "the industry", and spells out printing industry in full when that term is intended.

Standard Industrial Classification Manual lists commercial printing as Industry No. 286, and offers the following definition:

> "Establishments primarily engaged in the production of commercial and/or job printing regardless of the printing method or process used . . ."

A detailed list of the products of commercial printing appears in Appendix B.

This study does not include in-house, short-run, non-profit xerography and office duplication. Nor does it deal with information processing, a division of the essential communications industry.

D. ACKNOWLEDGEMENTS

Thanks are due to the many members of the industry who gave generously of time and effort to make this study a success.

Figure 1

A CONCEPT OF COMMUNICATIONS INDUSTRIES DEFINITIONS

Characteristics	Categories of Communications		
	Creative	Graphic	Essential
Medium	Motion Picture Literature Fine Arts Theatre Broadcast	Commercial Printing Typography Packaging Production "Print" and mass media Advertising Production	Information Processing Business Publishing Newspaper Publishing Business Forms Computer
Content	Dramatic Artistic Graphic Arts	Information Applied Graphic Arts	Facts Information
Function	Enlightenment Entertainment	Persuasion Education Information Exchange	Data processing storage and retrieval Process control, monitoring Required Reporting Simulation
Value	Intrinsic Intangible Cultural	Tangible-value is added. Respondent action is initiated.	Highly tangible - compulsory Required for institutional or organizational survival.
Format	Books - poetry, fiction & non-fiction Plays Movies Music TV & Radio Broadcasting	Advertising Production "Print media", signs, labels Business & government reports Direct mail Audio-Visual aids Video-tapes	Catalogues, Directories, Maps, Blueprints, "Trade Press", Cheques, Printed Forms, Stamps, Money, Educational & Instruction Books, Financial Reports, Computer Print-outs, Daily & weekly newspapers, Dictionaries, Teletype - CRT Displays - Computer-output-microfilm (COM)

II

OVERVIEW OF THE COMMERCIAL PRINTING INDUSTRY

This chapter presents a general picture of the commercial printing industry in Canada. It describes the industry and analyses its rate of growth in relation to other segments of the Canadian economy.

A. RELATIVE IMPORTANCE OF THE COMMERCIAL PRINTING INDUSTRY

1. Comparison with the Economy

Value of total shipments of the industry for 1973 is estimated at $945 million. Comparisons: 0.8% of Canada's gross national product (GNP); 1.5% of value of total manufacturing shipments.

The industry has grown steadily in recent years but since 1962, has not kept pace with GNP growth. Comparisons: in 1962 it represented .96% of GNP; in 1973 it represented .79%.

The industry's share of total manufacturing output remained relatively steady since 1962.

See Tables 1 to 5 for relative importance of commercial printing to GNP, total manufacturing, and employment for Canada and by province.

2. Share of Employment

The industry employed 40,600 people in 1971 (39,600 workers, 895 working owners and partners). This represents .5% of total labour force in Canada.

Employment in the industry has grown steadily but remains at about 2½% of total employment in manufacturing.

Table 1

COMMERCIAL PRINTING IN COMPARISON WITH GNP AND TOTAL MANUFACTURING

1962 - 1973

Year	Total Shipments Commercial Printing ($'000,000)	Total Manufacturing Industries Shipments and Services ($'000,000)	GNP ($'000,000)	Percent of Commercial Printing to	
				Total Manufacturing %	GNP %
1962	389	25,790	42,927	1.50	.96
1965	488	33,889	55,364	1.44	.88
1968	624	42,061	72,586	1.48	.86
1970	711	46,380	85,610	1.53	.83
1971	764	50,275	93,402	1.52	.82
1972	830(1)	N/A	103,407	-	.80
1973	945(1)	N/A	118,678	-	.79

(1) Estimated by Stevenson & Kellogg.

Table 2

COMMERCIAL PRINTING SHIPMENTS
IN RELATION TO
PRINTING AND ALLIED INDUSTRIES AND TOTAL MANUFACTURING
($'000)

Year	Commercial Printing	%	Printing & Allied Industries	%	Total Manufacturing	%
1962	389,483	1.5	893,721	3.5	25,790,087	100
1963	416,530	1.5	727,922	3.3	28,014,888	100
1964	442,185	1.4	983,921	3.2	30,856,099	100
1965	488,278	1.4	1,003,229	3.2	33,839,425	100
1966	550,957	1.5	1,160,665	3.1	37,303,455	100
1967	596,770	1.5	1,297,276	3.3	38,955,389	100
1968	624,142	1.5	1,370,351	3.3	42,061,555	100
1969	680,602	1.5	1,488,301	3.2	45,930,438	100
1970	711,429	1.5	1,545,321	3.3	46,380,935	100
1971	764,189	1.5	1,653,839	3.3	50,275,917	100
1972						

SOURCE: Statistics Canada

Table 3

RELATIVE IMPORTANCE OF COMMERCIAL PRINTING
IN TERMS OF VALUE OF SHIPMENTS AND SERVICES - BY PROVINCE
1971 ($'000)

Region	Commercial Printing		Printing & Allied Industries		Total Economy All Goods & Services (1)	
		%		%		%
Newfoundland	*	*	*	*	1,387,000[1]	100
P.E.I.	*	*	*	*	281,000	100
Nova Scotia	4,031	.16	*	*	2,557,000	100
New Brunswick	4,086	.21	14,553	.76	1,907,000	100
Quebec	227,242	.98	474,695	2.04	23,265,000	100
Ontario	421,693	1.11	848,131	2.23	38,100,000	100
Manitoba	30,950	.75	70,081	1.71	4,100,000	100
Saskatchewan	5,604	.22	23,781	.94	2,520,000	100
Alberta	23,766	.43	68,923	1.25	5,526,000	100
Br. Columbia	44,872	.42	123,241	1.16	10,646,000	100
Total Canada	764,189	.82	1,653,839	1.77	90,289,000	100

* Confidential.

Notes(1) Unpublished data compiled by Provincial governments. Federal total by Statistics Canada is $93.4 billion.

Table 4

TRENDS IN COMMERCIAL PRINTING EMPLOYMENT
IN RELATION TO PRINTING AND ALLIED INDUSTRIES
(Number of employees, i.e. not including working owners or partners.)

Year	Commercial Printing		Printing & Allied Industries		Total Manufacturing Employment	
		%		%		%
1962	32,489	2.3	74,544	5.4	1,389,516	100
1963	33,480	2.3	75,166	5.3	1,425,440	100
1964	33,560	2.2	75,448	5.1	1,491,257	100
1965	35,264	2.2	78,737	5.0	1,570,299	100
1966	37,269	2.3	81,996	5.0	1,646,024	100
1967	38,154	2.3	83,594	5.1	1,652,827	100
1968	38,437	2.3	84,143	5.1	1,642,352	100
1969	38,723	2.3	84,654	5.1	1,675,332	100
1970	38,874	2.4	84,045	5.1	1,637,001	100
1971	39,632	2.4	84,110	5.2	1,628,404	100
1972						100

SOURCE: Statistics Canada

Table 5

RELATIVE IMPORTANCE OF COMMERCIAL PRINTING
IN TERMS OF NUMBER OF EMPLOYEES - BY PROVINCE
1971

Region	Commercial Printing		Printing & Allied Industries		All Manufacturing Industry		Total Employment ('000)
		%		%		%	
Newfoundland	*	*	*	*	12,580	100	-
P.E.I.	*	*	*	*	2,290	100	-
Nova Scotia	337	1.1	*	*	31,958	100	-
New Brunswick	304	1.1	1,029	3.6	28,565	100	-
otal: Atlantic Prov.	*	*	*	*	75,393	100	618
Quebec	11,452	2.3	22,367	4.4	508,591	100	2,197
Ontario	21,529	2.7	43,015	5.4	800,047	100	3,079
Manitoba	1,783	3.7	4,141	8.6	48,325	100	
Sask.	398	2.7	1,534	10.5	14,578	100	1,338
Alberta	1,353	2.6	3,656	7.0	51,941	100	
Br. Columbia	2,330	1.8	6,297	4.9	129,308	100	847
Yukon & N.W.T.	*	*	*	*	221	100	-
Total Canada	39,632	2.4	84,110	5.2	1,628,404	100	8,079

Source: Statistics Canada

* Confidential

3. Comparison with all Printing, Publishing and Allied Industries

Commercial printing is classified as part of a larger group -- the printing, publishing and allied industries. This group consists of:

- commercial printing industry (SIC 286);
- platemaking, typesetting and trade bindery industry (SIC 287);
- publishing only (SIC 288);
- publishing and printing (SIC 289).

From 1962 to 1971, commercial printing increased its relative importance within the total printing, publishing and allied industries group.

Of total group establishments, commercial printing now represents 58.3% (56.5% in 1962); total employment -- 47.1% (43.6% in 1962); total shipments and services -- 46.2% (43.5% in 1962). Figure 2 graphs these comparisons.

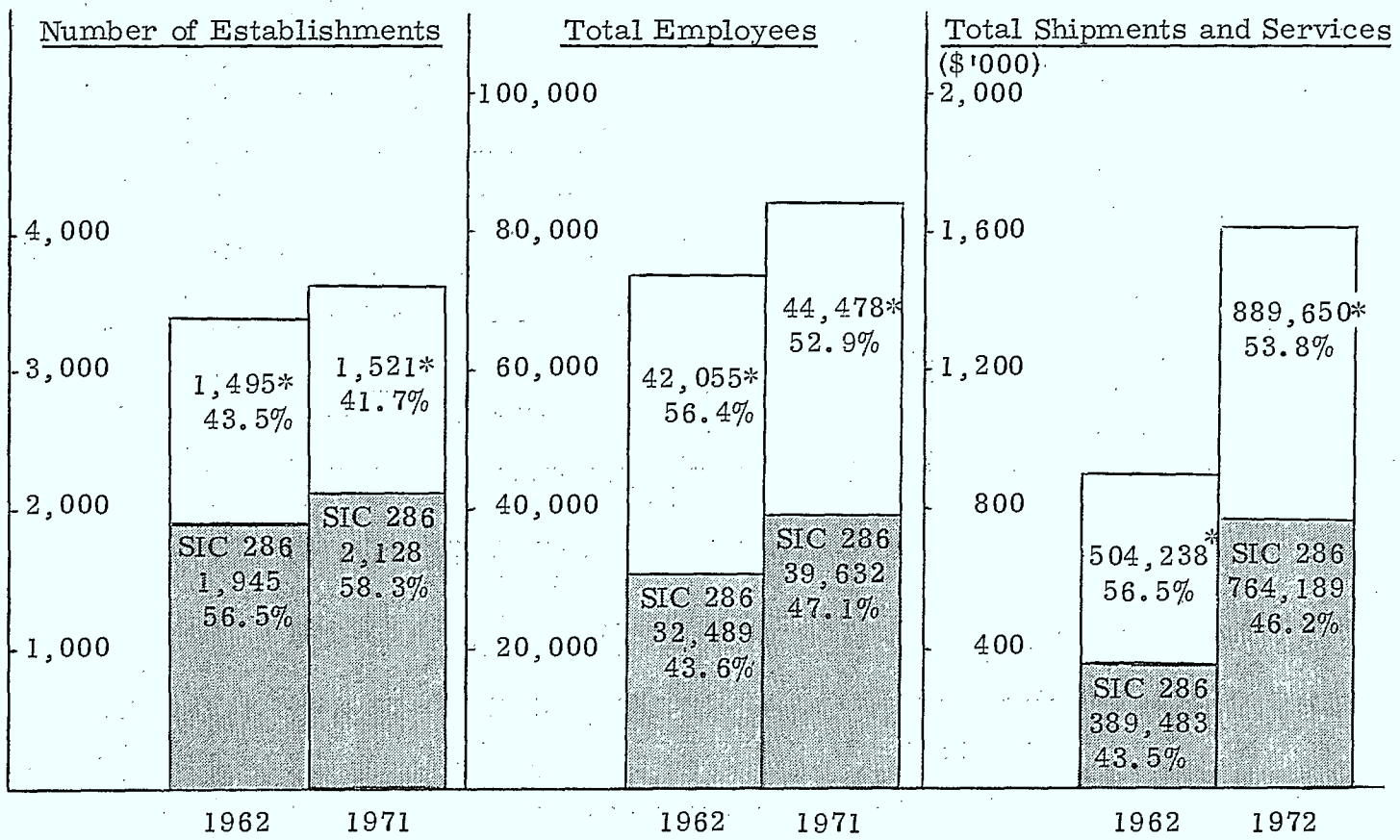
4. Relative Importance Compared With Other Industries

In people employed, commercial printing ranks 8th largest in all industries (40,000 employees); in total shipments, 13th largest ($764 million in 1972); in terms of value added, 9th place ($472 million in 1972). Figures 3, 4 and 5 chart these comparisons.

Commercial printing has more establishments than any other industry (see Figure 6). With over 2,100 establishments it comprises 6.6% of total manufacturing establishments.

Figure 2

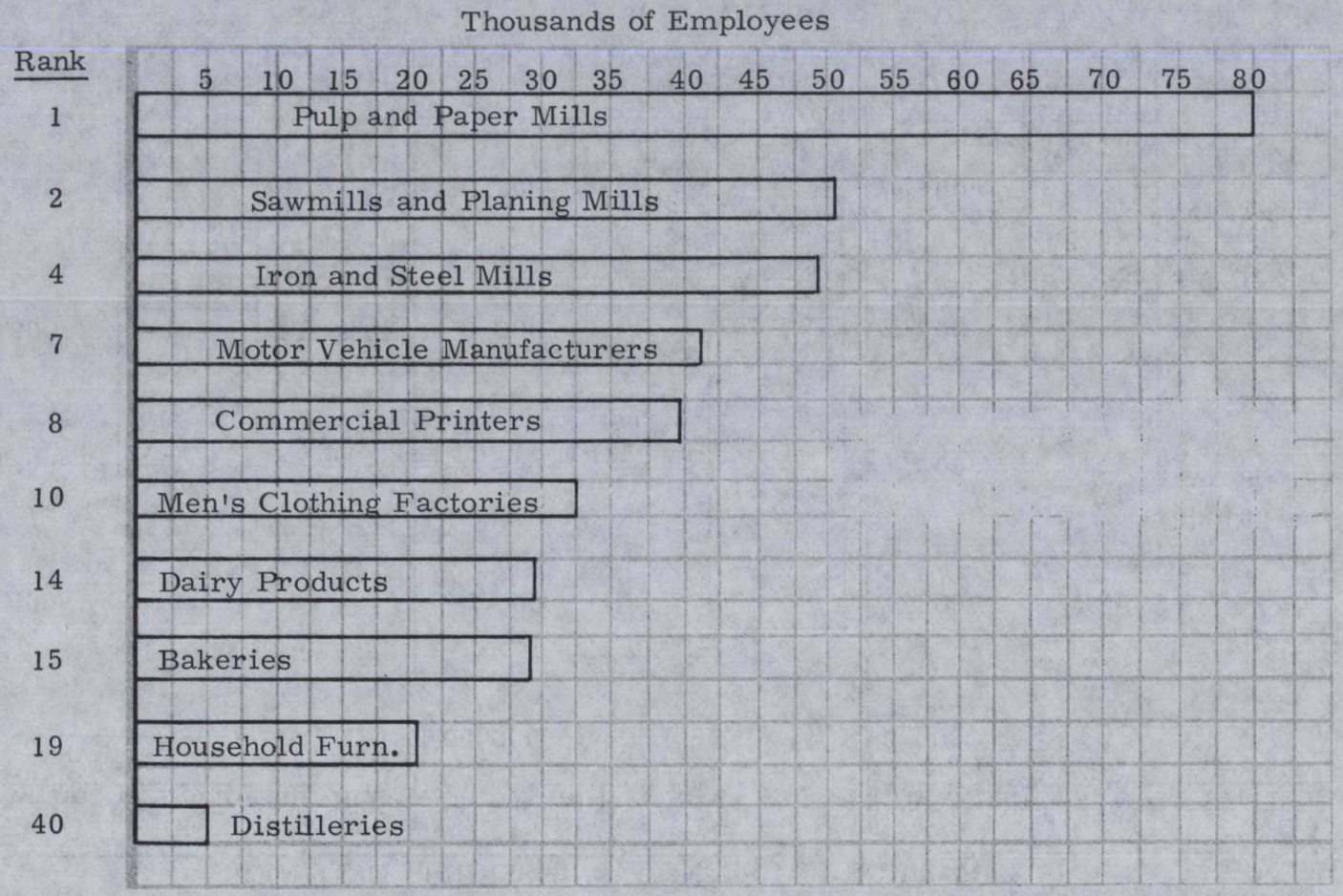
RELATIVE IMPORTANCE OF COMMERCIAL PRINTING IN RELATION WITH PRINTING, PUBLISHING AND ALLIED INDUSTRIES



* Other allied industries include: SIC 287 - Platemaking, typesetting and trade bindery
SIC 288 - Publishing only
SIC 289 - Publishing and Printing

Figure 3

NUMBER OF EMPLOYEES OF LEADING INDUSTRIES
(1971)

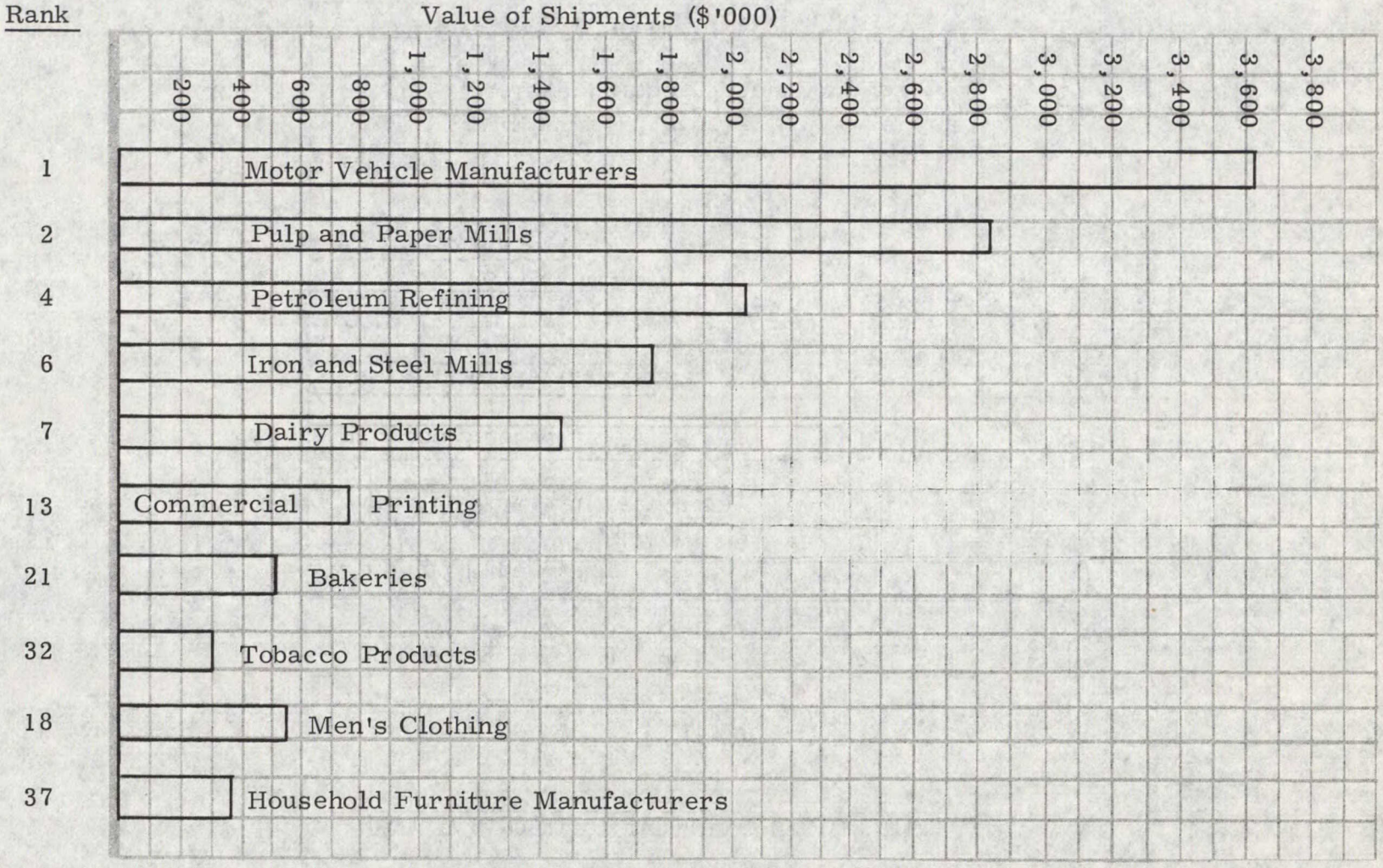


Source: Statistics Canada, General Review of Manufacturing Industries, 1971.

Figure 4

SHIPMENTS OF LEADING INDUSTRIES

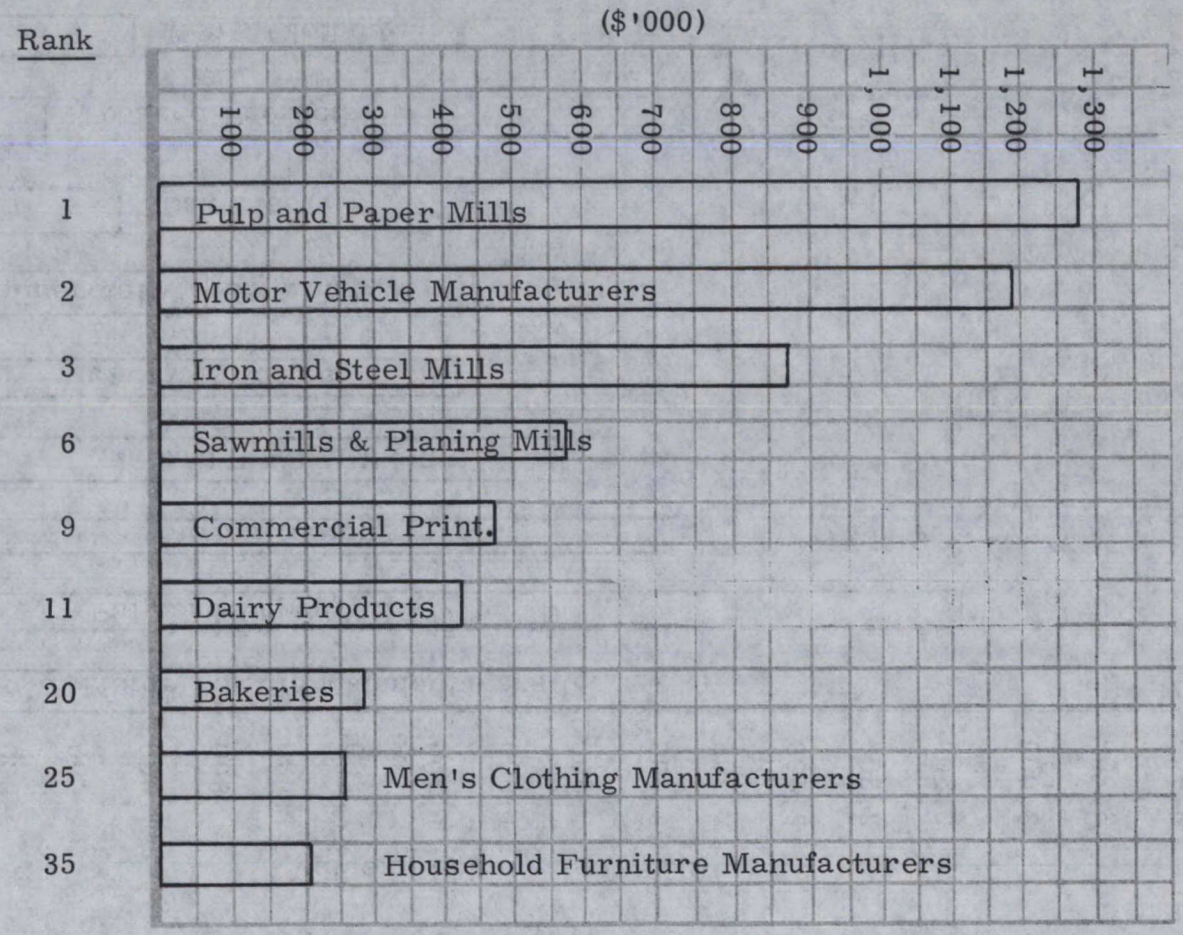
1971



Source: Statistics Canada, General Review of Manufacturing Industries, 1971.

Figure 5

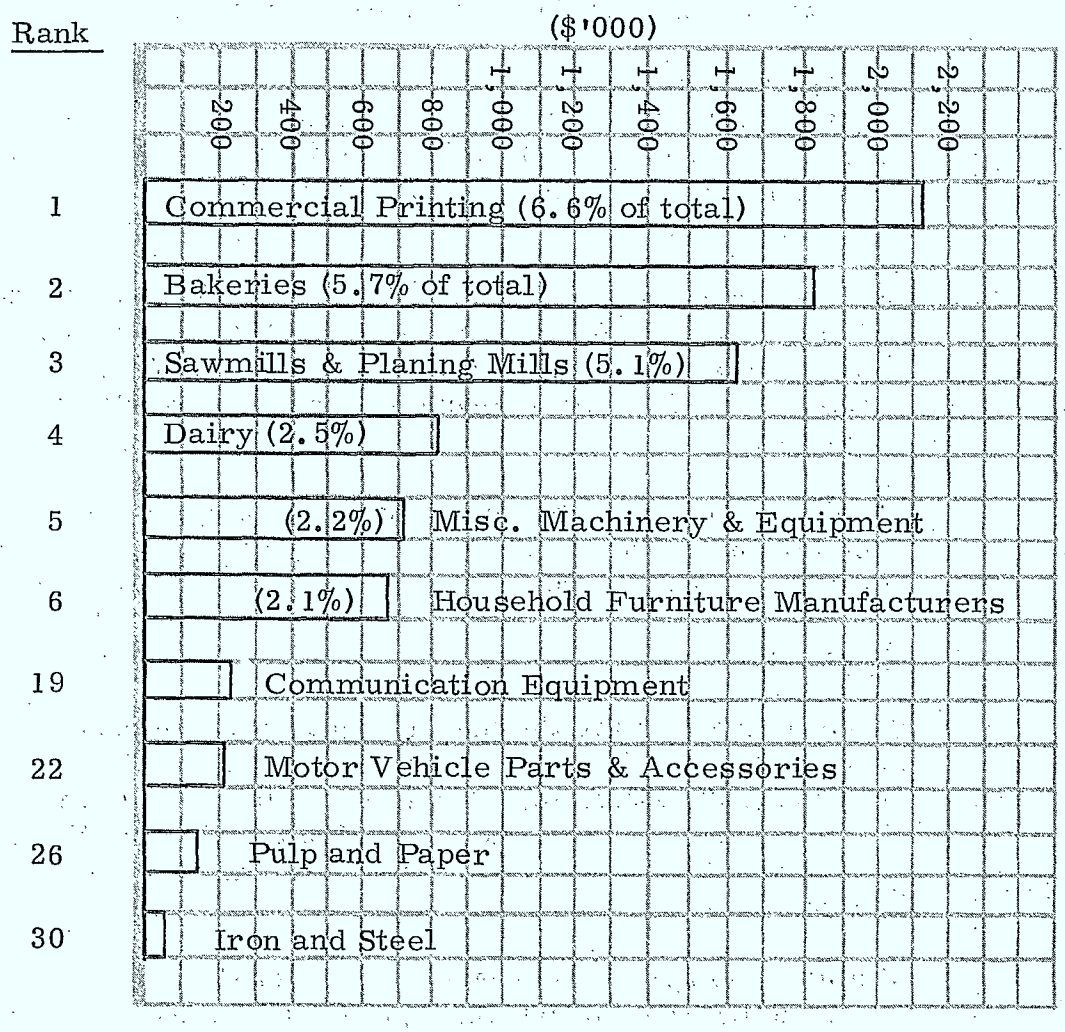
VALUE ADDED OF LEADING INDUSTRIES
1971



Source: Statistics Canada, General Review of Manufacturing Industries, 1971.

Figure 6

NUMBER OF ESTABLISHMENTS OF LEADING INDUSTRIES
(1971)



Source: Statistics Canada, General Review of Manufacturing Industries, 1971.

B. PAST GROWTH AND CURRENT SIZE

1. Number of Establishments

Table 6 shows that the industry has increased its establishments from 1,990 (1962) to 2,128 (1971). Estimated (but not yet published) for 1973 -- about 2,140.

Increases from province to province varies. Smaller provinces show relatively constant number over the 1962-71 period. But Ontario establishments increased by 55, British Columbia by 39, Quebec by 34, and Alberta by 15.

Size of firms varies greatly. Some 1,960 firms (92.1% of total) employ 50 people or fewer. Of these, 1,000 employ fewer than five people. These 1,960 firms account for 38.1% of total industry shipments (Tables 7 and 8).

At the other end of the scale, some 65 large firms employ 100 or more (3% of total), and account for 42.5% of industry's total shipments.

2. Shipments

Total shipments for the industry grew at a compound rate of 8.5% -- from $389.5 million (1962) to $945 million (1973 estimate). Growth rate increased in the last two years, never lower than 4.5% (1970) nor higher than 13.9% (1973). Table 9 shows shipments in current dollars.

Value of shipments increased 96% from 1962 to 1971. This varied from province to province. British Columbia, Alberta, Quebec and Saskatchewan grew more rapidly than the national average. New Brunswick, Ontario, Manitoba and Nova Scotia grew at less than the average rate.

In constant dollars (1961 = 100) total industry shipments

Table 6

NUMBER OF ESTABLISHMENTS - BY PROVINCE

Region / Year	Nfld.	P.E.I.	Nova Scotia	New Brunswick	Total Atlantic Prov.	Quebec	Ontario	Manitoba	Sask.	Alberta	British Columbia	Yukon & N.W.T.	Total Canada	% Change
1962	19	4	40	24	87	646	887	88	36	89	157	-	1,990	
1963	19	4	40	23	86	648	878	90	33	89	151	-	1,975	- .8
1964	16	5	37	21	79	647	861	92	36	90	152	-	1,957	- .9
1965	16	5	38	22	81	661	872	91	35	97	156	-	1,993	+ 1.0
1966	17	5	37	24	83	668	896	88	36	97	158	-	2,026	+ 1.6
1967	18	5	36	22	81	679	921	87	36	105	162	1	2,072	+ 2.3
1968	18	5	35	21	79	684	931	81	34	111	167	1	2,088	+ .8
1969	20	5	40	23	88	680	955	81	36	108	170	1	2,119	+ 1.5
1970	19	6	38	23	86	666	952	84	35	107	174	1	2,105	- .7
1971	14	6	39	24	83	680	942	88	34	104	196	1	2,128	+ 1.1
1972														

SOURCE: Statistics Canada

Table 7

DISTRIBUTION OF ESTABLISHMENTS BY SIZE
NUMBER OF EMPLOYEES PER ESTABLISHMENT
1971

Number of Employees	Establishments		Shipments	
	Number	%	Value ($'000)	%
1-4	938	44.1	34,678	4.5
5-49	1,022	48.0	256,327	33.6
50-99	103	4.9	148,603	19.4
100-199	37	1.7	110,803	14.5
200-499	22	1.0	126,888	16.6
500 +	6	0.3	86,891	11.4
TOTAL	2,128	100.0	764,190	100.0

Source: Statistics Canada, unpublished data.

Table 8

DISTRIBUTION OF ESTABLISHMENTS BY SIZE AND BY PROVINCE
MEASURED IN TERMS OF NUMBER OF EMPLOYEES - 1970

Province		Size by Number of Employees								Total
		1 to 4	5 to 14	15 to 49	50 to 99	100 to 199	200 to 499	500 to 999	1,000 to 1,499	
Newfoundland	#	14	3	1	1					19
	%	73.7	15.7	5.2	5.2					100.0%
Prince Edward Island	#	4	2							6
	%	66.6	33.4							100.0%
Nova Scotia	#	18	12	7	1					38
	%	47.4	31.6	18.4	2.6					100.0%
New Brunswick	#	12	5	6						23
	%	52.2	21.7	26.1						100.0%
Quebec	#	319	185	112	35	7	7	1		666
	%	47.8	27.8	16.8	5.3	1.1	1.1	0.1		100.0%
Ontario	#	410	288	166	45	24	14	4	1	952
	%	43.1	30.1	17.4	4.8	2.6	1.5	0.4	0.1	100.0%
Manitoba	#	36	24	11	9	4				84
	%	42.8	28.6	13.1	10.7	4.8				100.0%
Saskatchewan	#	13	17	3	2					35
	%	37.1	48.6	8.6	5.7					100.0%
Alberta	#	41	36	27	3					107
	%	38.3	33.7	25.2	2.8					100.0%
British Columbia	#	84	56	25	6	2	1			174
	%	48.3	32.2	14.4	3.5	1.1	0.5			100.0%
Yukon and Northwest Territories	#	1								1
	%	100.0								100.0%
TOTAL	#	952	628	358	102	37	22	5	1	2,105
	%	45.2	29.8	17.0	4.9	1.8	1.0	0.2	0.1	100.0%

Source: Statistics Canada, unpublished data.

Table 9

VALUE (IN CURRENT DOLLARS) OF TOTAL SHIPMENTS - BY PROVINCE
('000)

Year \ Region	Nfld.	P.E.I.	Nova Scotia	New Brunswick	Total Atlantic Prov.	Quebec	Ontario	Manitoba	Sask.	Alberta	British Columbia	Yukon & N.W.T.	Total Canada	% Change
1962	1,094	240	3,146	2,107	6,587	102,668	234,014	17,914	2,600	9,601	16,098	-	389,483	
1963	1,069	244	3,389	2,207	6,909	112,773	247,257	18,509	2,788	10,252	18,043	-	416,530	6.9
1964	1,080	286	3,026	2,568	6,960	121,009	260,134	19,729	3,294	11,657	19,402	-	442,185	6.2
1965	1,169	292	3,425	2,696	7,582	136,298	284,046	21,169	4,273	12,448	22,461	-	488,278	10.4
1966	1,297	303	3,145	2,918	7,663	155,592	318,443	22,459	4,859	13,901	28,042	-	550,957	12.8
1967	1,279	*	3,165	3,098	*	170,152	343,010	23,909	5,030	15,849	30,937	*	596,770	8.3
1968	1,422	*	3,075	2,557	*	184,836	350,786	24,792	5,159	17,608	33,526	*	624,142	4.6
1969	*	349	3,339	2,758	*	203,785	380,410	26,402	4,937	19,968	37,103	*	680,602	9.4
1970	*	431	3,604	3,211	*	208,969	396,676	28,666	5,102	21,673	41,659	*	711,429	4.5
1971	*	*	4,031	4,036	*	227,242	421,693	30,950	5,604	23,766	44,872	*	764,189	7.4
1972[1]													830,000	8.6
1973 Est.[1]													945,000[1]	13.8

[1] Estimated by Stevenson & Kellogg.
* Confidential
Source: Statistics Canada.

averaged an annual compound growth of 4.1%: from $383.7 million (1962) to $618 million (1973 estimated). The growth rate averaged around 4% with highest of 7.1% (1965) to lowest of 0.2% (1970). Table 10 shows values in constant dollars.

3. Employment

Average increase in labour force is 2.2% annually. This works out as a total increase of 6,806 people between 1962 (32,489 employees plus 1,232 owners) and 1971 (39,632 employees plus 895 owners). Estimated employment for 1973 was 42,000 (see Table 11).

4. Size of Firms in the Industry

The following tables summarize the most significant information about three groups of printing establishments:

- Group I - Firms employing over 50 employees.
  - Sales of $1,000,000 and over.
- Group II - Firms employing from 15 to 49 employees.
  - Sales varying from $250,000 to $1,000,000.
- Group III - Firms employing less than 15 employees.
  - Sales under $250,000.

The information displayed in these tables includes:

- Number of Establishments (Table 12)
- Value of Shipments (Table 12)
- Average Sales of Establishments (Table 12)
- Total Profits Before Tax (Table 13)
- Average Profits on Sales (Table 13)

Table 10

VALUE OF TOTAL SHIPMENTS (CONSTANT DOLLARS) - BY PROVINCE
(Base 1961 - 100)

Year \ Region	Nfld.	P.E.I.	Nova Scotia	New Brunswick	Sub-Total Atlantic	Quebec	Ontario	Manitoba	Sask.	Alberta	British Columbia	Total Canada	Index (L)	% Change
1962	1,080	240	3,100	2,080	6,500	101,150	230,560	17,650	2,560	9,460	15,860	383,730	101.5	
1963	1,030	240	3,270	2,130	6,660	108,750	238,440	17,850	2,690	9,890	17,400	401,670	103.7	4.7
1964	1,020	270	2,860	2,420	6,570	114,270	245,640	18,630	3,110	11,010	18,320	417,550	105.9	4.0
1965	1,070	270	3,140	2,470	6,950	124,820	260,120	19,390	3,910	11,400	20,570	447,140	109.2	7.1
1966	1,140	270	2,760	2,560	6,730	136,480	279,340	19,700	4,260	12,190	24,600	483,300	114.0	5.9
1967	1,080	*	2,680	2,620	6,650	144,070	290,440	20,240	4,260	13,420	26,200	505,310	118.1	4.6
1968	1,160	*	2,510	2,090	6,030	151,010	286,590	20,250	4,210	14,390	27,390	509,990	122.4	.9
1969	*	270	2,600	2,150	6,180	158,960	296,730	20,590	3,850	15,580	28,940	530,890	128.2	4.1
1970	*	320	2,700	2,400	6,580	156,300	296,690	21,440	3,820	16,210	31,160	532,110	133.7	.2
1971	*	*	2,910	2,920	7,310	164,310	304,910	22,380	4,050	17,180	32,450	552,560	138.3	3.8
1972 Est.												574,800	144.40	4.0
1973 Est.												618,000	153.0	7.5

*Confidential
Index: Total Domestic Demand, GNE, Implicit Price Indiex, 1961 = 100.
Source: Statistics Canada.

Table 11

NUMBER OF EMPLOYEES (TOTAL ACTIVITY) - BY PROVINCE[1]

Region / Year	Nfld.	P.E.I.	Nova Scotia	New Brunswick	Total Atlantic Prov.	Quebec	Ontario	Manitoba	Sask.	Alberta	British Columbia	Yukon & N.W.T.	Total Canada	Working Owners	Total Personnel	% Change
1962	152	26	352	252	782	8,818	18,662	1,614	286	961	1,367	-	32,489	1,232	33,721	-
1963	151	22	353	252	778	9,207	19,100	1,702	288	984	1,421	-	33,480	1,128	34,608	2.6
1964	148	22	336	312	818	9,434	18,788	1,704	311	1,015	1,490	-	33,560	1,079	34,639	-
1965	148	24	333	302	807	10,166	19,471	1,725	417	1,023	1,655	-	35,264	1,038	36,402	5.1
1966	146	24	337	300	807	10,577	20,703	1,800	439	1,076	1,867	-	37,269	1,034	38,303	5.2
1967	138	*	316	280	*	10,638	21,303	1,841	440	1,144	2,025	*	38,154	1,047	39,201	2.3
1968	146	*	287	228	*	10,988	21,177	1,811	432	1,239	2,101	*	38,437	988	39,425	.6
1969	*	28	300	221	*	11,138	21,256	1,646	420	1,293	2,279	*	38,723	1,003	39,726	.8
1970	*	27	306	229	*	10,910	21,493	1,718	397	1,349	2,311	*	38,874	935	39,809	.2
1971	*	*	337	304	*	11,452	21,529	1,783	398	1,353	2,330	*	39,632	895	40,527	1.8
1972																

*Confidential

[1]Source: Statistics Canada
Stevenson & Kellogg estimate of total employment in 1972 was 41,200 and in 1973 was 42,000

Table 12

SUMMARY TABLE - INDUSTRY STRUCTURE GROUP
ESTIMATED NUMBER OF ESTABLISHMENTS, VALUE OF
SHIPMENTS AND AVERAGE SALES PER ESTABLISHMENT
1973

Industry Structure			Number of Establishments		Value of Shipments		Average Sales Per Establishment
Group	Size Range						
	Total Employees	Sales Volume	No.	Percent	Dollar Volume	Percent	
I	Over 50	$1,000,000 and over	177	8.2	$585,000,000	61.9	$3,305,800
II	15 - 49	$250,000 to $1,000,000	395	18.5	$221,100,000	23.4	$ 559,800
III	Under 15	Under $250,000	1,568	73.3	$138,900,000	14.7	$ 88,600
		TOTALS	2,140	100.0	$945,000,000	100.0	$ 441,600

Source: Stevenson & Kellogg projected estimates.

Table 13

SUMMARY TABLE - INDUSTRY STRUCTURE GROUPS
ESTIMATED PROFITABILITY OF ESTABLISHMENTS BY
GROUP SIZE RELATIVE TO SALES VOLUME
1973

Industry Structure Group	Sales Volume Size Range	Total Group Sales ($'000)	Total Before Tax Profits ($'000)	Profits on Sales (%)
I	$1,000,000 and over	585,000	29,320	5.0
II	$250,000 to $1,000,000	221,100	8,940	4.0
III	Under $250,000	138,900	7,290	5.3
	TOTAL	$945,000	$45,550	4.82%

Source: Estimated by Stevenson & Kellogg.

- Number of Establishments from 1970 to 1973 (Table 14)
- Growth in Shipments from 1970 to 1973 (Table 15)
- Growth in Total Employment from 1970 to 1973 (Table 16)
- Growth in Average Sales per Establishment from 1970 to 1973 (Table 17)
- Profits on Sales and ROI for 1970 to 1973 (Table 18)
- Total Assets Employed by Size from 1970 to 1973 (Table 19)

These tables will be discussed in the following chapters. In most of the cases the three categories will be divided into smaller sub-groups.

C. CONSUMPTION OF SUPPLIES AND EQUIPMENT

Materials, supplies and purchased services represent an overall 40% of the value of shipments. The elements include:

	Percent of Shipments
Fine and printing specialty papers	20
Newsprint	3
Supply materials - films, plates, chemicals, blankets, etc.	6
Services purchased outside	5
Ink	2
All others	4
	40%

Table 14

SUMMARY TABLE - INDUSTRY STRUCTURE GROUPS
ESTIMATED PAST GROWTH OF NUMBER OF ESTABLISHMENTS
BY SIZE GROUP 1970-1973

Industry Size Group	Size Range By Employees	Estimated Number of Establishments							
		1970		1971		1972		1973	
		No.	%	No.	%	No.	%	No.	%
I	50 and over	167	7.9	170	8.0	173	8.1	177	8.2
II	15 - 49	358	17.0	372	17.5	384	18.0	395	18.5
III	Under 15	1,580	75.1	1,586	74.5	1,577	73.9	1,568	73.3
	TOTAL	2,105	100.0	2,128	100.0	2,134	100.0	2,140	100.0

Source: Statistics Canada and Stevenson & Kellogg projected estimates.

Table 15

SUMMARY TABLE - INDUSTRY STRUCTURE GROUPS
ESTIMATED PAST GROWTH OF VALUE OF SHIPMENTS
BY SIZE GROUP 1970-1973

Industry Size Group	Size Range By Employees	Estimated Value of Shipments ($'000)							
		1970		1971		1972		1973	
		No.	%	No.	%	No.	%	No.	%
I	50 and over	440,700	62.0	473,000	61.9	526,200	61.9	585,000	61.9
II	15 - 49	158,200	22.2	175,000	22.9	200,600	23.6	221,100	23.4
III	Under 15	112,500	15.8	116,200	15.2	123,200	14.5	138,900	14.7
	TOTAL	711,400	100.0	764,200	100.0	850,000	100.0	945,000	100.0

Source: Statistics Canada and Stevenson & Kellogg projected estimates.

Table 16

SUMMARY TABLE - INDUSTRY STRUCTURE GROUPS
ESTIMATED PAST GROWTH OF TOTAL EMPLOYMENT
BY SIZE GROUP 1970-1973

Industry Size Group	Size Range By Employees	Estimated Total Employment ('000)							
		1970		1971		1972		1973	
		No.	%	No.	%	No.	%	No.	%
I	50 and over	23,250	58.4	23,600	58.3	24,000	58.3	24,600	58.6
II	15 - 49	9,250	23.2	9,600	23.7	9,900	24.0	10,200	24.3
III	Under 15	7,300	18.4	7,300	18.0	7,300	17.7	7,200	17.1
	TOTAL	39,800	100.0	40,500	100.0	41,200	100.0	42,000	100.0

Source: Statistics Canada and Stevenson & Kellogg projected estimates.

Table 17

SUMMARY TABLE - INDUSTRY STRUCTURE GROUPS
ESTIMATED PAST GROWTH OF AVERAGE SALES PER ESTABLISHMENT
BY SIZE GROUP 1970-1973

Industry Size Group	Size Range By Employees	Estimated Average Sales Per Establishment			
		1970	1971	1972	1973
I	50 and over	$2,639,000	$2,782,000	$3,042,000	$3,305,800
II	15 - 49	442,000	470,000	522,000	559,800
III	Under 15	71,200	73,300	78,100	88,600
Industry Average (1)		$ 338,000	$ 359,000	$ 398,000	$ 442,000

NOTE: (1) Industry averages do not total to sub-categories above.

Source: Tables 7 and 8.

Table 18

SUMMARY TABLE - INDUSTRY STRUCTURE GROUPS
ESTIMATED PAST GROWTH OF FIRM PROFITABILITY[1]
BY SIZE GROUP 1970-1973

Industry Size Group	Size Range By Employees	1970		1971		1972		1973	
		Profits on Sales[1]	ROI[2]	Profits on Sales	ROI	Profits on Sales	ROI	Profits on Sales	ROI
I	50 and over	5.36	5.64	4.89	5.42	4.93	5.46	5.0	5.5
II	15 - 49	3.75	4.2	4.69	5.20	4.59	5.30	4.6	5.3
III	Under 15			4.50	5.12	5.20	7.01	5.0	6.6
Industry Average		5.10	5.42	4.86	5.39	4.89	5.48	4.9	5.6

NOTE: (1) "Profits on Sales" in this table mean Net Income before taxes.
(2) "ROI" is before tax, operating return on operating assets

Source: 1970-1972 GAIA Data, 1973 projected estimate by Stevenson & Kellogg.

Table 19

SUMMARY TABLE - INDUSTRY STRUCTURE GROUPS
ESTIMATED PAST GROWTH OF TOTAL ASSETS EMPLOYED (1)
BY SIZE GROUP 1970-1973

Industry Size Group	Size Range Sales Volume	Estimated Total Assets Employed ($'000)							
		1970		1971		1972		1973	
		$	%	$	%	$	%	$	%
I	$1,000,000 and over	439,500	65.7	473,000	66.2	504,000	66.0	538,000	66.4
II	$250,000 to $1,000,000	113,000	17.0	127,000	17.8	148,000	19.3	169,000	20.8
III	Under $250,000	115,000	17.3	114,000	16.0	112,000	14.7	104,000	12.8
	TOTAL	667,500	100.0	714,000	100.0	764,000	100.0	811,000	100.0

(1) Total assets employed are valued before depreciation.

Source: Stevenson & Kellogg estimates.

1. Fine Papers

Commercial printers bought 57% ($139 million) of fine and printing papers produced in Canada in 1971. (After exports and imports, this figure becomes 70 to 75% of available quantities.) This represents annual growth of $6\frac{1}{2}$% compounded from a 1962 level of $78.8 million. Consumption in 1973 is estimated at $190 million.

See Table 20 for details of purchases (1962 to 1971) and their relation to Canadian production, imports and exports.

2. Newsprint

Commercial printers consumed $20 million in 1971, triple the value in 1962. This represents 2% of Canadian production. Table 21 shows this relationship.

3. Ink

Commercial printers spent $14 million on ink in 1971. This represents 45% of Canadian ink production. Table 22 shows growth in ink purchases since 1962. Note the consistent pattern of growth averaging 9% per year during this period.

4. Machinery and Equipment

In 1971 the printing industry imported machinery and equipment valued at $56.6 million. (There is no significant manufacturer of printing equipment in Canada. Capital value of imported machinery when installed would increase roughly 50%.) Table 23 shows data on imports.

Commercial printers account for slightly less than half of the machinery imported. The publishing and printing sector of the industry buys 45%; engraving and allied industries buy 8 to 9%.

Table 20

RELATIVE IMPORTANCE OF COMMERCIAL PRINTERS AS PURCHASERS OF PAPER[1]

Year	Establishments	Purchases[1]		Produced in Canada[1]		Imports[2]	Exports[3]	
		($'000)	%	($'000)	%	($'000)	($'000)	%
1962	1,990	78,775	66	119,405	100	N.A.	14,013	12
1963	1,975	83,893	66	126,650	100	N.A.	15,578	12
1964	1,957	91,459	66	138,157	100	7,104	21,072	15
1965	1,993	99,580	66	150,289	100	8,051	24,750	16
1966	2,026	116,883	66	176,278	100	10,295	32,932	19
1967	2,072	124,581	67	184,943	100	10,337	35,516	19
1968	2,088	123,235	66	187,145	100	12,131	32,321	17
1969	2,119	133,758	65	206,686	100	16,236	48,662	24
1970	2,105	133,953	56	238,232	100	16,235	69,636	29
1971	2,128	139,009	57	241,810	100	18,895	69,693	29

Source: Statistics Canada

(1) Paper includes paper products classified as fine papers, book papers, groundwood printing and specialty papers used by printers. Percentages based on Canadian production being 100%.

(2) Import classifications include paper for printing such as bond, chart, ledger, covers, bristols, and fine papers. Imported newsprint is also included under the general classification of "paper for printing" which accounts for about 40% of total imports shown.

(3) Export classifications include paper for base stock for coated printing paper, groundwood printing paper, writing and reproduction paper, and fine papers. Percentages based on Canadian production being 100%.

N.A. - Not available due to changes in classification in 1964.

Table 21

RELATIVE IMPORTANCE OF COMMERCIAL PRINTERS AS PURCHASERS OF NEWSPRINT PAPER

Year	Establishments	Purchases(1)		Produced in Canada	
		($'000)	%	($'000)	%
1962	1,990	7,145	.9	819,079	100
1963	1,975	8,592	1.1	809,248	100
1964	1,957	8,028	.9	887,612	100
1965	1,993	8,956	1.0	927,832	100
1966	2,026	10,485	1.0	1,025,048	100
1967	2,072	12,053	1.2	998,020	100
1968	2,088	14,039	1.4	1,015,794	100
1969	2,119	17,110	1.5	1,114,707	100
1970	2,105	19,438	1.8	1,106,688	100
1971	2,128	21,618	2.0	1,083,225	100

Source: Statistics Canada

(1) Newsprint purchases shown refers only to purchases by commercial printing establishments, i.e. in SIC 286. "Publishing and Printing" establishments (i.e. SIC 289) account for over $90 million consumption of newsprint.

Table 22

RELATIVE IMPORTANCE OF COMMERCIAL PRINTERS AS PURCHASERS OF INK

Year	Establishments	Purchases(1)		Produced in Canada		Imports	Exports	
		($'000)	%	($'000)	%	($'000)	($'000)	%
1962	1,990	6,153	32	19,244	100	N.A.	DATA NOT AVAILABLE	
1963	1,975	7,038	36	19,632	100	N.A.		
1964	1,957	8,334	41	20,177	100	2,127		
1965	1,993	8,812	39	22,352	100	2,076		
1966	2,026	10,113	42	24,127	100	1,954		
1967	2,072	10,962	43	25,457	100	2,334		
1968	2,088	11,217	42	27,002	100	2,289		
1969	2,119	12,764	47	27,333	100	2,917		
1970	2,105	13,603	50	27,074	100	1,984		
1971	2,128	14,131	45	31,494	100	1,672		

Source: Statistics Canada

(1) Ink purchases shown refers only to purchases by commercial printing establishments, i.e. in SIC 286.

Table 23

CANADIAN IMPORTS [1] OF PRINTING AND RELATED MACHINERY AND EQUIPMENT

Year	Type of Machinery and Equipment			Total[5]
	Preparatory[2]	Printing[3]	Finishing[4]	
1962	Not available due to classification changes in 1964.			
1963				
1964	7,714	25,468	1,763	34,945
1965	7,564	20,644	1,838	30,046
1966	7,193	21,892	2,324	31,409
1967	8,404	27,090	2,674	38,168
1968	7,289	29,789	2,707	39,785
1969	9,280	34,024	4,101	47,405
1970	12,035	39,188	3,728	54,951
1971	10,685	43,079	2,850	56,614

Source: Statistics Canada

(1) Virtually all new machinery purchased is imported into Canada.

(2) Preparatory equipment includes typesetting, composing, type foundry, and special type equipment.

(3) Printing equipment includes presses and parts of all types.

(4) Finishing equipment includes bookbinding machinery. Note: paper shears are included in printing equipment classifications in (3) above.

(5) Commercial printers are estimated to purchase about one-half of these totals.

5. Printing Press Machinery

Commercial printers and publisher/printers bought $43 million in printing machinery in 1971, or 70 to 75% of total printing and related machinery purchased. (In-house printing purchased between $3 and $4 million.)

6. Preparatory Machinery (typesetting, composing machines)

This machinery accounted for $2.9 million in 1971, or 19 to 23% of machinery purchased in the industry.

7. Finishing Equipment

This consists of machines to handle and bind matter into the finished product and accounted for $2.9 million in 1971, or 7 to 9% of machinery purchased in the industry.

D. CONCENTRATION RATIOS

1. In Terms of Number of Establishments

A small number of businesses produce a large percentage of the industry's output. Table 24 shows that in 1971, 1.1% of the total number of establishments accounted for 27.1% of the value of shipments. It further showed that 125 establishments (7% of total) shared 61% of value of shipments.

Here is further indication of this high concentration: 65% of total number of establishments account for 97.4% of total shipments. At the lower end of the scale, 35% of the establishments ($50,000 and under group) share a mere 2.6% of total industry shipments.

However, this concentration is not abnormal. When compared with other industries, printing does not differ in terms of concentration. Here is a comparison: in 1968, 2% of the printing companies accounted for from 40 to 45% of total shipments. In two other industries --

Table 24

CONCENTRATION OF SHIPMENTS BY ESTABLISHMENTS IN COMMERCIAL PRINTING - 1971

Size Group By Shipments	Establishments	Accumulated Total Establishments	Shipment $'000	Accumulated Shipments $'000	Concentration Ratios	
					% Estab.	% Shipments
$5,000,000 +	23	23	207,018	207,018	1.1	27.1
$1,000,000 to 4,999,999	125	148	258,144	465,162	7.0	60.9
$500,000 to 999,999	151	294	101,906	567,068	13.8	74.2
$200,000 to 499,999	311	610	97,902	664,970	28.6	87.01
$100,000 to 199,999	351	961	49,433	714,403	45.2	93.5
$50,000 to 99,999	422	1,383	30,276	744,679	65.0	97.4
$49,999 to 0	745	2,128	19,510	764,189	100.0	100.0

SOURCE: Statistics Canada, unpublished data.

baking and logging (both having about the same number of establishments as printing) -- 2% of the companies accounted for from 60 to 75% of the industry's shipments.

2. In Terms of Leading Companies

A look at leading companies (Table 25) shows further concentration in the industry. In 1965 and again in 1968, the top 20 companies shared 34% of total shipments. The top 50 companies shared 48%. Figure 7 graphs this relationship.

3. In Terms of Establishments Per Companies

Evidence suggests that leading companies do not tend toward significant increases in their concentration. To wit:

In 1965 the top 20 companies controlled 47 establishments. In 1968 this grew to 53, an increase of 12% in the three years.

In 1965 the top 50 companies controlled 83 establishments. In 1968 this grew to 88, an increase of 3.5% in the three years.

E. PROXIMITY TO MARKETS

Commercial printers tend to locate close to their markets. The survey shows that 81% of establishments send the bulk of shipments within a 50 mile radius. A mere 2% of establishments report the bulk of shipments over 500 miles. Table 26 shows these radius ranges by province.

On the basis of shipment dollars, 68% is shipped within 50 miles, 5% shipped beyond 500 miles. Table 27 shows this in detail.

Table 25

CONCENTRATION OF SHIPMENTS BY COMPANIES
IN COMMERCIAL PRINTING - 1965 vs. 1968

	1965(1)		1968(2)	
NO. OF LEADING COMPANIES(1)	NO. OF ESTABLISHMENTS	% OF SHIPMENTS	NO. OF ESTABLISHMENTS	% OF SHIPMENTS
4	23	13.5	24	15.0
8	28	22.5	31	23.3
12	39	27.4	41	28.2
16	43	31.3	46	31.6
20	47	34.5	53	34.7
50	83	48.1	88	48.4

Source: Statistics Canada

(1) In 1965, there were 1,956 companies and 1,991 establishments.
(2) In 1968, there were 2,045 companies and 2,088 establishments.

Figure 7

PERCENT OF SHIPMENTS
RELATED TO ESTABLISHMENTS

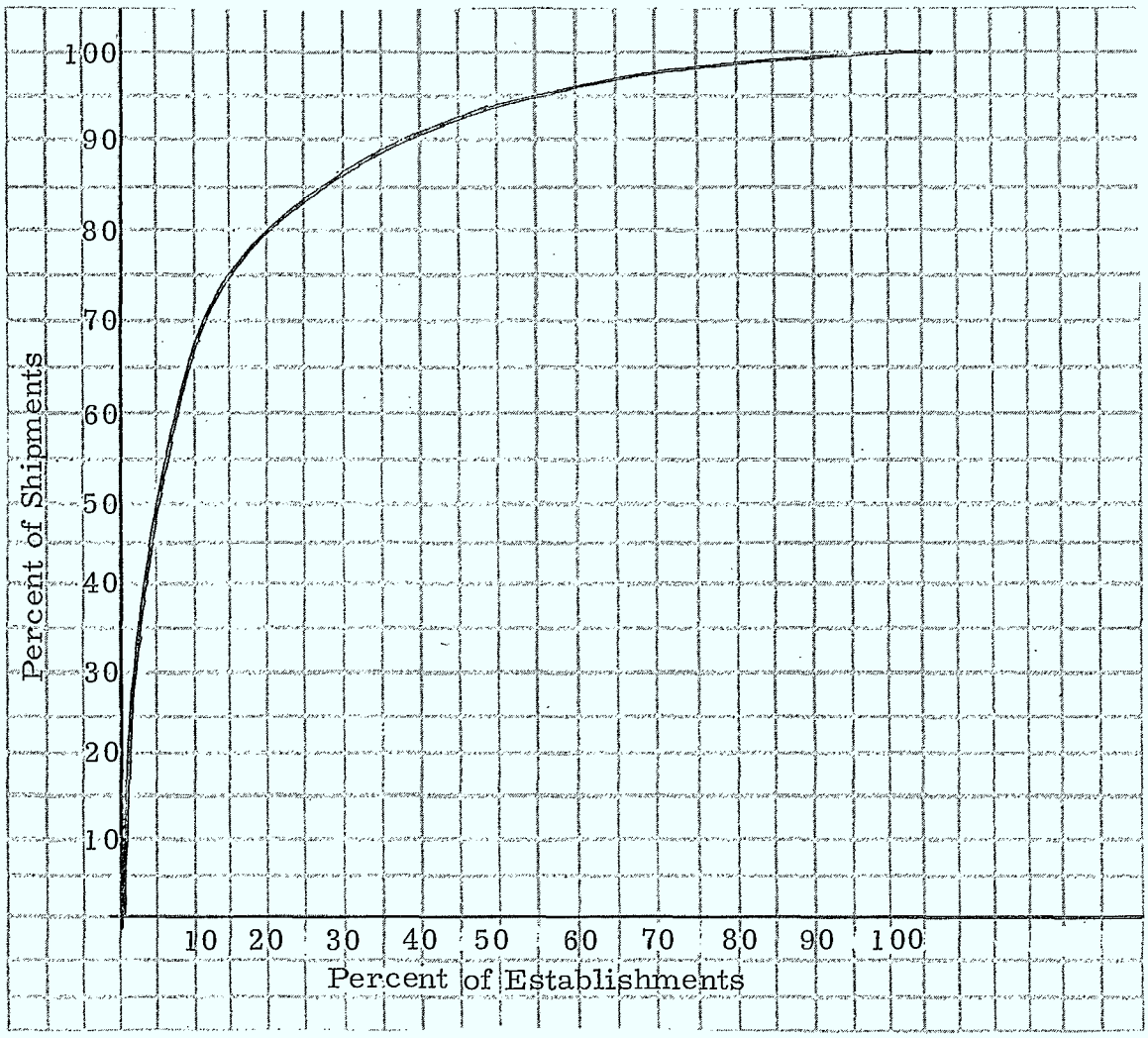


Table 26

RANGES OF SHIPPING DISTANCES
IN TERMS OF ESTABLISHMENTS[1]
1974

Range		Province										Total
		Nfld.	PEI	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	
0 - 25 miles	No.	Insignificant Data		9	3	77	121	15	12	30	29	296
	%			75	50	66	63	71	86	83	81	68
0 - 50 miles	No.			10	4	92	149	17	14	34	32	352
	%			83	67	79	78	81	100	94	89	81
0 - 100 miles	No.			-	-	107	165	-	-	-	35	387
	%			-	-	92	86	-	-	-	97	89
0 - 200 miles	No.			-	86	110	175	18	-	35	36	405
	%			-	100	95	91	86	-	97	100	93
0 - 500 miles	No.			12	-	115	188	-	-	-	-	425
	%			100	-	99	98	-	-	-	-	98
Over 500 miles	No.			-	-	1	4	3	-	1	-	9
	%			-	-	1	2	14	-	3	-	2
TOTAL	No.	1		12	6	116	192	21	14	36	36	434
	%	-		100	100	100	100	100	100	100	100	100

Source: Stevenson & Kellogg Industry Survey, March 1974.

[1] The numbers of establishments shown in the table are those who reported that "the bulk of their shipments" are within the radius range specified.

Table 27

RANGES OF SHIPPING DISTANCES
IN TERMS OF SHIPMENT DOLLARS
1974 - ($, 000)

Range		Province										Total
		Nfld.	PEI	N. S.	N. B.	Que.	Ont.	Man.	Sask.	Alta.	B. C.	
0 - 25 miles	$	Insignificant Data		1,137	247	56,266	113,858	8,358	2,490	8,665	15,440	206,457
	%			52	20	58	58	53	95	72	88	60
0 - 50 miles	$			1,383	963	61,297	131,701	8,627	2,611	10,513	16,613	233,710
	%			63	77	63	67	55	100	87	95	68
0 - 100 miles	$			-	-	66,693	141,505	-	-	-	17,426	249,723
	%			-	-	68	72	-	-	-	100	73
0 - 200 miles	$			-	1,257	67,401	158,446	11,032	-	11,680	17,489	271,302
	%			-	100	69	81	70	-	97	-	79
0 - 500 miles	$			2,190	-	89,165	192,444	-	-	-	-	327,870
	%			100	-	92	98	-	-	-	-	95
Over 500 miles	$			-	-	7,559	4,198	4,739	-	400	-	16,897
	%			-	-	8	2	30	-	3	-	5
TOTAL	$			2,190	1,257	96,724	196,642	15,771	2,611	12,080	17,489	344,767
	%			100	100	100	100	100	100	100	100	100

Source: Stevenson & Kellogg Industry Survey, March 1974.

F. FORM OF OWNERSHIP

1. In Terms of Establishments: Canada

Statistics Canada for 1971 shows Canadian ownership in commercial printing firms as follows (see Table 28):

Individual ownerships	28%
Partnerships	7%
Incorporated companies and cooperatives	65%

This roughly parallels the situation in manufacturing. For all manufacturing in Canada, according to the S & K survey, ownership is:

	1971	1974
Individual ownership	22%	21%
Partnerships	5%	10%
Incorporated companies and cooperatives	73%	68%

2. In Terms of Establishments: the Provinces

(a) Individual Ownership

In Quebec and the Maritime provinces, individual ownership accounts for more than 30% of establishments. Ontario and Western provinces averaged less than 30% (see Table 29).

(b) Partnerships

The national average (7%) varies little by province. Largest is Nova Scotia -- 10.4%. Smallest is Quebec -- 6.6%.

(c) Incorporated Companies and Cooperatives

These lead in all provinces. In Ontario and the west -- 65%; in Alberta (the highest) -- 84.6%.

Table 28

TYPES OF ORGANIZATION - COMMERCIAL PRINTING INDUSTRY COMPARED WITH ALL MANUFACTURING INDUSTRIES - 1969 AND COMMERCIAL PRINTING SURVEY - 1974

Type of Organization	SIC 286, Commercial Printing Canada, 1971		All Manufacturing Industries 1971		SIC 286, Commercial Printing, Survey, 1974	
	Establishments	%	Establishments	%	Establishments	%
Individual Ownership	589	28	7,043	22	90	21
Partnerships	150	7	1,751	5	45	10
Incorporated Companies	1,389	65	22,622	71	296	68
Co-operatives			492	2	3	1
Total	2,128	100	31,908	100	434	100

Source: Statistics Canada, unpublished data and Stevenson & Kellogg survey of 434 commercial printers.

Table 29

NUMBER OF ESTABLISHMENTS BY TYPE OF ORGANIZATION - 1971

Type of Organization		Newfoundland and Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Sask-atchewan	Alberta	British Columbia	Total Canada	Study Sample #	Study Sample %
Individual Ownership	#	9	12	9	241	256	18	6	8	30	589	90	
	% ▽	42.9	30.7	37.0	35.4	27.2	20.4	17.6	7.7	15.3	27.7%		21
	% ▷	1.5	2.0	1.5	40.9	43.5	3.1	1.0	1.4	5.1	100.0%		
Partnership	#	3	4	-	45	69	7	-	8	14	150	45	
	% ▽	14.3	10.4	-	6.6	7.3	8.0	-	7.7	7.1	7.0%		10
	% ▷	2.0	2.7	-	30.0	46.0	4.7	-	5.3	9.3	100.0%		
Incorporated Co. Incorporated Co-op. Unincorporated Co-op.	#	9	23	15	394	617	63	28	88	152	1,389	299	
	% ▽	42.8	58.9	63.0	58.0	65.5	71.6	82.4	84.6	77.6	65.3%		69
	% ▷	.7	1.7	1.1	28.4	44.4	4.5	2.0	6.3	10.9	100.0%		
TOTAL	#	21	39	24	680	942	88	34	104	196	2,128	434	
	% ▽	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0%		100
	% ▷	1.1	1.8	1.1	32.0	44.2	4.1	1.6	4.9	9.2	100.0%		

Source: Statistics Canada, unpublished data.

3. In Terms of Sales and Employment

Individual owners account for 2.8% of sales, 3.6% of employment. Partnerships account for 1.3% of sales, 1.7% of employment. Incorporated companies and cooperatives account for 95.9% of sales and 94.7% of employment (see Tables 30 and 31).

Table 30

SALES BY TYPE OF ORGANIZATION - 1971

Type of Organization		Newfoundland and Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Sask-atchewan	Alberta	British Columbia	Total Canada
Individual Ownership	$'000	190	313	227	8,998	10,186	530	165	228	791	21,628
	% ▼	9.8	7.7	5.6	4.0	2.4	1.7	3.0	1.0	1.8	2.8%
	% ▲	.9	1.4	1.0	41.6	47.0	2.5	.8	1.1	3.7	100.0%
Partnership	$'000	126	149	-	3,025	5,149	222	-	363	757	9,791
	% ▼	6.5	3.7	-	1.3	1.2	.8	-	1.5	1.7	1.3%
	% ▲	1.3	1.5	-	30.9	52.6	2.3	-	3.7	7.7	100.0%
Incorporated Co. Incorporated Co-op. Unincorporated Co-op.	$'000	1,629	3,569	3,858	215,219	406,359	30,198	5,439	23,176	43,324	732,771
	% ▼	83.7	88.6	94.4	94.7	96.4	97.5	97.0	97.5	96.5	95.9%
	% ▲	.2	.5	.5	29.4	55.5	4.1	.7	3.2	5.9	100.0%
TOTAL	$'000	1,945	4,031	4,086	227,242	421,693	30,950	5,604	23,766	44,872	764,189
	% ▼	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0%
	% ▲	.3	.5	.5	29.7	55.2	4.1	.7	3.1	5.9	100.0%

Source: Statistics Canada, unpublished data.

Table 31

NUMBER OF EMPLOYEES BY TYPE OF ORGANIZATION - 1971

Type of Organization		Newfoundland and Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total Canada
Individual Ownership		30	25	14	620	658	45	14	15	52	1,463
	% ↓	18.5	7.0	4.5	5.3	3.0	2.5	3.5	1.1	2.2	3.6%
	% →	2.2	1.8	.2	42.5	45.1	3.2	.2	1.1	3.7	100.0%
Partnership		-	15	-	205	341	21	-	26	49	667
	% ↓	-	4.2	-	1.7	1.6	1.1	-	1.9	2.1	1.7%
	% →	-	2.3	-	31.2	51.3	3.4	-	4.2	7.6	100.0%
Incorporated Co. Incorporated Co-op. Unincorporated Co-op.		132	317	299	10,958	20,929	1,748	391	1,336	2,287	38,397
	% ↓	81.5	88.8	95.5	93.0	95.4	96.4	96.5	97.0	95.7	94.7%
	% →	.3	.8	.8	28.5	54.5	4.6	1.0	3.5	6.0	100.0%
TOTAL		202	357	313	11,773	21,928	1,814	405	1,377	2,388	40,527
	% ↓	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0%
	% →	.5	.9	.8	29.0	54.0	4.5	1.0	3.4	5.9	100.0%

Source: Statistics Canada, unpublished data.

III

PRODUCT AND PRODUCTION CHARACTERISTICS

This chapter presents data on the production of goods by the commercial printing industry. Much of the information stems from the Stevenson & Kellogg survey done in March 1974. To permit comparisons, the study reallocated Statistics Canada figures for 1968 on the industry.

A. SHIPMENT BY PRODUCT LINE

1. Major Product Line

The study identifies seven broad groups of products. One of these groups -- specialties -- breaks down into seven sub-groups plus "other" classification (see Table 32).

Specialty printing accounts for 58% of total industry shipments. Estimated increase from 1968 to 1973 is 52% for this group compared to a total industry increase of 51% (see Table 33).

Business forms (second largest) account for 14.7%. Increase from 1968 to 1973 is 45%, somewhat lower than the general industry.

Publications accounted for 11.6%, an increase of 57%.

Labels and tags represents 5.4% of 1973 shipments, an increase of 50%.

Books represent 5.5%, an increase of 57%.

Packaging accounts for 3.1% but shows the largest increase -- 81%.

Non-printed products represent 1.7%, an increase of 7%.

Table 32

ESTIMATED TOTAL VALUE OF SHIPMENTS BY PRODUCT[1]
(From 1968 to 1973)
($'000)

Product	1968	1969	1970	1971	1972	1973
1. Specialties						
Advertising, (pamphlets, etc.)	117,500	130,500	133,700	143,700	161,300	191,000
Display Posters, Billboards	19,400	21,600	22,200	24,000	26,000	29,000
Catalogues	45,000	50,000	51,300	55,000	60,000	68,000
Greeting Cards	33,500	37,200	38,200	41,000	43,000	45,000
Blank Books and Printed Forms	19,400	21,600	22,200	24,000	24,500	25,000
Calendars	5,400	6,000	6,200	6,500	7,200	8,000
Stationery	67,000	74,400	76,300	82,000	89,000	100,000
Other Printed Products	52,900	58,800	60,300	65,000	70,000	82,000
Sub-Total	360,100	400,100	410,400	441,200	481,000	548,000
2. Business Forms						
Continuous Types	51,800	55,100	59,400	63,000	69,000	75,000
Individual Types	44,200	46,900	50,600	55,000	59,000	64,000
Sub-Total	96,000	102,000	110,000	118,000	128,000	139,000
3. Publications (for publishers)						
Newspapers	9,500	9,900	10,800	11,600	13,500	15,000
Magazines	47,200	49,200	54,000	58,100	62,800	74,000
Directories	13,300	13,900	15,200	16,300	17,700	21,000
Sub-Total	70,000	73,000	80,000	86,000	94,000	110,000
4. Labels and Tags	34,000	35,500	37,000	39,800	42,000	51,000
5. Book Printing	33,000	35,000	38,000	42,000	45,000	52,000
6. Packaging	16,000	20,000	21,000	23,000	25,000	29,000
7. Non-Printed Products	15,000	15,000	15,000	14,000	15,000	16,000
GRAND TOTAL	624,100	680,600	711,400	764,000	830,000	945,000
% Change		+9.0%	+4.5%	+7.4%	+8.6%	+13.9%

(1) Approximately 35% of shipments reported by Statistics Canada are of a general or unspecified product. In this table these values have been distributed, based on survey data.

Source: Statistics Canada grand totals for 1968 to 1971 and Stevenson & Kellogg estimates for 1972 - 1973.

Table 33

DISTRIBUTION OF MAJOR PRODUCT LINES WITHIN COMMERCIAL PRINTING
($'000,000)

Product Line	Shipments (SIC 186)		Percent of Total Industry		Growth From 1968 to 1973
	1968[1]	1973[2]	1968	1973	
Specialties (advertising, catalogues, greeting cards, blank books, calendars, stationery and other)	360	548	58.8	58.0	52%
Business Forms	96	139	15.4	14.7	45
Publication	70	110	11.2	11.6	57
Labels and Tags	34	51	5.4	5.4	50
Books	33	52	5.3	5.5	57
Packaging	16	29	2.1	3.1	81
Non-Printed Products	15	16	2.4	1.7	7
TOTAL	624	945	100.0	100.0	51%

[1] Approximately 35% of shipments reported by Statistics Canada are classed as general. In this table these values have been distributed to the product lines listed above. This distribution is based on data obtained in the Stevenson & Kellogg survey.

[2] Estimated by Stevenson & Kellogg.

2. Shipment by Product Within Selected Major Lines

(a) Specialty Printing

This group increased 24.2% from 1971 to 1973. Advertising material increased the greatest -- 33%. Catalogues, calendars and stationary increased 23%. Blank books and greeting cards increased less than 10% (see Table 34).

(b) Business Forms

This group accounts for 14.7% of 1973 shipments. It divides itself into two products:

	1973 Shipments ($'000)	% of Total Industry	Increase from 1971-1973
Continuous	$ 75,000	7.9%	19.0
Individual	64,000	6.8	16.0
Total	$139,000	14.7%	

Past increase for business forms has been lower than increase of the industry. However, continuous forms grew faster than did individual forms.

(c) Publications

The three products in this class -- newspapers, magazines and directories -- increased 27.9% from 1971 to 1973. Total industry increase was 23.7%. All three increased at much the same rate.

Table 34

INDUSTRY SHIPMENTS BY TYPE OF PRODUCT

Specialties	1973 ($'000,000)	% of Total Industry	Estimated Increase From 1971-1973
Advertising Matter	191	20.2	32.9%
Display Posters, Billboards	29	3.1	20.8
Catalogues	68	7.2	23.6
Greeting Cards	45	4.8	9.7
Blank Books and Printed Forms	25	2.6	4.2
Calendars	8	.8	23.0
Stationery	100	10.6	22.0
Other Printed Products	82	8.7	26.1
Total Specialties Printing	548	58.0	24.2
TOTAL INDUSTRY	$945	100.0%	23.7%

	1973 Shipments ($'000)	% of Total Industry	Increase from 1971-1973
Newspapers	$ 15,000	1.6%	29.3%
Magazines	74,000	7.8	27.4
Directories	21,000	2.2	28.8
	$110,000	11.6%	

B. SHIPMENTS BY PROCESS

Table 35 summarizes percent distribution of various printing processes and dollar shipments by product and process. Figures result from a questionnaire survey. The principal processes in use are:

- offset printing -- 78.9%
- letterpress printing -- 13.8%
- gravure printing -- 2.8%
- screen printing -- 2.0%

1. Offset (Lithographic) Printing

Offset is the most-used process. Most printers have both offset and letterpress. But figures for their use (in terms of sales) tell the story: offset -- 80 to 90%; letterpress -- 10 to 20%. The survey suggests 78.9% as an overall use of offset. This percentage, applied to total sales of $945 million (estimated) for 1973, suggests that offset printing produced $732.4 million for that year.

2. Letterpress Printing

Letterpress accounts for about 13.8% of all shipments ($127.8 million in 1973). Most printers have both offset and letterpress. A few use offset exclusively; a very few use letterpress exclusively.

Table 35

ESTIMATED SHIPMENTS BY PRODUCT AND PROCESS
(1973)

Product	Estimated		Estimated Shipments by Printing Process ($'000)							
	%	($'000)	Letterpress	Offset	Gravure	Screen	Flexograph	Electro	Other	Total
1. Specialties										
Advertising (pamphlets, etc.)	20.2	191,000	14,900	171,800	-	4,000	-	100	200	191,000
Display Posters, Billboards	3.1	29,000	1,200	17,400	-	9,500	-	100	800	29,000
Catalogues	7.2	68,000	1,100	46,800	20,000	-	-	100	-	68,000
Greeting Cards	4.8	45,000	11,000	33,500	-	-	-	-	500	45,000
Blank Books and Printed Forms	2.6	25,000	4,700	20,300	-	-	-	-	-	25,000
Calendars	.8	8,000	1,400	6,600	-	-	-	-	-	8,000
Stationery	10.6	100,000	27,200	70,500	-	-	-	100	2,200	100,000
Other Printed Products	8.7	82,000	18,300	42,400	300	2,500	3,500	300	14,700	82,000
2. Business Forms										
Continuous Types	7.9	75,000	5,500	69,100	-	-	300	100	-	75,000
Individual Types	6.8	64,000	1,200	62,600	-	-	100	-	100	64,000
3. Publications (for publishers)										
Newspapers	1.6	15,000	700	14,300	-	-	-	-	-	15,000
Magazines	7.8	74,000	10,300	63,700	-	-	-	-	-	74,000
Directories	2.2	21,000	14,300	6,700	-	-	-	-	-	21,000
4. Labels and Tags	5.4	51,000	4,800	43,000	-	2,600	600	-	-	51,000
5. Book Printing	5.5	52,000	9,500	42,400	-	-	-	-	100	52,000
6. Packaging	3.1	29,000	1,700	21,300	6,000	-	-	-	-	29,000
7. Non-Printed Products	1.7	16,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL	100.0	945,000	127,800	732,400	26,300	18,600	4,500	800	18,600	929,000
% of Total by Process			13.8%	78.9%	2.8%	2.0%	.5%	-	2.0%	100.0%

Source: Stevenson & Kellogg industry survey, March 1974.

3. Gravure Printing

Gravure accounts for 2.8% ($26.3 million in 1973). Printers use gravure almost exclusively on catalogues and packaging applications.

The above figures exclude gravure done by others than commercial printers. For example, some newspapers have their own gravure printing machinery. Such establishments are classified as Publishing and Printing, SIC 289, of which there are over 600 establishments.

4. Screen Printing

Screen process accounts for 2% ($18.6 million in 1973). Over 70% of screen applications are in products related to advertising, principally the larger display types.

Screen process is also used in production of labels. This accounted for 5.1% ($2.6 million) of tags and labels shipments of $51 million for 1973.

C. PROCESSES USED TO PRINT PRINCIPAL PRODUCTS

The products listed below account for about 80% of shipments. This section discusses these products in terms of processes used.

1. Advertising

Advertising represents the largest group in commercial printing. It accounts for 23.4% ($220 million of 1973 estimated shipments).

Offset (lithography) prints about 86% of advertising, while letterpress prints about 7.3%. Screen process is used for larger types of displays, posters, billboards, etc. This process accounts for 30% of advertising ($13.5 million in 1973).

2. Business Forms

Business forms account for 14.7% of commercial printing ($139 million estimated for 1973).

Offset processed 97.8% of all business forms. Letterpress was used to some extent (7.3%) for individual type forms (snap sets, etc.), but here too the dominant process was offset (92.2%).

3. Stationery

Stationery accounts for 10.6% of commercial printing ($100 million in 1973).

Offset processes 70.5% of this group, letterpress, 27.2%. This is the highest percentage use of letterpress in the major product lines. (Directories use letterpress for 68% of their work, but directories are a relatively small group -- 2.2% of the industry.

Other processes (embossing, intaglio, thermography) account for a relatively small volume in this stationery group.

4. Magazines

Magazines (as printed for publishers, business enterprises, or institutions) account for 7.8% of commercial printing ($74 million in 1973). Of the newspaper/magazine/directories group, magazines account for about two-thirds of shipments.

Processes for magazines consist of 86% offset and 14% letterpress.

5. Catalogues

This accounts for 7.2% of shipments ($68 million). Processes consist of 68% offset and 29.5% gravure. The gravure process finds its greatest use in catalogues ($20 million in 1973).

6. Book Printing

Books account for 5.5% of industry shipments ($52 million in 1973).

Processes consist of 81.5% offset ($42.4 million), and 18.2% letterpress ($9.5 million).

7. Labels and Tags

This combined category represents 5.4% or $52 million of shipments. (Labels exceed tags by 3 to 1.)

Processes consist of 84.2% offset; 9.5% letterpress; and 5.1% screen ($2.6 million).

8. Greeting Cards

Greeting cards account for 4.8% of shipments ($45 million in 1973).

Processes consist of 75.2% offset ($35.5 million), and 23.8% letterpress ($11 million). Other processes account for a minor percentage.

D. REGIONAL DISTRIBUTION OF THE INDUSTRY

This section discusses the distribution of the industry throughout the country. Details appear in Table 36.

Ontario leads the industry with 44% establishments, 55.2% shipments. Production increased 80% over the last ten years (as against a total increase in Canadian printing of 96%). Average sales per establishment are highest in Canada -- $448,000. The printing industry accounts for 1.61% of total manufacturing industry within the province.

Quebec has 32% of establishments, 29.7% of shipments. Production increased 121% over the 1962-1971 period. Average size of establishments is considerably smaller than in Ontario -- $334,000. Printing accounts for 1.64% of total Quebec manufacturing activity.

Table 36

REGIONAL DISTRIBUTION OF THE INDUSTRY

	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Yukon and N.W.T.	Total Canada
Number of Establishments in 1971	14	6	39	24	680	942	88	34	104	196	1	2,128
Increase (or decrease) in number of establishments from 1962-1971	-5	+2	-1	0	+34	+55	0	-2	+15	+39	1	138
Shipments by Province in 1971 in $'000	1,945		4,031	4,036	227,242	421,693	30,550	5,604	23,766	44,372		764,189
Increase in Shipments from 1962-1971 in $'000			885	1,929	124,574	187,589	13,036	3,004	14,165	28,364		374,706
Increase in % shipment 1970-1971			28.1%	91.6%	121.3%	80.2%	72.7%	115.5%	147.5%	177.2%		96%
Number of total employees in 1971			357	313	11,773	21,928	1,814	405	1,377	2,388	40,527	
Relative importance of province in total Canadian printing industry:												
% of total Canadian shipments			0.5%	0.5%	29.7%	55.2%	4.1%	0.7%	3.1%	5.9%		100%
% of total Canadian employees			0.9%	0.8%	29.0%	54.1%	4.5%	1.0%	3.4%	5.9%		100%
% of total Canadian establishments	.7	.3	1.8%	1.1%	32.0%	44.3%	4.1%	1.6%	4.9%	9.2%		100%
Total Provincial Value of Total Shipments ($,000,000) 1971	261	58	798 .005%	806 .005%	13,833 1.64%	26,270 1.61%	1,344 2.30%	578 .97%	2,080 1.14%	4,235 1.05%	7,700	50,275 1.52%

British Columbia has 9.2% of establishments, 5.9% of shipments. Production increased 177% over the last ten years. Average sales per establishment are $226,000. Printing accounts for 1.05% of total manufacturing industry.

Manitoba has 4.1% of establishments, 4.1% of shipments. Production increased 72.7% over the last ten years, number of establishments remain constant. Printing accounts for 2.3% of total manufacturing (note: this is the highest percentage of all provinces). Sales per establishment average $347,000 per year.

Alberta showed 147% increase in shipments over the 1960-1971 period. Sales per establishment average some $226,000 annually.

Saskatchewan has 1.6% of establishments, 0.7% of sales. Production increased over the 1962-1971 period by 115% although number of establishments decreased. Sales per establishment average $169,000 annually.

New Brunswick and Nova Scotia each represent about 1% of Canadian shipments. New Brunswick showed an increase in shipments of 92% in 1962-1971 period while Nova Scotia showed an increase in shipments of 28.1%. New Brunswick has fewer establishments (24) than has Nova Scotia (39). Shipments for Nova Scotia averaged $103,000 per establishment.

Table 37 gives distribution of commercial printing by selected metropolitan regions over 100,000 population. Any shifts since 1970 (the date of these figures) would tend to give metropolitan regions a larger part of the total Canadian production.

Metropolitan areas over 100,000 account for 73% of total establishments, 83% of total shipments. The ten metropolitan cities listed in Table 37 account for 80% of total Canadian shipments. Toronto and Montreal represent 57% of total industry shipments as of 1970, and this share would be somewhat higher in 1974. In most provinces, 80% of provincial production is done in one or two of their largest cities.

Table 37

DISTRIBUTION OF COMMERCIAL PRINTING BY SELECTED METROPOLITAN REGIONS OVER 100,000 POPULATION

(1970)

City	Percent Distribution
Toronto	35.9%
Montreal	21.3%
Ottawa	5.6%
Vancouver	5.3%
Winnipeg	3.9%
London	2.0%
Calgary	1.6%
Quebec	1.5%
Hamilton	1.3%
Edmonton	1.3%
TOTAL	79.7%

Source: Statistics Canada, unpublished data.

E. OPERATING COSTS

Operating costs are grouped into six cost elements (see Table 38). Sources of information are: GAIA Ratios 1972-73, reports from 177 firms; All Canada 1971, reports from 2,128 firms to Statistics Canada.

1. Factory Payroll

Payroll includes executive salaries (for time devoted to factory production), direct wages, general factory salaries and wages, packaging, shipping and delivery wages, payroll taxes and employee benefits.

Factory payroll, the highest operating expense item, averages 32.6% of sales (GAIA), 26.1% (All Canada).

Small firms ($25,000 sales and under) report lowest payroll expense as 29.5% of sales. Large firms ($5 million and over) report the highest -- 34%.

2. Paper

Paper, second highest item, averages 24.8% of sales (GAIA), 24% (All Canadian).

In large firms ($5 million and over), paper represents 28.5% of total sales (highest percentage of firms surveyed). In medium-sized firms ($500,000 to $1,500,000), paper represents 20.7% of sales (lowest percentage of firms surveyed).

Paper costs (as a proportion of sales) tend to increase as sales increase. This does not apply to small establishments ($250,000 and under).

3. Other Expenses

These include outside materials and services (ink, film, plates, composition, binding, etc.). This group represents 13.5% of sales. The percentage tend to increase with the size of firms. But in the $5 million and over category it reverses. It drops to 10.9% of sales.

Table 38

OPERATING COSTS BY FIRM SIZE CATEGORY

Category	1972 - 1973						1971
	I	II	III	IV	V	All(1) GAIA	All(2) Canada
	%	%	%	%	%	%	%
Sales	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Payroll	29.5	29.9	32.3	31.4	34.0	32.6	26.1
Paper	24.0	20.9	20.7	22.5	28.5	24.8	24.0
Other Expense	11.6	12.3	13.8	17.5	10.9	13.5	14.3
Administrative Expense	12.3	11.2	8.7	6.6	4.6	6.5	5.5
Factory Expense	10.5	9.7	10.8	10.0	11.2	10.7	-
Selling Expense	6.6	9.9	9.4	7.8	5.5	7.2	7.9

Note: All % are on Sales, i.e. Sales is 100%.
Not included in this table is the operating income that brings the total to 100.

Source: Summary of other data presented herein.

Legend:

I - Firms less than $250,000 in sales.
II - Firms between $250,000 and $499,999 in sales.
III - Firms between $500,000 and $1,499,999 in sales.
IV - Firms between $1,500,000 and $4,999,999 in sales.
V - Firms with $5,000,000 and over in sales.

(1) All GAIA: is 177 firms from 1972 - 1973 GAIA ratios.
(2) All Canada: is 2,128 firms reporting to Statistics Canada in 1971.

4. Administrative Expenses

This includes executive salaries, clerical help serving in a general overall capacity, payroll taxes of this latter group, general office expenses, bad debts, and other taxes.

GAIA reports 6.5% of sales for administration. All Canada reports 5.5%.

Administration expenses decrease proportionately as size of firm increases.

5. Factory Expenses

This includes rent, heat, insurance and taxes on real estate, depreciation, and payments for rented or leased machinery and equipment.

GAIA reports factory expenses as averaging 10.7% of sales. This figure varies only slightly from small to large firms.

6. Selling Expenses

This includes salaries, compensation and commissions to executives, salesmen and clerks in connection with selling, and their payroll taxes and benefits. It also includes general and travelling expenses, and advertising expenses.

GAIA report selling expenses as averaging 7.2% of sales; All Canada reports 7.9%. Between categories of firms, the figures suggest no definite trend.

F. DEGREE OF OBSOLESCENCE OF PRINTING EQUIPMENT

In the industry, there is a fair amount of old equipment. It is not necessarily obsolete. But newer equipment can produce work more rapidly and of improved quality. However, new equipment usually requires substantial capital investment.

Printers interviewed for this study comment as follows:

- Much equipment is designed to operate for many years.
- Work can still be produced profitably on older equipment.
- Printers tend to buy new equipment to increase capacity, rather than to replace obsolete equipment.
- Small printing firms are often brought into existence because someone bought an older press from an established printing company.

1. Composition

Half the firms surveyed reported that their composition and preparation facilities were "old but still efficient". This reflects the presence of hot metal composition, still used in many printing plants. But other factors are relevant in this connection:

- Composition and preparation require large capital investment.
- New equipment becomes obsolete very quickly. Printers feel they should wait for better equipment, i.e. more complete systems.
- Outside firms can offer preparation services cheaply and effectively.
- Another consideration -- printers are not always abreast of changing technologies.

The other half of firms surveyed reported having modern or less-than-five-year-old preparation and composing equipment. Some of these reported that, as the rate of technological change was so rapid, they were uncertain as to how to answer the questionnaire.

2. Printing

Printers tend to judge their printing machines on the basis of speed rather than on the basis of novel processes offered by new equipment. They acknowledge that some of their presses are not always efficient, but maintain that they are worth keeping for handling excess work loads. Most often used presses were "recent" (five to ten years) or "modern" (less than five years).

3. Finishing

Printers expressed a need to improve their finishing equipment and offered two reasons:

- To match the increased speed of their presses.
- To reduce the labour content that finishing operations require.

Some 30% said that their finishing equipment was old but still efficient. About 40% said their machinery was modern or recent. The remaining 30% expressed a need to replace old equipment with up-to-date machines.

G. LEVEL OF CAPACITY OF THE INDUSTRY

1. Overall Capacity

It is difficult to establish the capacity of the industry. This is due to the number of establishments and to the variety of products and equipment. However, informed managers suggest that the industry could increase output some 35% to 65% by having all equipment working a three-shift day.

Questionnaires and interviews revealed that only the larger firms operate two or three shifts. Most printers consider that they operate at capacity if their major

presses are working one shift plus a reasonable amount (10% to 20%) of overtime. A rough estimate suggests that the industry is operating at about 90% of its one-shift capacity.

Many printers claimed that machinery and equipment were not limiting factors to increased output. What really limited output, they claimed, was the lack of trained personnel to staff a second or third shift.

2. Capacity and Profitability

Interviews revealed an important relationship between capacity and profitability within a market area. Note the following points:

- Printing firms are generally located near the market they serve. They are not confined to these local markets, but certain factors constrain them from entering more remote areas.

- Over-capacity often causes a printer to adopt aggressive selling practices. He may reduce prices to more nearly balance sales and capacity.

Thus, over-capacity in a market area tends toward price competition. This reduces profits for firms in the area.

Certain markets are sensitive to increased capacity. Thus, new equipment can affect the sales-capacity balance. Efforts to utilize new equipment may well spawn a wave of price-cutting in an area. This happened recently in the Montreal area -- local over-capacity resulted in lower prices, reduced profits.

Printers generally are concerned that new firms entering their area would upset the existing price stability.

H. SUPPORT INDUSTRY LOCATION

Printers are located relatively close to their suppliers of raw materials and services (see Table 39). This reflects the concentration of the industry in large urban areas.

Paper suppliers exist within 25 miles of more than 49% of printers.[1] (This percentage would be higher if expressed in value of shipments.) More than 25% of firms are 51 to 200 miles from paper suppliers; 16% are over 200 miles distant.

More than 77% of ink suppliers exist within 100 miles of printers served.

Purchased services are relatively close to printers. For example, 63.8% of printers are within 25 miles of their typeset/engraving suppliers; 51.9% are within 25 miles of binding suppliers (based on 1974 survey).

I. VERTICAL INTEGRATION

The study shows few signs of vertical integration (e.g. printers merging with suppliers or distribution networks). A few printers enter the publishing business, conceivably to increase the use of under-utilized equipment. These are isolated cases.

The study further examined vertical integration in terms of the work a printer can perform:

- art work;
- camera work;
- composition;
- platemaking;

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[1] Paper suppliers here means paper merchants, not paper mills.

Table 39

RANGE OF SUPPLIERS DISTANCES
FOR PAPER, INK AND PURCHASING SERVICES

DISTANCE	CATEGORY OF SUPPLY							
	PAPER		INK		TYPESET/ ENGRAVING (as purchased services)		BINDING (as purchased services)	
	No.	%	No.	%	No.	%	No.	%
0 - 25 Miles	214	49.3	231	53.2	277	63.8	225	51.9
26 - 50 Miles	32	7.4	32	7.4	21	4.8	20	4.6
51 - 100 Miles	73	16.8	74	17.0	26	6.0	29	6.7
101 - 200 Miles	41	9.4	39	9.0	14	3.2	20	4.6
201 - 500 Miles	52	12.0	45	10.4	19	4.4	11	2.5
Over 500 Miles	19	4.4	6	1.4	3	.7	3	.7
Not Applicable	3	.7	7	1.6	74	17.1	126	29.0
TOTAL:-	434	100.0	434	100.0	434	100.0	434	100.0

Source: Industry Questionnaire

Table 40

WORK PERFORMED INTERNALLY VERSUS WORK SENT OUT

Category of Work	% Requiring Work	% Completing The Work 100% Internally	% Having Some Work Performed By Others	Distribution of Work By Others					
				Less 5%	5% 24%	25% 49%	50% 74%	74% 90%	90% Over
Art Work	95.7%	33.4%	62.2%	16.	9.6	3.6	4.3	7.3	20.2
Composition Hot	76.0	34.8	41.2	9.2	5.0	.9	2.3	1.6	22.1
Composition Cold	86.2	37.1	49.1	12.9	5.3	1.8	3.9	1.8	23.3
Platemaking	95.2	59.4	35.7	18.7	4.8	1.8	1.4	.9	8.1
Camera Work	95.9	44.2	51.6	16.4	7.8	2.1	2.3	1.8	21.2
Printing	87.5	62.2	35.3	26.5	5.1	1.6	.2	.5	1.4
Finishing	95.6	44.7	50.9	23.5	13.8	4.6	2.5	2.5	3.9

SOURCE: INDUSTRY QUESTIONNAIRE, MARCH 1974

- printing;
- finishing.

With the exception of the very large firms, few printers are totally integrated in this respect. However, most printers have some equipment for preparation, printing, and finishing.

Table 40 pictures the situation in detail. It suggests that more than 50% of firms obtain some art work, camera work, and finishing work from outside firms. For example:

- Art work -- 62% of printers questioned obtained some art work from suppliers. Of this group, 20% sub-contracted over 90% of their art work. The nature of art work lends itself to sub-contracting. Further, many big customers contract separately for art work and for printing. This is often true for work requiring high quality, e.g. advertising.
- Camera work -- printers are better off sending work outside. Reasons for this are: colour separation requires complex equipment; and new technologies require large capital investment.

Further facts concerning printing sub-contracting:

- By sub-contracting, printers may charge customers a mark-up of 10% to 30%.
- Hot composition -- 35% of printers do this internally; 22% obtain full requirements outside.
- Cold composition -- 37% do this internally; 23% obtain full requirements outside.
- Most firms provide their full printing and platemaking requirements.
- Printers have extensive finishing facilities. Some 45% do all their own finishing work; 24% sub-contract for less than 5% of their needs.

IV

TRENDS IN COMMERCIAL PRINTING

A. IN-PLANT PRINTING

Some large organizations operate their own printing plants (e.g. large manufacturers, insurance companies, public utilities, retailers, various levels of government). Such in-plant printing, of course, bypasses the commercial printer.

This chapter discusses in-plant printing activities under the following headings:

- Definition of in-plant printing
- Typical in-plant printing operations
- The importance of in-plant printing
- Trends
- The impact of in-plant printing

1. Definition of In-Plant Printing

For the purposes of this study, in-plant printing is defined as follows:

> "In-plant printing consists of all printing done by establishments for their own use, where those establishments do not normally derive any revenue from printing."

This category includes governmental and institutional establishments; manufacturing, merchandising, and service organizations that concern themselves with activities other than printing. Note: the study does not

include xerography or duplicating.

The final product of in-plant printing is relatively simple printed matter, without high quality requirements and done on letterhead or legal size paper with one colour, usually black, and printed on one side only.

Major (70%) in-plant activity concerns the production of forms. Remaining 30% is fairly evenly distributed between letterheads, envelopes, memos, business cards, reports, and other miscellaneous printing.

2. The Typical In-Plant Operation

Typical in-plant shop contains one press (national average is 1.2 presses per establishment). In addition to a press, there will usually be a binding and stitching machine, a collating machine, a plate-maker, and possibly a camera and a line-up table.

The average shop employs 1-1/2 people. Most in-plant printing takes place in the same building as the company's head office. A typical shop will be attached to the paper and office supplies department and will occupy about 500 sq. ft. of relatively expensive office space.

About ten very large in-plant operations in Canada are atypical (governments excluded). All have more than five presses, two have more than ten. Companies having large in-plant operations are insurance companies (London Life, Canada Life), oil companies (Imperial Oil, Shell Oil), and public utilities (Bell Telephone, Ontario Hydro). These large in-plant operations make up less than 5% of total value of in-plant printing so their impact on in-plant printing activity is not very great.

3. Importance of In-Plant Printing

No authoritative information exists about the size of in-plant activities in Canada. This study, therefore, att-

empted to measure amounts of paper, ink, and supplies consumed by in-plant printing. To this was added people, space, maintenance and service costs estimates.

By this means, the study estimated the equivalent cost of in-plant printing in Canada in 1973 to have been about $110 million. (This figure includes equipment, paper, ink, non-renewable supplies, space, maintenance and labour).

The following section further analyzes the importance of in-plant printing. It looks at the various cost elements that make up the total value (cost) of goods produced by in-plant printing. The findings result from interviews with the following groups of people who supplied not only opinions, but firm, quantitative data:

- Paper merchants
- Ink and printing suppliers
- Equipment manufacturers
- Association officials
- In-plant printing managers
- Government officials
- Industry experts

(a) Paper

Consumption in 1973 by in-plant printing establishments ranged between $45 million and $59 million. Almost all paper used was 8-1/2 x 11, or legal size, 20 lb. bond, number 7 grade.

(b) Ink and Non-Renewable Supplies

Ink and non-renewable supplies ranged from $5.7 million to $8.1 million. About 90% of ink used was black, 10% coloured. Non-renewable supplies included dampers, plates, washes, blankets, dyes, etc.

(c) Equipment

About 90% of all in-plant shop presses are offset. The remaining 10% are mainly letterpress. Each in-plant establishment has 1.2 presses on average.

Research indicates about 3,000 in-plant printing operations in Canada. Hence there are about 3,600 presses in use.

Each press generally requires back-up equipment: collators, stitchers and binders, line-up tables, etc. All this suggests that a figure of about $40 million represents the total value of all in-plant printing equipment in Canada.

The operating life of this equipment averages ten years. Hence the actual costs (rather than accounting cost) of equipment is about $4 million per year.

(d) People

(i) Hourly

Normally there is one operator per press. Collating, binding, etc. usually requires an additional person part-time.

On the average, there are about 1.2 persons employed per printing press and ancillary equipment.

The average wage of these people, including fringes, is $4 per hour. Hence the total cost of hourly labour in 1973 in Canada was about $32.5 million.

(ii) Salaried

In most companies, a manager devotes about 10% of his time to look after the in-plant printing shop. Total cost of such managerial activity comes to about $4.5 million per year.

Hence the total cost of labour and supervision for in-plant printing in 1973 comes to about $37 million.

(e) Overhead

Overhead for in-plant printing shops falls into two principal divisions: space, maintenance and repairs.

(i) Space

The average in-plant shop occupies about 500 sq. ft. It is usually in an office building in the business section of a city. Based on 1973 office rental rates, the total cost of space for all in-plant shops in Canada would be about $7.6 million.

(ii) Maintenance and Repairs

Interviews with machine suppliers and in-plant shop managers suggest that the cost of maintenance and repairs ranges between $600 and $1,000 per press per year.

Hence the total cost of maintenance and repairs in the in-plant industry in Canada ranges between $2.1 million and $3.6 million per year.

(f) Summary

Based on the above elemental breakdown, the equivalent cost of all in-plant printing in Canada in 1973 came to $110 million. The maximum anticipated error of this figure is ± 8%. The above figure is based on the total cost of paper, ink, equipment, labour and overheads that are related to the printing industry in Canada. It does not include any profit which would be necessary to estimate an "equivalent" sales value. Table 41 summarizes the breakdown into cost elements of in-plant printing in Canada (at 1973 prices).

4. Trends in In-Plant Printing

(a) Growth Rate

Over the last five years, in-plant printing activity has increased substantially. Industry experts agree that since 1969, the growth rate has averaged 10%.

An example of this rapid development: in 1973, about $6 million of new equipment was sold to in-plant printing establishments.

Table 41

VALUE OF ALL IN-PLANT PRINTING IN CANADA[1]

Element		Value ($ million)
Paper		45.0 to 59.0
Ink and non-renewable supplies		5.7 to 8.1
Equipment		
- presses	2.9	
- ancillary	1.1	
Total		4.0
Labour		
- hourly	32.5	
- salaried	4.5	
Total		37.0
Overheads		
- space	7.5	
- maintenance and repairs	2.1 to 3.6	
Total		9.6 to 11.1
TOTAL		101.3 to 119.2
MEAN		110.25

[1]Value means cost, i.e. no "profit" included. To get equivalent sales value before tax, add say 5%.

(b) Reasons for Increase in In-Plant Printing Activity

There are two main reasons why in-plant printing has enjoyed a rapid growth in the past few years:

- recent technological developments;
- the attitude of larger companies.

(i) Recent Technological Developments

In the last year or so, both of the two major suppliers of printing equipment to the in-plant market (A. B. Dick Company and Addressograph-Multigraph Company) have started to market a relatively inexpensive printing system. These systems cost between $20,000 and $25,000 and include a printing press and most of the ancilliary equipment necessary to run an in-plant printing operation. As a rule, if a company requires more than 1 million impressions per year, a system similar to those described above can often reduce costs.

(ii) The Attitude of Larger Companies

Increasing paper work in industry, government, and industrial organizations brings increasing demands for printed matter. Hence, in-plant printing shops are becoming more readily justifiable (i. e. apparent cost reduction is larger).

Besides the cost benefits, there are three other potential advantages for the existence of in-plant printing facilities:

- convenience
- control
- confidentiality

In conclusion, therefore, an increasing demand for printed word matter, coupled with the availability of relatively inexpensive equipment, has stimulated in-plant printing.

5. The Impact of In-Plant Printing

To what extent does in-plant printing affect the commercial printing industry?

Large commercial firms ($3 million and over) are unaffected. Such firms are geared to high volume, high quality, multi-volume and specialized work. They are not oriented to short-run, low quality work.

Medium commercial printers ($250,000 to $3 million sales) are vulnerable. Reasons:

(a) A business large enough to consider in-plant printing has usually obtained its work from medium-sized printers.

(b) Commercial printing firms in small cities tend to have important local customers.

When such customers turn to in-plant printing, the lost business cannot be immediately replaced on the local market. Conclusions: medium-sized firms in small localities are likely to be affected by trends to in-plant printing.

Small commercial printers (under $250,000 sales) are not affected. They have a variety of customers for whom they do short-run job printing. Businesses large enough to consider in-plant printing will generally not have dealt with small printing establishments.

Small instant printing establishments are vulnerable. The instant printers compete directly with in-plant printing: they provide much the same quality and service levels. So any trend toward in-plant printing reduces the market for the instant printer.

B. INSTANT PRINTING

Instant printing has become significant during the past ten years due to a growing demand of general duplicating services. The substantial growth in recent years has been supported by new technological developments.

This study defines instant printing as follows:

- Short run printing, i.e. range from 10 to 10,000 copies and average of 50 copies.
- It is produced on offset machines using plastic or paper plates (not metal as used by commercial printing presses).
- Not complex -- little or no layout or artwork performed.
- Quality requirements are low.
- Prices are relatively low -- considering the alternative cost of commercial printing -- prices are normally published.
- Instant printing is produced in a relatively short time period, with many shops offering "while you wait" or pick-up and delivery services.

Instant printing is similar to in-plant printing, i.e. it is produced with black ink, on 8-1/2 x 11 or 8-1/2 x 14 paper, no artwork, fast turnaround, inexpensive equipment used, etc.

The principal reason for the success of instant printers is that they cater to a growing general demand for printing material. This demand is characterized by relatively short runs, acceptable quality, and rapid delivery requirements.

The instant printer's ability to compete on a pricing basis is principally due to new technologies which reduce set-up time and permits a a lower cost per page, especially on short-run jobs. It also allows a flexible operating schedule, and hence high machine utilization.

Instant printers are located close to their markets. Certain successful operators have demonstrated the ability to manage a number of outlets.

1. Importance of Instant Printing

The total value of instant printing work in Canada in 1973 was in the order of $70 million. Instant printing grows at a rate of 15% annually.

The study further indicated that:

- There are 400 to 500 instant printing establishments in Canada.
- Each establishment has an average of five to six production employees.
- Each employee produces an average of $25,000 to $30,000 worth of sales yearly.

Many instant printers also do conventional commercial printing as part of their business. They do not always define themselves explicitly as instant printers. Conversely, there are conventional commercial printers who have instant printing operations. These printers

often underplay their involvement in instant work in order to guard their reputation for quality work.

The Toronto area appears to be the most densely populated with instant printers -- 70 to 90 establishments.

Percentage of franchised instant printers is not high. Less than 5% of instant printers in Canada operate under a franchise arrangement. However, 30% to 40% of the instant printers operate more than one outlet.

2. Impact of Instant Printing

It is difficult to evaluate the impact of instant printing on commercial printing. Interviews with commercial printers showed that they consider instant printing as "second class printing". The identify themselves with "quality" work. They feel that instant printing does not really affect them.

Instant printers agree. They claim that they are satisfying a new market demand which did not exist previously. Hence, they are not affecting the commercial printers significantly.

This study views instant printing as simply a specialized sector of the commercial printing industry. It specializes in a type of work (short run, no colour, acceptable quality) and in rapidity of service. Firms in this sector are organized and located to serve their markets very effectively.

C. SPECIALIZATION

In the printing industry, any establishment having a press can print almost any product. However, some printers limit themselves to certain types of products or to certain clients, and call themselves "specialists".

Interviews with many printers produced worthwhile opinions and information on the subject of specialization.

Discussions with printing firm managers included:

- the definition and meaning of specialization;
- the level of specialization of their firm;
- the trend toward further specialization;
- the difficulties in specialization;
- the advantages of specialization;
- future opportunities for specialization.

From these discussions, certain general conclusions emerge. These conclusions are discussed below.

1. General Conclusions

   - Most of the printers view specialization as a desirable thing.
   - Many printers indicated that they will tend to be more specialized in the future.
   - Not all printers mean the same thing by the word specialization.
   - Many printers say that they cannot specialize.
   - A direct relationship between specialization and profits is difficult to detect -- probably due to problems with the term itself.
   - The more profitable printers are those that meet the definition of "specialist" offered by this study.

- In major population centres, the specialized firms tend to be the most profitable.
- In smaller population centres, specialization is very difficult.
- Specialization does not always provide protection against price cutting by competitors.
- There can be over-capacity in a specific specialized sector.
- Specialization is often based on marketing.

2. Definition of Specialization

This study defines a "specialist" as one who focuses his efforts on a particular element of the market. Further, he provides a service that makes it advantageous for customers to buy from him rather than from others who could also produce some or all of the same products or services.

In other words, the specialist is able to achieve a position wherein he has something, or appears to have something, that other printers do not have.

Specialization often involves concentration on some segment of the market -- or some phase of the printing process -- in combination with innovations in the printing plant itself. It may also involve providing a distinct type of service in connection with the distribution of products.

Some printers regard themselves as specialists, but do not conform to the above definitions. Others do not regard themselves as specialists but do conform to the above definitions.

3. Types of Specialization

As indicated, specialization can take many forms, each corresponding to the distinctive elements a printer presents to his clients.

(a) Specialization Based on Equipment

A printer may possess a certain piece of equipment:

- to make a specific product that cannot be made competitively on other types of equipment;
- to achieve a quality level otherwise not obtainable;
- to produce at lower cost and therefore, at a price that competitors cannot meet, and still achieve respectable profit margins;
- to handle work more rapidly and thus provide shorter delivery intervals than can competitors.

(b) Specialization by Product

This is closely related to, and often occurs, in conjunction with specialization based on type of equipment. It may entail the arranging of an entire printing plant specifically for production of one product (e.g. bank cheques, drug labels).

(c) Specialization Based on Service

Without having special equipment or producing a distinctive product, a printer can be a spec-

ialist if the service he offers gives him a distinctive advantage over his competitors.

This specialization can be based on:

- technical services at conception, at preparation, at finishing or at any other phase of the production process;
- capacity to deliver in a distinctive manner;
- capacity to perform other handling and administrative tasks.

The "instant printer" can be considered as a specialist. He specializes in that sector of the market that demands rapid delivery of relatively small orders with minimal quality requirements.

Another specialist is the printer who becomes equipped especially to produce and distribute a product in large volume, e.g. direct mail advertising. He offers a complete service including generating mailing lists, printing, stuffing envelopes, applying postage and delivery to the post office. His plant is geared to providing a complete service at low cost.

(d) Specialization Based on Type of Client

This type of specialization has many characteristics similar to the "specialization based on services". It is sometimes difficult to differentiate between this and specialization by service.

This type of specialization depends on the capacity of the printer to cater to the needs of a group of similar clients.

Printers in this category get the bulk of their sales from a variety of clients in a particular industry. These printers have no important equipment advantages. However, their organizations employ people who:

- offer a "custom made" service to a particular industry;
- speak the common language of this industry;
- share the preoccupations of their customers;
- discuss customer problems intelligently;
- help customers with problems not always related to printing.

4. Advantages of Specialization

The people interviewed identified many advantages gained by specialization. The following advantages were mentioned most frequently:

- to limit the number of competitors to those who have the same competitive advantages;
- to buy the most sophisticated equipment for a product;
- to become very expert, and therefore efficient, by providing a specialized service, and maintaining an organization geared to the customer;

- to give the best prices and retain a large margin of profit;
- to compete on factors other than price;
- to simplify the operation of the enterprise;
- to permit continuous evaluation of competitors' activities;
- to train employees more easily.

5. Disadvantages of Specialization

Though specialization offers many advantages, there are some disadvantages. They include:

- a large investment in a limited sector or in a unique product;
- too much dependence on the existence of the product or the client;
- less flexibility in their equipment and in their personnel;
- a difficulty to find employees with appropriate experience.

6. Specialization and Local Markets

The size of the market in which a printer operates is important in relation to his opportunities to specialize.

In small population centres, it is difficult to become a specialist simply because the market is not big enough.

Some specialist firms are located in small cities. However, their sales are mainly to customers located in major population centres. Such printers specialize in

particular products, but their success stems from very effective marketing activities.

In smaller population centres, especially in centres remote from large markets, the ability of a printer to handle a variety of types of work will often determine his level of profitability. This is because the overall printing demand is not large enough to support a specialist in a specific product. In such areas, specialization is less related to products. It is more related to service and to the approach used in servicing the client.

In major population centres, the more a printer is specialized, the more profitable he will tend to be. That implies that the printer has not only found a way to obtain a competitive advantage in producing a specific product, but also that the overall demand for the product is large enough to support his specialized organization.

7. Difficulty in Specialization

It is difficult to become a specialist. A printer must have sizeable sales in his specialty. Only then can he justify the cost of equipment that gives him a competitive advantage. And further, he needs big sales to support an organization geared to his specific service and to a certain type of client.

Following are further difficulties:

- insufficient size of local market;
- a psychological barrier in the mind of the buyer located in a large centre to buy from a printer located in a small centre;
- the high selling costs associated with developing and maintaining customers located outside the immediate area;

- higher transportation costs.

Most printers questioned in the survey favour specialization. Those who now specialize hope to increase their level of operation. Those who do not, are looking for an appropriate formula for specialization. They claim they would have fewer problems.

V

FOREIGN TRADE

A. PAST AND PRESENT IMPORT LEVELS

Imported printed matter represents a significant portion of Canadian consumption. Official information shows the magnitude of imports, origin, the general categories and overall trends. (Table 42 summarizes imports).

Imports increased from $123.3 million (1964) to $258.4 million (1971). This represents an annual average increase of 10% per year over the seven year period. These values equal 11.2% of the Apparent Canadian Market in 1964 and 13.7% in 1971. (Apparent Canadian Market -- ACM -- is calculated as industry shipments plus imports, minus exports.) During the same period, the ACM increased an average of 8% per year.

The U.S.A. accounts for 83% of imports. The U.K. and France are sources of another 6.5% each. Thus, these three countries of origin account for 96% of all imports. During the seven year period, imports from the U.S.A. and U.K. doubled, those from France and West Germany tripled, and those from Japan increased five-fold.

1. Books and Pamphlets

The most significant category of printed products, books and pamphlets represent 50% of all imports. The 1964 imports of $45.7 million increased to $133.6 million in 1971. This represents 65.5% of the Apparent Canadian Market in 1964 and 75.5% in 1971. About 80% of books and pamphlets imported comes from the U.S.A. In 1964, 12% came from the U.K. and 7% from France. By 1971, imports from France had increased four-fold to 10% and imports from the U.K. increased by a factor of 2 to 1 to 8%. (See Table 43 for details)

Table 42

IMPORTS OF COMMERCIAL PRINTED PRODUCTS [1]
IN RELATION TO APPARENT CANADIAN MARKET

CATEGORY		Imports and Shipments			
		1964		1971	
		$'000	%	$'000	%
Total Shipments	Commercial Printing (SIC 286)	442,185	-	764,189	-
	Printing, Publishing & Allied Industries	983,921	-	1,653,839	-
Apparent Canadian Market [2]		1,097,243	100.0	1,889,872	100.0
Import From	U.S.A.	106,004	9.7	213,756	11.3
	U.K.	8,094	.7	16,626	.9
	West Germany	900	.1	2,691	.1
	France	5,359	.5	16,710	.9
	Japan	293	-	1,517	.1
	Other	2,691	.2	7,006	.4
	Total Imports	123,341	11.2	258,366	13.7

Source: Statistics Canada

[1] Imports include the following commodity classifications:

		% Distribution in 1971
891	Newspaper, Magazines & Periodicals	27
893	Books & Pamphlets (non-advertising)	52
894	Maps, Pictures, Greeting Cards, Music	3
895	Other Printed Matter	18
		100%

[2] Apparent Canadian Market equals total shipments by the industry, plus imports minus exports.

Table 43

IMPORTS OF COMMERCIAL PRINTED PRODUCTS
IN RELATION TO APPARENT CANADIAN MARKET -- BOOKS[1]

Category		Imports and Shipments			
		1964		1971	
		$'000	%	$'000	%
Total Shipments	Commercial Printing (SIC 286)	18,720	-	37,825	-
	Printing, Publishing & Allied Industries	26,757	-	51,632	-
Apparent Canadian Market[3]		69,867	100.0	176,782	100.0
Import From	U.S.A.	36,230	51.9	105,254	59.5
	U.K.	5,456	7.8	10,766	6.1
	W. Germany	188	.3	573	.3
	France	3,267	4.7	12,969	7.3
	Japan	31	-	252	.1
	Other	542	.8	4,246	2.4
	TOTAL	45,714	65.5	133,556	75.7

Source: Statistics Canada

[1]Imports include the following commodity classifications:

893-04	Religious Books and Pamphlets[2]	3%
893-25	Books published by foreign governments	-
893-29	Dictionaries, Encyclopaedias, Atlases	9%
893-41	Books and Pamphlets NES excluding English	10%
893-45	Novels and Works of Fiction NES	14%
893-49	Books and Pamphlets NES[2]	63%
894-90	Children's Picture Books	1%
		100%

[2]Pamphlets imported under these classifications are normally non-advertising.

[3]Apparent Canadian Market equals total industry shipments plus imports minus exports.

2. Newspapers, Magazines and Periodicals

These items account for 27% of all printed products imported. Imports of $46.3 million in 1964 increased to $71 million in 1971 (20.5% of ACM). The U.S. accounts for 90% of all periodical imports. (See Table 44 for details.)

3. Advertising Matter

Imports for 1971 were $16.4 million (9.8% of the ACM). In absolute terms, this represents a five-fold increase since 1964. The U.S. accounts for 83% of imports in this category. Japan, the third largest (following U.K.) rose from an insignificant level in 1964 to $0.6 million in 1971. (See Table 45 for details.)

4. Tags and Labels

These items accounted for $2.8 million in 1971 (equivalent to 6.8% of ACM). The U.S. accounts for 90% of imports. Imports for 1964 represented about 8.7% of the Canadian market. (See Table 46 for details.)

B. PAST AND PRESENT EXPORT LEVELS

Printing, Publishing and Allied Industries exported $32.3 million in 1971, out of total shipments of $1,653 million. Thus, exports represent 2.0% of shipments in 1971. Over the 1964-1971 period, exports grew at a rate of 17% per year. This growth rate for exports exceeds the growth rate of the industry by over 2 to 1. (See Table 47 for details.)

The largest percentage of exports is to the U.S. Currently it is about 85% ($27.4 million in 1971) having increased steadily as a portion of all exports, from about 72% in 1962. The U.K. is the next most important country for Canadian exports although the value is only $1 million to $1.5 million or about 4%. Next comes France at $0.3 million or only 1%. The remaining exports ($3 million or 10%) are spread over all other countries.

Table 44

IMPORTS OF COMMERCIAL PRINTED PRODUCTS
IN RELATION TO APPARENT CANADIAN MARKET
NEWSPAPERS, MAGAZINES AND PERIODICALS[1]

Category		Imports and Shipments			
		1964		1971	
		$'000	%	$'000	%
Total Shipments[2]	Commercial Printing (SIC 286)	50,891	-	75,597	-
	Printing, Publishing & Allied Industries	162,854	-	286,097	-
Apparent Canadian Market[3]		205,540	100.0	345,550	100.0
Import From	U.S.A.	42,871	20.9	62,850	18.2
	U.K.	904	.4	2,848	.8
	W. Germany	122	.1	471	.1
	France	1,875	.9	3,326	1.0
	Japan	10	-	52	-
	Other	507	.2	1,546	.4
	TOTAL	46,289	22.5	71,093	20.5

Source: Statistics Canada

[1]Imports include the following commodity classifications:

	% Within Group
891-04 Newspaper supplements and sections	3%
891-08 Newspaper, unbound, NES	4%
891-29 Magazines and Periodicals NES	93%

[2]Total shipments exclude revenues from advertising -- which was $294 million in 1964 and $475 million in 1971.

[3]Apparent Canadian Market equals total industry shipments plus imports minus exports.

Table 45

IMPORTS OF COMMERCIAL PRINTED PRODUCTS IN RELATION TO APPARENT CANADIAN MARKET ADVERTISING MATTER[1]

Category		Imports and Shipments			
		1964		1971	
		$'000	%	$'000	%
Total Shipments	Commercial Printing[2] (SIC 286)	104,000	-	154,344	-
	Printing, Publishing & Allied Industries	110,954	-	165,876	-
Apparent Canadian Market[3]		113,667	100.0	181,000	100.0
Import From	U.S.A.	2,620	2.3	13,649	7.5
	U.K.	245	.2	904	.5
	W. Germany	88	.1	368	.2
	France	40	-	176	.1
	Japan	9	-	620	.3
	Other	111	.1	712	.4
	TOTAL	3,113	2.7	16,429	9.0

Source: Statistics Canada

[1] Imports include the following commodity classification: 895-89 Advertising Matter (approx. 6% of all Imported Printed Products).

[2] Shipments from commercial printing of "Advertising Matter" consists of "Catalogues" and "Other Advertising Matter" in the ratio of about 30% to 70% respectively. Revenue from advertising is not included.

[3] Apparent Canadian Market equals total industry shipments plus imports minus exports.

Table 46

IMPORTS OF COMMERCIAL PRINTED PRODUCTS IN RELATION TO APPARENT CANADIAN MARKET TAGS AND LABELS[1]

Category		Imports and Shipments			
		1964		1971	
		$'000	%	$'000	%
Total Shipments	Commercial Printing (SIC 286)	19,686	-	39,803	-
	Printing, Publishing & Allied Industries	20,160	-	40,760	-
Apparent Canadian Market[2]		22,081	100.0	43,547	100.0
Import From	U.S.A.	1,807	8.2	2,505	5.8
	U.K.	72	.3	138	.3
	W. Germany	12	.1	30	.1
	France	-	-	10	-
	Japan	4	-	31	.1
	Other	26	.1	73	.2
	TOTAL	1,921	8.7	2,787	6.5

Source: Statistics Canada

[1] Imports include the following commodity classification: 895-20 Labels, Tags and Wrappers of Paper (approximately 1% of all imported printed matter).

[2] Apparent Canadian Market equals total industry shipments plus imports. Exports are not reported separately and are estimated as not significant.

Table 47

EXPORTS OF COMMERCIAL PRINTED PRODUCTS IN RELATION TO DOMESTIC OUTPUT ($'000) [1]

Year	Total Shipments			Exports To											
	Commercial Printers	Printing, Publishing & Allied Industries[2]	%	U.S.A.	%	U.K.	%	France	%	Other	%	Total	%
1962	389,483	925,443	100	5,083	.6	450	-	58	-	1,350	.1	6,941	.7
1963	416,530	927,921	100	5,511	.6	731	.1	51	-	1,397	.2	7,588	.8
1964	442,185	983,921	100	7,522	.8	677	.1	58	-	1,762	.2	10,019	1.1
1965	488,278	1,085,229	100	7,971	.7	702	.1	130	-	1,827	.2	10,630	.9
1966	550,957	1,204,665	100	8,776	.7	945	.1	128	-	2,073	.2	11,922	1.0
1967	596,770	1,297,275	100	11,676	.9	1,353	.1	130	-	2,572	.2	15,731	1.2
1968	624,142	1,370,353	100	14,698	1.1	924	.1	249	-	2,630	.2	18,501	1.4
1969	680,602	1,488,301	100	19,505	1.3	1,251	.1	364	-	2,913	.2	24,033	1.6
1970	711,429	1,545,320	100	25,341	1.6	953	.1	248	-	3,465	.2	30,007	1.9
1971	764,189	1,653,839	100	27,407	1.7	1,556	.1	335	-	3,035	.2	32,333	2.0
1972													

[1] Source: Statistics Canada Catalogue

[2] Domestic Shipments by Printing, Publishing & Allied Industries includes revenue from advertising which accounts for about 29% of total shipments.

C. APPLICABLE DUTIES

The duties applicable to printed matter imported into Canada are usually based on three elements:

- the value as declared by the importer;
- the classification of printed material;
- the country of manufacture.

The determination of duty starts with the value as declared by the importer. This by itself presents some problems. Quite naturally, importers will tend to under-value the product in order to minimize duty charges. Customs officers cannot be expected to know the value of printed material. Furthermore, products produced in long press runs will have a unit cost that is substantially lower than short run products. The Graphic Arts Industries Association has made submissions to the federal government in which they suggest methods to establish "fair value", which can be applied to certain types of printed matter.

The present method used by customs is to increase the declared cost by a predetermined percentage before applying duty:

- 30% for black and white or single colour;
- 35% for multi-colour printing.

There are a variety of classifications for printed matter. Some of the more commonly used classifications and duties are as follows (duties refer to "most favoured nations"):

▷ Printed books	Normally 10%
▷ Books or pamphlets used for promotion of the arts, surgery, law, science, technical training, study of languages, etc.	No duty
▷ Printed matter, no advertising content	20%

▷ Printed matter, containing advertising	25%
▷ Small advertising pieces having a value each of $1.00 or less	No duty
▷ Maps	$17\frac{1}{2}$%
▷ Printing machinery:	
- If size of printing area is 374 sq. in. or larger	No duty
- If less than 374 sq. in.	10%

Most countries enjoy "most favoured nation" status. An exception is the "preference" status of Commonwealth Countries in which case printed matter is duty free.

The status is determined by the country of manufacture. For example, if a British publisher decided to have a book printed in Holland, the books would be dutiable and the British preference would not apply.

VI

MANAGEMENT CONSIDERATIONS

A. LEVEL OF MANAGEMENT SOPHISTICATION

The degree of management consideration varies from firm to firm in the industry. The level of management sophistication increases directly with the size of the firm. Table 48 shows the use of various managerial and control techniques by size of establishment.

In general, larger firms are operated by well-educated managers. These people see themselves as professionals and tend to adopt proven planning and control techniques.

In small firms, and in many medium size firms, the emphasis is on production or direct selling skills. Such firms are often operated by the owner-manager. Virtually all decisions are made by one or two people, and then are frequently made by instinct. The amount of formal planning is minimal. There is very little emphasis on achieving a set of long-term objectives.

This lack of management skills to direct successful growth is a major problem facing small and medium sized printing firms. A few firms have identified marketing objectives and have good financial control, but these are in the minority. The application of effective management systems is confined mainly to the large firms and to a few medium sized printers.

Areas where improvement would almost surely increase profits are:

- cost estimating;
- production planning;
- most aspects of marketing.

Table 48

USE OF MANAGEMENT CONTROLS
BY SMALL, MEDIUM AND LARGE ESTABLISHMENTS

Type of Control	% of Establishments			
	Small Up to $250,000	Medium $250,000 to $1,500,000	Large Over $1,500,000	Combined
Production Planning	46%	86%	98%	65%
Quality Control	40	60	75	50
Cost Control	38	80	89	57
Sales Forecasting	18	48	83	35
Production Standards	13	29	55	20
Wage Incentives	6	10	21	9
Reports by Salesmen	7	48	72	27
Number of Respondents	244	143	47	434

Source: Stevenson & Kellogg Industry Survey, March 1974.

B. CAPITAL STRUCTURE

1. Distribution of Assets

In 1970, total value of assets employed by the industry was $476.9 million (see Table 49). Actual value for 1973 is an estimated $630.0 million.

In 1970, assets were distributed in the following proportion: current assets - 53%; fixed assets - 47%.

Generally speaking, current assets represent a greater proportion of total assets in small firms than in large firms. Receivables represent a greater proportion of small firms' assets than of large firms' assets (34% vs. 31%). Inventories account for smaller proportions of assets of small firms.

Large firms have a greater proportion of fixed assets in land and buildings (12% vs. 7.9%) and in equipment and machinery (28.9% vs. 26.4%) than have small firms.

2. Funds Sources Used

Sources of funds vary considerably for the different sizes of establishments. Industry-wide figures show that 35.4% of total assets are financed by current liabilities, 16.6% by long-term borrowing, and 48.0% by shareholders' equity.

Firms in the $1.5 million to $5 million category have the greatest percentage of long-term borrowing (24.6%) and the smallest percentage of shareholders' equity (37.5%). In that sense, they can be considered as the most under-capitalized segment of the industry.

Firms in the $5 million and over category average long-term borrowings of 12.4% and shareholders' equity of 56.4%. This confers a certain financial strength to this group.

Table 49

DISTRIBUTION OF ASSETS, LIABILITIES AND EQUITY
OF COMMERCIAL PRINTING COMPANIES
GAIA - 1973 AND TOTAL INDUSTRY - 1970

Size of Firms	Under 250,000		250,000 to 499,999		500,000 to 1,499,999		1,500,000 to 4,999,999		5,000,000 and Over		Total		1970[1] SIC-286	
Number of Firms	43		39		53		32		10		177		1,655	
	($'000)	%	($'000)	%	($'000)	%	($'000)	%	($'000)	%	($'000)	%	($'000)	%
CURRENT ASSETS														
Cash	124	3.7	382	5.2	685	2.6	438	1.0	458	.7	2,088	1.4	12,800	2.7
Net Receivables	1,161	34.1	2,692	36.4	8,114	31.1	14,224	31.6	19,513	29.3	45,705	30.8	139,100	29.1
Inventories	321	9.5	761	10.3	4,010	15.3	8,187	18.2	10,079	15.2	23,358	15.7	79,300	16.7
Securities	97	2.9	190	2.6	400	1.5	604	1.3	1,129	1.7	2,422	1.6	15,400	3.2
Other Current Assets	163	4.8	128	1.7	1,185	4.5	864	1.9	851	1.3	3,194	2.2	6,200	1.3
Total Current Assets	1,868	55.0	4,154	56.2	14,396	55.0	24,318	54.0	32,031	48.2	76,769	51.7	252,900	53.0
FIXED ASSETS														
Net Land & Building	268	7.9	558	7.5	2,784	10.6	5,465	12.1	8,050	12.1	17,126	11.5		
Net Machinery & Equipment	898	26.4	1,943	26.2	7,045	27.1	12,746	28.2	19,165	28.8	41,800	28.2		
Net Other Fixed Assets	364	10.7	748	10.1	1,910	7.3	2,556	5.7	7,241	10.8	12,821	8.6		
Total Fixed Assets	1,531	45.0	3,249	43.8	11,741	45.0	20,767	46.0	34,457	51.8	71,749	48.3	224,000	47.0
TOTAL ASSETS	3,400	100.0	7,405	100.0	26,137	100.0	45,086	100.0	66,489	100.0	148,518	100.0	476,900	100.0
LIABILITIES														
Current Liabilities	1,165	34.3	2,695	36.4	8,716	33.3	17,067	37.9	20,763	31.2	50,408	33.9	167,100	35.4
Long Term Borrowing	733	21.6	1,561	21.1	5,617	21.5	11,088	24.6	8,241	12.4	27,242	18.3	79,300	16.6
Shareholders' Equity	1,501	44.1	3,148	42.5	11,803	45.2	16,930	37.5	37,484	56.4	70,868	47.8	230,500	48.0
TOTAL LIABILITIES	3,400	100.0	7,405	100.0	26,137	100.0	45,086	100.0	66,489	100.0	148,518	100.0	476,900	100.0

Source: GAIA, Ratio Study - 1972/1973
Statistics Canada

[1] 1970 was the most recent year of published data on a composite balance sheet for commercial printing.

The differences in capital structure have a significant impact on return on investment.

C. INVESTMENT IN REAL ESTATE

1. Owned and Rented

The S&K survey gives an indication on the ownership of real estate in the industry:

- own all -- 39%
- rent some -- 61%

Rented real estate represents about 38% of total real estate investment. (This figure is an estimate based on GAIA ratio study - 36%, and a Stevenson & Kellogg survey - 44%. This last survey took in a larger proportion of small firms). Table 50 shows the real estate situation in detail.

Small firms tend to rent real estate more than do large firms. Table 50 indicates the following:

- Small firms (sales below $250,000) rent an average of 73% of the total value of real estate investment.
- Large firms (sales over $5,000,000) rent an average of 26% of the total value of real estate investment.

2. Value of Investment

Total value of investment in real estate was $131 million in 1971, after depreciation.

The industry requires an average investment of $172 in real estate for each $1,000 of sales (see Table 49 for details).

Table 50

OWNED AND RENTED REAL ESTATE BY FIRM SIZE

Size of Firms ($'000)	GAIA Ratio Study 1972-1973, Dollar Sales per Firm						S & K Survey	Canada 1971 Estimate
	0 to 250,000	250,000 to 500,000	500,000 to 1,500,000	1,500,000 to 5,000,000	5,000,000 +	All Firms		
Number of Firms Responding to Questionnaire	43	39	53	32	10	177	434	N/A
Real Estate Before Depreciation	342	755	4,366	7,818	14,203	27,485	35,435	81,000
Accumulated Depreciation on Bldgs.	73	197	1,581	2,353	6,153	10,359	-	-
Net Real Estate	269	558	2,785	5,465	8,050	17,126	-	-
Estimated Rental Expenses for Real Estate	94	126	360	525	495	2,100	-	-
Estimated Value of Rented Real Estate	940	1,260	3,600	5,250	4,950	16,000	27,871	50,000
Estimated Value of Total Real Estate Used	1,282	2,015	7,966	13,068	19,153	43,485	63,306	131,000
RATIO								
1. % Rented Real Estate	73%	62%	45%	40%	26%	36%	44%	38%
2. Dollars of Gross Real Estate per $1,000 Sales	49.98	53.76	98.01	100.93	123.16	106.43	103.00	106.00
3. Dollars of Net Real Estate per $1,000 Sales	39.16	39.73	62.50	70.55	69.78	66.31	-	-
4. Dollars of Estimated Value of Rented Real Estate per $1,000 Sales	137.38	89.73	80.82	66.16	42.91	12.01	81.03	66.00
5. Dollars of Total Estimated Real Estate Used per $1,000 Sales	187.37	143.49	178.83	167.09	166.07	168.44	184.03	172.00

Source: GAIA - Ratio Study - 1972/1973; Stevenson & Kellogg Survey, March 1974; Stevenson & Kellogg estimate for 1971.

D. INVESTMENT IN MACHINERY AND EQUIPMENT

1. Owned and Rented

The S&K survey gives an indication on the ownership of machinery and equipment in the industry:

- own all -- 74%
- rent some -- 26%

Rented equipment amounts to only 3.2% of the total value of equipment used by the industry.

Small and medium sized firms tend to rent machinery and equipment more than do large firms. Table 51 shows the percentage of rented equipment as follows:

- Small firms (sales up to $500,000) -- 7.3%
- Medium sized firms (over $500,000 to $5 million) -- 3.9%
- Large firms (over $5 million) -- 0.8%

2. Value of Investment

Total value of machinery and equipment in use in 1971, before depreciation, is estimated at $313 million. For 1973, estimated value runs to $408 million. Thus during 1972 and 1973, the industry invested some $95 million in machinery and equipment.

On average, the gross investment in equipment and machinery is about $400 per $1,000 sales. This measure for firms of various sizes results in the following:

- Small firms (sales below $250,000) average $349 investment in machinery per $1,000 sales.

Table 51

OWNED AND RENTED EQUIPMENT AND MACHINERY BY FIRM SIZE
INDUSTRY - 1971 (ESTIMATE)

Size of Firms	GAIA Ratio Study 1972-1973, Dollar Sales per Firm						Canada 1971 Estimate
	0 to 250,000	250,000 to 500,000	500,000 to 1,500,000	1,500,000 to 5,000,000	5,000,000 +	Total	
Number of Firms responding to Questionnaire	43	39	53	32	10	177	N/A
Gross E & M Before Depreciation ($'000)	2,388	4,773	20,165	31,497	51,848	110,671	303,000
Net E & M After Depreciation ($'000)	898	1,943	7,045	12,746	19,165	41,797	119,000
Estimated Rental Expenses ($'000)	32	81	199	215	85	612	2,000
Estimated Value of Rented E & M ($'000)	160	405	995	1,075	425	3,060	10,000
Estimated Total E & M Used ($'000) [1]	2,548	5,178	21,160	32,572	52,273	113,731	313,000
RATIO							
1. % Rented E & M	6.3%	7.8%	4.7%	3.3%	0.8%	2.7%	3.2%
2. Dollars of Gross E & M per $1,000 Sales	349	339	453	406	449	428	396
3. Dollars of Net E & M per $1,000 Sales	131	138	158	165	166	167	155
4. Dollars of Estimated Value of Rented E & M per $1,000 Sales	23	29	22	14	4	12	14
5. Dollars of Estimated Total E & M Used per $1,000 Sales	372	368	475	420	453	440	410

Source: GAIA - Ratio Study - 1972/1973; Stevenson & Kellogg Estimate for 1971.

[1] Total E & M used is E & M owned (before depreciation) plus an equivalent value of rented E & M (rent x 5).

- Medium sized firms (sales $250,000 to $1,500,000) average $425 investment in machinery per $1,000 sales.

- Large firms (over $1,500,000 sales) average $432 investment in machinery per $1,000 sales.

E. LEVELS OF PROFITABILITY

1. Profits on Sales

Total profits before taxes in the industry in 1973 were about 4.8% of sales. This represents a 29% drop since 1971 when industry profits on sales were about 6.8%.

For this study, several sources of data were analyzed to determine industry profitability. These sources included:

- Statistics Canada -- Current data was not available. However, composite financial statements for the commercial printing industry were published for 1969 and 1970.

- GAIA -- The Graphic Arts Industries Association publish a wide range of useful data in their annual study of ratios. However, these data represent results of member firms who respond to the annual questionnaire. The data is valuable as a tool to analyze differences between size of firms. Caution was exercised when using this data to estimate characteristics of the total industry in Canada.

- Dun & Bradstreet -- D & B publish an annual review of key business ratios. The breadth of coverage is extensive -- probably at least 80% or 90% of the industry. These data also provide a basis for comparing printing with other industries.

- Stevenson & Kellogg industry survey -- Not all firms responded to questions on profitability. Findings based on these data were not conclusive. However, the data provided some insight into the profitability of various sizes of firms within the industry.

Data on profitability by size of firm show a like pattern: small and large firms are the most profitable. They earn 35% to 40% higher profits per sales dollar than the industry average. Firms in the $250,000 to $5 million size range (35% of all establishments) earn 15% to 20% less profits per sales dollar than the industry average.

This study estimated the percentage of profit on sales in six size ranges of firms in 1973, based on combining all the data available. This is shown in Table 52.

In addition, Table 53 shows profitability of GAIA firms by size in 1972.

Proportion of industry profits exceed proportion of industry sales in certain size categories -- particularly large firms. Large firms (over $5 million sales) earn an estimated 54% of total industry profits, and account for 45% of total industry sales. Small firms (under $500,000) show this same relationship (although dollars involved are smaller): 8.8% of industry profits earned on 8.0% of industry sales. In the medium size firms ($500,000 to $5 million), proportion of profit is less than proportion of sales.

Profitability varies considerably between individual firms within any size range. This variation is more pronounced in small firms of up to $2 or $3 million sales.

2. Comparison of Profitability with Other Industries

Based on percentage of profits on sales, Dun & Bradstreet ranks commercial printing as 43rd out of 90

Table 52

ESTIMATED PROFITABILITY OF THE
COMMERCIAL PRINTING INDUSTRY BY SIZE OF FIRMS
1973

Size of Firms	Total Sales		Profit on Sales (before tax)		% of Total Profits
	$'000	%	$'000	% on Sales	
Less than $100,000	59,000	6.2	4,030	6.8	8.8
$100,000 to $250,000	80,000	8.5	3,260	4.1	7.2
$250,000 to $500,000	100,000	10.5	4,500	4.5	9.9
$500,000 to $1,500,000	200,000	21.2	7,400	3.7	16.2
$1,500,000 to $5,000,000	253,000	26.8	10,260	4.0	22.5
Over $5,000,000	253,000	26.8	16,100	6.4	35.4
Total (Estimated 2,140 firms)	945,000	100.0	45,550	4.8[1]	100.0

(1) Estimated profit on sales after tax is 2.5%.

Table 53

PROFITABILITY OF GAIA FIRMS BY SIZE - 1972
PROFIT ON SALES
RETURN ON EQUITY

Firms Reporting			Total Sales		Total Profits Before Taxes		Profits On Sales	Total Shareholder's Equity		Return on Equity
Size	No.	%	$'000	%	$'000	%	%	$'000	%	%
Up to $250,000	43	24.3	6,842	2.6	355	2.8	5.2	1,501	2.1	23.65
$250,000 to $500,000	39	22.0	14,042	5.4	755	6.0	5.4	3,148	4.4	23.98
$500,000 to $1,500,000	53	29.9	44,544	17.2	1,824	14.4	4.0	11,803	16.7	15.45
$1,500,000 to $5,000,000	32	18.1	77,459	30.0	2,869	22.7	3.7	16,930	23.9	16.94
$5,000,000 and Over	10	5.7	115,353	44.8	6,832	54.1	5.9	37,484	52.9	18.22
Total Before Tax	177	100.0	258,244	100.0	12,637	100.0	4.89	70,868	100.0	17.83
Total After Tax							2.51%(1)			9.16%(2)

(1) Dun & Bradstreet reported after tax Profits on Sales of 3.40% in 1972, 2.51% in 1973.
(2) Dun & Bradstreet reported after tax Return on Equity of 10.10% in 1972, 7.94% in 1973.

Source: GAIA Canadian Ratios 1972-1973 (i.e. although published in 1973, operating year is mainly in calendar 1972).

industries (1973). Table 54 compares printing with eleven other industries.

3. Return on Equity

Return on equity provides another measure of profitability. This is sometimes more meaningful to investors. Return on equity (after tax) for 1973 for the printing industry was reported by D & B at 7.94%.

Based on return on equity, Dun & Bradstreet ranks commercial printing as 38th out of 90 industries (1973). Table 54 compares printing with eleven other industries.

Based on the survey, S&K estimates return on equity (after tax) in commercial printing runs, by size of firms, as follows:

- Small firms (under $500,000 sales) -- 9.1% to 9.5%
- Medium firms ($500,000 to $5 million) -- 6.8% to 7.0%
- Large firms (over $5 million) -- average 8.5%

Table 55 enlarges on this data.

F. PRODUCTIVITY IN THE PRINTING INDUSTRY

An important measure of the health and competitive viability of an industry is its productivity -- the efficiency with which it utilizes its resources. Traditionally the most widely accepted measure of productivity is "output per man-hour, or output per employee". This criterion reflects the task facing management when labour was the most important resource in the production "mix".

Nowadays increasing attention is directed at other resources. Of these, the most significant is capital. But, another is the managerial, or "think" resources.

Table 54

PROFITABILITY COMPARISONS BETWEEN COMMERCIAL PRINTING AND SOME OTHER INDUSTRIES - 1973

Rank	Profit[1] As % of Sales	Line of Business	No. of Companies	Profit[1] As % of Equity	Rank
1	11.46	Distilleries	(26)	27.21	1
2	7.16	Publishing & Printing	(378)	12.69	4
3	7.07	Pharmaceuticals	(154)	14.18	3
4	5.54	Chemicals, Industrial	(165)	7.62	10
5	4.28	Publishing Only	(404)	18.82	2
6	4.06	Metal Stamping	(695)	12.10	5
7	3.45	Machinery, Other	(790)	8.82	8
8	3.13	Manufacturing	(21,811)	7.52	11
9	2.98	Paper Boxes & Bags	(192)	10.24	6
10	2.51	Commercial Printing	(1,655)	7.94	9
11	2.41	Metal Products, Misc.	(454)	7.13	12
12	2.21	Machine Shops	(791)	9.06	7

Source: Dun & Bradstreet Key Business Ratios - 1973.

[1] Profits are after taxes.

Table 55

ESTIMATED RETURN ON EQUITY OF THE COMMERCIAL INDUSTRY BY SIZE OF FIRMS
1973

Size of Firms	Estimated Return		Estimated Equity	Return on Equity
	Before Tax	After Tax		
	($'000)	($'000)	($'000)	%
Less than $100,000	4,032	2,180	23,700	9.2
$100,000 to $250,000	3,260	1,760	19,400	9.1
$250,000 to $500,000	4,500	2,430	25,700	9.5
$500,000 to $1,500,000	7,400	4,000	59,100	6.8
$1,500,000 to $5,000,000	10,260	5,540	79,500	7.0
Over $5,000,000	16,100	8,700	101,800	8.5
TOTAL	45,550	24,610	309,200	8.0

Source: Estimated by Stevenson & Kellogg.

Data on this last resource, and on its utilization, is difficult to collect and compare. However, our questionnaire and the GAIA annual survey do provide comparisons on the utilization of labour and capital. The following sections highlight some of the important trends and comparisons in these areas.

1. Labour

The printing industry, in common with many service industries and a few manufacturing industries, presents a difficult problem in measuring productivity. This difficulty centres on the determination of "output".

In other manufacturing industries which produce a steady stream of goods; cars, newsprint or steel for example, output can be measured in terms of units or tons. Similarly, productivity can be expressed in terms of tons per man-hour.

One possible measure of output in the printing industry is "Net Sales". This represents the value that the market puts on the production of a company or the industry. On this basis productivity could be expressed as "Net Sales per Employee".

However, this measure has one significant drawback. A substantial part of the sales value of the printing industry represents the cost of direct materials -- especially paper. And, as the cost of paper fluctuates over time, and between countries, it tends to distort comparison of output or productivity.

One solution lies in measuring output in terms of "value added". Labour productivity would thus be expressed in terms of value added per employee. Using this measure we find that productivity has increased from about $10,300 in 1962 to $18,308 in 1972 -- an increase of 78%. During the same period the corresponding values in the U.S.A. were $12,155 and $20,173, an increase of 66%. (See Table 56.)

Table 56

VALUE ADDED PER (FACTORY) EMPLOYEE*

Year	Canada	Canada & U.S.A.
1962	$10,305	$12,155
1963	10,544	12,692
1964	11,246	13,253
1965	11,751	14,054
1966	11,683	14,450
1967	12,300	15,270
1968	13,173	15,612
1969	13,905	16,543
1970	15,986	17,716
1971	16,478	19,691
1972	18,308	20,173

* GAIA Ratio Study Reports

Although productivity appears to be increasing at a greater rate in Canada, the gap between the two countries has remained more or less constant at $2,000 value added per employee.

This difference in productivity is largely offset by (or, in fact actually causes) a lower wage structure in the Canadian industry. In 1972, the latest year for which comparative statistics are available, the payroll cost per employee is about $1,500 less per annum in Canada than in the U.S.A.

A comparison of factory payroll as a percentage of value added shows a striking similarity between Canada and the U.S.A. In the early 1960's, factory payroll in Canada was about 54% of value added. In the U.S.A. it was 49%. Gradually the ratios have converged, so that in 1969, the ratio in both countries was 51.40%. Since then there has been no significant deviation from this figure in either country.

Within the Canadian industry, productivity varies between firms of different sizes. Table 57 shows that the total sales per employee and value added per employee increases with size of firm. The table also indicates that sales per factory employee, sales per salesman and added value per factory employee increase with firm size. One minor exception to this rule seems to apply for firms with sales ranging between $250,000 to $499,999. Firms in this group are slightly more productive than those in the $500,000 to $1,499,999 category.

Another insight into this comparative output and productivity of the Canadian industry can be gained from equating paper usage between Canadian and U.S. firms. If we assume that the average firm reporting in the GAIA survey is as efficient in using paper as its counterpart in the P.I.A. (this appears not unreasonable since the firms are of comparable size) then it is possible to develop the relationship shown below between relative selling prices and labour cost per unit of output:

	Canada	U.S.A.
Selling price per unit	$94.79	$100.00
Factory payroll cost per unit	$29.70	$ 32.20

During the period 1966 to 1972, the payroll cost per employee in the U.S.A. printing industry has averaged 118% of that of his Canadian counterpart. The above relationship suggests that the payroll cost per unit of output in the U.S.A. is only 109% of that in Canada. Consequently, it appears that the productivity of the U.S. employee is about 9% higher than in Canada.

Although there is insufficient reliable data to validate the thesis, it appears from this analysis that:

- Productivity of the Canadian employee is somewhat lower than that of his counterpart in the U.S. printing industry.

Table 57

PRODUCTIVITY PER EMPLOYEE

	GAIA 1972						All Canada 1971
	Under 250,000	250,000 to 499,999	500,000 to 1,499,999	1,500,000 to 4,999,999	5,000,000 and Over	Total GAIA	
Firms in Sample	43	39	53	32	10	177	
Sales per Total Employee	17,609	20,346	20,049	24,906	27,626	24,394	19,282
Sales per Factory Employee	24,439	29,056	26,933	31,728	32,577	30,745	26,644
Sales per Salesman	107,523	88,941	136,314	272,380	414,290	241,203	N/A
Added Value per Total Employee	11,339	13,580	13,127	14,954	16,741	15,054	11,915
Added Value per Factory Employee	15,737	19,393	17,634	19,053	19,743	18,972	16,478

Source: GAIA, Ratio Study - 1972/1973
Statistics Canada for 1971

- Despite higher U.S. productivity, the Canadian industry could at least meet U.S. prices and return a satisfactory profit at these prices.

2. Capital

The second significant resource of concern to management is capital. Consequently a measure of efficiency within the firm is the turnover of fixed investment or the net sales per dollar invested in buildings, machinery and equipment.

Table 58 indicates that Canadian managers are getting better utilization from their investments than in the past. However, their performance is still inferior to their U.S. counterparts.

Of special significance in this respect is the 12% Federal tax on production machinery. The above figures suggest that if this tax were eliminated the Canadian printer would be virtually as productive as the U.S. printer in utilizing his capital investment.

Contrary to popular impressions, productivity of capital does not appear to improve in the larger firms. Table 59 shows that sales per dollar invested are highest in the small firms shipping less than $500,000 of printing per year.

G. RESEARCH AND DEVELOPMENT

Research and development activities on the part of printers themselves are quite rare in the Canadian printing industry. The vast majority of firms depend on R & D by the material and the equipment suppliers. Generally, all printers looked to the equipment suppliers for technological innovation.

A few printers carry on some research and development activities. However, in most cases, they do not have an explicit budget or person

Table 58

TURNOVER OF GROSS FIXED INVESTMENT

Year	Canada	U.S.A.	Ratio
1960	177.9	293.6	1.65
1961	194.4	291.1	1.49
1962	192.3	276.5	1.44
1963	189.1	269.3	1.42
1964	197.5	265.1	1.34
1965	212.2	265.3	1.25
1966	215.5	271.0	1.26
1967	224.9	282.0	1.25
1968	221.3	263.8	1.19
1969	216.6	257.5	1.18
1970	223.9	254.6	1.14

Table 59

PRODUCTIVITY OF CAPITAL BY SIZE OF FIRMS (GAIA - 1973)

	Up to $250,000	$250,000 to $499,999	$500,000 to $1,499,999	$1,500,000 to $4,999,999	$5,000,000 and Over	Total
	($'000)	($'000)	($'000)	($'000)	($'000)	($'000)
Firms in GAIA Sample	43	39	53	32	10	177
Total Sales	6,842	14,042	44,545	77,459	115,353	258,244
Total Raw Material	2,436	4,670	15,377	30,950	45,444	98,879
Total Added Value	4,406	9,372	29,168	46,509	69,909	159,365
Total Investment(1)	5,074	10,679	41,517	66,842	106,536	230,650
Estimated Value of Rented Real Estate	938	1,276	3,600	5,245	4,963	16,024
Estimated Value of Leased Equipment	163	407	996	1,076	428	3,071
Total Value of Assets Employed	6,175	12,362	46,113	73,163	111,927	249,745
Sales per Dollar Invested	1.34	1.31	1.07	1.15	1.08	1.11
Added Value per Dollar Invested	.86	.87	.70	.69	.65	.69
Sales per Dollar of Assets Employed	1.10	1.13	.96	1.05	1.03	1.03
Added Value per Dollar of Assets Employed	.71	.75	.63	.63	.62	.63

(1) Gross assets before depreciation.

assigned full time to the activity. Those involved in research and development tended to be specialists. Their purpose in R & D is to further refine their established specialty. Their research projects are directed either toward reconfiguration of existing equipment to handle a larger volume of a specific product, or to improve product quality.

Certain large firms indicated some tendency to work jointly with large U.S. printers in R & D. The objective here is to obtain access to new technological developments and to keep abreast of developments in the larger U.S. market while minimizing cost.

Many printers think that it would be desirable to have funds made available for Canadian research and development. However, the greater size of the U.S. market makes funding of research and development projects in the U.S. correspondingly easier.

H. MARKETING TECHNIQUES

This section examines ways in which commercial printers approach their markets, the strategies they adopt, and the techniques they use.

To summarize:

- Most commercial printing firms are not marketing oriented. They make only limited use of marketing techniques and do not follow any consciously adopted marketing strategy.

- For many firms, marketing is limited to having salesmen.

- Many specialist firms owe their success to a market-oriented approach. Customers tend to look on such firms as ideal suppliers.

- The most profitable firms view marketing as more important to the success of their enterprise than production.

▷ Certain obstacles in the printing industry tend to make it difficult for firms to follow a marketing strategy.

The following enlarges on the above points.

1. Most Printing Firms are not Marketing Oriented

Over 60% of printers reported that their establishment did not emphasize any particular marketing strategy. Others were vague on the question, referring to marketing only in terms of their sales force or in terms of particular products. Few were able to give a clear description of their marketing approach.

Very few printers have defined the strengths and weaknesses of their firm.

Few firms have evaluated the size of the market they serve, the number and nature of their competitors, the characteristics of their most profitable products, or their various market opportunities.

Few firms have adopted a precise marketing strategy, mainly because of a lack of analysis of their own strengths and weaknesses and a lack of knowledge of their markets and competitors.

(a) Market Research

Few printers undertake any analysis of their market. They have very limited knowledge about their share of the market, their competitors' share or the relative importance of the products they produce.

(b) Product Profitability

Few printers know the true cost of selling, producing and distributing various products. Their accounting and estimating systems are

generally not set up to reveal important differences from product to product.

(c) Advertising

Few firms in the industry advertise. Those who do generally use direct mail. One third of the questionnaire respondents (Table 60) reported using direct mail and/or print media to promote their services. Radio and television were mentioned by 8% of the respondents.

Firms in the industry spend an estimated 0.3% of total sales dollars on advertising. This percentage is about the same for all sizes of firms.

2. For Many Printers, Marketing is Limited to Having Salesmen

Most printers agree that they do not make effective use of various marketing techniques available to them. One reason: many view printing as a craft and themselves as craftsmen. Their orientation is essentially toward the production aspects of the business.

(a) Salesmen

Personal selling as a means to reach the customer is the most accepted marketing technique in this industry.

Some 85% of printers interviewed used direct selling (see Table 60). The table below shows the number of salesmen employed by firms of various sizes. The number of salesmen per firm, and sales per salesman increase with firm size (Table 61).

Table 60

USE OF MARKETING TECHNIQUES

BY SIZE OF FIRM

	Up to $100,000		$100,000-$250,000		$250,000-$500,000		$500,000-$1,500,000		$1,500,000-$5,000,000		$5,000,000 and Over		Total	
Number of Firms Returning Questionnaire	166		78		56		87		36		11		434	
Selling Techniques	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Personal Selling	124	74	68	87	52	93	79	91	35	97	11	100	369	85
Selling Through Agents	17	10	18	23	12	22	20	23	7	19	3	27	77	18
Selling Through Distributors and Jobbers	21	13	15	19	11	20	12	14	4	10	1	9	64	15
Advertising														
Direct Mail	52	31	20	26	15	27	29	33	21	58	6	55	143	33
Print Media	53	32	31	40	15	27	20	23	13	36	3	27	135	31
Radio and T.V.	14	9	11	14	5	9	4	5	1	3	0	0	35	8
Posters	1	0	0	0	1	2	2	2	4	10	0	0	8	12
Other	35	21	10	10	9	16	17	20	10	28	1	9	80	19

Source: Stevenson & Kellogg Questionnaire Survey, March 1974.

Table 61

NUMBER OF SALESMEN EMPLOYED

	I	II	III	IV	V	Total Canada
Average number of salesmen by firm	1	4	6	9	28	6
Sales per salesmen	108,000	89,000	136,000	272,000	414,000	241,000

Source: 1972-1973 GAIA Report.

I - $250,000 and under.
II - $250,000 to $499,999.
III - $500,000 to $1,499,999.
IV - $1,500,000 to $4,999,999.
V - $5,000,000 and over.

Over half of the firms questioned assigned their salesmen to specific accounts or customers. About 25% assign their salesmen to a specific territory.

One-third of the printers questioned having salesmen reported that they have established sales quotas. Only 9.5% reported using profit quotas for salesmen.

Nearly 40% of the firms questioned use no system for controlling the activities of their sales force. On cases where no control system was used, the printers suggested that their compensation system provided a sufficient incentive for their salesmen.

The most common compensation system used by printers is a base salary plus a commission

on sales. Rarely are salesmen paid on a straight salary basis or on a full commission basis.

(b) Agents and Jobbers

Selling through agents or jobbers is used extensively for certain product lines (e.g. business forms, greeting cards, blank books, specialized types of printing). A few printers indicated that the use of agents or jobbers gave them representation in markets where they could not afford to maintain company salesmen. As shown in Table 60, only 18% of the printers indicated selling to some extent through agents and 15% through jobbers.

Some printers reported the presence in the market of free agents who position themselves between the printers and the customers. These free agents obtain quotations and sub-contract orders with the lowest bidder. In some cases these free agents supply the paper and hence, avoid delays and minimize mark-ups.

3. The Most Profitable Firms View Marketing as a More Important Function Than Production

Interviews revealed an apparent correlation between profitability and marketing orientation. The few firms that had evaluated the market for certain products and who had analyzed the profitability of various products, achieved above average profits. In general, their success was also closely related to specialization on their part. The market knowledge possessed by these firms played an important part in establishing their field of specialization.

These firms were able to select the right type of sales representative and to direct the efforts of their sales

force toward a specific market segment. As they became more specialized, they were able to tailor the production side of the business to fit the market served.

4. A Number of Obstacles in the Printing Industry Tend to Make it Difficult for Firms to Follow a Marketing Strategy

These include:

- the nature of the products;
- established customer-printer relationships;
- price competition for major customers' work;
- proximity of markets.

The following enlarges on these points:

(a) Nature of Products

Whether in general printing or in specialized printing, printers refer to their products as a total package that includes:

- appropriate quality;
- timely delivery;
- other related services to customers;
- personal attention.

Most printers agree on this larger definition of products. Many indicated that printing work is tailored to the needs of a specific customer, not to the needs of all potential customers.

Moreover, it is felt that printing is very often a matter of "convenience" to the customer. The product itself will mean less than the specific quality, or the delivery or the services relative to it.

Thus, many firms are quite naturally oriented toward satisfying the needs of their specific customers rather than following a broader approach to a particular market segment.

(b) Established Customer-Printer Relationships

Although there is no brand or product loyalty on the part of customers in the industry, there is a certain supplier loyalty. Customers tend to continue to buy from printers who have performed satisfactorily in the past. Because of this reluctance to change on the part of customers, printers have to demonstrate some clear advantage in order to persuade a customer to place an order with him for the first time.

Many printers indicated that their customers generally do not obtain competitive bids for printing work that they purchase, largely because of the satisfactory relationship with their printing firm. Some printers made reference to their most profitable customers rather than to their most profitable products.

These established relationships between printers and customers make it difficult for printers to penetrate new market segments.

(c) Price Competition for Major Customers' Work

Price becomes increasingly important when the demand originates from large buyers of

printed material. These buyers usually obtain competitive bids from several printers. Price competition for this work is severe. It is difficult for any printing firm to pursue a specific marketing strategy in this environment while continuing to maintain former profit margins.

(d) Proximity to Market

Printers located outside large metropolitan areas encounter difficulty in adopting an effective marketing strategy. The following suggests reasons for this:

- The large metropolitan areas make up the major part of the industry's market.
- Buyers in the metropolitan areas are reluctant to place orders with printers in smaller communities outside their market area.
- Manufacturing companies established in smaller communities tend to engage advertising agencies located in larger centres. The agencies often recommend printers located in the larger centres.

These constraints tend to restrict small printers to their own local market areas. These areas are often not large enough to permit a specific marketing strategy to be adopted.

I. LABOUR SUPPLY

In general, the firms surveyed indicated difficulty in obtaining staff for their operations.

The most critical area is in the supply of skilled operators. Some 69% of the respondent firms indicated that they have difficulty obtaining staff in this category. Only 3% indicated that skilled staff are readily available. Typesetters, compositors, pressmen, were all difficult to obtain. Most firms had difficulty attracting experienced production foremen, production supervisors and estimators.

About half the firms questioned reported difficulty in obtaining suitable sales and marketing personnel. This problem stemmed mainly from a lack of sales and marketing personnel with the required technical background.

Table 62 presents specific details about personnel.

These problems were felt all across the country. However, printers operating in smaller population centres were most affected because their skilled employees often leave to join firms in large cities paying higher salaries.

Many printers reported difficulty in obtaining people to staff evening or night shifts. This appears to constrain many printers from increasing their sales.

J. INDUSTRIAL RELATIONS AND UNIONIZATION

Questionnaire data on the extent and impact of unions on the industry were incomplete. They did not provide sufficiently meaningful information to permit analysis by region, size of plant or type of process. Nor was it possible to determine the impact of a collective agreement on wage levels.

However, it is apparent that the industry is extensively unionized. The printing, publishing and allied industries employ about 84,000 people. Of these, according to data from the Department of Manpower and Immigration, some 30,000 are members of a union. And of these, the vast majority are members of an international union. The more important unions, their membership and recent growth are presented in Table 63.

Table 62

AVAILABILITY OF PERSONNEL

Personnel Category	Firms Reporting Requirements of Personnel		Number of Firms Reporting			
	No.	Percentage of Total Respondents (434)	Readily Available	Not Always Available	Difficult to Obtain	No Answer
Unskilled Workers	304	70%	169 56%	91 30%	22 7%	22 7%
Skilled Operators	363	84%	9 3%	96 26%	251 69%	7 2%
Technicians	177	41%	3 2%	30 17%	88 50%	56 31%
Skilled Clerical and Administrative Personnel	294	68%	66 22%	153 52%	47 16%	28 10%
Marketing, Sales and Distribution Personnel	178	41%	10 5%	44 25%	87 49%	37 20%

Source: Stevenson & Kellogg Study 1974.

Table 63

PRINCIPAL UNIONS IN THE PRINTING, PUBLISHING AND ALLIED INDUSTRIES

	CANADIAN MEMBERSHIP			
	1962	1970	1971	1972
International Unions				
Bookbinders International Brotherhood*	N/A	3,452	3,704	10,307*
Lithographers & Photoengravers International Union*	N/A	6,388	6,605	
International Printing Pressmen & Assistants Union of North America	8,150	10,569	9,955	10,041
Stereotypers & Electrotypers Union of North America	773	557	517	532
International Typographical Union	8,040	7,202	7,130	7,130
National Unions				
Federation of Canadian Printing & Information (CNTU)	3,873	3,516	1,707	N/A
	N/A	31,684	29,618	28,010

*These two unions merged to form the Graphic Arts International Union in 1972

The smaller firms in the commercial printing industry (up to 15 employees) tend not to be unionized. Firms in this size range make up 73% of total establishments. They employ only 17% of the people employed in the industry, however.

The larger firms in the industry tend to be extensively unionized. Thus, although only about 30% of the firms are unionized, over two-thirds of the tradesmen are members of and are represented by one of the several labour organizations active in the industry.

Our survey shows that labour-management relations in the industry have been relatively good. The 434 firms who responded to our questionnaire experienced a total of only 46 work stoppages due to labour-management disputes in the years 1971 through 1973. This means that about 11% of the firms experienced a work stoppage during that three year period (see Table 64).

Table 64

DEGREE OF UNIONIZATION
STUDY SAMPLE

	Number of Firms Reporting	%
Not At All Unionized	303	69.8
Partially Unionized	83	19.12
Completely Unionized	48	11.06
Total	434	100

Source: Stevenson & Kellogg Industry Survey, 1974.

The duration of the work stoppages was relatively short, averaging about eleven days.

These work stoppages were confined to Ontario, Quebec, Manitoba and Saskatchewan. Firms in the remaining provinces reported no work stoppages during the period (see Table 65).

Throughout the industry, management and labour appear to have learned to get along with each other. This is made easier by the fact that increased wages or improved working conditions established in the larger companies soon take effect throughout the industry. Companies have found it feasible to pass increased costs on to their customers.

Not surprisingly, labour-management strife often takes place when the union or its membership feel threatened. This occurs when management introduces technological change that alters or eliminates established jobs. Resistance on the part of labour to dislocation stemming from new technology has made it difficult for management to obtain fully the potential benefits of such investment.

K. AVAILABILITY OF TRAINING AND RE-TRAINING PROGRAMS

Historically, the major training technique for printing trade skills is "on-the-job" training having its roots in apprenticeship programs. Technical schools offering training in graphic arts exist in many communities.

Some of the community colleges, for example George Brown College of Applied Arts and Technology in Toronto, offer courses in many aspects of graphic arts including actual operation of presses. Part of the cost may be government sponsored and credits are granted as part of the apprenticeship program to achieve journeyman status.

The Canadian Lithographic Institute operates training schools in five locations -- London, Toronto, Ottawa, Montreal and Quebec City -- for apprentices in the lithographic branch of graphic arts. The Institute is supported as a joint venture between the Graphic Arts International Union and employers having labour contracts with that union. Apprentices who attend do so on their own time.

Table 65

PRODUCTION DAYS LOST IN WORK STOPPAGES FOR 1971 - 1972 - 1973
AS REPORTED BY 434 FIRMS

		Quebec	Ontario	Manitoba	Saskatchewan	Total
1971	Work Stoppages Reported	10	1	0	0	11
	Production Days Lost	15	1	0	0	16
1972	Work Stoppages Reported	0	3	1	3	7
	Production Days Lost	0	168	49	143	360
1973	Work Stoppages Reported	16	2	0	10	28
	Production Days Lost	17	114	0	10	141
Total	Work Stoppages Reported	26	6	1	13	46
	Production Days Lost	32	283	49	153	517

Source: Stevenson & Kellogg Industry Survey, 1974.

Ryerson Polytechnical Institute in Toronto has a graphic arts program which provides a broad understanding of graphic arts leading to positions in management or sales within the industry.

A wide range of training programs are available in the general fields of accounting, sales and marketing, supervision and management. These are found in all the major centres in Canada. As a general rule, however, none is directed toward the specific field of the graphic arts.

The question of training was raised in our personal interviews and our questionnaire survey. For skilled operators (e.g. pressmen, typographers, platemakers, cameramen, etc.), about 40% of firms indicated awareness of training programs within "a convenient distance". Of these, about 50% indicated some participation at some time by their employees. In general, the "on-the-job" training is most prevalent. Only the larger or more sophisticated firms utilize the training programs that are available.

The need for retraining within the industry arises from changing technology. This is also almost completely a matter of "on-the-job" training. Equipment manufacturers will frequently provide on-the-job instruction in the operation and maintenance of new equipment.

L. RECRUITMENT TECHNIQUES

Table 66 shows the methods used by firms in the industry to obtain various types of personnel. The industry shows no important pattern in connection with its recruitment methods.

For unskilled personnel, Canada Manpower and newspaper advertising are used extensively.

For skilled personnel, unlike many other industries, the union is an important recruiting source. Skilled personnel are recruited through the union in some 16% of the cases. This is at least partly a reflection of the fact that the union exercises control over the apprentice program in certain districts.

Table 66

RECRUITMENT TECHNIQUES USED FOR CATEGORY OF WORKERS
(Study Sample Excluding "Not Applicable")

Category of Workers		Canada Manpower	Advertising	Promotion From Within Firm	Personal Contact	Union	Private Agency and Other	None	Total Applicable # and % of Sample(1)
Unskilled	#	136	66	8	18	2	21	87	338
	%	40.2	19.5	2.3	5.3	.5	6.2	25.7	77.8
Skilled	#	57	136	37	34	61	10	51	386
	%	14.7	35.2	9.5	8.8	15.8	2.5	13.2	88.9
Technicians	#	16	44	9	19	16	9	82	195
	%	8.2	22.5	4.6	9.7	8.2	4.6	42.0	44.9
Skilled Clerical/ Administration	#	47	99	12	26	2	59	65	310
	%	15.1	31.9	3.8	8.3	.6	19.0	20.9	71.4
Marketing/Sales/ Distribution	#	6	27	43	18	1	25	77	197
	%	3.0	13.7	21.8	9.1	.5	12.6	39.0	45.4

Source: Stevenson & Kellogg industry survey, March 1974.

(1) Respondents in sample totalled 434.

Newspaper advertising, however, is the most popular method of recruiting all types of personnel except the unskilled.

Firms also make extensive use of private agencies as sources of clerical, administrative, marketing and sales personnel.

M. MATERIAL SUPPLY PROBLEMS

Printing firms report shortages of several materials. These include:

- many grades and sizes of paper;
- inks;
- certain chemicals.

Very few firms, however, have had to curtail production or have lost sales as a result of such shortages.

In the face of paper shortages, the most common practice has been to make substitutions. In recent years, paper manufacturers have reduced the number of grades and specialties offered. Printers indicate that their customers have become accustomed to the idea of substitution.

Some firms have actually benefited from the shortage. They have been able to do so because their customers were concerned about not being able to obtain printed material. The customers wanted to ensure that they would receive the printing work they required. They were prepared to pay higher prices if necessary. The printing firms increased prices significantly, thus increasing profit margins.

A few printers reported delays in obtaining papers of particular sizes and types. Popular types and sizes have apparently been available consistently. For the most part, customers have accepted the delays.

Firms which have long-term contracts to supply printing at an agreed price, such as newspapers and magazines, have been affected.

Increasing prices for paper have cut into their profit margins. Many have been able to negotiate price adjustments, but these were not always sufficient to maintain usual margins.

A few firms experienced difficulty simply because there were no available substitutes. This was reported to be the case for carton papers.

One effect of the shortage has been the tightening of credit by paper suppliers. Suppliers took the position that those who failed to make prompt payment for goods received could expect to have their supply curtailed.

Price increases for materials are an additional problem facing the industry. Although these increases are ultimately passed on to the customer, there is a continuing search for substitutions.

Difficulties in ink supply were identified more as a problem in quality than a problem of quantity.

Among chemical shortages, industrial alcohols were identified as the most important. Also mentioned were shortages of materials used in press clean-up.

N. TRADE ASSOCIATIONS

In Canada, there are several printing industry organizations of which firms of the Printing, Publishing and Allied Industries group are members. They are listed in Table 67.

The principal trade association that serves most segments of the industry in Canada is the Graphic Arts Industries Association. The segments served by GAIA include:

- Commercial Printing (Statistics Canada, SIC 287).
- Printing specialists such as business forms manufacturers.

Table 67

MEMBERSHIP IN PRINCIPAL TRADE ASSOCIATIONS

Trade Association	Short Form	Active Membership		Headquarters
		Canadian	Total	
Graphic Arts Industries Association	GAIA	555	555	Ottawa
Canadian Book Manufacturers Association		18	18	Ottawa
Canadian Bank Cheque Manufacturers		12	12	Ottawa
Canadian Business Forms Association		19	19	Ottawa
Printing Industries of America, Inc.	PIA	(All GAIA members)	7,000 plus	Washington
National Assoc. of Photo-Lithographers	NAPL	54	1,800	New York
International Typographic Composition Assoc.	ITCA	25	327	Washington
Book Manufacturers Institute	BMI	4	35	New York
Graphic Arts Technical Foundation(1)	GATF	63	1,000 to 1,300	Pittsburg
Council of Printing Industries(2)	CPI	150	150	Toronto
International Association of Printing House Craftsmen(3)		1,600	11,500	Cincinnati

(1) GATF is not strictly a trade association. It is a scientific and educational organization serving the international graphics communications industry.

(2) CPI is an organization that assists or acts in labour negotiation on behalf of the management of member firms.

(3) Sometimes called simply the Craftsmen Club, this association is organized primarily as local clubs whose principal purpose is to share knowledge of technical and general interest related to crafts in the graphic arts.

- Trade Typesetting (Statistics Canada, SIC 287).
- Trade Binderies (Statistics Canada, SIC 287).
- Trade Platemaking (Statistics Canada, SIC 287).
- Publishing and Printing (Statistics Canada, SIC 289).

GAIA provides for membership on the part of supplier organizations through associate membership.

Within GAIA there are some 14 regional graphic arts associations which function as chapters or affiliates of the parent organization. For example, in Montreal there are some 70 printers who comprise L'Association des Maîtres - Imprimeurs which is a part of GAIA.

Membership in GAIA is currently about 550 firms. This represents about 20% of commercial printing firms in Canada. Membership is made up of large and medium size firms. Sales of member firms total in excess of $500 million annually or about 60% of total commercial printing industry sales.

The GAIA has a close affiliation with Printing Industries of America (PIA) which is the principal trade association in the United States.

GAIA exists to serve its member firms. It does so in several ways:

- It presents the industry's position to the public and to government on issues that affect the industry.
- It provides in-house training to managers relative to specific aspects of printing plant operations.
- It makes available a wide range of operating data from the industry, to guide management.
- It provides management people an opportunity to meet, and keep abreast of events in the industry, through its annual convention.

Member firms we contacted viewed GAIA as an effective trade association. Many firms make use of the financial information and training that the association provides. The association has been instrumental in the past in obtaining certain restrictions on imported printed matter.

Some firms indicated that the industry has certain unfilled needs which might be provided by GAIA. These include:

- Conducting surveys within the whole industry to produce information to help firms in negotiations with their employees (wage rates by region, working condition comparisons, etc.).

- Providing information on new technology and innovations in the industry in a way that is more continuous than at present, say by setting up a "technical section" within GAIA.

- Providing a more effective means of exchange of ideas on industry problems, say through the establishment of a system of local chapters.

Other trade associations to which some commercial printers also belong are:

- Canadian Book Manufacturing Association (special section within GAIA, having a membership of about 18 firms).

- Canadian Bank Cheque Manufacturers (special section within GAIA, having a membership of about 12 firms).

- Canadian Business Forms Association (special section within GAIA, having a membership of about 19 firms).

- NAPL -- National Association of Photo-Lithographers. A U.S.-based association of 1,800 members of which about 54 are Canadian.

- BMI -- Book Manufacturers Institute. (A U.S.-based association of 35 members of which 4 are Canadian.)

- PIP -- Printing Industries of the Pacific. (A U.S.-based association with 43 Canadian members in Western Canada, but who now are affiliated through PIP with GAIA).

The Graphic Arts Technical Foundation, although not a trade association, is an important source of graphic arts technology for the industry. GATF is an international organization whose purposes are to perform or sponsor research and provide educational services and technical assistance. Some 63 Canadian firms are members out of a total international membership of about 1,300.

The Council of Printing Industries is an organization of printing firms that represents its members in the negotiation of labour agreements. There are about 150 firms within the Council, most of whom are located in Ontario.

The International Association of Printing House Craftsmen is organized primarily at the local level as an association (or club) of craftsmen and persons interested in the printing crafts. The international membership exceeds 11,000 of which over 1,600 are Canadian. Both the "Toronto Craftsmen Club" and the "Montreal Craftsmen Club" have memberships in excess of 400.

VII

PUBLIC POLICY ISSUES

A. BARRIERS TO ENTRY IN THE INDUSTRY

Compared to many other manufacturing industries, it is relatively easy to get started in the general printing business. This is so for several reasons:

- Capital investment requirements are relatively low. A printing business can be started for $15,000 to $30,000. Printing presses are relatively easy to obtain. Equipment manufacturers or suppliers are frequently prepared to assist a new printer by permitting payments over an extended period of time. Used equipment is also available. The medium-sized firms may even encourage a new printer by selling off older equipment as it is replaced by more modern equipment.

- Even the smallest printing firm has the ability to produce many types of work. Most printing equipment can be used to produce a wide range of products. This gives the starting printer many sales possibilities.

- New firms in the industry have opportunities to secure new business. Most printing jobs are unique projects and are not repeated in exactly the same form. Thus, the actual number of orders placed is high. All this provides a possible market for the newcomer.

- There are many sources of supply for paper, ink, and other materials. The phenomenon of material shortages is only recent and is unlikely to become a critical factor for small printing firms.

- To get started a printer need not have all the necessary skills within his own operation. Specialized service firms such as typographers, binderies and colour plate

processors are available in most areas. Thus, certain elements of the printing process may be contracted out as required. This is not an uncommon practice in the industry.

- Buyers have no particular brand or product loyalty, but have a loyalty to a supplier.

While it is relatively easy to start a small general printing business, there are barriers to entry into some of the specialized sectors of the industry. For example:

- High quality colour work requires extensive capital investment. The same is true of continuous business forms.

- Major buyers in the industry naturally have a preference for firms with an established reputation for quality and delivery performance. Thus, it is difficult for a new firm to obtain large volume accounts.

- Many firms in the industry strive to maintain a close contact with their customers. They succeed in establishing a certain degree of customer loyalty. A new firm endeavouring to obtain part of the customer's business can usually do so only by offering lower prices. This action is often met by price cutting on the part of the established printer. Thus, a barrier is set up because new business with major accounts tends to be obtained only by reducing profit margins.

A typical person starting a printing operation would be a skilled production man (press operator or typographer, etc.) who, through experience, knows who his potential customers are. Another typical person would be a printing services salesman or buyer who has a wide knowledge of the market. It is not unusual to find these two types of experience being combined to start a new printing operation.

The relative ease of entry is demonstrated by the proliferation of printing establishments. In fact, small firms (i.e. doing $100,000 sales or less) represent about 55% of all establishments. However, their sales account for less than 10% of the total for the industry.

B. DEGREE OF NON-RESIDENT (I.E. FOREIGN) OWNERSHIP

The degree of foreign ownership in the printing industry is difficult to determine with precision. There is very little published information except for the entire group of Printing, Publishing and Allied Industries. The most recent data available for this group covers 1967-1970. Nevertheless, some general comments are possible based on this data coupled with information gained in personal interviews.

As stated elsewhere in this report, the commercial printing industry is characterized by a large number of small firms and very few large firms. Most of the small and indeed, many of the medium-sized firms are closely held companies whose owners are actively involved in operating the business. The natural consequence of this phenomenon is that there is relatively little foreign or non-resident ownership in commercial printing.

We estimate about 2% of printing companies are owned or controlled by non-residents. Of these, about 75% or $1\frac{1}{2}$% of the total, are companies that have sales in excess of $500,000.

We estimate that non-resident controlled companies account for no more than 20% of total industry sales.

C. TENDENCIES TOWARD AMALGAMATION

Firms in the commercial printing industry show a significant tendency to merge with or be acquired by other firms. This tendency to amalgamate is shown in Table 68.

The table shows that some 23% of the firms we surveyed have been involved in some form of amalgamation during the last five years. This implies that up to 500 firms in the industry have been similarly involved in the same period.

In spite of the tendency to amalgamate, there has been a steady but moderate increase in the total number of establishments. This is explained by an apparent high rate of formation of new establishments. This is demonstrated in data on the age of establishments as shown in Table 69. About 18% of firms surveyed had been in operation for five years or less.

Table 68

ESTABLISHMENTS INVOLVED IN AMALGAMATION ACTIVITIES FROM 1968 TO 1973

	Small $250,000 and under		Medium $250,000 to $5,000,000		Large $5,000,000 and over		Total	
	No.	%	No.	%	No.	%	No.	%
Merger Only	2	1	3	2	1	9	6	1
Acquisition Only	41	17	38	21	4	36	83	19
Merger & Acquisition	5	2	6	3	0	0	11	3
Total Involved[1]	48	20	47	26	5	45	100	23
Not Involved	196	80	132	74	6	55	334	77
TOTAL	244	100%	179	100%	11	100%	434	100%

(1) "Total involved" does not necessarily mean frequency of involvement. Some firms may have been involved more than once during the five-year period.

Source: Industry Questionnaire, March 1974.

Table 69

AGE OF ESTABLISHMENTS

Age	Number of Firms	Percent
Under 1 year	6	1.4
1 to 2 years	15	3.5
2 to 5 years	57	13.1
5 to 10 years	49	11.3
10 years and over	307	70.7
TOTAL	434	100.0

Source: Stevenson & Kellogg Industry Survey, March 1974.

Although the number of mergers and acquisitions in the industry is high, for the most part the individual firms retain a high degree of autonomy. There is very little effort to obtain the apparent benefits of merger such as:

- increased plant specialization;
- centralized purchasing;
- centrally directed sales and marketing functions.

Parent firms seem to view subsidiary firms primarily as further investments in the printing industry.

D. IMPACT OF EXISTING LEGISLATION

From our discussions with managers in many printing establishments, we conclude that legislation affects this industry in much the same way as it does other industries.

The printers whom we interviewed generally reflected a relatively independent point of view. They indicated that there should be a minimum of government involvement in the industry.

The effect of various government assistance programs has been minimal. Those we interviewed did not express strong interest in such programs.

Many had taken advantage of past opportunities to accelerate the rate of depreciation on new equipment.

Federal sales and corporate profits taxation apparently present no important issues.

Imported printed matter and government legislation connected with it naturally has an important impact on the industry. This is because imported work comprises a significant share of the total market. Printing executives generally feel that the industry is being adversely affected by imports despite existing tariff protection.

E. GOVERNMENT INCENTIVE & DEVELOPMENT PROGRAMS

Several incentive and development programs provided by the federal government are available to commercial printers. The principal programs include:

- IRDIA -- Industrial Research and Development Incentives Act
- PAIT -- Program for the Advancement of Industrial Technology
- PEP -- Program to Enhance Productivity
- MACH -- Machinery Program
- CASE -- Counselling Assistance to Small Enterprises
- DREE -- Department of Regional Economic Expansion

Knowledge of the existence of these programs varies in the industry. Only 10% of the firms we surveyed were familiar with MACH. Some 52% however, were familiar with DREE.

Table 70 summarizes the rates of application for grants and success rates of each program.

Relatively few firms have applied for assistance under these programs. Greatest interest by far has been shown for DREE grants where 10% reported as having applied. 3.6% have applied for PEP grants. All the other programs have had an application rate of 2% or less. This is doubtless a reflection of the independent attitude of management in this industry.

It is interesting to note, however, that of those who apply for government assistance programs, the success rate was between 60% and 90% in four out of the six programs listed.

Provincial government assistance programs did not appear to be significant in the commercial printing industry.

Table 70

KNOWLEDGE AND USAGE OF GOVERNMENT ASSISTANCE PROGRAMS
(Study Sample)

Programs	Knowledge		Participation			
	434 Firms Reporting					
	Firms Having Never Heard of Program	Firms Having Heard of Existence of Program	Number of Firms Reporting Having Applied For Program	Percentage of Firms Having Applied For Program	Number of Firms Having Participated	Success Rate[1] of Applicants
	%	%		%		%
IRDIA	74.9	25.1	9	2.0	8	89
PEP	75.6	24.4	16	3.6	12	75
PAIT	85.1	14.9	6	1.3	1	17
MACH	89.9	10.1	5	1.1	3	60
CASE	70.6	29.4	8	1.8	2	25
DREE	47.7	52.3	43	9.9	29	67
TOTAL			87		55	

Source: Stevenson & Kellogg Industry Survey, March 1974.

(1) Success Rate means percentage of applications that were accepted. For example, for IRDIA, eight firms in the survey participated out of nine applications, i.e. 89%.

Another program -- The Development of Management Courses -- is a potential for indirect benefit to commercial printers. The program is designed to help associations (e.g. trade, industry, professional, business) to develop management courses of high quality.

In general, the personal interviews confirmed the low level of awareness and interest in government programs as revealed in the questionnaire survey.

Several firms expressed the view that government grants tend to encourage the creation of excess capacity. These printers felt that while the objective of creating jobs in a particular area may be achieved, the overall result may also be some disruption in the industry. They felt, therefore, that it was very important to assess fully the impact of any major investment in new printing capacity in any market area.

In the west, commercial printers view factors that interfere with trade with the U.S. as more important than direct government assistance programs. Western printers ask for nothing more than the situation where they can compete with each other and with U.S. printers on an equally competitive basis.

APPENDIX A

COPY OF QUESTIONNAIRE USED IN SURVEY

INTRODUCTION

The enclosed letter from Dr. F. R. Denham of Stevenson & Kellogg informs you of a study of the commercial printing industry in Canada. The attached questionnaire represents one phase of this study. It has been designed to obtain information about all printing establishments in Canada. Because we understand that there are different kinds and sizes of printing establishments, we realize that not all of the questions will appear to be applicable to your operation. However, we encourage you to try to respond to each question as fully as you can, since a thorough understanding of your operation will contribute to a fuller understanding of the entire industry.

Certain sections of the questionnaire may be more readily completed by company officers other than yourself.

In instances where percentages and numeric values are requested, an estimate or rounded figure is acceptable.

The questionnaire has been prepared by Stevenson & Kellogg Ltd., Toronto, Ontario

All information obtained in this survey is strictly confidential. Identification of your establishment will at no time and under no circumstances be divulged.

DEFINITIONS:

Establishment: An establishment is defined as follows:

The smallest unit which is a separate operating entity and is treated as a separate accounting entity.

Latest Balance Sheet/Last Fiscal Year: These terms are used to signify the 12 month period used as an accounting entity for your company. If your fiscal year for 1973 ended on December 31, 1973, please use figures from January to December 1973 as your last fiscal year. If your year has not yet ended, please use the last completed year for which you have records. Where used in the questionnaire, the last "three fiscal years" mean completed accounting entities.

PLEASE REPORT INFORMATION REQUESTED IN THIS QUESTIONNAIRE FOR THE ESTABLISHMENT DESIGNATED IN THE MAILING ADDRESS ONLY.

PLEASE COMPLETE THE ATTACHED QUESTIONNAIRE AND MAIL IT, IN THE STAMPED ENVELOPE PROVIDED, AS SOON AS POSSIBLE. PLEASE TRY TO HAVE THE QUESTIONNAIRE IN THE MAIL NO LATER THAN MARCH 8, 1974.

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FOR OFFICE USE ONLY

1

NAME AND ADDRESS OF ESTABLISHMENT:

1-a) NAME: _____
ESTABLISHMENT NAME

ADDRESS: _____
STREET

_____
CITY

_____
PROVINCE

2-a) Is the establishment part of a multi-establishment company, that is, a company with more than one establishment (PLEASE SEE DEFINITION OF ESTABLISHMENT CONTAINED IN INTRODUCTION)?

PART OF MULTI-ESTABLISHMENT COMPANY ☐ 10

SINGLE ESTABLISHMENT COMPANY ☐ 11

-b) Which of the following terms best describes the structure of your company? (PLEASE CHECK ONE BOX ONLY)

Is it:

a - Individually Owned ..... ☐ 12

b - A Partnership ..... ☐ 13

c - An Incorporated Company ..... ☐ 14

d - An Incorporated Co-operative ..... ☐ 15

e - An Unincorporated Co-operative? ..... ☐ 16

f - Other (Please Specify) _____ ☐ 17

_____

_____

3-a) Has this company been involved in a merger, an acquisition or both in the past five years, that is 1968 through 1973? (PLEASE CHECK ONE BOX ONLY)

Merger Only ..... ☐ 18

Acquisition Only ..... ☐ 19

Both Merger And Acquisition ..... ☐ 20

None Of The Above ..... ☐ 21

-b) Please mark the category that best describes the number of years this establishment has been in operation. Is it...

Less Than 1 Year ..... ☐ 22

Between 1 And 2 Years ..... ☐ 23

Between 2 And 5 Years ..... ☐ 24

Between 5 And 10 Years ..... ☐ 25

10 Years And Over?..... ☐ 26

4-a) Is this establishment operation, excluding management, completely unionized, partially unionized, or not at all unionized?

COMPLETELY ..... ☐ 27

PARTIALLY ..... ☐ 28

NOT AT ALL ..... ☐ 29

-b) If this establishment is partially unionized, please indicate below your best estimate of the proportion of your employees belonging to a union.

Under 25% ..... ☐ 30

25 To 49% ..... ☐ 31

50 To 75% ..... ☐ 32

Over 75% ..... ☐ 33

-c) Please estimate the number of work stoppages exceeding one day that have occurred as a direct result of labour-management disputes within your own establishment in the calendar years 1971, 1972 and 1973. Enter a "0" if no work stoppages occurred in a particular year. Also please indicate the total number of days lost in the particular year.

YEAR	NUMBER OF WORK STOPPAGES	NUMBER OF DAYS LOST
1971	☐☐ 34	☐☐ 36
1972	☐☐ 38	☐☐ 40
1973	☐☐ 42	☐☐ 44

5-a) At present, there are shortages of certain types of papers. Please indicate on the scale below, the effect these shortages have had on your production in the last 12 months. Please note that negative numbers indicate percent decrease in production and positive numbers indicate an increase. Please place an "X" in the box that best describes the effect of the paper shortage on your production.

DECREASE IN PRODUCTION					INCREASE IN PRODUCTION			
MORE THAN -40%	-30%	-20%	-10%	No Effect	+10%	+20%	+30%	MORE THAN +40%

46

6. Please indicate in the spaces provided below the number of persons employed at this establishment in calendar years 1971, 1972, 1973, where applicable. Please include part-time and temporary employees and those who worked only a portion of the calendar year by converting the number of part-time, temporary, etc. employees into equivalent man-years. Then add this number to the total number of full-time employees, (for example, one man working full-time for one year is equal to one man-year). Please estimate the total number of man-years you have consumed in the calendar years 1971, 1972, 1973 where applicable. Please enter one number per year.

	1971	1972	1973
Total Number Of Employees	☐☐☐	☐☐☐	☐☐☐
	55		63

7-a) Please indicate on the table below your estimate of the availability of some of the different types of employees required to operate your establishment. That is, for each employee category please indicate whether qualified people are readily available, not always available or very difficult to find.

If you do not require employees in any one of the categories listed below, please enter a check in the column marked "Not Applicable".

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	AVAILABILITY				
	Readily Available (1)	Not Always Available (2)	Very Difficult To Find (3)	Not Applicable (4)	
Unskilled Workers	☐	☐	☐	☐	64
Skilled Operators	☐	☐	☐	☐	65
Technicians	☐	☐	☐	☐	66
Skilled Clerical/ Administrative	☐	☐	☐	☐	67
Marketing/Sales/ Distribution	☐	☐	☐	☐	68
Executive/Managerial	☐	☐	☐	☐	69

7-b) When you require an employee in any of the employee categories, which of the following methods do you usually use to find a suitable employee? Please check only one box for each employee category.

If you do not have a usual method, please check in the column under "No Usual Method".

If you do not recruit employees in any one of the categories listed below, please enter a check in the column marked "Not Applicable".

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EMPLOYEE CATEGORY	USUAL TECHNIQUE: Personal Contact With Other Firms Or Business Associates (1)	Promote From Within (2)	Advertise (Newspaper, Trade Papers etc.) (3)	Private Placement Agency (4)	Canada Manpower (5)	Union (6)	Other Usual Method (7)	No Usual Method (8)	Not Applicable (9)	
Unskilled Workers	☐	☐	☐	☐	☐	☐	☐	☐	☐	70
Skilled Operators	☐	☐	☐	☐	☐	☐	☐	☐	☐	71
Technicians	☐	☐	☐	☐	☐	☐	☐	☐	☐	72
Skilled Clerical/ Administrative	☐	☐	☐	☐	☐	☐	☐	☐	☐	73
Marketing/Sales/ Distribution	☐	☐	☐	☐	☐	☐	☐	☐	☐	74
Executive/ Managerial	☐	☐	☐	☐	☐	☐	☐	☐	☐	75

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8-a) Please indicate in the spaces provided below whether training and/or retraining programmes for each of the listed employee categories are available or are not available within a convenient radius of your establishment.

If you are not aware of the availability of training programmes for any one employee category, please check the box under "Don't Know".

Please check one box for each employee category.

-b) If such programmes are available, please indicate whether any of your employees have attended them, during their employment with your establishment.

If your employees in any one employee category have not attended them, please check the box under "Have Not Participated".

CARD 2

EMPLOYEE CATEGORY	(a) Training Programmes Available	(a) Training Programmes Not Available	(a) Don't Know	(b) EMPLOYEES PARTICIPATION: Have Participated	(b) EMPLOYEES PARTICIPATION: Have Not Participated
	(1)	(2)	(3)	(1)	(2)
Skilled Operator	☐	☐	☐ 10	☐	☐ 11
Technician	☐	☐	☐ 12	☐	☐ 13
Skilled Clerical/ Administrative	☐	☐	☐ 14	☐	☐ 15
Marketing/Sales/ Distribution	☐	☐	☐ 16	☐	☐ 17
Executive/ Managerial	☐	☐	☐ 18	☐	☐ 19

9-a) Please indicate below which of the following federal government incentive programmes you have ever heard of.

If you have not heard of any one programme, please check the appropriate box under "Have Not Heard Of" below.

-b) Have you ever applied for participation in any of the following programmes?

-c) And which, if any, of these programmes has your establishment participated in?

PROGRAMMES	(a) Have Heard Of (1)	(a) Have Not Heard Of (2)	(b) Have Applied (1)	(b) Have Not Applied (2)	(c) Have participated (1)	(c) Have Not participated (2)
IRDIA (Industrial Research and Development Incentives Act)	☐	☐ 20	☐	☐ 21	☐	☐ 22
PAIT (Program for the Advancement of Industrial Technology)	☐	☐ 23	☐	☐ 24	☐	☐ 25
PEP (Program to enhance Productivity)	☐	☐ 26	☐	☐ 27	☐	☐ 28
MACH (Machinery Program)	☐	☐ 29	☐	☐ 30	☐	☐ 31
CASE (Counselling Assistance to Small Enterprises)	☐	☐ 32	☐	☐ 33	☐	☐ 34
DREE (Department of Regional Economic Expansion)	☐	☐ 35	☐	☐ 36	☐	☐ 37

10. Is your establishment organized so that specific individuals or departments are responsible for management of the following functional areas? Please check all that apply.

Production Planning And Control ..... ☐ 38

Quality Control ..... ☐ 39

Cost Control ..... ☐ 40

Sales Forecasting ..... ☐ 41

Production Standards Development ..... ☐ 42

Wage Incentive System Administration ..... ☐ 43

Preparation Of Sales Reports By Salesman ..... ☐ 44

Preparation Of Sales Reports By Product ..... ☐ 45

Preparation Of Sales Reports By Process ..... ☐ 46

Marketing Research ..... ☐ 47

Production Research ..... ☐ 48

Administrative Research ..... ☐ 49

Other (Please Specify) _____ ☐ 50

_____

_____

None Of The Above ..... ☐ 51

11. Which of the following methods do you use as controls for your sales force? Please mark all that apply.

Sales Quotas For Salesmen ..... ☐ 52

Profit Quotas For Salesmen ..... ☐ 53

Territorial Or Account Responsibility For Sales Force ..... ☐ 54

Other (Please Specify) _____ ☐ 55

_____

_____

None Of The Above ..... ☐ 56

Not Applicable ..... ☐ 57

12-a) Please indicate the approximate percentage of your total annual sales for the last fiscal year which were made to foreign markets.

No Sales To Foreign Markets ..... ☐ 58

Under 25% ..... ☐ 59

25% To 49% ..... ☐ 60

50% To 75% ..... ☐ 61

More Than 75% ..... ☐ 62

12-b) Please indicate which of the following marketing techniques you use when selling to domestic markets. If you make any sales to foreign markets, please also indicate which marketing techniques you use. For both domestic and foreign markets, please check all techniques which apply.

	DOMESTIC MARKET	FOREIGN MARKET
Personal Selling	☐ 63	☐ 64
Selling Through Agents.....	☐ 65	☐ 66
Selling Through Distributors And Jobbers	☐ 67	☐ 68
Regular Advertising		
Direct Mail	☐ 69	☐ 70
Print Media/Publications	☐ 71	☐ 72
Radio Or Television	☐ 73	☐ 74
Posters	☐ 75	☐ 76
Other	☐ 77	☐ 78

(Please Specify) _____

_____

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CARD 3

3-a) Thinking about 1973, were the bulk of your total shipments delivered within a....(PLEASE CHECK ONE ONLY)

- 0-25 Mile Radius ..... ☐ 10
- 26 To 50 Mile Radius ..... ☐ 11
- 51 To 100 Mile Radius ..... ☐ 12
- 101 To 200 Mile Radius ..... ☐ 13
- 201 To 500 Mile Radius ..... ☐ 14
- More Than 500 Mile Radius? ..... ☐ 15

-b) Now, thinking about the distance between your establishment and your suppliers of materials and services, please select the number of miles which best defines the distance between your establishment and suppliers of 75% of your paper, ink, typesetting and engraving services, and binding service.

Please mark one only for each service or material. If you never use one of the categories listed, please mark the "Not Applicable" column for that category only.

	MILES RADIUS							
	0-25 (1)	26-50 (2)	51-100 (3)	101-200 (4)	201-500 (5)	MORE THAN 500 (6)	NOT APPLICABLE (7)	
Paper	☐	☐	☐	☐	☐	☐	☐	16
Ink	☐	☐	☐	☐	☐	☐	☐	17
Typesetting Engraving	☐	☐	☐	☐	☐	☐	☐	18
Binding	☐	☐	☐	☐	☐	☐	☐	19

14-a) Please indicate which of the following operations are required for the manufacture of products by your establishment regardless of whether the operation occurs in-house or is sent out.

-b) For each of the operations required by your establishment, please indicate which are always performed in-house and which are sent out in part or in total to another company or to another establishment within your own company. Please record under -b).

	(a) NOT REQUIRED (1)	(a) REQUIRED (2)		(b) SENT OUT NO (1)	(b) SENT OUT YES (2)	
Art Work	☐	☐	20	☐	☐	21
Composition - Hot	☐	☐	22	☐	☐	23
Composition - Cold	☐	☐	24	☐	☐	25
Platemaking	☐	☐	26	☐	☐	27
Camera Work	☐	☐	28	☐	☐	29
Printing	☐	☐	30	☐	☐	31
Finishing	☐	☐	32	☐	☐	33

-c) For each operation sent out, please indicate what approximate percentage of your total annual requirement for this operation is done outside.

	PERCENTAGE OF TOTAL REQUIREMENTS SENT OUT						
	Less Than 5% (1)	5% To 24% (2)	25% To 49% (3)	50% To 74% (4)	75% To 90% (5)	Over 90% (6)	
Art Work	☐	☐	☐	☐	☐	☐	34
Composition - Hot	☐	☐	☐	☐	☐	☐	35
Composition - Cold	☐	☐	☐	☐	☐	☐	36
Platemaking	☐	☐	☐	☐	☐	☐	37
Camera Work	☐	☐	☐	☐	☐	☐	38
Printing	☐	☐	☐	☐	☐	☐	39
Finishing	☐	☐	☐	☐	☐	☐	40

5-a) Please write in below opposite each of the categories listed, the approximate percentage of your last fiscal year's total production.

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CATEGORIES	PERCENTAGE OF TOTAL PRODUCTION	
BUSINESS FORMS - Continuous for machine writing Continuous for handwriting	☐☐☐	43
BUSINESS FORMS - Individual gummed or snap-out sets	☐☐☐	46
BLANK BOOKS & PRINTED FORMS, sheets or in pads	☐☐☐	49
STATIONERY Letterhead, Billheads, Invoices	☐☐☐	52
ADVERTISING MATERIAL - Pamphlets, Leaflets, Handcards	☐☐☐	55
- Displays, Large Posters, Billboards, etc.	☐☐☐	58
CATALOGUES	☐☐☐	61
MAGAZINES AND PERIODICALS	☐☐☐	64
NEWSPAPERS Printed for Publishers	☐☐☐	67
DIRECTORIES	☐☐☐	70
TAGS AND LABELS	☐☐☐	73
BOOKS	☐☐☐	76
GREETING CARDS	☐☐☐	79

CARD 4

PACKAGING-Boxes, Cartons	☐☐☐	12
CALENDARS, CALENDAR PADS	☐☐☐	15
NON-PRINTED PRODUCTS-Preparation, Binding, etc. for Others	☐☐☐	18
OTHER PRINTED PRODUCTS (TO BRING TOTAL TO 100%)	☐☐☐	21
TOTAL PRODUCTION:	☐☐☐	24

Note: Total must be 100%

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15-b) Now, again thinking of the product categories which comprised your last fiscal year's production, please indicate which process was used to make each product. If more than one process was used for any one product, please write in the approximate percentage for the product's total production. If only one process was used, you need only mark the appropriate box.

PRINTING PROCESS

CATEGORIES:	LETTERPRESS (WEB AND SHEET) T	OFFSET (WEB AND SHEET) U	GRAVURE V	SILK SCREEN W	FLEXO-GRAPHY X	ELECTRO-STATIC Y	OTHER PLEASE SPECIFY Z	TOTAL PRODUCTION FOR EACH PRODUCT
BUSINESS FORMS - Continuous for machine writing, Continuous for handwriting	☐	☐	☐	☐	☐	☐	☐	100%
BUSINESS FORMS - Individual gummed or snap-out sets	☐	☐	☐	☐	☐	☐	☐	100%
BLANK BOOKS & PRINTED FORMS, - Sheet or in pads	☐	☐	☐	☐	☐	☐	☐	100%
STATIONERY - Letterhead, Billheads, Invoices	☐	☐	☐	☐	☐	☐	☐	100%
ADVERTISING MATERIAL - Pamphlets, Leaflets, Handcards	☐	☐	☐	☐	☐	☐	☐	100%
- Display, Large Posters, Billboards	☐	☐	☐	☐	☐	☐	☐	100%
CATALOGUES	☐	☐	☐	☐	☐	☐	☐	100%
MAGAZINES AND PERIODICALS	☐	☐	☐	☐	☐	☐	☐	100%
NEWSPAPERS - Printed for Publishers	☐	☐	☐	☐	☐	☐	☐	100%
DIRECTORIES	☐	☐	☐	☐	☐	☐	☐	100%
TAGS AND LABELS	☐	☐	☐	☐	☐	☐	☐	100%
BOOKS	☐	☐	☐	☐	☐	☐	☐	100%
GREETING CARDS	☐	☐	☐	☐	☐	☐	☐	100%
PACKAGING - Boxes, Cartons	☐	☐	☐	☐	☐	☐	☐	100%
CALENDARS, CALENDAR PADS	☐	☐	☐	☐	☐	☐	☐	100%
NON-PRINTED PRODUCTS - Preparation, Binding, [redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	100%
OTHER PRINTED PRODUCTS	☐	☐	☐	☐	☐	☐	☐	100%

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Do not punch this section on Card 4. Punch this after keypunching pages 14 and 15.

A/ ;

B/ ;

C/ ;

D/ ;

E/ ;

F/ ;

G/ ;

H/ ;

I/ ;

J/ ;

K/ ;

L/ ;

M/ ;

N/ ;

O/ ;

P/ ;

[redacted]

16-a) What were your fixed assets, before depreciation as indicated on your last annual balance sheet? Please enter approximate dollar values for each of the following:

If you have no fixed assets in one of the following categories, please enter "0" in the appropriate box.

25/32

LAND AND BUILDINGS	$ ☐☐☐☐,☐☐☐,☐00 (33–40)
MACHINERY AND EQUIPMENT	$ ☐☐☐☐☐☐☐,☐00 (41–48)
OTHER	$ ☐☐☐☐☐☐☐,☐00 (49–56)
TOTAL FIXED ASSETS	$ ☐☐☐☐☐☐☐,☐00

-b) During the last completed fiscal year, did you rent or lease any of the following?

57

	DID RENT OR LEASE (1)	DID NOT RENT OR LEASE (2)	
LAND AND BUILDINGS	☐	☐	58
MACHINERY AND EQUIPMENT	☐	☐	59

-c) ONLY TO BE ANSWERED BY ESTABLISHMENTS WHICH DID RENT LAND, BUILDINGS OR EQUIPMENT

According to your last annual statement, what was the approximate rental payment per annum for each of the following? Please enter approximate dollar amounts only for categories where rental occured.

60/65

LAND AND BUILDINGS	$ ☐☐☐☐☐☐☐,☐00 (66–71)
MACHINERY AND EQUIPMENT	$ ☐☐☐☐☐☐☐,☐00 (72–77)

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CARD

17. What was the dollar value of your shipments in each of the following fiscal years if available? Please enter approximate dollar amounts in the three spaces provided.

FISCAL YEAR	
1973	$ [ ][ ][ ][ ][ ][ ][ ][0][0] (10–17)
1972	$ [ ][ ][ ][ ][ ][ ][ ][0][0] (18–25)
1971	$ [ ][ ][ ][ ][ ][ ][ ][0][0] (26–33)

18. What was the net profit or loss (before taxes) for your last three fiscal years of operation, that is, total value of product sold and for services supplied minus cost of materials used, factory and management/sales payroll and factory and management/sales expenses? Enter the approximate net profit or loss in dollars for each of the following fiscal years if available.

FISCAL YEAR	NET PROFIT OR LOSS (BEFORE TAXES)	INDICATE PROFIT (1)	LOSS (2)
1973	$ [ ][ ][ ][ ][ ][ ][ ][0][0] (34–41)	[ ]	[ ] (42)
1972	$ [ ][ ][ ][ ][ ][ ][ ][0][0] (43–50)	[ ]	[ ] (51)
1971	$ [ ][ ][ ][ ][ ][ ][ ][0][0] (52–59)	[ ]	[ ] (60)

APPENDIX B

PRODUCTS OF COMMERCIAL PRINTING (SIC 286)

Source: Standard Industrial Classification Manual,
Statistics Canada, December 1970

- album manufacturing
- binder loose leaf, mfg.
- blank book making
- bookbinding
- book, blank, making
- book gilding, bronzing and edging
- book repairing
- calendars printing or lithographing
- cards, greeting, printed, mfg.
- cards, playing, mfg.
- catalogue printing
- Christmas cards mfg.
- colour printing or lithographing
- commercial or job printing
- decalcomanias, dry transfers, mfg.
- deckling
- embossing books or paper
- engraving, plateless
- envelope printing
- facsimile letters printing
- forms, commercial, lithographing
- gilding books, cards or paper
- gold stamping on books
- gravure printing
- greeting cards, printed, mfg.
- gummed labels and seals, printing
- imprinting on paper
- inventory blanks mfg.
- job or commercial printing
- job printing
- labels, seals, paper, printing and embossing
- library binders, loose leaf devices, mfg.
- lithographic printing
- lithographing
- loose leaf binders, forms, mfg.
- maps, printing or lithographing
- music printing not publishing
- newspaper printing shops
- offset printing
- pamphlet binding
- pamphlets printing not publishing

- paper bronzing, gilding and edging
- paper cutting
- paper labels, seals and tags, printing
- paper ruling
- photogravure printing
- photo-lithographing
- photo-offset printing
- plateless engraving
- playing card mfg.
- post cards, picture, printing or lithographing
- posters lithographing
- printers of plastic film
- printers, silk screen
- printing, commercial
- printing, from engraved plates
- printing, gravure
- printing, job
- printing, photogravure
- printing, rotogravure
- printing shops, general
- printing, silk screen
- printing stationery
- rebinding books, magazines or pamphlets
- receipt books mfg.
- repairing books
- rotogravure printing
- ruling paper
- sample mounting
- seals and labels printing, lithographing, embossing
- seals, Christmas, mfg.
- sheet music printing not publishing
- shops, printing, general
- show cards, printed, mfg.
- show cards, silk screened, mfg.
- silk screen printers, exc. glass and textiles
- souvenir cards printing or lithographing
- stationery printing
- tags lithographing
- tickets printing or lithographing
- transfers, decalomania, dry, mfg.
- vandyke printing
- wrappers printing or lithographing.

APPENDIX C

ORGANIZATIONS AND ASSOCIATIONS REFERRED TO IN THE TEXTS

Administrative Management Society
Willow Grove
Pennsylvania 19090

American Newspaper Publishers Association
750 Third Avenue
New York, New York 10017

Book Manufacturers Institute
25 West 43rd Street
New York, New York 10036

Bookbinders International Brotherhood
6 Adelaide Street East
Suite 604
Toronto, Ontario
M5C 1H6

Canadian Lithographic Institute
19 Duncan Ave.
Toronto, Ontario

Council of Printing Industries of Canada
159 Bay Street
Toronto, Ontario

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VOLUME III

COMMERCIAL PRINTING IN THE FUTURE

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PREFACE

ABREVIATIONS AND ACRONYMS

GAIA	-	Graphic Arts Industries Association
SIC	-	Standard Industrial Classification
CRT	-	Cathode Ray Tube
COM	-	Computer-Output-Microfilm
GNP	-	Gross National Product
S & K	-	Stevenson & Kellogg, Ltd.
GNE	-	Gross National Expenditure
ROI	-	Return on Investment
ACM	-	Apparent Canadian Market
U.K.	-	United Kingdom
U.S.A.	-	United States of America
NES	-	Not Elsewhere Specified
E & M	-	Equipment and Machinery
D & B	-	Dun & Bradstreet
R & D	-	Research and Development
CNTU	-	Confederation of National Trade Unions
GATF	-	Graphic Arts Technical Foundation
CPI	-	Council of Printing Industries
NAPL	-	National Association of Printers & Lithographers
BMI	-	Book Manufacturers Institute
PIA	-	Printing Industries of America
ITCA	-	International Typographic Composition Association
IRDIA	-	Industrial Research and Development Incentives Act
PAIT	-	Program for the Advancement of Industrial Technology
PEP	-	Program to Enhance Productivity
MACH	-	Machinery Program
CASE	-	Counselling Assistance to Small Enterprises
DREE	-	Department of Regional Economic Expansion
COX	-	Computer-Output-Xerography
FT	-	Facsimile Transmission
MIT	-	Massachusetts Institute of Technology
OCR	-	Optical Character Recognition
UV	-	Ultraviolet (ink)
AGI	-	Annual Growth Index
UPC	-	Universal Product Code
GATT	-	General Agreement on Tariffs and Trade
ORACLE	-	Optical Reception of Announcements by Coded Line Electronics

I

INTRODUCTION AND SUMMARY

A. INTRODUCTION

As part of a comprehensive study of the commercial printing industry in Canada, this volume presents a forecast of technological developments facing the industry in the 1970's and early 1980's. In addition, there is discussion of developments in the broader field of communications of which commercial printing is an important part.

This technology forecast is based on information available from:

- Research institutes;
- Industry publications;
- Manufacturers and suppliers of equipment.
- Major printers.

Many of these sources are listed in the appendix at the end of this volume.

B. SUMMARY

The principal points in the technology forecast are summarized below. Details of each subject are discussed in the following chapters.

1. R&D by Industry Suppliers

The objectives of manufacturers of graphic arts supplies, materials, equipment and machinery are to meet profit goals. They do this by fulfilling the needs of graphic arts producers for:

- increased output per hour;
- improved quality;
- reduced cost of production.

2. Impact of Technology

The principal impact of improved technology is twofold:

- plants have greater capacity; and
- the need for more effective marketing increases considerably.

3. Secondary Effects of Technology

Advancing technology has a number of secondary, but nonetheless significant, effects on the commercial printing industry in Canada. They are:

- decreased decision-making by workers;
- increasing costs for maintaining conventional technologies;
- lower new equipment costs (per unit of output) where economies of scale are achieved by sophisticated refinements;
- simplified machine maintenance resulting from the use of modular components;
- need for new management and production skills.

4. Increasing Capital Intensity

The continuing introduction of sophisticated technology will increase the capital per employee ratio, more so in large than in small companies. The rate of increase in this ratio will be rapid.

5. Increasing Automation

By 1985 the use of mini and micro computers for process control will be more evident in graphic arts. As industry complexity grows, management will be able to find ways to solve problems with computers. Personnel will be expected to work in a less subjective, more abstract environment.

6. Amalgamation of Medium-Size Printers

Medium-sized firms (having sales of $250,000 to $1 million) will be pressed to acquire expensive new equipment in order to remain competitive. New equipment with greater capacity will demand increased volume from marketing. Some of these companies may not be able to find simultaneous solutions to the financial and organizational problems. The logical outcome will be mergers of companies in similar businesses or sale to larger companies with available resources.

7. Altered Industry Structures

Some new technology will alter industry structures. Some already have done so. A large percentage of weekly newspapers, for instance, is now printed in regional plants. Formerly each weekly was printed locally.

We expect numerous developments to change the current structure of companies which traditionally supply composition or colour separation. These developments are in scanners, computers, Cathode Ray Tube image generation and engraving. To a major extent they will be linked together from transparency and typed copy to the printing plate in one continuous operation.

8. Manpower

New skills and attitudes will be mandatory. Industry and government will have to develop apprenticeship

programs to fit new technologies, many of which will eliminate craft requirements. The industries will need to create public awareness of career opportunities which they offer if they are to compete successfully in the labour market with other industries seeking promising young people.

9. Microfilming Impact

The principal area where new technology will have an adverse impact on current commercial printing industry shipments is printing for business record-keeping and publishing.

This reduction will occur as microfilms physically replace printed matter. The two principal application areas into which users will expand microfilming are record-keeping and short-life publications. Large companies who currently prepare massive parts lists and customer catalogues by their own in-plant printing operations will be similarly affected.

Short-life publications (weekly periodicals, daily newspapers, newsletters, etc.) may be affected significantl by such developments as "ORACLE"* and video cassettes.

10. Substantial Impact of Computer

The impact of the computer on the Canadian commercial printing industry will continue to have dramatic results. The principal areas will be:

(a) Process control.

(b) Computer-output-microfilm (COM).

(c) Computer-output-xerography (COX).

In-plant printing and data processing functions can also be expected to converge organizationally.

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*Acronym for "Optical Reception of Announcements by Coded Line Electronics" -- see page 8 for description.

II

COMMUNICATIONS

A. ROLE OF THE COMMERCIAL PRINTER

1. Scope of the Role

The commercial printer plays an important role in communications but one not so clearly defined as that for mass media nor for communications systems such as telephone or teletype. Commercial printers' services vary from integrated publishing and printing through many communications activities such as writing, editing, photography, and information processing, to the performance of mechanical tasks on the customers' orders.

2. Competition

Through his involvement in the creation of products such as books, magazines, newspapers and advertising materials, the commercial printer is directly or indirectly in competition with media which transmits information. His fortunes are thus affected by competing media. The impact of other media on the individual printer is seldom obvious.

B. CHANGING PATTERNS OF COMMUNICATIONS

1. Increase of Specific Interest Periodical

Some mass communications show a marked movement away from general interest content to that aimed at specific market segments. While the general magazines have been losing ground, the specific ones increase in numbers and in circulation. Newsletters without advertising revenue are proving to be successful. The theory

is that people, in striving to maintain individuality, seek information which addresses them personally, setting them apart from the masses.

2. Decline of General Interest Publications

Further, large daily newspapers maintain strength while smaller dailies and rural weeklies grow. Television is displacing the general interest magazine, so popular 15 years ago. Business communications developments are numerous and many have the potential for disrupting existing patterns with a resulting impact on commercial printers.

C. MAJOR TECHNOLOGICAL DEVELOPMENTS

1. The PicturePhone

The picturephone, developed at a cost of nearly $500 million, and heralded as a service with unlimited demand, proved to be impractical and was finally withdrawn. Its failure was attributed to the inability to transmit data other than by voice, and to the high cost of terminals.

2. Super-Videophone[(1)*]

The super-videophone is now under development and expected to be in use by 1982. This machine may feature small-screen colour TV, image resolution to TV standards, and a slow-scan model for high-resolution transmission of text or other graphic material. It would also be a high-speed transmitter-receiver for facsimile transmission, and a videorecorder with an input keyboard for character generation on a video display screen.

Multi-plant printing companies could use super-videophone for the transmission of data and written instructions augmented by oral discussion of the material. In circumstances where immediacy supersedes cost, such a system

* All footnote references are listed in Appendix A, "Footnotes to Technology Forecast"

could be very convenient for buyer and producer of printed matter.

3. Data Transmission

A Canadian data transmission system called Dataroute* has made a marked reduction in cost. The Canadian system was developed a year ahead of the Americans, offering a satellite relay telecommunications service within North America. The cost of transmission from Halifax to Vancouver by Canadian Dataroute is one-tenth that of the conventional method. This reduction opens rapid data transmission for more users.[2]

It is now possible to set computerized composition in Toronto and then to relay, via satellite, to a photo-output unit in Vancouver to complete the work.

Lasers are capable of carrying a great volume of data and may become useful where information can be transmitted from one switching point to another.

4. Home Communications

Many of us imagine direct communication from home to a remote computer, through an in-home terminal. The problem to date is the lack of reliable low cost terminals. Steady advancements in computer and terminal technology will eventually reduce the cost to a practical level for many households. At that time new services will be available in the home, including home study courses.

The dramatic increase in the numbers and varieties of terminals appearing in the last two or three years is

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*Dataroute is a private line digital data transmission service developed by Bell Canada. The service is offered within the trans-Canada telephone system.

an indication of the rapid progress in this technology. The large number of choices of activities available to householders will probably retard the widespread introduction of in-home terminals. Once installed with access to far-ranging information on computers, such devices may serve to reduce the demand for printing. When and by how much is unknown now.

5. Television Monitors

Special applications of communications technology can assist printing management. For instance, the foreman of a highly-capitalized department of a multi-plant U.S. box company was away from his work station frequently and was, therefore, not supervising the investment. A television camera was installed, focussed on the equipment and monitored from a remote location staffed by a supervisor. Videotape units were also installed in each plant. As the industrial engineering staff devised more effective procedures, these were recorded and distributed to all plants and replayed for training purposes.

6. Video Cassettes

Video cassettes are being developed for educational roles. Concern has been expressed that these may displace traditional printed works, but to date, little impact is apparent. Such material is mainly of a supplementary nature. Video cassettes are now being offered by publishers, but many problems must be solved before the "software" will be widely accepted. Improvements are being made, and eventually video cassettes will be found in libraries for reference or circulation. The significance of new communications devices, techniques and software is evident in an example such as the 1972 figures from Bell & Howell. The company's Education and Training Group accounted for 37% of corporate sales and 57% of profit.[3]

7. "ORACLE"

The Independent Broadcasting Authority (United Kingdom) has had under test for about one year a system whose acronym is "ORACLE" -- Optical Reception of Announcement by Coded Line Electronics.[4] The system features the use of existing television facilities. The text is displayed on an ordinary household receiver which has been adapted by an externally or internally mounted modification. Fifty pages of 22 lines of 40 characters can be handled and transmitted in about two minutes. The viewer can select for display any one of the 50 pages. These can be held indefinitely as the viewer wishes. Appropriate applications are those involving material requiring updating, such as stock market reports or news stories. Although this development appears to do little more than extend television utility, it is significant in surmounting one major weakness in television -- the inability to recall for review.

8. Facsimile Transmission (FT)

Facsimile transmission devices scan copy and reproduce it at a remote receiving unit which occupies only about three cubic feet of space and now rents at a monthly rate up to $100. Transmission may be by wire or by radio. Commercial FT houses provide service for those with occasional demand. Current development is aimed at increasing speed from six minutes per 8-1/2" x 11" page to one minute. The cost of the equipment will rise as a result of the improvement but will be accepted by the user to whom speed is advantageous.[5]

(a) Laserphoto -- Recently a graphic arts equipment manufacturer and a news service combined efforts to develop the laserphoto, which produces fast, dry-form print detail, uses telephone lines for transmission, and promises lowered cost. Fifty units were in use by May 1974.[6]

(b) Colour Facsimile Transmission -- Another company is completing work on a facsimile system that will transmit computer page formats of type, line and halftone in colour. This system requires line carrying capacity 50 times greater than that for existing facsimile transmission.[7]

(c) Aid to Printing Management -- FT accelerates the production cycle in some printing operations; for instance, transmission of proofs between the typesetting source and the client on tightly scheduled work, or the transmission of fully made up pages over long distances where speed is essential. This constitutes the greatest advantage of FT for printers and allows it to complement but not compete with commercial printing.

D. RAPID ADVANCES IN MICROIMAGING

Rapid development is taking place in the technology of microimaging -- microfilm and microfiche (98 pages on 105 x 148 mm. film). There are several reasons for this. Increases in the number of items to be stored and retrieved as reference, such as documents, books, records; the difficulty and cost of handling large quantities of paper; the cost of originating the material on paper; the cost of mailing and shipping.

1. Advantages

Microforms save space and can be shipped at low cost -- obvious benefits for the Canadian market. One ounze of film is equivalent to ten pounds of paper. Original micropublishing expense is greatly reduced by the elimination of press-work and finishing. For example, a mammoth maintenance manual for an aircraft cost $560 to produce on paper while its microfilm twin costs only $24.[8]

2. Disadvantages

Although microforms prove themselves convenient and attractively economical, they are not in great demand because of resistance to reading against light, the loss of flexibility resulting from use of the reader, and the cost of the reading machines. One manufacturer aims at a price below $1,000 for a complete microfilm system -- a camera, film processor and viewer. Good microfiche readers are now about $100. One manufacturer intends to get the price down to around $50 by 1976-1977.

3. Acceptance

About 2,000 people attended the two-day symposium on "Effective Microfilm Management" sponsored by the Administrative Management Society in 1973. This attests to the high level of interest in microforms.[9] Micro-publishing in the U.S. is now classified separately in the census figures and embraces over 200 companies.

The Guide to Microforms in Print itemizes 27,000 books. journals, newspapers and multi-volume works available in one or more of the microform formats.[10] Computer Output Microfilm (COM), despite obvious advantages, requires more developmental work before wide acceptance is achieved. In North America signs appear of growth in the use of microforms. Sales of micrographic products rose by 20% in 1972 in the U.S.

In Europe, after ten years of availability, COM has not been widely adopted. Reasons given are the cost, lack of suitable applications and the volume of throughput required to warrant the investment -- approximately 60,000 to 100,000 pages per month.

4. Application

Micro-publishing has been classified in three categories: retrospective, simultaneous, and original. Retrospective is exemplified by the Library of American Civilization published in microfiche form, representing 15,000 titles, selling for $20,000. The same number of titles conventionally re-published and priced at $5.00 each would be worth $75,000.

Publication on paper and on microfiche has begun at the University of Toronto Press, a decision taken in recognition of space and budget problems in libraries, the arrival of microfiche as an accepted reference device, and the fact that microfiche is the ideal micro-publishing medium. The National Geographic, New Scientist, and many other publications are being simultaneously micro-published. Books in English is an original micro-publication combining computer output microfilm and ultrafiche (310 pages on 105 x 148 mm. film).[11] Work is underway on fiche containing 510 pages.

5. Developments

The "Phochromic Micro Image" system when developed will feature resolution of 1,000 lines per millimetre, resulting in 3,200 pages per microfiche (105 x 148 mm.).[12]

An effective, low cost microfiche reader and an inexpensive COM system would make the micro-publishing of telephone books much more economical than conventional printing. The COM recorder operates at 20 to 30 times the speed of present impact line printers. The computer produces the updated listings which are then reproduced in the quantities required. Huge savings would accrue from elimination of platemaking, printing, binding and paper. Further cost reduction would also be experienced in distribution.

6. Miniature Type

A variation of micro-publishing may develop. A 16,000 page dictionary was photographically reduced and conventionally reprinted in 4,000 pages, each containing four of the original pages. 10,000 copies, each with a reading glass, were sold quickly at one-third the price of the original.[13] In times of rising costs and material shortages there could be good markets for similar miniature type publications.

7. Applications in Specialized Publishing

In specialized publishing the possibility exists to use microforms for newsletters, abstracts and scientific journals.

One weakness of microforms has been the difficulty of updating a portion of work on film. A U.S. company has now perfected an electrostatic method for adding information to existing microforms via a photoconductive material.

E. PROBABLE IMPACT ON GRAPHIC ARTS

Technological advances in communications are expected to impact the graphics arts industries in one of three ways -- increased sales, reduced costs or reduced shipments. We believe that only microforms will have significant impact on the industry by 1985.

Micro-publishing is most likely to reduce industry shipments. It is currently having an effect likely unnoticed in statistical data. Of concern to printers who previously printed parts catalogues or price lists these and similar products are now produced in microform. The economics of microforms guarantee their further inroads into printing markets.

COM and Microforms are discussed further in Chapter III.

III

MICROFORMS AND RELATED SYSTEMS

Microforms and computer-output-microfilming (COM) are the only areas of future technology which we expect to affect commercial printing industry shipments in Canada. Further, individuals knowledgeable in COM have a greater awareness and appreciation of the role of possible applications of advancing graphic arts in general. This chapter presents terminology, product offerings, COX, applications, and current demand constraints.

A. TERMINOLOGY AND PRODUCT OFFERINGS

Microform is the generic name for any type of microfilm, either a roll film or a unitized form such as microfiche, microjackets or strip film. The major segmentation of the industry is business films and large document films.

1. Business Films

Microfiche and 16 mm. roll film have been the typical format for business information systems. Fiche is a relatively new form that is most appropriate for micro-publishing. It has also found other uses where widespread distribution of micro-information is important. Source documents that are filmed have generally been 8-1/2 inches x 11 inches or smaller.

2. Large Document Films

Larger documents, such as engineering drawings and newspapers for library files, are filmed most commonly on 35 mm. and to a minor extent on 70 mm. or 105 mm. films. Because most libraries in North America use

35 mm. viewing equipment, other library material, such as educational works and college theses, are also filmed on 35 mm. films.

3. Conventional Systems

From an equipment viewpoint, "conventional microfilm systems" create microimages by filming the original source documents with a microfilm camera (or "microfilmer").

4. Computer-Output-Microfilm (COM)

COM is a relatively recent development which utilizes an electronic microfilm recorder to transfer computer-generated data directly from a roll of magnetic tape to microfilm. The conventional computer line printer and use of printed paper computer forms are completely eliminated.

B. SIGNIFICANCE OF COMPUTER LINKED XEROGRAPHY

The entry of the IBM Co. into the xerography market is highly significant from a number of points of view. (Xerography is a copying process that utilizes electrostatic forces to form an image.)

1. Computer-Output-Xerography (COX)

The true significance of IBM's entry into xerography is that we are witnessing the unfolding of a new industry segment -- computer-output-xerography (COX). We have learned from industry sources that "Copier II" is the leading edge of IBM's move toward COX. Hard copy will be obtainable from xerography units operating directly from magnetic tape. The number of copies, paper size and type-face will be capable of being specified to serve a wide range of users needs.

To counter IBM's moves, the Xerox Co. has elected to expand its line into computer peripherals. Although widespread

usage is years away, the potential impact on the commercial printing industry may be significant.

2. Convergence of In-Plant and Data Processing

In view of the forthcoming changes in the xerography-computer interface, and the increased demands for the rationalization of data processing and information handling, we expect the eventual convergence to occur between in-plant printing and data processing. These developments will only occur in the largest Canadian companies and government agencies whose data processing and printing requirements are quite voluminous.

C. PRINCIPAL MICROFORM APPLICATIONS

1. Conventional Microfilming Systems

A number of applications characterize the conventional applications:

- Engineering drawings.
- Record retention for corporations and hospitals.
- Commercial check filming by banks.
- Credit card document records.
- Maintenance manuals and parts lists.
- Catalogues.
- In-store catalogues on microfiche.
- Scientific and technical documents filmed by government agencies on fiche.

2. COM-Generated Applications

Any computer-prepared report is suitable for COM processing, provided the data does not have to be modified or updated for a period of time. The most prevalent applications are:

- Typical high volume, periodic computer reports.
- Sales and accounting reports for distribution to numerous locations.
- Inventory data.
- Customer records, particularly where telephone operator-customer service look-up is important.
- Preparation of corporation stockholder lists.

3. Microform Applications by Firm Size

Large government agencies and major corporations tend to use microfilm systems for active business reports and look-up applications in addition to traditional uses.

Medium-sized organizations tend to use outside service bureaus and limit their internal usage to engineering drawings and records retention.

D. CURRENT DEMAND CONSTRAINTS

A number of constraints on demand characterize the North American market.

1. Lack of User Awareness

The most significant obstacle facing vendors is the fact that many potential users are not acquainted with newer methods and applications, especially COM.

2. Cross-Functional Systems

A major constraint is an organizational one. Records administrators in most firms are not orientated to data processing systems. Operators of computer centres are often not interested in records management. As a result, internal cooperation within large firms is inadequate for rationalized information generation, processing and storage.

3. Substantial Cost-Justified Volume

Surveys published in the late 1960's indicated breakeven volumes for COM in the 160,000 to 200,000 pages per month range for in-house installations. COM service bureau utilization cost-justified volumes are considerably less.

E. COM SERVICE BUREAUS

Generally speaking, most new COM users start with COM service centres. After gaining general acceptance of the new procedures required (without heavy investment), users then establish in-house operations. Major suppliers, such as 3M and Kodak, report that many service bureaus assist their customers in establishing in-house facilities.

The last microfilm service to be taken in-house is usually film processing and duplicating. Medium-sized firms (sales of $2 million to $5 million) tend to use COM service bureaus indefinitely.

F. COM AND COMPUTERIZED TYPESETTING

We believe that actual evolutionary experience of COM systems will give real insight into the further development of computerized typesetting systems. Major commercial printers would be well advised to develop an understanding of the microform industry.

G. MICROFILM PRINTERS

Companies such as 3M, Xerox, Itek and Addressograph-Multigraph offer hardcopy printers which are extensions of offset product lines. Printers use a variety of systems, printing from masters, aperture cards, roll film and positive film.

Continuous form, single-copy microfilm printers for COM data are available from two major vendors. The NCR Company has a printer which uses microfiche input.

H. READERS AND READER-PRINTERS

1. Readers

The microfilm reader or viewer is basically an optical piece of equipment that restores the image to readable size. It is comparatively inexpensive to produce and does not require the paper chemistry and paper handling capabilities of a reader-printer. When very inexpensive readers become available, we expect the acceptability and usage of microfilms to expand considerably.

2. Reader-Printers

Reader-printers are based upon one of three common systems: (a) wet silver halide paper; (b) heat treated, dry silver process paper; or (c) electrostatic. The technology is improving rapidly, but cost remains an obstacle to wide-scale usage.

IV

DEVELOPMENTS IN GRAPHIC ARTS TECHNOLOGY

There is now a wave of "systems concepts" in the printing industries. Commercial printers are viewing the various aspects of production as "systems" and are seeking to organize their operations in a systematic way.

A. COMPOSITION TECHNOLOGY

Around 1948 the first successful experiments in phototypesetting aroused expectations as new developments seemed to improve quality, output and costs. Phototypesetting was seen as the successor to hot metal composition.

1. Acceptance of Phototypesetting

Now almost 30 years later, about 70 to 75% of composition is still done by hot metal machines.(14) The pace of acceptance has quickened. In 1973, 10% of phototypesetting equipment sold to commercial shops went to those who had no more than strike-on equipment.(15)

Phototypesetting equipment sales in 1970 were four times the volume of 1963.(16) Hot metal machine sales have dwindled to the extent that automatic line-casting machine manufacturing has ceased in North America, having been transferred to European plants.

2. Price Declines

The greater acceptance stems from lower prices of machinery, more reliability and improvements in systems which have no problems of proof-reading and correcting. Phototypesetting machines are now available in a wide range of models, priced from $7,500 upwards. Prices down to $5,000 are anticipated. In 1974, $10,000 machines will

be capable of setting 100 lines per minute at 30 characters to a line.[17] Hot metal machines are capable of 10 to 12 lines per minute and cost more than three times as much.

3. Phototypesetting Future

Most major hardware problems in phototypesetting have been solved or are about to be solved. A survey of manufacturers late in 1973 revealed that "...practical refinements in technology rather than quantum jumps with emphasis on equipment reliability and cost effectiveness..." would characterize these developments.

4. Cathode Ray Tube Typesetting

The "fourth generation" typesetting machines -- the Cathode Ray Tube (CRT) models -- are now being seen by some enthusiasts as the ultimate solution to typesetting requirements. Speed, good flexibility and quality support such opinion. The formerly high cost of CRT machines is dropping. From several hundred thousand dollars a few years ago, these machines are now available for less than $100,000. Two different machines were recently announced at $69,000 and $40,000.[18] The latter is capable of 500 lines per minute.

The acceptance of phototypesetters and CRT typesetters, in combination with computers required for full realization of the potential, imposes problems upon the users. Programming is a vital function for effective performance of the hardware, and programming can be very expensive. Thus, costs must be recovered from the sale of a substantial volume of work.

5. Computers in Typesetting

Computerized typesetting is most practical and economical when copy is furnished in mechanical language and multiple uses exist for the information. For example, a publisher using a computer to edit text can also update information in lieu of conventional typing, composing and

proofing repetitively. When editing and revising is completed, the tape can be run through the composing machine and held for future updating.

6. Computer Applications

Computer use in the composition of periodically revised material such as airline schedules, telephone directories or price lists contributed to convenience, speed and lower costs. It is also effective for jobs with many pages, many special characters, and where the copy is set in a simple format.[19]

7. Development

The first computerized composition was done at the Massachusetts Institute of Technology in 1961. By 1975, this system will have a capability to compose full pages of mixed type, line illustration and half-tones. Page composition software will cost approximately $25,000 and will provide for "multiple column setting, rule generation, footnotes, picture insertion and full pagination, including running head, folio and accurate vertical justification".[20] By 1980 it is estimated that computerized composition through CRT character generation will be the dominant method of typographic composition.[21]

8. Software

In the 1950's, software costs represented only 5% of total composition cost and have risen in this decade to an estimated 70%.[22] The "thinking" proportion of total output costs has risen dramatically. Programmers, relatively new to the graphic arts field, will be used in larger numbers as more computers are employed in typesetting.

9. Word Processing

Word processing (any process that stores words on a receptive medium as a result of keyboarding) is a concept of current interest. A person can both keyboard and edit as work progresses. Alternatively, editing can be done on the "captured" keystrokes at a later time.

10. Video Display Terminals

The number of video display terminals for original keystroking or for editing and correcting previously prepared tapes will increase very quickly. These machines permit the creation of clean tape for input to photosetting machines and can eliminate costly corrections done after copy is composed. Such utility is unquestioned and the costs are reasonable in terms of the benefits.

11. Laser Composition

The prospects for the use of lasers in composition have increased as a result of the laserphoto now used to transmit newspaper photographs. It is only a step from setting halftone dots to character dots. Some people believe that laser character generation would be better than that of the CRT.

12. Optical Character Recognition (OCR)

Optical Character Recognition is now gaining acceptance as an input device for composition in preference to a keyboard. Within certain limits, OCR machines can read typewritten or printed copy. The reading speed is fast, and machine prices are dropping rapidly; less than ten years ago, an OCR reader cost about $500,000; in 1970, $90,000. Today they average about $30,000 with some models down to $14,000.[23] A Massachusetts newspaper installed a scanner valued at $89,000, eliminated its tape-punch and reduced expenses by $120,000 annually.[24]

13. Accurate Text Copy Preparation

Within the writing-editing-composing cycle, there will be changes of economic benefit to buyers. Customers are encouraged to edit and prepare letter-perfect copy for sending to the typesetter as unjustified tape. This places the responsibility and the cost of accurate input at the source and will place non-technical expenses in the lower hourly rate brackets.

B. COLOUR SEPARATION

1. Scanning

(a) Initial Impact

In a lengthy series of time-consuming steps, full-colour art, prior to the era of electronic scanning, was separated into its four printing colours on a graphic arts camera. Then followed intricate correcting, platemaking and proofing. These stages once absorbed over 50 man-hours; actual colour separation can be done now in minutes.

It is estimated that the demand for colour separation work grows at about 15% per annum. It is not surprising that speed, consistency of results, reduction in the number of process steps and the lower cost drew work to the scanner soon after its introduction, giving the process an uncontested lead at the outset.

(b) Use and Cost

There are fewer than ten manufacturers of scanning equipment. Scanners may now be purchased for prices between $80,000 and $200,000. The machines have a correspondingly wide range of capabilities which fit each model to a specific market. About 150 scanners were in use in the U.S. in 1968, and the number will rise to 300 by 1975 to 1980.[25] Canada has eight at the moment and will have about twenty by about 1985. Present estimates are that 25% to 30% of all separations done annually in the U.S. are by scanner; in Europe the percentage is much higher.

(c) Capabilities

Scanners can now make screened separations whereas earlier scanners produced continuous tone separations which required an extra step to incorporate the screen. Testing is taking place on dot generation by laser. Proponents claim that lasers speed the process, eliminate the halftone screen, allow for a greater range of film speeds and produce better highlights.

One manufacturer in the U.S.A. hopes to reduce the operator skill and training time necessary by incorporating a variable viewer to translate subjective appraisal of an original image into objective data for the scanner. This company is also trying to perfect self-programming within the scanner to cut set-up time.

Other coming innovations are the assembly of complete page layouts, image combination and type drop-out. Technology exists to program a scanner for any particular printing conditions by means of a CRT (Cathode Ray Tube) colour previewer. It has already been successfully demonstrated that a scanned image can be transmitted over telephone lines for exposure without deterioration at destination.

A highly systematized colour separation plant is operating in the U.S.A. It uses a computer with storage capacity of 16,000 bytes (bits of information), two colour enlargers and two film processors. The computer is fed descriptive data on the physical characteristics of the job and densitometer readings from the original. These are used at all subsequent stages of separation. Results are consistent and predictable. Re-makes are reduced to 2% or less; separation time is shortened.[26]

(d) Alternative Technology

Technological innovations in exposure control, processing equipment, light sources and materials have so improved conventional colour separation that some early advantages of scanners, such as consistency, no longer exist. Recent studies at GATF failed to detect the means of colour separation in printed material.[27]

Direct screening by enlarger or camera is still cost-competitive with scanning, but scanners are more flexible in achieving the correct colour and for image assembly. Both methods will be in use, but the consensus is that by 1980 scanners will dominate colour separation. By 1985 integrated systems will be available that will scan and separate, proof and correct, and feed data into a CRT image generator to create output for whatever printing process is selected.

2. Colour Proofing

Recent advances in proofing for full-colour process are designed to make proofs of separated work more quickly and at less cost by eliminating the necessity for plates and presswork. Systems can now produce a proof that may be reliably compared with the original under standard lighting. The cost of these proofs is reasonable and process time short. One such American-originated system is enjoying meteoric acceptance with 50 units in operation in 1972 and 1,000 in 1973.[28] An Australian system based on electrostatic principles produces high quality full-colour proofs in 45 minutes. It requires fully air-conditioned space and greater capital outlay.[29]

Difficulties in creating acceptable proofs for colour gravure centre around reproducing tonal gradations. Adaptation of colour-key technology has resulted in proofs for gravure in 30 minutes. Starting with continuous

tone separations and incorporating the screen, the results match the standard colours of The Gravure Technical Association. These proofs closely approximate tonal reproduction achieved by gravure.[30]

Technological developments within the next decade will concentrate on efforts to eliminate high cost conventional proofing and approximate proofing by the substitution of previewing on a colour CRT (Cathode Ray Tube) coupled with a computer. Alteration of the previewed image can be made in pre-platemaking steps to ensure the desired quality.[31] Such technology will simplify the complex operations in the colour separation-proofing cycle and will be cheaper as volume use of the method is accomplished. Practical application may be achieved by 1985.

C. PRINTING PLATES

Many recent advances in the technology of platemaking materials and processing methods are having an impact on printing operations. Some of these are photopolymer* plates for letterpress; new, quick-processing plates for lithography; wrap-around plates for gravure and electronic engraving for gravure cylinder making. Technology close to realization involves laser engraving for newspaper plates.

1. Letterpress

Heavy stereotypes, which restrict press speed, and the high cost of combining phototypesetting with stereos, pose problems for large newspapers. Making a relief surface for molds to cast stereos is expensive. So is photoengraving, used to bridge the gap between phototypesetting and stereo plates. Photopolymer plates are seen as the solution with a proven longevity of 400,000 to 500,000 impressions.[32]

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*Photopolymer plates for letterpress consist of photosensitive plastics from which the unexposed non-printing areas are dissolved to produce a relief image.

Changes in platemaking for letterpress promises new life for a process which had been diminishing in importance. The most significant changes are seen in the use of photopolymer plates. In 1970, four major producers made materials for these plates, but by 1973, there were twelve, mostly large chemical or resin manufacturers. One producer has 4,000 installations worldwide. Japan has more such manufacturers than any other country. Of the 40,000 presses in Japan, about 29,000 are letterpress. A recent upswing there in the sales of sheet-fed rotary presses is attributed to photopolymer plates.[33]

The simplicity and speed of processing meet stringent newspaper schedule demands. One American publication printer claims that make-ready for photopolymer is about 25% that for electrotypes. Quality is good and cost competitive.[34] Over 200 American printers and 50 publications outside the newspaper field have accepted one brand of new plates alone. This brand is also being used for labels, packages, books, forms and brochures.[35] Further developments will lead to use for full-colour printing.

Other new letterpress plate systems use a combination of molding from a relief surface, type and/or engravings, followed by injection molding of the printing plate with polypropylene or other similar material. Such plates are satisfactory but have not received the same user support as the photographically produced photopolymer which by-passes the engraving and molding steps.

A U.S. newspaper chain has spent $4.5 million to perfect a laser-based platemaking system for letterpress plates. Each unit produces two plates per minute on plastic and metal. The first production models will be ready for use in late 1974 and will employ phototypesetting machine output.

2. Lithography

Plate processing machines for lithographic plates are

readily available and are satisfactory where the volume of work warrants their use. Fast, consistent development, with reduction in quantity of developer used, are benefits. Machine cost varies from $3,000 to $12,000, depending on size and features. Among the new plates marketed, none has duplicated the advantages of deep-etch plates to their exclusion.

Five years of refinement have gone into a dry-process plate for lithography. In this procedure, the image is exposed onto a material which is in turn fused to a metal plate, eliminating the need for sinks and related equipment. Capable of producing 100,000 impressions, this plate is designed for newspaper use and requires a capital investment of $30,000 to $50,000.[36] Certain quality levels of commercial work could be printed from these plates now.

Driography* plates, available since 1970, have not penetrated the market because of problems with ink, no ink being stable enough to avoid toning. By 1980-1985 such plates are expected to be commercially acceptable.[37]

Photomechanical transfer processes promise reduction of processing time. The system permits a semi-automatic processing from camera to press in under five minutes, eliminating negatives, film stripping and plate burning.

3. Gravure

Disadvantages curtailing the growth of the gravure process are the complexity and cost of producing gravure printing cylinders, which involves electroplating, elaborate preparation of the cylinder for etching, and a

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*Driography is a new printing process invented by the 3M Co. which is similar to lithography in that the plates are planographic but they print without water.

painstaking etching process. The Gravure Research Institute, to surmount these difficulties, has put forward a wrap-around gravure plate -- trimetallic, chrome-plated copper on steel. The plate is magnetically mounted to the plate cylinder.[38]

Electronic engraving is gradually replacing the old etching process, and one of Europe's most quality conscious gravure printers has stated that the process meets quality requirements, after holding out against strong economic pressure to adopt the method.[39] This electronic method is ten times faster than mechanical engraving.

4. Alternatives

The computer-cum-electronic character generation will eventually lead to systems which will compose type, combine type and illustration and expose the plate in one continuous operation. Beyond this stage lies the potential for printing from ink jets without the intermediate plate stage. The first stage could be reached by 1985; the latter is a possibility in the decade between 1990 and 2000.

D. PRINTING PRESSES

There are no new printing processes involving revolutionary press technology at this time, but much creativity has been devoted to press engineering. There is always a demand for better quality, greater productive output and reduced costs. Presses represent a major portion of fixed capital investment for commercial printers and effort has been expended on increasing the output per dollar of investment and per dollar of labour.

In general press speeds have risen during the past few years from approximately 7,500 sheets per hour to 10,000 sheets per hour and from about 1,200 feet per minute to 2,000 feet per minute for web-fed machines.

Any change in design or addition to existing press design will pro-

bably add to press cost rather than reduce it. To be acceptable, it must be balanced by a relative increase in quality and/or output. The ideal press is one that will cost little, print satisfactorily on low-priced paper at high speed, with little make-ready and little maintenance. The economies of scale are proven in presses where the capital cost per square inch of printed surface per hour decreases as the press size increases. Variety and demand preclude the use of large equipment for runs too short to realize the economies.

Press manufacturers are now concentrating on evolutionary improvements. The same is true for many manufacturers of press accessories. Designers are interested in simplifying press operations and building in controls that will in large part replace human judgement. Work in this area has succeeded in simplifying the training of press crews, improving quality by more consistent output and reducing nonproductive time and amount of wastage. Improvements to the mechanical features of presses will enable running more sheets per hour.

1. Lithography

Lithographic sheet-fed presses, dominant in the industry, suffer limitations regarding increased speeds. Mechanical cylinder trip devices are estimated to have reached their practical limits on presses at 10,000 sheets per hour where the trip must operate at 1/10 of a second. Advances will come from hydraulic or pneumatic devices which can work at higher speeds. Paper delivery is difficult on sheet-fed presses at high speed; some control of leading and trailing edges is effective, but the problem remains of instantly removing air from beneath the sheet settling on the delivery.[40] Direct in-line feed to a folder would help resolve this, while simultaneously imposing other problems such as quick drying of ink and lack of flexibility in uniting two operations not always required in sequence.

(a) Ink Control

Lithography involves more variables than other processes. Effort is being made to develop detailed knowledge of the variables and their

relationships. Progress is evident in the controls which are developing for some variables. Three major press manufacturers have introduced new controls for ink distribution to the plates. These control systems are designed to reduce make-ready time by getting preliminary settings of the ink fountain close to that required for correct ink supply, and to reduce paper wastage by reaching the specified colour more quickly and by staying within tolerances during running. Paper wastage is said to be reduced by up to 50% and make-ready time by 20%.[41]

One of these systems features a closed loop sequence for ink control. Densitometers read colours while the job is in process, a computer compares the reading with the pre-set standard and makes adjustments to the appropriate segment of the fountain. The pressman can preset 33 standards in the computer. The system works in four modes; in the first, the fountain is preset from unmounted plates. In the second, comparing and balancing colour on the sheet takes place using the present standards. In the third, the computer controls the colour. In the fourth, a logging process produces a teletype printout with data for production control, cost control and record for a re-run of the job.[42]

(b) Dampening

A method of control for plate dampening is being investigated simultaneously with experimentation on the amount of dampening required in varying circumstances. This method involves projecting light through an infra-red filter onto the damp plate. The water absorbs infra-red according to its film thickness so measurement of loss on reflection will indicate water film thickness.

Pursuit of this information should lead to eventual automatic control of plate dampening. Control of ink and control of water, leading to control of ink-water balance will improve quality and reduce wastage.[43]

(c) Drying

Improvements in ink drying are numerous. Stimulation for these items from demand for improved drying in high speed in-line operation, for the elimination of anti-offset spray, and for reduction of air pollutants, radiation drying is proving very satisfactory in terms of print quality and drying speed. Ultra-violet is now successful and is being adopted in commercial installations. Disadvantages are the hazardous emissions, the cost of the ink, the cost of installation and the cost of operating the ultra-violet source. These have not delayed installations, however. Considering the $4 million development cost borne by two U.S. ink companies,[44] it is not surprising that over 20 web presses in North America were on UV or committed as of September 1973.

(d) Auxiliary Equipment

The flow of progressive innovations for litho presses is reflected in the automatic air-activated "hickey picker" in tests on web and sheet-fed offset presses and the automatic sheet de-curler being installed on presses already in use.

A U.K. manufacturer of small presses has announced a model capable of 15,000 impressions per hour. It features disposable offset blankets which are fed into and ejected from the press in timing with the in-feed of printing plates.

2. Letterpress

The decline of letterpress over the past 20 years reduced the number of manufacturers for this equipment and consequently reduced technological improvements. Recent developments in photopolymer plates for letterpress have potential for the revival of the process.

Another breakthrough occurred in letterpress with the advent of the belt press. The plates are mounted off press on a belt which can be quickly placed on the press. Make-ready times range from 20 minutes to two hours. Current models of belt presses (with book-line) seem to be gaining rapid favour when, in view of the capital involved, eight have been purchased to date.

Letterpress presses are less costly to build because fewer parts are required. Simplification of make-ready, less expensive plates and adaptability of the plates to phototypesetting offer new opportunities to exploit the simplicity of letterpress.

3. Gravure

The high cost of gravure cylinders has retarded growth of this process, otherwise distinguished for simplicity, speed, high quality, and the ability to utilize cheap paper. Advances in cylinder engraving referred to earlier will permit gravure to compete more favourably with other processes for work involving shorter press runs.

(a) Controls

Efforts to perfect in-process controls for gravure presses are showing results. A German company and a Swiss company have developed a device which determines colour density values from a running gravure web. A computer can then be used to interpret and transmit decision output to the inking mechanism.[45]

(b) Innovations

In test are small gravure presses running at up to 4,500 feet per minute. They incorporate new inking mechanisms designed for these higher speeds. When these speeds are commercially usable, no drying problems are expected because of the over-capacity built into most drying systems.[46]

Innovation can speed gravure operations as revealed in the announcement of printing trolleys. Using these, an eight-colour change-over can be made in two minutes per unit.[47] Many future gravure presses will be marketed in narrow web widths to compete with other narrow web equipment designed for a wide range of commercial printing. When new development in cylinder making are in widespread use, gravure will make inroads into markets normally served by lithography and letterpress. The re-orientation and re-equipment necessary will take time, so it is unlikely that the impact of gravure's departure from traditional long-run markets will occur until after 1985.[48]

4. Screen Presses

Steady progress in the development of screen printing has brought it to the stage of market expansion. The perfection of photographic stencils and increased press speeds coupled with faster drying techniques account for this. Now available are fully automatic cylinder screen presses, capable of 4,000 sheets per hour -- a great improvement over the speeds achieved by hand-fed presses or the first slow automatic presses.[49]

5. Electrostatic Printing

Traditionally employed in office copying, the electrostatic printing process is being developed to print at speeds which bring it into competition with conventional methods. Electrostatic process will now produce halftone with type and can print both sides of a sheet. To compete successfully with other methods, total costs for platemaking, printing, collating and stitching will have to be reduced.

6. Ink Jet Presses

Experimental work with ink jet printing has been going on since 1930 when mechanical nozzle controls were tried. Electronic advances now make the use of ink jets more practical and some production applications have been made. At web speeds of 700 feet per minute, ink jets were employed to address over one million tax returns in the U.S.A.[50] The American Newspaper Publishers Association has initiated an intensive development project aimed at the perfection of ink jet printing for newspapers. Specifications call for web speeds up to 3,000 feet per minute.[51]

The perfection of this press will constitute a technological revolution. No conventional typesetting, graphic arts photography or platemaking will be needed. Text, advertising and photocopy will simply be entered through CRT display terminals and scanners into a computer. Editing and makeup will be accomplished on the terminals, and when all is ready to print, the computer will control the press, producing pages a line at a time.

Historically, there have been long intervals between the beginning of a new technology and its commercial acceptance. Although basic technology now exists for ink jet presses, there is a vast amount of work required to solve the problems posed in making them commercially practical. Predictions for practical use range from 1980 to 2000, with realism on the far side of that span.

E. INKS

1. Ultra-Violet Drying Ink

The most promising new ink is ultra-violet (UV), which should gain a dominant position over the next five years in situations where fast drying is essential. Ink manufacturers have made great strides in ink drying technology and, in the last few years, have perfected UV drying inks with superior quality characteristics, a positive contribution to improved production. These inks permit almost instantaneous drying, a must for further operations in the printing process. Quick drying holds the ink upon the paper surface, thereby improving appearance.

(a) High Cost

Currently, UV inks are from 50% to 100% more costly than conventional inks. The cost of drying units is high. Tube replacement cost is high. Another disadvantage of UV is the difficulty of de-inking paper for re-cycling. Offsetting these points is energy-use reduction. UV drying requires about 20% of the energy needed in dryers for heat-set inks.[52] Lower paper temperatures are beneficial to the end product.

(b) Ultra-Violet Ink Benefits

Despite some cost disadvantages in the UV ink systems, the benefits are attracting users in processes where drying is difficult, such as printing on metal, on plastic, and where improved quality output is obtained -- folding boxes, catalogues and books.

Web-fed presses generally have more critical drying requirements than sheet-fed presses because of in-line operations like folding or

die-cutting. Over 20 new web installations in Canada and the U.S.A. utilize UV.[53] The consumption of ultra-violet ink in the U.S.A., estimated at $2 million in 1973, is expected to reach $5 million by 1975.[54]

2. Infra-Red Drying Ink

Infra-red drying is of interest now because of new infra-red sensitive inks and improvements in the drying units themselves.

3. Water-Based Inks

Water-based inks, in use for some time in flexography on bags and boxes, are being put to new uses because of demand for reduction of solvents in gravure and the need to eliminate air pollution.

There are some problems with paper and with drying. Costs are also unfavourable. The long-run advantage of solvent elimination will provide impetus for development. Water-based inks will become more prevalent in the future.

4. Catalytic Inks

Catalytic inks with low solvent content are being developed to cure at lower temperatures than catalytics without solvents. Web temperatures have dropped from a range of 325-350° F (163-177° C) to 250-300° F (121-149° C). Less energy is required, less paper moisture is lost.

5. Heat Transfer

New developments in heat transfer printing utilize new inks and should open fresh markets for printers. A design is printed on paper by gravure, flexography or lithography, then transferred under heat for 30 seconds at 400 degrees F. to a textile. The economics of incorporating design in fabrics this way should stimulate growth of the method.

F. PAPER

1. Shortages

Extensive shortages now will not be remedied for several years until new paper mills come into production and not many have been started. World demand for paper is rising by reason of increased population and higher standards of living in developing countries. This means more pressure on the supply and higher prices for some time.

2. Mechanical Pulps

Technological response is felt in the increasing use of mechanical pulps which are more efficient wood resource users than are chemical pulps: 90% efficiency vs. 50% to 60%.[55] Greater machine speeds are possible: from 1,700 to 1,800 feet per minute on rebuilt old machines; up to 2,000 to 2,400 feet per minute on new machines.[56] Refinements in air-laid fibre machines aim for fine-paper quality production. This may take as long as 20 years, to 1990.[57]

Two great advantages are offered: the mill need not be near a large water source and requires about 40% less capital per ton of annual capacity.[58] Additional advantage will accrue from the ability to add production increments in smaller units than is practical with existing technology. This will lead to a better balance between supply and demand.

3. Twin-Wire Papers

Twin-wire papers are produced on a machine giving like-characteristics to both sides of the sheet. The machine delivers a more uniform sheet at a greater speed than the wire-felt.

4. Computer Controls

Process control by computers is gaining acceptance among paper makers. One computer manufacturer, specializing in controls for paper machines, claims cuts in overall production costs by 8% and profit increases per machine up to $3,500 daily. Over 100 machines are now equipped with this control but any savings are not yet obvious to paper buyers, nor will they be under current market conditions.[59]

5. Paper Weights

The increasing cost of paper, mailing and shipping tend to promote the use of lighter papers. One catalogue, for instance, was reduced from 6.1 lb. to 2.9 lb., a saving in material exceeding 50%.[60]

6. Re-cycling

Two problems impede re-cycling progress despite the environmental and economic advantages. One is the guaranteed arrival of a given daily quantity of waste at the mill. The second is posed by the contamination of the waste. Until better segregation and collection systems are found, these drawbacks prevent large-scale use of wastes.

7. Plastic Papers

Plastic papers have properties far superior to normal paper in specific applications. Their use is insignificant, however, in comparison to that of paper. World production of plastic paper is estimated at around 15,000 tons; cellulose paper, about 30,000,000 tons.[61] Use of plastic paper will be retarded by the changes in world prices for crude oil necessary in its manufacture. Prior to the oil crisis, plastic papers cost about twice as much as ordinary paper, but the crisis has broadened the gap.

G. BINDING AND FINISHING OPERATIONS

1. Relationships

Graphic arts finishing operations managers commonly say that all the production delays prior to finishing have to be made up in binding and finishing if delivery dates are to be met. Such a state of affairs has resulted in pressure on suppliers to produce machines or materials that will hasten output in this area. A further push for greater output comes because of increased production from the presses that feed into finishing operations.

2. Systems

Probably the most significant of recent developments are those based on the "systems concept". A good example is the Cameron press (founded on the Stroud-Bridgeman concept of Canadian origin) which has been designed to produce complete books from roll stock to either case-bound or perfect-bound books on an integrated machine system. The finishing operations on the Cameron commence at the book line and eliminate the conventional folding, gathering and sewing -- steps between the press and the subsequent book-line operations eliminated by perfect binding techniques.

(a) Cost Savings

The Cameron innovations have greatly reduced the "in-process" time for book manufacturing and have resulted in substantial savings in time and money, from 15% to 40%.

A different system for making a book in one pass has been designed in Sweden. The mechanics differ but the goal is the same -- lower book costs. Another system under study involves printing from roll to roll, then aligning webs one atop the other to collate and feed into a unit which cuts this "sandwich" into sheets, folds and finally sends them into binding units.

(b) Benefits of Systems Approach

The significance is in the engineering approach to book production problems arising from a multitude of operations. This systematic engineering will be applied in all finishing operations where sufficient volume of a product, highly adaptable to standardization, is produced. Examples would be cheques or labels.

Segmented market demands are stimulating the engineering of specific systems such as a manufacturer's book line described as "medium speed" at 40 books per minute. Systems for different markets are capable of 200 books per minute.

3. Adhesives

We are witnessing new technology in adhesives to meet industry requests for improved end-use performance, faster adhesive setting and reduced cost. Recently introduced is a thermoplastic adhesive for use in bookbinding which can be activated from outside the book by a magnetic field. This process permits the acceleration of casing-in and building- operations. It reduces costs while simultaneously improving the strength of book hinges where failure is most likely to occur.[62] The process has the potential to make Smythe-sewn* books as strong as McCain-sewn and thus to avoid the hard-to-open drawback of juvenile books which are now being McCain-sewn for durability.

Better adhesive bindings and greater acceptance of the products by buyers has resulted in a large proportion of

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*In Smythe-sewn books the thread is sewn close to the fold of the "signature" whereas in the McCain-sewn method the thread passes through the "signature" at a somewhat greater distance.

bookbinding work being done by perfect-binding in both hard and soft cover. The economics are favourable and the trend should continue. It is a common feeling that most books, particularly where obsolescence is a factor, will be adhesive-bound.

4. Alternatives

Work to counter the inroads of adhesive binding will combine milling, sewing and adhesive binding in a single machine. A prototype model is to be available in 1974. Efforts to eliminate the need for adhesives in binding books and pamphlets are reflected in patents issued to inventors of a process wherein a specially formulated paper containing thermoplastic resins is used. It bonds when heat is applied to the areas where bonding is required.

5. Future Developments

Future concentration will be on the improvement of existing technology and on new systems to integrate as many operations as possible. A limiting factor is the diversity of finishing operations necessary to complete the variety of custom products demanded.

Finishing operations have traditionally involved a great deal of material handling. As better production machinery and methods yield more output, the time spent on handling will become proportionately greater and will attract attention for reduction. This should increase mechanization of material handling and automation where warranted. CABCON*, the Computer Assisted Bindery Control, is a forerunner of future developments.[63] The system is now in operation on two rotary gathering lines producing over four million magazines monthly.

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*CABCON is a type of control system for gathering lines, produced by Harris-Intertype Corporation, Sheridan Division, Easton, Penn., U.S.A.

H. INCREASING AUTOMATION

Increased productivity in commercial printing will arise not only from new production machinery, but also from the ingenuity of management in applying the principles of mechanization and automation whenever possible. Opportunities to do this will come from developments in mini and micro computers and industrial robots.

1. Mini Computers

Mini computers with considerable capacity are now available in the $3,500 to $25,000 range. Micro computers range from $500 to $4,000. Today a $4,000 computer has the capability of a $100,000 machine of ten years ago, is much easier to use and is more reliable.[64] New circuit technology makes this possible. One computer used in control of typesetting has dramatically dropped in price from $18,000 in 1965 to $4,000 in 1972.

The demand for small computers is confirmed by U.S. figures reporting a 50% increase in sales of small computers between 1972 and 1973 to $700 million.[65] A forecast by a Palo Alto, California research company predicts a 19% per annum growth in the sale of process control computers through the mid-70's.[66]

2. Plant Expenditures

A large manufacturer predicts steep acceleration in the rate of expenditures for plant automation -- a five-fold increase in the years between 1965 and 1975. A further observation is that about 50% of new capital flowing into U.S. plants will be used for automation. Two objectives underlie this significant investment -- reduction of manufacturing costs and improvement of quality.

Inexpensive computers are now being built into original capital equipment to improve control, increase output and improve the quality. Computer control of printing machinery will not be accomplished as easily as envi-

sioned because of the large number of variables to be controlled. The complexity of such control is indicated by an interaction chart for a single-colour lithographic press which shows 90 variables. The potential for gain is demonstrated by news from the Philip Morris Co. that a new plant incorporating many computers will be 50% more productive than existing plants.[67] As production speeds increase, it becomes more difficult for people to keep pace with inspection. Electronic devices will be employed for this wherever possible.

3. Industrial Robots

There are early signs of progress in a developing field of technology that promises much for mechanization. In 1971, the Japanese started an industrial robot association, and in 1972 preliminaries began for an American association. Specialists in the field already classify robots in three generations.[68]

Second generation robots are characterized by such capabilities as six controllable articulations and moving target synchronization. Undoubtably, such machines will be useful in graphic arts; for example, in binding and finishing where much material handling is necessary. Third generation robots feature ability to "see" and "hand-eye" coordination.

4. Rate of Development and Implementation

Technical progress in automation and mechanization will probably move along more quickly than will the adaptation of the technology by graphic arts. In industries producing more highly standardized products, there are operations involving fewer variables than in the printing processes, better developed standards of quality, and long runs of an item which lends itself to improvement by mechanization and automation.

The beginnings of computer control are evident in new presses, typesetting and colour separation. From these applications there will slowly come an awareness of computer potential for improvements in productivity. By 1985, a well-established trend towards intensive mechanization and computerization will have already influenced large producers who are usually the first to try new technology.

5. Problems in Process Control

The most difficult problems to solve when introducing computers for control have been in the delineation of parameters and in the creation of software. The extent to which this makes itself felt may be seen from the experience of one trade typesetting house which now employs five full-time computer programmers in a plant with two photo units and one CRT on computer control.

V

MANPOWER

A. CHANGE IN TECHNOLOGY

Underlying considerations of manpower in the future is the fact that the printing industries are moving from a low-level, primarily mechanical technology to a high-level, automated technology. This will put increased demands on the work force for people with greater technical skills and ability to work in a more abstract environment.

B. KNOWN SHORTAGES

An extensive graphic arts manpower survey conducted in the U.S. revealed critical shortages of qualified personnel in production, sales and management. It noted that educational programs in graphic arts were outdated. New technology is not being taught in many institutions.

C. TECHNOLOGY CONFUSES BUYERS

The complexity of new technology confuses printing buyers, illuminating the need for more technically proficient sales people to interpret innovations for the layman buyer.

D. INDUSTRY OPPORTUNITY

There is a lack of awareness of opportunities in the printing industry by the general public. This "low profile" is a recognized factor in the common problem of attracting young people to the career opportunities which exist. Other communications industries carry an aura of "romance" such as television and radio, although the graphic arts is technologically just as exciting and promising for young Canadians in search of an appealing career.

E. RESULTS OF SHORTAGES

Shortages of skilled and unskilled people will exert pressure towards the development of industry methods employing minimum manpower; it is another step in the direction of more capital-intensive industries.

APPENDIX A

FOOTNOTES TO TECHNOLOGY FORECAST

FOOTNOTES TO TECHNOLOGY FORECAST

1. Spectrum, November 1973.
2. Business Week, March 3, 1973.
3. Business Week, May 5, 1973.
4. Professional Printer, January 1974.
5. Business Graphics, December 1973.
6. Graphic Communications Weekly, February 5, 1974.
7. Inland Printer/American Lithographer, December 1973.
8. Printing Technology, December 1972.
9. Graphic Communications Weekly, August 28, 1973.
10. Graphic Communications Weekly, February 5, 1974.
11. Printing Technology, December 1972.
12. Printing Technology, December 1972.
13. Printing Technology, December 1972.
14. International Comprint, October 1972.
15. Newspaper Production, December 1973.
16. Kodak Bulletin 26.
17. Inland Printer/American Lithographer, December 1973.
18. Composition Information Services, February 1974.
19. International Comprint, October 1972.

20. Composition Information Services, February 1974.

21. International Comprint, October 1972.

22. Professional Printer, January 1973.

23. Book Production Industry, November 1973.

24. Newspaper Production, December 1973.

25. Comprint 90.

26. Graphic Arts Monthly, March 1973.

27. Professional Printer, January 1973.

28. Graphic Communications Weekly, March 20, 1973.

29. Comprint 90.

30. Graphic Communications Weekly, November 20, 1973.

31. Comprint 90.

32. Professional Printer, July 1973.

33. Professional Printer, July 1973.

34. Inland Printer/American Lithographer, January 1974.

35. Graphic Communications Weekly, October 18, 1973.

36. Graphic Communications Weekly, February 12, 1974.

37. Graphic Communications Weekly, September 11, 1973.

38. Inland Printer/American Lithographer, December 1973.

39. Gravure, May 1973.

40. Professional Printer, July 1972.

41. Graphic Arts Monthly, May 1973.

42. Graphic Arts Monthly, May 1973.

43. Professional Printer, July 1973.

44. Graphic Communications Weekly, September 19, 1972.

45. International Comprint.

46. International Comprint.

47. Gravure, October 1973.

48. International Comprint.

49. Graphic Communications Weekly, April 10, 1973.

50. Graphic Communications Weekly, April 17, 1973.

51. Graphic Communications Weekly, October 24, 1972.

52. Sinclair & Valentine Research Department.

53. What's New(s) in Graphic Arts, International Paper Co.

54. Graphic Communications Weekly, September 4, 1973.

55. International Comprint.

56. Abitibi Provincial Research Centre.

57. Abitibi Provincial Research Centre.

58. International Comprint.

59. Business Week, January 27, 1974.

60. Graphic Communications Weekly, November 13, 1973.

61. International Comprint.

62. Advertising Age.

63. Book Production Industry.

64. Business Week, January 27, 1973.

65. Business Week, January 27, 1973.

66. Business Week, January 27, 1973.

67. Business Week, December 8, 1973.

68. Automation, June 1972.

APPENDIX B

ORGANIZATIONS AND ASSOCIATIONS REFERRED TO IN THE TEXTS

Administrative Management Society
Willow Grove
Pennsylvania 19090

American Newspaper Publishers Association
750 Third Avenue
New York, New York 10017

Book Manufacturers Institute
25 West 43rd Street
New York, New York 10036

Bookbinders International Brotherhood
6 Adelaide Street East
Suite 604
Toronto, Ontario
M5C 1H6

Canadian Lithographic Institute
19 Duncan Ave.
Toronto, Ontario

Council of Printing Industries of Canada
159 Bay Street
Toronto, Ontario

Federation of Canadian Printing & Information (CNTU)
1001 St. Denis Street
Montreal, P.Q.

George Brown College of Applied Arts & Technology
P.O. Box 1015, Station B
Toronto, Ontario

Graphic Arts Industries Association
Fuller Bldg.
75 Albert Street
Ottawa, Ontario
K1P 5E7

Graphic Arts International Union
612 Sherbourne Street
Room 202
Toronto, Ontario
M4X 1L6

Graphic Arts Technical Foundation, Inc.
4615 Forbes Ave.
Pittsburg, Pennsylvania 15213

Gravure Research Institute
22 Manhasset Ave.
Manorhaven
Port Washington, N.Y. 11050

Gravure Technical Association
Lincoln Building
60 East 42nd Street
New York, N.Y. 10017

Independent Broadcasting Authority
70 Brompton Road
London SW3 IEY

International Association of Printing House Craftsmen
7599 Kenwood Road
Cincinnati, Ohio 45236

International Printing Pressmen & Assistants Union
of North America
1730 Rhode Island Ave. N.W.
Washington, D.C. 23006

International Typographic Composition Association
The Georgetown Building
2233 Wisconsin Avenue N.W.
Washington, D.C. 20007

International Typographical Union
301 South Union Blvd.
P.O. Box 2341
Colorado Springs, Colo. 80901

Lithographers & Photoengravers International Union
1900 L Street
Washington, D.C. 23006

National Association of Photo-Lithographers
230 West 41st Street
New York, N.Y. 10036

Printing Industries of America
20 Chevy Chase Circle, N.W.
Washington, D.C. 20015

Printing Industries of the Pacific
921 ICO Building
Portland, Oregon 97204

Ryerson Polytechnical Institute
50 Gould Street
Toronto, Ontario
M5B 1E8

VOLUME IV

A STRATEGY FOR GROWTH

TABLE OF CONTENTS

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PREFACE

ABREVIATIONS AND ACRONYMS

GAIA	-	Graphic Arts Industries Association
SIC	-	Standard Industrial Classification
CRT	-	Cathode Ray Tube
COM	-	Computer-Output-Microfilm
GNP	-	Gross National Product
S & K	-	Stevenson & Kellogg, Ltd.
GNE	-	Gross National Expenditure
ROI	-	Return on Investment
ACM	-	Apparent Canadian Market
U.K.	-	United Kingdom
U.S.A.	-	United States of America
NES	-	Not Elsewhere Specified
E & M	-	Equipment and Machinery
D & B	-	Dun & Bradstreet
R & D	-	Research and Development
CNTU	-	Confederation of National Trade Unions
GATF	-	Graphic Arts Technical Foundation
CPI	-	Council of Printing Industries
NAPL	-	National Association of Printers & Lithographers
BMI	-	Book Manufacturers Institute
PIA	-	Printing Industries of America
ITCA	-	International Typographic Composition Association
IRDIA	-	Industrial Research and Development Incentives Act
PAIT	-	Program for the Advancement of Industrial Technology
PEP	-	Program to Enhance Productivity
MACH	-	Machinery Program
CASE	-	Counselling Assistance to Small Enterprises
DREE	-	Department of Regional Economic Expansion
COX	-	Computer-Output-Xerography
FT	-	Facsimile Transmission
MIT	-	Massachusetts Institute of Technology
OCR	-	Optical Character Recognition
UV	-	Ultraviolet (ink)
AGI	-	Annual Growth Index
UPC	-	Universal Product Code
GATT	-	General Agreement on Tariffs and Trade
ORACLE	-	Optical Reception of Announcements by Coded Line Electronics

I

INTRODUCTION AND SUMMARY

A. INTRODUCTION

As part of a comprehensive study of the commercial printing industry in Canada, this volume evaluates the problems and opportunities facing the industry in the next decade.

The basis of this evaluation is a projection of the market for commercial printing in 1985, and the possible threats facing the industry as it responds from its 1974 base to this growing opportunity.

This growth presents some major opportunities for the industry. But it also poses some threats. Through an evaluation of alternative courses of action, the report concludes with a program designed to enhance the role of the industry in promoting Canadian economic growth and development.

B. SUMMARY

We project continued significant growth in the domestic market for commercial printing. On the basis of an assumed real growth of 4% and an inflation rate of 6%, we project the value of shipments at $1,700 million in 1980 and $2,500 million in 1985. If instant printing is included, these figures are increased by about 10%.

Employment in the industry should grow to over 51,000 in 1980 and 57,500 five years later. On the other hand, the number of conventional commercial printing establishments will grow only slightly to about 2,450 in 1985. If to this figure is added the expected proliferation of instant printers, the total number of establishments could reach over 2,800.

Growth of the domestic market provides both a challenge and an opportunity to the Canadian commercial printing industry. We expect that imports of books, covered by U.S. copyright laws, and magazines

will continue to expand. Other printed materials will grow but at a declining rate as Canada becomes aware of its bi-cultural heritage and stresses Canadian language and customs.

A significant opportunity for the industry lies in exports to the U.S. Analysis of productivity and value-added indicates that the Canadian industry should be competitive with the U.S. This is especially true if Canadian printers specialize in particular segments of the market.

But this opportunity will not be realized without change in the industry. Improvements in management skills, especially in marketing and financial management, are essential. So also is the need to realize better utilization of machinery and equipment.

II

THE COMMERCIAL PRINTING INDUSTRY IN 1974

A. INTRODUCTION

Volume II of this study presented a detailed description of the commercial printing industry. It also described its evolution during the past decade and analyzed its competitive strengths and weaknesses. This chapter reviews briefly those features of the industry that are especially significant in evaluating the way it will respond to the challenges facing it in 1985.

B. THE SIZE OF THE MARKET

During the period 1962 to 1972, total shipments by the industry grew at an average annual rate of 8.5%. Growth by year varied from a low of 4.5% in 1970 to a high of 12.8% in 1966. The year 1973 also saw a marked increase in the rate of growth -- due in part to a surge in inflationary pressures. Based on preliminary data, we have estimated the growth in that year at 13.9% in terms of current dollars. The present year -- 1974 -- has seen a continuation of growth and price increases. We believe that the increase during the year will be about 12%.

On the basis of these assumptions, it is estimated that the value of shipments by the industry in 1974 will be slightly in excess of $1 billion. Table 1 presents a breakdown into each of the major product categories.

C. THE NATURE OF THE INDUSTRY

1. The "Local" Nature of the Market

An important characteristic of this industry, from the viewpoint of evaluating its future development, is that it consists of many relatively small firms. Although

Table 1

SHIPMENTS BY THE COMMERCIAL PRINTING INDUSTRY
PROJECTED TO 1974
($'000,000)

	1968	1969	1970	1971	1972	1973[1]	1974[1]
Commercial Printing Industry - Total (SIC 286)	624.1	680.6	711.4	764.0	830.0	945.0	1,058
A.G.I.[2]	-	9.1	4.5	7.4	8.6	13.9	12.0
1. Total Specialties	360.1	400.1	410.4	441.2	481.0	548.0	613
2. Business Forms	96.0	102.0	110.0	118.0	128.0	139.0	162
3. Publications	70.0	73.0	80.0	86.0	94.0	110.0	121
4. Labels and Tags	34.0	35.5	37.0	39.8	42.0	51.0	55
5. Book Printing	33.0	35.0	38.0	42.0	45.0	52.0	57
6. Packaging	16.0	20.0	21.0	23.0	25.0	29.0	33
7. Non-Printing Products	15.0	15.0	15.0	14.0	15.0	16.0	17
8. Franchised "Instant" Printing	41.3	45.9	51.0	56.7	63.0	70.0	77

[1] Stevenson & Kellogg forecast.

[2] Annual Growth Increment -- expressed as a percent increase over previous year.

it is ninth in terms of value-added, and eighth in terms of employment, among leading industries it features the largest number of establishments.

It represents 6.6% of the number of manufacturing establishments. Its output is only 1.5% however.

This fragmented nature of the industry has been determined by a number of factors. Some of the more significant are:

- The majority of customers are small, placing orders intermittently for a variety of printing needs.
- The needs of customers are unique -- there is no "standard" product or service.
- Service is important. Considerable stress is placed by customers on speed of service and understanding of the customer's problem.
- Loyalty is high between customers and printers, especially where the plant is run by the owner.
- It is relatively easy to enter the printing industry. Initial investment can be minimal because of the relatively low cost of equipment and the ease of obtaining financing.

This "local" nature of the industry is seen in the statistics collected during the survey. Sixty percent of all shipments, in terms of value, go to customers within 25 miles of the plant. And, 68% of the industry (number of establishments) reports that the bulk of its business is within 25 miles of the plant.

Another important aspect of the commercial printing industry is its support for local firms. Not only are printing establishments located in virtually all urban

communities, and thus able to provide service to customers, they also support other firms in the community. For example, 64% of commercial printers buy their typesetting and/or engraving within 25 miles of the plant. Fifty-one percent of binding is done within the same radius.

Thus, the commercial printing industry is supportive of programs to develop the less urbanized regions of the country.

2. Many Small Plants

Customers for the printing industry exist in virtually every urban community. Consequently, if 68% of printing business is with firms within 25 miles, it suggests a highly dispersed industry of many small plants.

Analysis of the questionnaires and other data during this study showed this to be so. The average value of shipments per establishment in 1971 amounted to only $357,000. Furthermore, almost 1,600 establishments, 73% of the industry, had annual sales of less than $250,000.

The majority of firms exist on a variety of small orders from a number of repeat customers. But some firms, in quest of greater profits, are specializing with considerable success. One firm, for example, caters primarily to the pharmaceutical industry. Another has specialized in printing sales brochures for one customer. This specialization can bring business from a wider geographical area but a narrower range of customers.

Although the questionnaire did not collect specific data on the size and frequency of shipments, it is possible to state with a reasonable degree of confidence that the majority of printers are "job-shops" handling a wide variety of orders on demand.

The characteristics of the printing industry in the U.S.A.

are not markedly different. Each year the Graphic Arts Industries Association (GAIA) and the Printing Industries of America (PIA) conduct annual surveys of their members. These two bodies are the principal trade associations of the commercial printing industry in Canada and the U.S.A. respectively. Their members represent a true cross-section of the industry. Data from these annual surveys, summarized in Table 2, suggests that the size of respondent firms in the U.S.A. is only marginally greater than in Canada.

Table 2

COMPARISON OF SHIPMENTS OF U.S. AND CANADIAN PRINTING FIRMS AS REPORTED IN GAIA AND PIA SURVEYS

Year	Average Annual Value of Shipments ($'000)	
	Canada (GAIA)	U.S.A. & Canada Composite(GAIA/ PIA)
1960	$ 609	$ 777
1961	778	909
1962	959	909
1963	1,076	983
1964	1,112	1,079
1965	1,062	1,250
1966	1,102	1,205
1967	1,135	1,329
1968	1,103	1,409

Differences between these values and the annual value of shipments stated earlier ($357,000) reflects the limited number of members reporting in the GAIA and PIA survey. The Composite data from the U.S.A. and Canada (GAIA/ PIA) are taken from some 900 to 1,000 firms.

D. THE NATURE OF COMPETITION

A key characteristic of the printing industry, essential to an understanding of its growth and development, is the nature of competition between firms. Analysis of questionnaires and of Statistics Canada data indicates that both small and large firms are successful. On the other hand, within each size range there are wide variations in profitability and return on investment.

The majority of small firms exist, and exist profitably, because they:

- Have developed a close personal relationship with customers, in turn engendering considerable loyalty. This is especially true in smaller communities where participation in service clubs, boards of trade, etc., lead to continuing business, much of it given on a non-competitive basis.

- Provide "good service". This could mean that orders are handled quickly to meet a customer's emergency. It also means good quality work, and an ability on the part of the printer, to provide some creative artistic skills.

It was reported in a number of interviews that a customer will tend to stay with one printer, unless:

- His price becomes significantly higher than charged by other printers. Yet even when this occurs, a friendly discussion between customer and printer will result in a lower quotation.

- He fails to meet a customer's need -- usually in terms of delivery -- and jeopardizes the confidence which had developed.

This importance of service is one of the principal raisons d'être of the small printer. The customer can drop in with an order. He can discuss layout, appearance, etc., and select the type of paper. Then when the order is ready, it can be picked up or delivered within minutes of completion.

In medium-sized firms the basis of competition shifts. These firms cannot generate adequate volume on small orders. They must obtain larger contracts. And this implies bidding against other firms with similar plant capacity. Delivery and proven quality of work are important factors in being invited to bid. But, increasingly, price is the ultimate criterion in selecting the supplier.

A solution to what might otherwise be a price-squeeze lies in specialization. A number of successful firms have identified a particular sector of the market and are going after that business -- frequently well outside their local area. Two notable examples of such specialization are the printing of bank cheques and pharmaceutical labels.

Larger firms capable of handling large production runs tend to get orders on the basis of price, provided that the quality of work and service are satisfactory. Typical of such orders are the printing of board for packaged foods or cigarette packs and of labels for beverages. In many instances, the customer will invite bids for a year's business. Then, after placing the order, he will release shipments at periodic intervals such as monthly, bi-monthly, quarterly, etc. Under such conditions, price usually determines which firm is awarded the contract. This is always subject, however, to the conviction that the printer has the physical capacity and the planning and control skills to meet quality and delivery specifications.

Thus, it is seen that the competitive pressures shift within the industry from one size of firm to another. In smaller firms service is paramount. The value of orders is sufficiently small that price differences are seldom significant. In the larger firms, the price of an order becomes a significant cost to the customer. Consequently, he is prepared to "shop around". Price becomes the main basis of competition.

This difference is reflected in the profits and return-on-sales reported by the industry. For smaller firms with annual sales less than $100,000, profit before tax is 6.8%. Larger firms having sales between $1.5 and $5 million report average profits of 4%.

The exception to this hypothesis occurs at the extreme upper end of the scale. Here firms with sales in excess of $5 million become more profitable again. We believe that this is due primarily to economics of scale in production, a significant investment in equipment, and an ability to handle jobs beyond the scope of most of their competition.

E. OWNERSHIP AND MANAGEMENT

Growth and development of any industry is moulded, in part, by the external forces acting on it. Even more significant, however, are the owners and management who have the responsibility of responding to these external forces. Consequently, another key variable in projecting the future of the industry is the nature and ability of this managerial group.

One outstanding characteristic of the industry is the prevalence of the individual entrepreneur. Thirty-five percent of Canadian firms are individual proprietorships or partnerships. This reflects the relative ease with which an individual can purchase or lease equipment and start up his own business.

However, although numerous, individual proprietorships and partnerships are not dominant in terms of value of shipments or number of employees. In fact, in 1972 they accounted for only 2.8% of industry shipments.

The bulk of the market is served by incorporated companies, many of which are relatively small as seen earlier. These small, and even some of the medium-sized, companies tend to be strongly dependent on the style and personality of a key executive. Most companies are closely held; management tends to be vested in the controlling family and close friends.

In most instances these executives are not sophisticated managerially. They tend to be strong technically or to have good sales skills. They tend to be self-reliant, having limited confidence in, and respect for government programs which they believe tend to disrupt the normal healthy interaction of market forces.

These generalizations are supported by a number of observations made during interviews within the industry. Among the more relevant of these observations are the following:

- There is little evidence of explicitly stated objectives.
- Few companies analyze market opportunities or develop a marketing plan.

- There is little evidence of financial planning and control -- nor even of an understanding of the financial implications of sales or marketing decisions.

- Few executives indicated any awareness of the possible benefits of research and development in any aspect of the business.

- Labour relations is a personal relationship in most companies. There is little understanding of the need for a more formal approach to collective bargaining as a company expands and becomes more structured.

- In general there is no pursuit of technological improvement. The exceptions to this rule occur when it becomes necessary to install new equipment -- either because existing equipment is obsolete, or because it is needed to produce a newly-negotiated order.

Naturally, there are exceptions to these generalizations, but they tend to centre on the small number of relatively large firms. In these more progressive firms, we see evidence of:

- specialization by product or customer;

- eager acceptance and use of new technology, especially computer controlled processes;

- active pursuit of export opportunities;

- expansion into distant markets by opening remote sales offices;

- more formal management training programs;

- effective use of more sophisticated management techniques such as "management by objectives", financial planning, market analysis and so forth.

However, these exceptions are few. They are listed primarily to indicate that some of the newer management concepts are relevant in the printing industry.

F. EQUIPMENT AND PRODUCTIVE CAPACITY

The industry continues to use a substantial amount of old but not necessarily obsolete equipment. Much of this old equipment can produce work profitably. It is designed to operate for many years and does so without the need for expensive or costly maintenance.

The industry is reluctant to retire old equipment. Newer equipment tends to provide additional, not replacement, capacity. In some instances old equipment is retained in order to provide capacity for excess workloads.

The implication of this attitude is that the industry tends towards over-capacity. Our interviews indicated that the industry could raise its output by up to 50% without installing additional machinery. This capacity will enable the industry to handle some of the future growth with no significant capital outlay. On the other hand, if the industry is to become more competitive, it will be desirable to change attitudes concerning the evaluation of new investments and utilization of facilities.

In summary, the printing industry has the potential to move forward in the next decade. One major concern centres on the ability of management to respond to a more competitive environment.

III

THE INDUSTRY IN 1985

A. THE PROBLEM OF DEFINITION

A major issue confronting anyone who wishes to describe the industry in 1985 and to formulate strategies for its growth is that of defining "commercial" printing. No similar problem exists when describing the industry in 1974 or its growth to the present. It is possible to define the industry in terms of SIC 286 -- a wide range of products[1] produced by printing establishments. Yet, even here, difficulties begin to emerge because of the proliferation of "Instant Printing" establishments and the spread of xerography as a means of graphic reproduction.

The difficulty of definition is seen by reference to Figure 1, a schematic diagram of the communications industry. This illustrates the relationship between commercial printing and the broader "communications industries" which it serves. This latter includes:

- book publishing
- photography
- advertising service
- motion pictures
- radio and television broadcasting
- theatre
- "multi-media" communications
- signs and display industry
- packaging production
- metal decorating

Already there are signs of a shift of certain activities from the traditional "commercial printing" to other elements of the communications industry. In-store or in-library photocopying machines are "selling" book and magazine reproduction, thereby eating into the traditional

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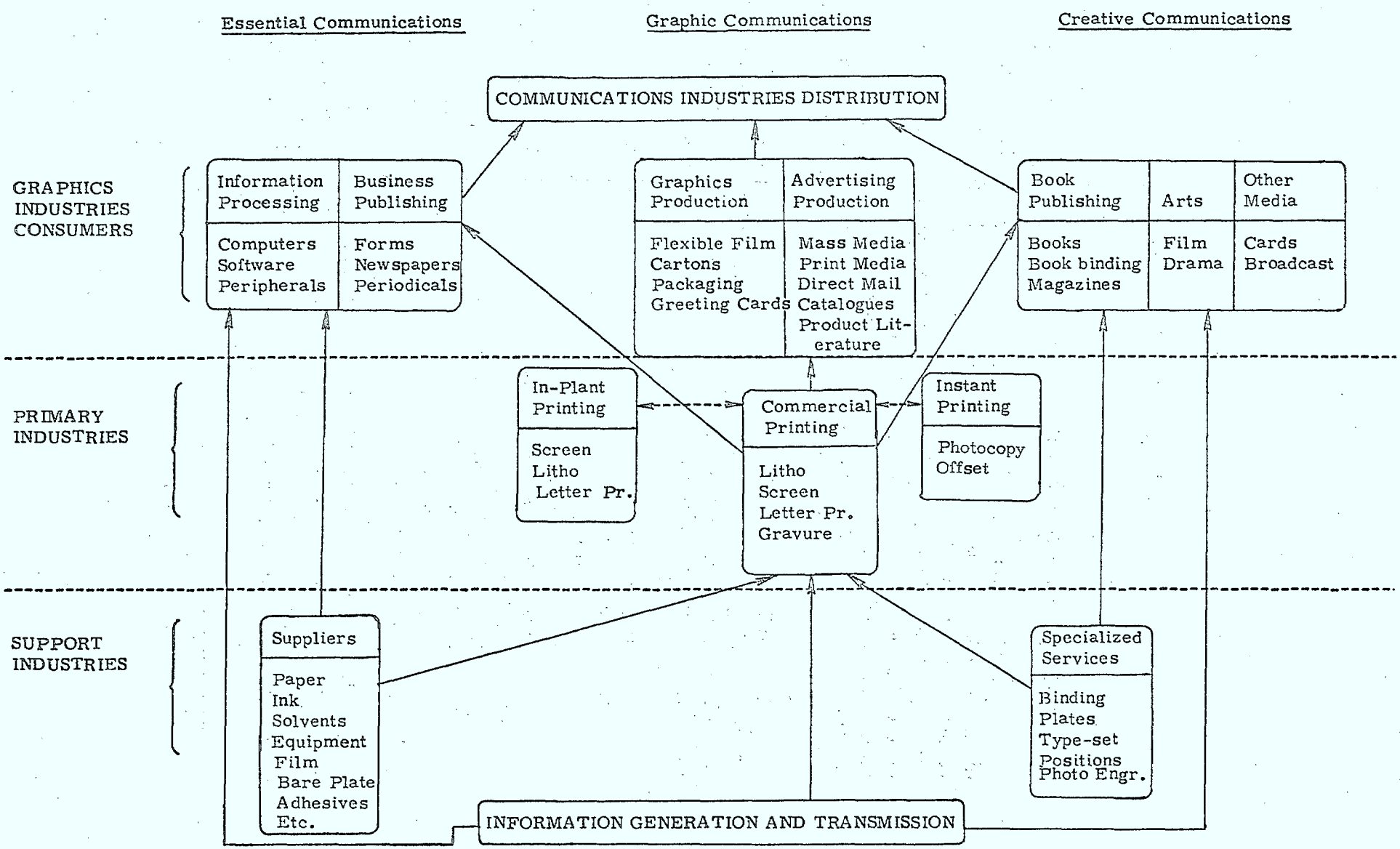
[1] Appendix B, Volume II.

Figure 1

COMMUNICATIONS INDUSTRIES STRUCTURES



printing market. And computer-to-computer dialogue is reducing the market for forms.

Recognizing these changes, some printing and/or publishing firms are attempting to move into other communications media. Maclean-Hunter Limited and The Southam Press Limited are actively involved in cable TV broadcasting. Undoubtedly, other publishing companies will move, or attempt to move, in the same direction. They understand that they are in the business of communications; printing is merely the means.

One definition of the printing industry, therefore, might be "what the printing industry does, and should do". Growth and strategy within this definition would then embrace diversification, or more correctly, integration into other branches of communications. In developing longer-range strategies and guidelines, this would appear to be the most appropriate framework.

But, in the shorter term, and within the terms of reference of this study, commercial printing can also be defined in terms of:

- the process: offset, letterpress, gravure and screen;
- the product: specialties, business forms, publications, labels and tags, book printing, packaging;
- the transaction: an arm's length commercial relationship with a customer (as opposed to in-plant printing).

This is the definition used in this report. But, in projecting the growth of the industry, it is essential to interpret the possible impact of other branches of the communications industry.

B. THE MARKET IN 1985

Determination of the 1985 market for commercial printing is a two-step procedure. The first is a projection of existing trends over the next ten years assuming no significant change in the industry. The second step is a detailed evaluation of the probable impact of technological or structural change on each section of the industry. This is the approach described below.

1. No-Change Trend

Current, not constant, dollars are the basis of this forecast. This approach has been adopted because the majority of people in the industry think in these terms. Annual reports, sales analysis by individual companies and published data reflect the conventional way of reporting company performance. Companies will report a sales increase of 10% when, in fact, output in physical units gained only 3%. The fact that financial statements, reports to bankers, income tax returns and forms for Statistics Canada all call for "current dollars" has conditioned the industry to think in these units.

However, wherever it is appropriate, comparisons are also presented in constant terms.

One major risk facing any would-be forecaster is the question of inflation. In the period 1962 to 1972, the base period for the analyses in Volume II, the GNP grew at an annual rate of 5.8% in real terms. In current dollars it showed an annual growth of 9.5%. Thus, the average rate of inflation was 3.7% per annum.

In the next decade, it is generally accepted that the Western world will face increasing inflation and slower real growth. Inflation currently proceeds at a much higher rate than in the 1960's. And, from analyses of the money market, there appears a widely-held belief that it will continue. An average rate of inflation of at least 6% over the next decade appears possible.

The overall economic outlook is not good. There is a serious threat of a recession in Europe because of oil-induced balance-of-payments crises. And, the U.S.A. and Germany appear dedicated to deflationary policies. These factors inevitably will reduce opportunities for Canadian exporters and lead, in turn, to a slow-down in our economy.

It therefore appears that Canada can expect lower real

growth and higher inflation. Growth of about 4% and inflation of about 6% for an overall apparent growth of about 10 to $10\frac{1}{2}$% annually do not seem improbable. This is only marginally higher than during the last decade.

The implications of this growth rate on the GNP and on selected aspects of printing, publishing and allied industries are shown in Table 3. The statistics for 1968 to 1972 are actual data, compiled generally from the Economic Council of Canada, Statistics Canada, and The Bank of Canada. Where necessary, we have made estimates where data was inadequate or inconsistent. The 1973, 1974, 1975, 1980 and 1985 figures are estimates prepared by Stevenson & Kellogg.

(a) Gross National Product

We expect GNP to grow from a current level of $131 billion to $340 billion by 1985. This assumes a fairly high level of inflation until approximately 1980.

(b) Population

We anticipate that the population of Canada will continue its modest increase of approximately 1% per year to a level of 25.2 million in 1985.

(c) Printing, Publishing and Allied Industry Shipments

In the decade 1962-72 industry shipments grew at an annual rate of 8.0%, somewhat less than the growth in the GNP. If this relationship holds until 1985, an annual growth of 8.3% is expected. This leads us to expect annual shipments of about $3.5 billion in 1980 and $5.2 billion in 1985.

Table 3

CANADIAN CURRENT DOLLAR FORECAST
DERIVED DEMAND - CANADIAN COMMERCIAL PRINTING INDUSTRY
1968-1972 ACTUAL AND 1973-1985 PROJECTED
($'000,000)

	1968	1969	1970	1971	1972	1973	1974[1]	Projected Annual Growth 1974-85 %	1975	1980	1985
1. Gross National Product	72.6	79.8	85.6	93.4	103.4	118.7	131		143.6	231.3	372.5
AGI*	9.3	10.0	7.3	9.1	10.7	14.8	10.0	10.0			
2. Population	20.6	20.9	21.2	21.5	21.7	22.0	22.2		22.5	23.8	25.2
AGI	-	1.5	1.4	1.4	0.9	1.4	0.9	1.0			
3. Printing, Publishing and Allied Industry Shipments (Major Group II)	1,370	1,488	1,545	1,654	1,783[1]	1,997[1]	2,217		2,401	3,577	5,329
AGI	-	8.6	3.8	7.1	7.8	12.0	11.0	8.3			
4. Commercial Printing Industry (SIC 286)	624.0	680.6	711.4	764.0	830[1]	945[1]	1,058		1,142	1,701	2,519
AGI	-	9.1	4.5	7.4	8.6	13.9	12.0	9.0			
5. Platemaking, Typesetting, Trade Bindery and Services (SIC 287)	82.7	90.0	94.3	97.6	107.9[1]	122.9[1]	136	8.7	147.7	224	340
6. Publishing Only (SIC 288)	125.6	145.6	150.8	177.2	167.6[1]	170.2[1]	179	7.4	180.0	238.0	340
7. Publishing and Printing (SIC 289)	537.9	572.7	588.8	614.9	677.5[1]	758.9[1]	843	10	927	1,492	2,405
8. In-Plant Printing[1]	70.0	75.0	83.0	91.0	100.0	110.0	121	10	133	236	379

Source: Economic Council of Canada, Statistics Canada and Stevenson & Kellogg, Ltd. estimates.

[1]Estimated.

*Annual Growth Index

(d) Commercial Printing Industry

The value of shipments by the commercial printing industry (SIC 286) increased at an average annual rate of just over 8% in the last decade. Assuming an increase from 9.5 to 10% in the rate of growth of the GNP suggests that the commercial printing industry should enjoy an annual growth of almost 9%.

(e) Platemaking, Typesetting, Trade Bindery and Services

Shipments of these services tend to parallel those of the commercial printing industry in general but at a slightly lower rate. Projecting current growth to 1980 and 1985 implies shipments of $224 million and $340 million respectively.

(f) Publishing Only

Publishing only, SIC 288, has grown at a slower rate than commercial printing SIC 286. During the past five years it recorded an average annual increase of only 4.8%. Allowing for increasing inflationary pressure suggests an annual growth of about 7.4%. This implies shipments of $238 million in 1980 and $340 million in 1985.

(g) Publishing and Printing

In the period 1969 to 1971 this group suffered a severe reduction in its growth. Prior to and since those years, growth has approached 10%. For the next decade we believe that shipments should increase in value at a rate of about 10%. This leads to an estimated sales volume of $1.5 billion in 1980 and almost $2.5 billion in 1985.

(h) In-Plant Printing

In-plant is estimated to be experiencing a reasonably high rate of growth. Unfortunately, published data is not a reliable indicator.

We believe that growth in the past five years has averaged almost 9%. The next ten years should see a slight increase in this rate, leading to shipments of $236 million in 1980 and $379 million in 1985.

(i) Shipments by Product Line

Within the commercial printing industry (SIC 286), there have been minor variations in the growth rate in the last decade. Instant printing has been one of the more successful components. It has enjoyed a growth of over 11%. At the other end of the scale, labels and tags have seen shipments grow by only 6.7% per year.

The cumulative impact of the individual growth patterns results in an industry growth of 9% per year to $2,519 million in 1985, excluding instant printing. If the latter is included, shipments will reach $2,769 million (Table 4).

Specialty materials, including advertising, remain the dominant product category. They will account for $1,474 million -- almost 60% of the total. And, within this category, advertising represents the largest single class, accounting for about 37% of this category or almost 20% of total industry shipments.

Instant printing, if it continues its growth and is reported correctly, could become increasingly important. In 1968 it represented about $6\frac{1}{2}$% of the commercial printing industry's

Table 4

CANADIAN CURRENT DOLLAR FORECAST
ACTUAL AND PROJECTED COMMERCIAL PRINTING
INDUSTRY SHIPMENTS BY PRODUCT LINE
1968-1972 ACTUAL AND 1973-1985 PROJECTED
($'000,000)

	1968	1969	1970	1971	1972[2]	1973[2]	1974[2]	Projected Annual Growth 1974-85 %	1975	1980	1985
Commercial Printing Industry - Total[1]	624.1	680.6	711.4	764.0	830.0	945.0	1,058		1,142	1,701	2,519
(SIC 286) AGI[3]	-	9.1	4.5	7.4	8.6	13.9	12.0	9.0			
1. Total Specialties	360.1	400.1	410.4	441.2	481.0	548.0	613	8.0	662	989	1,474
2. Business Forms	96.0	102.0	110.0	118.0	128.0	139.0	162	7.6	174	250	361
3. Publications	70.0	73.0	80.0	86.0	94.0	110.0	121	8.9	132	202	309
4. Labels and Tags	34.0	35.5	37.0	39.8	42.0	51.0	55	6.7	59	81	112
5. Book Printing	33.0	35.0	38.0	42.0	45.0	52.0	57	9.0	62	96	135
6. Packaging	16.0	20.0	21.0	23.0	25.0	29.0	33	10.9	36	61	103
7. Non-Printing Products	15.0	15.0	15.0	14.0	15.0	16.0	17	2.0	17	22	25
8. Franchised "Instant" Printing	41.3	45.9	51.0	56.7	63.0	70.0	77	11.3	86	146	250

[1] Excluding "Instant" Printing.

[2] Estimated

[3] Annual Growth Increment -- expressed as a percent increase over previous year.

shipments. By 1985, due to a more rapid growth, it could account for almost 10%.

(j) The Impact of Inflation

The previous tables assumes a real growth of 4% and inflation averaging 6% of the next decade. But, there is much uncertainty in projecting such figures over a ten-year horizon. Consequently, it is useful to analyze the cumulative impact of other growth rates.

Table 5 illustrates the probable value of industry shipments in 1980 and 1985 under a range of conditions. They demonstrate the difficulty inherent in making categoric statements about the size of the industry ten years hence.

Table 5

EFFECT OF VARIOUS GROWTH RATES ON THE VALUE OF SHIPMENTS BY THE COMMERCIAL PRINTING INDUSTRY
(Current $'000,000)

Apparent Growth Rate (Real Growth Plus Inflation)	Value of Shipments		
	1974	1980	1985
8%	1,058	1,679	2,467
9%	1,058	1,774	2,730
10%	1,058	1,874	3,018
11%	1,058	1,978	3,334
12%	1,058	2,088	3,680
13%	1,058	2,203	4,058

If it is generally agreed that inflation will average between 6 and 8%, and real growth between 4 and 5% (the trend in the industry during the last decade), the industry can expect to ship between $3 and $4 billion of printing in 1985.

2. Deviations From These Projections

Potentially more significant than inflation to the future of the industry could be the introduction of some of the technological changes discussed in Volume III of this study. The rate of inflation certainly affects the value of shipments. It could lead to a variation of up to 33% in 1985. But its impact within the industry tends to be neutral. It may give some benefit to the firm that is highly leveraged. And, it would benefit those owning their real estate. But these opportunities are open to most firms.

However, a change in technology -- especially a shift by a user to a medium other than the printed word -- could cause a major disruption within the industry.

This section briefly assesses the probable impact within the industry of some of the more imminent changes.

(a) Specialties

This category includes advertising (pamphlets, etc.), display posters, billboards, catalogues, greeting cards, blank books, printed forms, calendars, stationary and miscellaneous other products.

In terms of end-use, they can be grouped into three categories:

(i) consumable, such as blank books and stationary;

(ii) repeated reference by a limited number of users in a limited number of locations (e.g. automotive parts list, aircraft engine repair manuals);

(iii) frequent reference by a wide range of unspecified people (e.g. advertising, consumer catalogues, etc.).

Two of the more imminent breakthroughs which could affect some of these categories are: use of the videophone to allow the customer to search for information; and use of microform for items in class (ii) above.

There are several reasons for expecting changes in these areas. Two of the more immediate are:

- the increasingly frequent need to revise consumer prices in catalogues during times of rapid inflation, and

- the ever-increasing logistics costs of distributing catalogues, directories, etc.

Discussions with officials of Bell Canada revealed that the videophone, or any other audio-visual communications device for the consumer, is many years away. Applications currently envisaged are strictly internal within Bell Canada.

Microfiche is already being used by airlines for keeping manuals up to date. They are being considered by the automotive industry for its dealer networks. They are being installed increasingly frequently in libraries.

However, it is unlikely to gain rapid acceptance at the consumer level. The initial cost

is a deterrent. Furthermore, people's reading habits are changing; increasingly books, magazines, etc., fill a need away from home -- on the bus, at the office, at lunch, and so forth.

Thus, the one significant branch of specialty items threatened by changing technology could be the printing of internal company catalogues and manuals. In 1973 they represented 12% of total specialty shipments. Thus in 1985 the threatened part of this market will total about $150 million. And, of this amount, we would estimate that, at a maximum, 25% might be lost to other media. Although small in total, this loss could be serious for individual companies.

(b) Business Forms

Here we see two changes which will, in part, tend to offset each other. On one hand, increasing use of business systems and computers will tend to accelerate the "paper explosion" in many companies.

On the other hand, the more sophisticated computer users will reduce their paper consumption (per unit of data). They will increasingly:

- store data in the computer, not on paper, and access it as needed;
- be more selective in specifying information needs;
- use inter-active terminals to communicate with the data in storage.

Taken together these two opposing factors will result in negligible net changes in the next decade. Growth in shipments will closely follow

the historical trend -- making allowance for inflation.

(c) Publications

This category includes newspapers (not printed by the publisher), magazines and directories. Magazines are the most important to the commercial printing industry. They represent over two-thirds of the value of shipments.

Magazine and periodical purchases have grown steadily with increasing leisure. Now, an added stimulus is provided by Canadians' increasing awareness of their culture and heritage. We expect this trend to continue.

Weekly newspapers also benefit from this cultural interest. In turn, the commercial printing industry will gain because many of these newspapers are printed outside the publishers' premises. These two positive influences should more than offset any decline in the printing of directories brought about through the use of microform.

The American Telephone and Telegraph Co. has been reported to be developing a microfilm reader which can be installed in the home for a rental of 50 cents per month. If true, the equipment would not only reduce the printing of telephone directories, it could eliminate many of the other consumer directories such as Eaton's, Canadian Tire, and so forth. However, more recent reports reveal that the reader is intended solely for use within the American Telephone and Telegraph Co.

(d) Book Printing

The current emphasis on our culture will benefit the Canadian commercial printing industry.

Increasingly, our Canadian historians, writers and novelists are seeing their books accepted by the mass-marketing organizations such as the "Book of the Month Club". In turn this will lead to a significant increase in domestic printing.

The only significant offsetting aspects are the possibilities of photocopy reproduction in bookstores and microform in libraries, schools, etc. The former technological threat will not be a commercial threat under existing copyright law. Similarly, the use of microform in special institutions will have a marked impact only on low circulation publications. The mass merchandised books, which provide most work for printers, will continue in their present form.

(e) Tags and Labels

One major change which is expected during the next decade is the general introduction of the Universal Product Code (UPC). The concept was started in 1932 but has been implemented only recently. By 1976 it should be in general use.

UPC is a system of product and manufacturer identification. It contains 10 digits. Five identify the manufacturer, five the product. The code symbols are a series of lines or stripes. The key to the code is the thickness of these lines. Consequently, their printing requires a much higher degree of precision than most work.

UPC does not require new or special printing machinery or process. But, it does demand sharp line definition and a dense colour -- black preferably, but other colours are accept-

able. Consequently, machinery must be well maintained. In some instances minor modifications or attachments may be needed. Machines may have to be run more slowly. However, none of the printers or machine manufacturers interviewed expressed any serious concern about their ability to handle this business.

It should be recognized, however, that this concept could lead to some product rationalization within the industry. Smaller printers may be unable to meet the requirements. Hence, larger printers, with better-maintained equipment and a capability for high quality work could gain at the expense of the smaller firm.

In short, changes will be evolutionary, not revolutionary. The technological changes discussed in the previous volume will not have a significant impact on the industry in the next decade. Their effect will be less than the errors in the forecast.

3. Imports

The major categories of imports in 1974, their equivalent printing value and share of the Apparent Canadian Market are:

- books -- $133,556,000 (75% of the market);
- newspapers, magazines and periodicals -- $71,000,000 (20%);
- advertising matter -- $16,400,000 (9%);
- tags and labels -- $2,800,000 (6.5%).

Together they account for about 87% of all imports of printed products.

The opportunity for the Canadian printer to gain a share of this business is small. And it does vary with the class of product.

(a) Books

Here the major problem facing the Canadian printer is copyright. The U.S.A. is the origin of about 79% of imported books. Books published in the U.S.A. receive copyright protection only if they are printed in that country. Consequently, it is most unlikely that any publisher would risk forfeiting that protection by contracting the printing to a Canadian firm.

(b) Newspapers, Magazines, Periodicals

Typical of the publications in this category are: Newsweek, Fortune, Business Week, Playboy, Scientific American, National Geographic Magazine, and a host of others intended primarily for the United States market. But Canadians enjoy these publications. Consequently, they represent "imported" printing.

The probability of this printing being subcontracted to a Canadian firm is low. Restrictions on imports would cut off the flow -- it would not lead to much work for Canadian printers.

Consequently, we would expect imports of these materials to continue to grow.

(c) Advertising Matter

The import of advertising matter is often a question of economics. The marginal cost of a tail-end run by a printer in the U.S.A. is substantially less than producing that same product in Canada.

In assessing the probable future growth of these imports, two factors are critical. First the growing integration of United States and Canadian industry will mean more opportunities for "one run". Unless Canadian printers promote their services to buyers in the U.S.A. they could lose an increasing share of this business.

The other factor is the growing Canadian self-awareness. Bilingual tendencies, a preference for English rather than American usage, and different labelling requirements will all help the domestic industry.

We expect this latter factor to become increasingly important. Coupled with a growing Canadian market, it should lead to some slowing in the rate of growth of imports.

(d) Tags and Labels

These imports are least significant of all the published categories. And their share of the Canadian market is declining.

They do not appear to be a major threat. At no time during our interviews were they mentioned as being of concern to the industry.

4. In-Plant Printing

With a few exceptions, in-plant printing is relatively unsophisticated. It emphasizes simple matter: internal newsletter, memoranda, price lists, catalogues, indices, etc.

As demands get more complex (e.g. for colour) and as the ability of outside agencies to provide faster service improves (Instant Printing), there will be a lower tendency to set up in-plant operations.

Thus, the next decade could see a slight reduction in the rate of growth of in-plant printing as more work is handled by the commercial sector of the industry.

C. EMPLOYMENT IN 1985

Employment in the commercial printing industry grew at an average rate of 2.2% per year prior to 1972. In 1962 the industry employed 32,489. In 1971, the last year for which statistics are available, this number had increased to 39,632.

Projecting this steady rate through the next decade suggests employment of 47,360 in 1980 and 52,274 in 1985. However, before accepting these figures, it is appropriate to assess the impact of alternative growth rates and changes in productivity.

Analysis of industry data since 1960 has shown a steady increase in value of shipments per employee. This ratio, converted into constant dollars to eliminate the impact of inflation, is shown in Table 6. It suggests that output per employee will increase to about $15,900 in 1980 and to $17,200 in 1985.

But this table conceals two conflicting trends. On one hand, the need for production economies in medium and large printing establishments has led to significant investments in capital equipment. These investments have paid dividends. Equipment and machinery permitted output to increase without a corresponding increase in employment. And we would expect this trend to continue, especially with the introduction of computerized composition and new techniques in gravure.

Its effect is shown in the early years in Figure 2. From 1962 to about 1967, output per employee increased at an average rate of $290 per employee per year.

Then, starting about 1966, a slower trend begins. This reflects the start of the proliferation of instant printers. Small, labour intensive, dedicated to fast service, they are well suited to short production runs.

Which trend will dominate during the next decade? If it is accepted

Table 6

THE RELATIONSHIP BETWEEN EMPLOYMENT AND VALUE OF SHIPMENTS (IN CONSTANT DOLLARS) IN THE COMMERCIAL PRINTING INDUSTRY

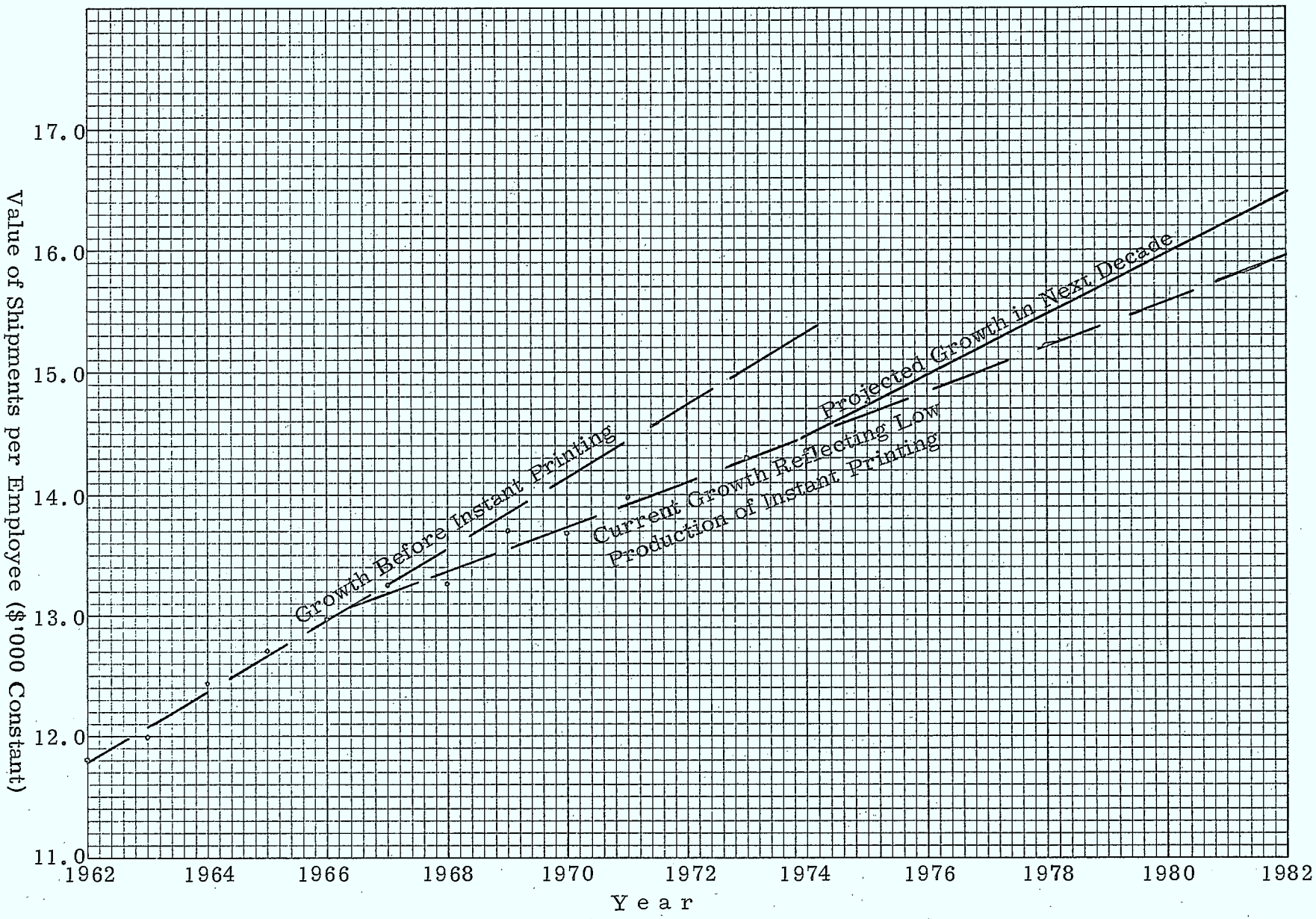
Year	Shipments (constant dollars)	Employment	Value of Shipments Per Employee
1962	$383,730	32,489	$11,810
1963	401,670	33,480	11,990
1964	417,550	33,560	12,440
1965	447,740	35,264	12,700
1966	483,300	37,269	12,970
1967	505,370	38,154	13,250
1968	509,990	38,437	13,270
1969	530,890	38,723	13,710
1970	532,110	38,874	13,690
1971	552,160	39,632	13,930
1972			
1973	618,000[1]	43,200	14,300
1980	813,000[1]	51,000[2]	15,960
1985	989,000[1]	57,500[2]	17,200

[1]Based on an assumed real growth of 4% per annum.

[2]Calculated from estimated "value of shipments per employee".

Figure 2

GROWTH IN OUTPUT PER EMPLOYEE
(IN CONSTANT $'000) IN THE
COMMERCIAL PRINTING INDUSTRY



that instant printing has just about reached saturation point, it is reasonable to expect a continuation of the higher increase in productivity seen in the early 1960's. But it will be somewhat slower because of the diluting effect of labour intensive instant printers.

If instant printing has some years to go before the market is saturated, the industry will see relatively slow overall improvement in productivity.

It is estimated that there are between 400 and 500 instant printers in Canada. New firms continue to start. But many others are going out of business. No reliable data is available on entries to and departures from the instant printing industry. However, a feeling is expressed by people knowledgeable in the field that it has almost reached a state of equilibrium.

If this is so, we might expect to see an increase in the rate of growth of output per employee. While this growth rate would probably not reach the figure of $290 per year, because of the diluting effect of instant printers, it might increase to $240 or $250 per employee per year.

Combining this improved productivity with a growth in real output of 4% per year indicates a probable employment in the industry of 51,000 in 1980 and 57,500 in 1985.

It is significant to observe the sensitivity of these figures to changes in real output. The introduction presented some reasons for believing that output in real terms might grow at a lower rate, at least for the balance of the decade. However, if real growth should average 6%, the value of shipments from the industry, in constant dollars, should reach $929 million in 1980 and $1,240 million in 1985. The corresponding employment would be 58,200 and 72,000 respectively.

In summary it appears that the industry will employ slightly over 50,000 in 1980 and about 57,000 five years later. That is, unless there are major deviations from the "normal" growth trend. The possibility of, and the means of bringing about, such changes are discussed in the next chapter.

It should be noted that a change in numbers of employees is not

the only significant dimension to be considered. Change in the nature of employment may be even more significant. Future growth will create demands for skills hitherto unrelated to printing. Automation, computer applications and systems design will be especially important. The availability of these skills could be a constraining influence unless preventive steps are taken in the near future.

D. THE NUMBER OF ESTABLISHMENTS IN 1985

Two conflicting pressures will affect the configuration of the industry. On the one hand, the majority of managers are small business men. They are entrepreneurial. Many formed their own business. Others have moved into senior management positions in closely held family or private corporations. This influence resists consolidation, rationalization and the trend towards fewer, larger firms.

On the other hand, the opportunities for specialization and the need for specialized or modern, faster, capital-intensive plants, will lead to fewer and larger operations.

The results of pressures to rationalize are apparent in the past five years. As reported in Volume II, some 23% of firms interviewed and surveyed reported that they had been involved in some form of merger or amalgamation. But, most managers involved in acquisitions view mergers merely as investments, not as opportunities to improve and/or rationalize production or marketing. In fact, one executive prominent in the industry, reported a reluctance to consolidate because of the need to service regional accounts. Yet, under questioning he agreed that a sales presence in each region was the key need, not a manufacturing capability.

At the same time as there has been consolidation, there has been proliferation. Instant printers, responding to local needs for fast service, have opened over 400 plants.

The net result of these two trends is that, despite merger, the actual number of establishments has grown at a rate of about 1% per year.

Looking to the future we believe that there will be strong economic pressures to consolidate operations and/or rationalize production in the

medium and larger size firms with shipments in excess of $500,000. This rationalization may take several forms. One of the most opportune will be the matching of similar orders for a number of customers or regions to run in one batch at one plant. This will reduce make-ready costs to a significant degree. It will also permit the use of faster, more productive equipment.

Smaller firms will continue to meet local or special needs. Their numbers should increase only slightly -- but they will remain quite profitable by providing a unique service.

Instant printing appears to be reaching maturity. Many new firms are starting. Others are being dissolved. But there appears still to be a net yearly gain.

Industry growth can be described in terms of two phenomenon. As the total demand for a product or service increases so does the output of each establishment in the industry. Each plant hires more staff. It invests in additional facilities and equipment. At the same time, new firms enter the industry. The rate of entry depends in large part upon the size of the investment and the availability of capital.

In general this relationship can be expressed by:

Value of Shipments = $(\text{Number of Establishments})^n$ in which n:

- is an index unique to each industry. It is determined by the basic economics of the industry.

- increases from year to year reflecting improvements in productivity of labour and capital.

Analysis of the relationship between shipments and number of establishments during the 1960's reveals a number of significant features.

- Between 1960 and 1966, output per plant gained rapidly. Under a combination of a shortage of technical skills, increasing competitive pressures and increasing capital for plant and equipment, the industry met the growing market demands by greater output per plant -- not by opening more plants.

- Then, starting in the early 60's but becoming a significant factor by 1966, instant printers caused a proliferation of new plants.

These changes appear clearly in Figure 3. It shows a marked discontinuity in 1966 as the number of instant printers soared. Then, by 1973, the trend is reverting to the slope that existed prior to 1966. This suggests that the number of instant printers has reached an equilibrium level. However, more reliable data is needed for 1972, 1973 and 1974 before any trend can be confirmed.

Looking ahead to 1980 and 1985, we believe that competitive pressures combined with a high cost of capital will lead to higher output per plant. We, therefore, expect to see a resumption of the growth rate of the early 1960's, modified slightly by the presence of a number of instant printing establishments.

This suggests that the industry will have just over 2,300 establishments in 1980 and about 2,450 in 1985 (see Table 7). Analysis of value of shipments in constant dollars results in no significant difference from these values.

What does this mean in terms of sizes of plant? Analysis of concentration within the industry in 1972 shows that 1.1% of establishments account for 27.1% of shipments and 7% (125 firms) account for 61% of all shipments.

As there is no reason to expect a significant change in this distribution, we can foresee each of the largest 25 plants shipping an average of $32 million of printed material in 1985. Over 170 establishments will show shipments in excess of $5 million annually.

This growth will pose a major challenge to management. Larger, more capital intensive plants will require more rationalization and specialization if they expect to show a satisfactory return to investors. In turn, it will call for a significant upgrading of management skills and know-how.

Figure 3

VALUE OF GROWTH INDEX "n" IN COMMERCIAL PRINTING INDUSTRY

VALUE OF SHIPMENTS = (NUMBER OF ESTABLISHMENTS)^n

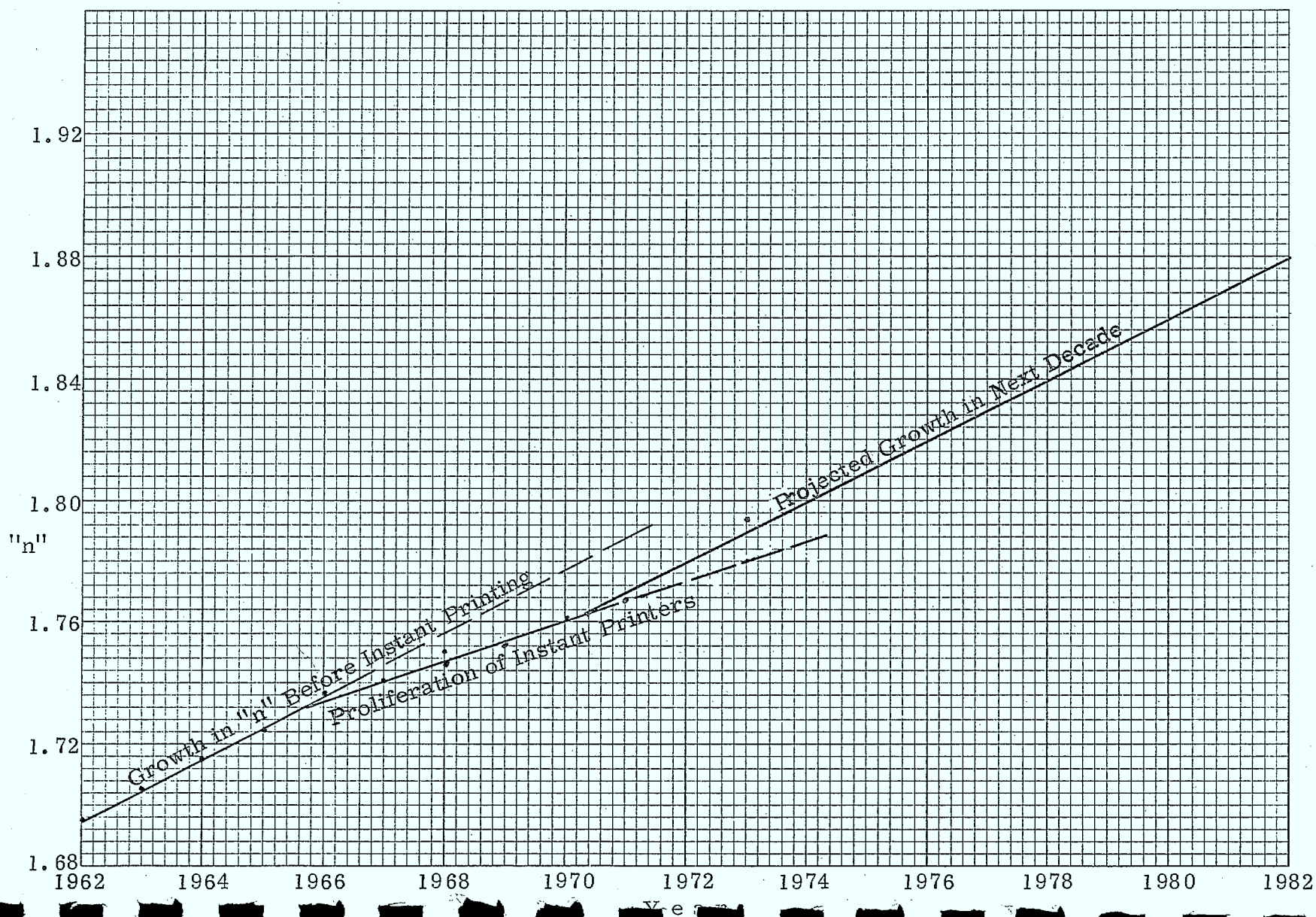


Table 7

NUMBER OF PRINTING ESTABLISHMENTS AND
THE RELATIONSHIP TO THE VALUE OF SHIPMENTS
VALUE OF SHIPMENTS = (NUMBER OF ESTABLISHMENTS)^n

Year	Value of Shipments ($'000)	Number of Establishments	"n"
1962	$ 389,483	1,990	1.695
1963	416,530	1,975	1.705
1964	442,185	1,957	1.715
1965	488,278	1,993	1.724
1966	550,957	2,016	1.736
1967	596,770	2,072	1.742
1968	624,142	2,088	1.746
1969	680,602	2,119	1.754
1970	711,429	2,105	1.761
1971	764,189	2,128	1.768
1972	830,000		
1973	945,000	2,140	1.794
1980	1,874,000[1]	2,310[2]	1.861
1985	3,018,000[2]	2,458[2]	1.911

[1] Stevenson & Kellogg estimated.

[2] Calculated from value of "n" obtained from Figure 3.

E. CAPITAL REQUIREMENTS

The projected growth of the industry will require a substantial investment. This section explores the financial implications of this growth and the corresponding demand for funds within the industry.

Analysis of investment turnover of a number of firms in Canada and U.S.A.[1] reveals a fairly static pattern during the last decade (Table 8).

On the assumption that the GAIA firms are representative of the industry, these ratios suggest that between 1974 and 1985 the industry will face the need for a gross additional investment of $1,612 million (Table 9). If the turnover rate increases to about 124% -- either through better management and/or reduction in taxes on production machinery -- the need for additional funds might be limited to about $1,490 million.

Some of these funds will be obtained from short-term sources -- trade accounts payable and short-term notes. Others will be generated internally from retained earnings. The balance will require outside financing -- additional equity or long-term borrowing.

Analysis of current liabilities over the past ten years shows that they have varied between 25% and 34% of net worth. The ratio of sales to current liabilities has ranged from 5.12 to 6.81.

These ratios are indication of the ability of the industry to finance its operations from short term sources. In the absence of major legislative or credit changes, they can be considered indicative of the future.

Another source of funds is depreciation -- a non-cash expense. In the period from 1964, the average industry depreciation expense has been 3.28% of sales. Continuation of present policies and attitudes towards depreciation will lead to a generation of about $735 million within the industry in the next decade.

Thus, the net requirement for additional funds between 1974 and 1984 is estimated to be $511 million. This reflects the analysis shown in Table 10.

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[1] GAIA Annual Surveys.

Table 8

TURNOVER OF TOTAL INVESTMENT BY FIRMS
REPORTING TO GAIA AND PIA ANNUAL SURVEYS

Year	Data From Firms Reporting to GAIA Survey			PIA Firms Annual Turnover of Total Investment
	Net Sales	Total Investment	Annual Turnover	
	($'000,000)	($'000,000)	%	%
1963	77.5	81.4	95.0	126.40
1964	101.2	102.3	99.0	122.16
1965	116.8	111.1	105.1	123.81
1966	120.0	113.1	106.10	124.65
1967	115.8	107.5	107.72	126.67
1968	110.3	101.4	108.78	123.50
1969	127.0	115.2	110.25	119.95
1970	193.0	171.2	112.71	123.50
1971	272.6	256.5	106.29	121.29
1972	265.7	239.4	110.97	116.52
1973	258.2	230.7	111.96	122.02

Table 9

INCREASE IN TOTAL INVESTMENT
IN PRINTING INDUSTRY 1974-85

Year	Net Sales	Annual Turnover	Total Investment	Additional Investment
	($'000,000)	%	($'000,000)	($'000,000)
1974	1,058	112	945	Base Year
1980	1,874	114	1,643	698
1985	3,018	118	2,557	1,612

Table 10

SOURCES AND APPLICATION OF FUNDS
1974-1985

		$'000,000
Total Requirement		1,612
Cumulative depreciation	735	
Total payables and other short-term sources	366	
		1,101
Balance From Outside Sources		$ 511

If the industry is able to maintain its present long-term credit, it should be able to continue its long-term borrowing at about 40% of owners equity. This source should thus be able to provide an additional $224 million. Additional equity financing will take up the difference -- about $287 million.

During the same period retained earnings will have increased by some $273 million resulting in the balance sheet shown in Table 11.

This overall requirement for an additional $511 million from outside sources should not create a major problem for the industry in aggregate. However, smaller firms, with limited access to the major sources of financing, may encounter difficulty.

Short-term financing -- trade accounts payable and short-term notes -- generally presents no major problem to any sector of the industry. If the firm is reasonably well managed and profitable, the banks will usually respond in the short-term. In some instances, they want security but this depends on the calibre of the manager of the printing firm.

Long-term financing, either equity or debt, can present difficulties. For the small firm with sales of less than $250,000, there is no ready source. The GAIA tries to persuade small and medium-size printers to use the GAIA ratio studies as evidence of good management in order to get bank financing. In some cases, key employees may be persuaded to become partners.

Medium-size firms with sales of up to $2 million often invite participation by friends of the owner. This spreads the equity base without incurring the problems of public offering. A major problem for the smaller firms is to improve the image of the printing industry as a worthy investment.

Large firms encounter least difficulty -- and least need long-term debt. Several firms are public -- existing financial institutions can arrange public offerings. Other large printing companies are part of larger corporations. Typical of this category are The Southam Printing Co. Ltd. and McLean-Hunter Limited. Here the printing division has access to money markets, if it becomes necessary, through the sponsorship of the corporate umbrella.

Table 11

INDUSTRY BALANCE SHEET

	1974	1980	1985
Value of Shipments ($'000,000)	1,058	1,874	3,018
Current Assets (3.36 turns)	314	557	898
Fixed Assets	286	513	822
Total Assets	600	1,070	1,720
Current Liabilities 30%	180	321	516
Long-Term Borrowing	120	214	344
Shareholders' Equity 50%	300	535	860
Total Liabilities	600	1,070	1,720

Thus, if the commercial printing industry is to grow in its present form, there needs to be a better source of financing for the smaller and medium-size companies. At the same time, there must be an improvement in financial management skills. Budgets and cash flow projections would engender the necessary confidence in a lender.

* * * * * * * * * * * * * * *

In summary then we foresee an orderly growth for the industry in the next decade in the absence of any significant external influence. Its growth will be slightly below that of the GNP. But it will provide employment for an additional 15,000 people.

Strategies for protecting this growth and even enhancing it further are discussed in the following chapter.

IV

STRATEGY AND POLICIES FOR THE INDUSTRY

A. OVERALL ECONOMIC GOALS

The underlying purpose of a strategy for the commercial printing industry should be the creation of wealth and the improvement of Canada's economic well-being. But of themselves these goals are not adequate. They need to be qualified by concern for:

- The distribution of wealth, both vertically through the economic strata and laterally across all geographic regions, so that all Canadians will benefit.
- The quality of life including opportunities for meaningful employment in all regions.
- The quality of the environment especially the fostering of balanced growth in all communities.

Philosophically we believe that our market economy will increase our economic well-being. But, in a number of instances it may need to be tempered by direct or indirect government action to overcome local imperfections to further these goals.

Thus the purpose of the strategies outlined in this chapter are:

- To increase income.
- To provide a reasonable return to capital and labour.
- To stimulate and foster employment, especially in lesser-developed regions.
- To preserve the finer qualities of Canadian life from the unfettered rampant pursuit of economic gain.

B. THE COMMERCIAL PRINTING INDUSTRY IN THIS FRAMEWORK

The role of the industry in meeting these goals can be envisioned if it is seen in the perspective of the "system" shown in Figure 4. Within this system commercial printing contributes in many ways to these goals:

- It employs labour;
- It is a market for a number of goods and services produced in Canada: paper, composition, inks, binding and so forth, all of which provide employment;
- It provides a service to intermediate users and, ultimately, the consumer.

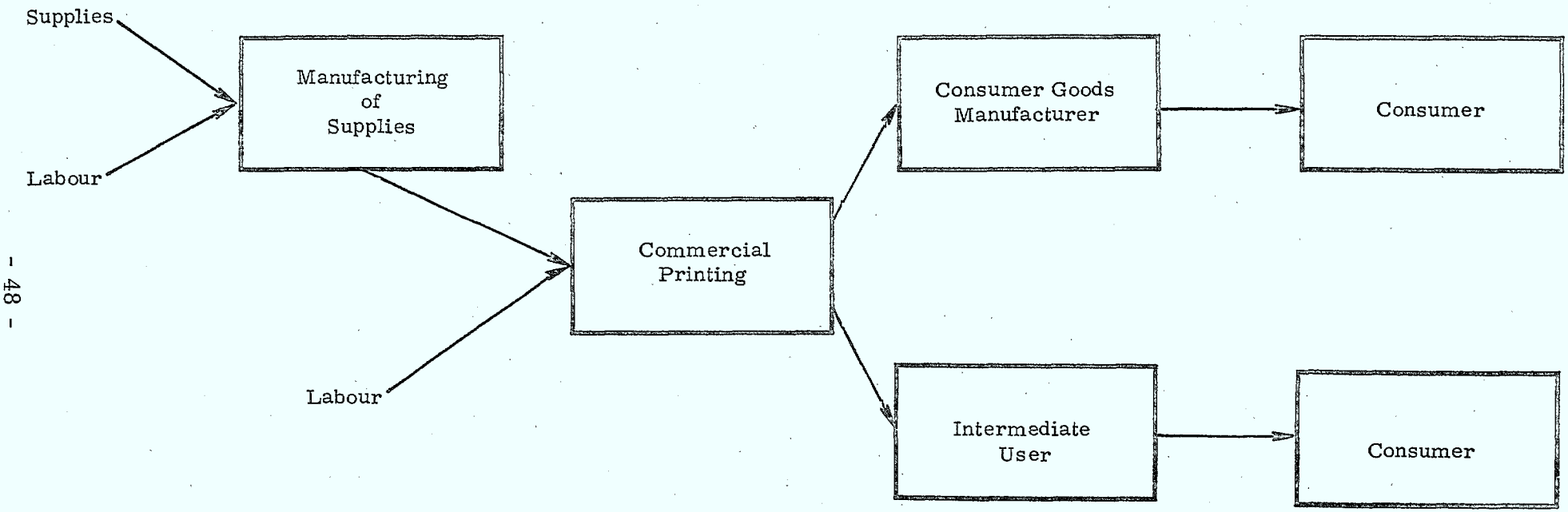
But depending on one's perspective the success of the printing industry is subject to different interpretation:

- The customer, industrial or consumer, wishes to buy printing at the lowest cost. This is consistent with raising the living standard of the consumer.
- This objective is somewhat inconsistent with that of providing employment. In fact the customer is most satisfied if the costs of printing -- labour and capital -- are minimized.
- Suppliers and "upstream" sources, including their employees are most satisfied if the commercial printing industry pays a higher rate for goods or services. But, this is inconsistent with the consumers' demand for the lowest total cost.

Despite these apparent conflicts the industry does have a number of social and economic characteristics that are beneficial from the viewpoint of national development:

Figure 4

THE COMMERCIAL PRINTING INDUSTRY SYSTEM



- It consists of many firms ranging in size from the very small, employing between one and four people, to those employing over 1,000.
- It is spread geographically throughout the country.
- It tends to serve local customers.
- It tends to buy supplies and services close to the plant.
- It is a relatively easy industry to enter.
- The economics of production and marketing are such that big, efficient firms are not interested in pursuing orders that are profitable for the small firm.

These characteristics have a number of implications. The small buyer and the small printer tend to do business together. Bargaining and negotiations tend to be among equals. There is little possibility of the larger size customer forcing the smaller printer into bankruptcy. Nor can the dominant printer command unreasonable prices from his customers. As soon as a printer becomes excessively profitable, he is inviting a competitor to set up in competition in the same market.

The establishment of a commercial printer in the community, especially a remote area, has a multiplier effect within the region. Statistics show that the majority of printers purchase their supplies within a radius of 25 miles of the plant. This multiplier effect, combined with the relatively low capital required to enter the industry, suggests it is an appropriate industry for the lesser developed regions of this country.

The ease of entry into the business ensures that the small customer, in less populated regions, can always buy printing at a competitive price.

Increments in printing capacity can be relatively small. This permits the industry to expand in an orderly manner, responding to demand as it occurs. This feature will tend to reduce the likelihood of excess capacity overhanging the industry. In turn, it should minimize

predatory unprofitable price cutting. The industry also encourages entrepreneurship. The relative ease of entry, minimum capital requirements and relative lack of managerial sophistication provides an opportunity for many individuals to sharpen their entrepreneurial skills.

In short, the present structure of the printing industry is compatible with our social-economic goals and objectives. It provides a reasonable return on capital and labour. It ensures competitive prices for customers.

C. THREATS TO THIS STRUCTURE IN THE NEXT DECADE

The growth of the Canadian commercial printing industry appears to be quite consistent with Canada's goals. Therefore our first concern must be the possibility of unforeseen events jeopardizing this development. Among the more serious of such possibilities are:

- A serious upsurge of low cost imports.
- A change in the economics of production in comparison with Canada's trading partners.
- Extensive rationalization within the industry and the absorption of many small firms.
- The need for vast amounts of capital in order to enter the industry or to expand production or markets.
- Inability to generate the required level of management ability.
- Shortage of needed technological skills.

What are the probabilities of these events occurring?

1. Low Cost Imports

Imports at present represent a substantial share of domestic shipments of books, magazines, advertising matter and specialties. Each of these is discussed in some detail below.

(a) Books

The majority of books are imported from the U.S.A. The reason lies in the copyright laws in the U.S.A. As long as the United States insists on books copyrighted in the U.S.A. being printed in that country, it is unlikely that the flow will slow down. On the other hand, there is little likelihood of Canadian published books being printed in the U.S.A. in large quantities. In short, although books do represent a significant share of imports, it is unlikely that there will be a marked change from the present trend.

The second major country of origin -- France -- reflects the francophone character of Canada. There is a ready market for French books in Quebec, so the trend will probably continue. On the other hand, the logistics of book printing are such that it is unlikely that books published in Quebec would be printed in France. The volume of individual imports from France is small. It is likely that they will remain so for some time to come.

In summary, imports of books are expected to grow at a steady trend. We do not anticipate any marked transfer of printing from Canada to other countries.

(b) Magazines

Magazines, periodicals, etc. imported from the U.S.A. and, to a lesser extent, from France and the United Kingdom represent little opportunity or threat to Canadian printers. With few exceptions these magazines are oriented towards audiences in their own country. Alternatively, they may be of world-

wide general interest. They are not oriented towards a Canadian audience. Consequently, they would seldom justify the setting-up and printing in this country.

Conversely, there is little likelihood that the printing of Canadian publications would be transferred outside this country. Printers in Canada are competitive with those in the U.S.A. This conclusion was demonstrated in the productivity analysis in Volume II. It was also confirmed in discussions with a number of Canadian printers. The likelihood of printing being transferred to more remote countries is also low. The costs of coordinating production operations and of transporting large volumes of paper tend to make this practice uneconomic.

The only significant threat to magazine printing could lie in an extreme outbreak of Canadian nationalism. Such an event might lead to the banning of certain U.S. publications such as "Time" and "Reader's Digest". These magazines are currently printed in Canada. If they were banned then production would be removed from certain printing establishments.

The probability of any of these threats materializing appears low. Consequently we do not see the need for structural changes to protect this sector of the printing industry.

(c) Specialties

This, the third significant class of imports does represent a potential threat to the Canadian commercial printing industry. Canadian industry generally is becoming more integrated with the U.S. An extreme example is the automotive industry in which North American firms

serve North American markets. Many consumer goods industries, the mining and oil industries are also closely integrated with a U. S. parent. Consequently there is a natural tendency for the U. S. buyer of printing materials to buy all his North American printing needs at one time. The exception, of course, is material for the Quebec market.

This practice significantly reduces the cost of the Canadian portion. This "tail end" of the production run poses a serious threat to the Canadian industry. Typical examples of specialty imports in this category are:

- Automobile sales brochures;
- Promotional "flyers" sent out by major oil companies.

How serious is this threat? On one hand the growing integration of Canadian and U. S. industry will provide more opportunities for printing "tail ends" in the U. S. A. But, this threat may be less serious than appears at the sight. The reason lies in the increasing awareness of our bi-cultural heritage. Increasingly Canadian users are insisting on bilingual printed materials. This naturally makes it less attractive to produce low cost tail end runs.

In fact, every threat presents an opportunity. The increasing integration of Canadian and U. S. business could provide a major opportunity for Canadian printers in the U. S. A. This is discussed in a later section.

(d) Imports from the "Third World"

Many companies, in other industries, in the past have set up plants in Japan, Hong Kong, Korea and Taiwan to take advantage of low production costs. The most notable example of this practice was in electronics. But it also occurred in garment manufacture and other industries. Is this likely to happen with printing?

In considering this issue it is necessary to make a distinction between the production process for electronic goods or garments and printing. The former are standard products produced to a forecast. Once the forecast is accepted production continues on the same item until there is a change in model or revision of forecast.

Printing is different. Each order is unique. And the time between placing the order and receiving the goods is short. This is one of the reasons why printing tends to be a local industry. It is difficult to control custom printing orders thousands of miles from the plant.

Another deterrent to distant printing is the cost of transportation. In order to meet a customer's needs the printed matter would have to be carried by air freight to the market. Over a distance of 5,000 miles or so the transportation cost could be as much as $1.50 per pound.

But, the value per pound of printed material shipped from the Canadian plant is comparable to this figure. Consequently, even if labour in these countries is cheap, the cost of paper plus the high cost of transportation (which is increasing rapidly because of higher aircraft

operating costs) makes it unattractive to print offshore.

In summary, therefore, we do not anticipate a serious threat from low cost imports. An exception to this generalization could occur if there were serious devaluations in the currencies of our trading partners. However, even if this were to occur, the logistics of moving printing materials are such that imports would not pose a major threat to the Canadian printer.

2. Changing Economics of Production

The price of the end product produced by a Canadian commercial printer will be competitive with that of a U. S. printer provided the costs of the principal factors of production are comparable. Of special significance in this context are:

- Cost of supplies, especially paper and inks.
- Cost of installed machinery and equipment.
- Cost of labour.

At the present time these individual costs are not comparable. Fortunately, increases in the cost of one factor are offset, at least in part, by the lower costs of another. Nevertheless, it is possible that, in the future, a manipulated change in one of these costs could pose a serious threat to the Canadian industry. This eventuality is discussed below.

(a) Paper and Supplies

Statistics of the Canadian and U. S. printing industry suggest that Canadian printers face a higher cost for paper than their U. S. counterparts. Analysis of the GAIA annual survey indicates that paper cost in Canada represents a greater proportion of the value of shipments than in the U. S. A.

In 1973, paper represented 24.8% of shipments in Canada, 21.2% in the U.S.A. In the previous years a similar difference prevailed:

	Paper Cost as Percentage of Shipments	
	1971	1972
Canada (GAIA members)	25.21%	26.76%
U.S.A. (PIA members)	21.60%	20.89%

Two possible reasons are advanced for this difference. It is possible that the cost of paper sold in Canada is actually priced higher than the identical paper in the U.S.A. Alternatively, the U.S. printer may, in general, be adding more value in his printing operations than his Canadian counterpart.

Discussions with knowledgeable individuals indicate that, in fact, paper in Canada is more costly. It is priced to reflect the tariff which protects Canadian paper manufacturers against imports from the U.S.A.

This practice undoubtedly helps the Canadian paper manufacturer. On the other hand, the U.S. printer, buying paper more cheaply than his Canadian competitor, could pose a serious threat to the long run viability of the Canadian industry. This would be especially significant if the current tariff protection on imports of printed matter were to be reduced.

(b) Machinery and Equipment

Another notable difference between Canadian and U.S. printing firms is seen in the turnover of fixed investment. This difference in the

years 1971 and 1972 is shown below:

	Turnover of Investment	
	1971	1972
Canada	2.21	2.26
U.S.A.	2.71	2.35

The corresponding depreciation expense in Canada, expressed as a percentage of sales, is also higher. In 1971 depreciation expense claimed by the Canadian industry was 3.23%. In the U.S.A. it was 3.03%. Similar differences are seen in other years.

This difference in capital investment and depreciation suggests the existence of two fundamental differences between the industries:

- The U.S. manager in the printing industry is more sophisticated than his Canadian counterpart. Through better planning of capital investment and tighter scheduling of his operations he obtains greater output from the same facilities.

- The combination of duties and taxes on production machinery paid by the Canadian printer is higher than those paid by his U.S. competitor. Thus, through no fault of his own, the Canadian manager is less efficient in converting his funds into production machinery.

No direct information is available on the utilization of machinery in the two industries. However, the ability of Canadian firms to

compete in the U. S. market suggests that Canadian managers are not significantly less effective than their U. S. counterparts.

This suggests that the major contributor to the difference in capital investment is the duty and tax paid on production machinery. Here the 12% federal sales tax could pose the major threat to the industry if tariffs were significantly reduced. Obviously, in an open economy the producer who is, of necessity, less efficient (as result of taxes) in converting his funds into machinery will be at a competitive disadvantage vis-à-vis his counterpart.

Consequently, if the Canadian authorities are contemplating tariff changes on printed material we suggest that the impact of this sales tax be evaluated in some depth.

(c) Labour and Productivity

The Canadian printer is in a fortunate position compared with his U. S. counterpart. Cost per employee, at both the factory and executive level is lower than in the U. S. A. During the last eight years the payroll cost per employee in the U. S. A. has averaged 118% of that in Canada.[1]

This higher labour cost is offset only partly by slightly higher productivity. Analysis of value added per employee indicates that the labour cost per unit of output is almost 9% higher than in Canada.

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[1] Volume II, Chapter IV

> Thus, a competent Canadian manager has little to fear from a U.S. competitor. Not only should his labour costs be lower; he is protected by a tariff on U.S. imports.
>
> Individual plants may be threatened by imports because of very low productivity and incompetent management. It might be argued that such plants should not be protected from competition. Rather is it in the interests of the Canadian community that the inefficient either be forced to improve or they should be encouraged to go out of business thereby releasing the resources for use by more effective management.

It appears, therefore, that the overall economics of production in Canada are comparable to those in the U.S. Higher costs of paper and machinery in this country are offset by lower labour costs and a protective tariff. If the tariff were to be removed, and if Canadian employees negotiate wages comparable to their U.S. counterparts, the Canadian industry could face a serious threat from the U.S.A. This threat could be minimized or even eliminated by removing the protective tariff on paper and eliminating the sales tax on production machinery.

3. Extensive Rationalization of the Industry

Rationalization and economies of scale provide the framework for contemporary management thought. Efficiency is the criterion by which many managers are judged, and, efficiency frequently is equated with size. Consequently, in their search for greater profits, managers naturally think of acquiring other firms, distributing overhead over more operations, eliminating short production runs and consolidating longer runs.

Undoubtedly economies of scale do exist in the printing industry. This is especially true among firms having

shipments in excess of $5 million. Large production runs justify significant capital investments. In turn, these investments permit significant economies. Finally, this increased efficiency is transformed into greater return on investment. So goes the conventional wisdom. So, it appears, are the economics of the printing industry.

However, the health of the printing industry does not depend solely on economy and efficiency. A substantial part of its success depends on its ability to respond to local needs. This has given rise to many small plants in virtually every urban community in Canada. These plants exert a stabilizing effect on the local economy. They generate employment within the community. They buy substantial goods and services within a small radius.

Consequently we believe it would not be in the interests of the country if a substantial number of smaller firms were acquired by larger organizations. Competition in the smaller communities would be reduced; a small customer would be threatened by the inequality in the buyer-seller relationship. Also, most acquisitions would lead to the centralization of the industry in the major cities. This would not be in the interests of the country at large.

It might also be reasoned that acquisition of small firms is not in the overall economic interest of the community. Both small and large firms currently show the greatest return on investment. Medium sized firms, typically those resulting from mergers of small companies, show lower returns. This fact suggests that preservation of the industry in its present form is most compatible with our national goals.

Mergers of larger companies would not have the same damaging effect. These companies are already located in the major centres. They buy supplies in these centres. They bid, generally, on the basis of price. They serve customers somewhat distant from the plant.

At this higher level the best interests of the country are served if there is rationalization and specialization. This will lead to better utilization of equipment. It will reduce non-productive time to a minimum. It will provide the economic base to permit the company to compete in markets distant from the plant.

It appears, therefore, that consolidation and rationalization within the industry is a two-edged sword. In the larger companies its effects are beneficial. They will permit the industry to become more efficient. It will provide a base for competing more effectively with larger U.S. organizations. In the smaller firms the effects of consolidation are detrimental. They will reduce the ability of the industry to respond to the needs of small communities; generating local employment and providing a high level of service.

4. Barriers to Entry

The customer has been protected because of the relative ease of entry into the commercial printing industry. No printer has been able to develop a monopolistic position. No printer has been able to enjoy undue profits for any length of time. He immediately faces the threat of a competitor wishing to share the benefits.

This situation is in marked contrast to many sectors of the Canadian economy. All primary industries: pulp and paper, iron and steel, mining and oil, require huge amounts of capital. It is virtually impossible for a would-be entrepreneur to enter these fields.

The Canadian printing industry will remain viable in its present form as long as there are no significant barriers to entry.

A look at the growth of the industry in the next ten years suggests that change will be evolutionary, not revolutionary. Increments in capacity and capital will both be small, relative to the size of the firm considering the investment. Larger firms will consider computer assisted

composition and automated presses. This will call for a relatively large investment but it is of a comparable order of magnitude to that incurred in the past for faster machines capable of longer runs at greater efficiency.

Small firms will continue to use relatively low cost presses for small production runs. Again, the investment will be comparable to the ability of the firm to generate or obtain the needed funds.

Manufacturers today offer a variety of equipment in a range of prices, output and performance. This variety enables virtually any commercial printer to obtain equipment closely matching his needs and his resources. As long as this pattern continues, entry to the industry will remain relatively easy. In turn the industry will continue to operate in the best interests of the customer and the economy.

One possible threat does exist however. This is the difficulty which the small printer faces in financing his equipment. Conventional banks are reluctant to accept the risks of financing small printers who have a relatively high corporate mortality. Other lending institutions are not well known to the small entrepreneur operating in the smaller communities.

This difficulty has been avoided in the past by the willingness of manufacturers to finance their equipment. This has been especially evident in the instant printing establishments. It is also evident in the financing of a wide range of purchases by small and medium sized firms.

A change of policy by equipment manufacturers could stifle, albeit temporarily, the growth of the industry. Unable to obtain the funds from conventional banks and not knowing of other sources of financing the small printer may well have to forego some profitable opportunities. However, the competitive pressures among equipment and machinery manufacturers make it highly unlikely that this restriction will occur. If it does, the

trade associations should bring to the attention of all their members the availability of financing from alternative sources.

5. Management Ability

Our survey indicated a wide range of managerial ability in the printing industry. In general, the larger the firm, the greater the sophistication of its management. For example, 98% of establishments having annual sales over $1.5 million had some form of production planning system. Among firms having sales below $250,000 only 46% had such systems.

The difference in marketing and financial sophistication is even greater. Among the larger firms 89% had some form of cost control, 83% were preparing sales forecasts and 72% used salesmen's reports as input to market planning. At the other end of the scale, among firms having sales of less than $250,000 annually, the comparable figures were 38%, 18% and 7%.

This lack of skill among the smaller and medium sized firms presents a competitive threat. A competitor having more sophisticated production planning and evaluation of capital equipment will enjoy a higher return on investment. Cost control and financial planning will lead to more effective use of funds and, in turn, greater profits and return on investment.

The firm which enjoys these skills is in a stronger competitive position. It can profitably underbid its competitors. It is in a better position to obtain outside financing. It is better able to attract and hold higher calibre talent by offering greater financial rewards.

Consequently, the notable lack of ability, especially in financial and marketing fields, poses a real threat to the small and medium sized firms. Unless these deficiencies are overcome mortalities and mergers will be the rule rather than the exception.

6. Availability of Skills

Many commercial printers reported either a shortage of, or difficulty in locating, skilled employees. This observation was frequently coupled with a complaint about the lack of adequate training facilities. This situation is especially critical in the remoter locations. Most major centres have technical colleges. And, even though these colleges may not offer courses in printing, they do offer courses in many technical subjects, and managerial subjects, which are of value in the printing industry. Larger centres also provide many opportunities for a would-be printer to apply his knowledge and gain broader experience.

This difficulty could become increasingly acute as the technical demands of printing increase. Printers in the remote areas such as the Atlantic Provinces and many rural communities will be unable to keep pace with developments in the major metropolitan areas. Their ability to handle special jobs calling for high quality, for example, will decline. They will find it increasingly difficult to be competitive on the larger orders placed by local firms. In turn, their purchases of supplies locally will decline and the printing industry will not make the contribution to the community it has in the past.

Statistics on the growth of the industry during the past decade suggest that this process might have started already. In the entire Atlantic Provinces there are fewer printing establishments now than there were in 1962. The value of shipments (in constant dollars) between 1962 and 1970 showed negligible improvement. The number of employees in the commercial printing industry in Nova Scotia actually declined in the decade between 1962 and 1972.

This decline is not consistent with the potential role of the commercial printing industry in the Canadian economy. It will be arrested only if technical and managerial skills, and opportunities for improving those skills, are available in all major regions of the country.

The previous chapter projected the growth of the industry to 1985. That projection showed shipments increasing to over $3 billion. The number of plants would increase to almost 2,500 and the number of employees to 57,000.

At the same time this growth would be in harmony with our national goals. Increasing income and a regionally-oriented growth were an essential part of this scene.

It appears that there are no external threats to prejudice this development. Even if duties on the import of printed products were reduced or eliminated, the industry could remain viable. It should be pointed out, of course, that such a move would have to be accompanied by a reduction of the tariff on paper and elimination of the tax on production machinery. In short, the industry would need to be on the same competitive basis as its counterpart in the U.S.A.

The only major threat to the industry is internal. A lack of managerial ability and a shortage of technical skills and training facilities could lead to a consolidation of the industry in the major metropolitan centres. This would not jeopardize the economic viability of the industry. But, it would reduce significantly its ability to contribute to the economy and quality of life in the smaller urban and rural regions.

D. IMPROVING THE PROJECTED GROWTH

The purpose of a set of strategies and policies is to enable the industry to contribute most effectively to the health and well-being of the country. In the previous section it was seen that there is little threat to the viability of the industry. Nothing appears on the horizon that will jeopardize its future healthy growth unless it is a shortage of trained and qualified managers and employees. In short there is no need for a defensive strategy to protect the industry against the threat from other branches of the communications industry or from foreign printers.

It is therefore appropriate to evaluate the merits of a more aggressive strategy that will generate a higher-than-normal contribution from the industry. Such improvement could come in a number of ways:

- The industry could generate more income.
- It could create more employment.
- It could be more responsive to Canadian needs, providing income and employment in the less urbanized communities.
- It could be more efficient and productive.

Not all of these improvements are in mutual harmony. Greater efficiency usually leads to lower employment unless it is accompanied by a corresponding growth in the demand for the product or service. And, as we have seen, responsiveness to regional needs is not necessarily consistent with greater efficiency and productivity.

However, in the longer term, it is consistent with our national goals that all resources, labour and capital, be used most effectively. In this way we will, as a people, enjoy a higher standard of living as a result of deriving the greatest utility from these resources.

Significant benefits accrue to our economy from the expansion of the commercial printing industry. Out of each dollar spent on printing, 35 cents goes to the purchase of materials and paper -- the majority of which are essentially supplied from domestic sources. Thirty-two cents represents payment for labour employed in the factory.

A relatively small amount represents foreign purchases. Machinery and equipment, mostly supplied from the U.S.A. accounts for only about 3%.

Thus it is strongly in our interests to foster this industry. Not only does it contribute significantly to social and regional development goals. It also benefits the Canadian economy to a significant degree.

The key to realizing these greater benefits lies in expanding output. If output grows, higher productivity is more acceptable to employees do not equate it with loss of jobs. Similarly, more employment, greater incomes and higher efficiency can be realized only if the industry can make inroads into other markets.

1. The Total Market

Within Canada the market for printing is relatively fixed. The demand for printing is derived from the demand for other goods and services. For example, the demand for lithographing packages is determined by the demand for a wide range of consumer goods such as packaged foods, cigarettes, beverages, etc. Only if sales for these end products increase will the demand for printing grow.

Similarly, demand for specialties, advertising materials, etc., is determined by the marketing program of the sponsor. There is little the printer can do to suggest that printed material is more effective than television, radio, newspapers or other media.

Consequently, expansion of the industry beyond the projected natural growth must come from one of two sources:

- Displacing other sources of printing such as in-plant printing and imports;
- Promoting exports of printed materials to other countries.

2. Displacing Other Sources

(a) In-Plant Printing

Displacing in-plant printing will increase the volume of work done by commercial printers, even though the transfer may not be at parity. This action would, therefore, benefit the commercial printing industry as such. However, within Canada it would merely represent a shift of work and employment from one sector to another.

Our analysis of in-plant printing revealed that it represented a market equivalent to annual shipments of about $110 million. It is about 12% of the commercial industry, in terms of value of shipments. And, it has been growing at about 10% annually -- comparable to the growth rate of the industry.

Some of the reasons given for this growth are:

- Better service. Printed work can be available within a few hours. And, the owner can assign priorities which he cannot do when dealing with commercial printing establishments.

- Confidentiality of the work, such as the Federal Government Budget. Many organizations prefer to print internally because of the risk of confidential information leaking to a competitor, consumer or even the public.

- Cost, although we find it difficult to accept the fact that if all true costs were assigned to in-plant printing, including overhead, heat, light, security, inventories of paper, etc. it would be cheaper than commercial work. In fact most in-plant printing plants are small. They frequently have only one machine and it is often under-utilized.

From the national viewpoint, if a company can obtain higher levels of service at a <u>lower total</u> cost, it is difficult to find a rationale

for artificial measures designed to transfer work to the commercial sector.

One factor which does influence the relative costs and profitability of in-plant printing is the federal sales tax. Commercial printing carries a sales tax of 12%. In-plant printing is taxed on the basis of an assumed equivalent value, namely 3.1 times the value of purchased materials.

Analysis of in-plant printing costs suggests that this basis of applying the tax gives a slight advantage to the commercial printer. Paper and supplies represent about 34% of the cost of shipments of commercial printers. Thus an equivalent value based on 3.1 times this figure would be slightly in excess of parity. However the difference is not significant.

What could be significant is the apparent major difference in the cost structure of in-plant printers. Based on the limited data available to our study it appears that in-plant printing is much less sophisticated than most commercial printing. Consequently the value-added is less in relation to the cost of paper and supplies. In fact it appears that these materials represent over 50% of the value of in-plant printing. On this basis, applying sales tax on 3.1 times the cost of supplies gives a marked advantage to commercial printing.

It does not appear therefore that the commercial printer will make significant inroads into the continued growth of in-plant printing.

(b) Imports

Some opportunities exist for increasing the amount of printing done in Canada at the expense of imports. In the earlier analysis of imports it was seen that the third major category was "specialty" materials representing about $12 million annually. Typically these items include advertising and promotional material produced as the "tail-end" of a production run in the U.S.A. There is little evidence of Canadian buyers placing orders directly on U.S. printers.

This is not a major opportunity. The value of imports of advertising matter is less than 2% of the total industry shipments. And, none of the printers interviewed or questioned felt it to be a serious issue. Consequently it is questionable whether strong corrective action should be taken, especially in view of the potential for exporting Canadian printed matter into the U.S.A. (discussed in the next section).

Two positive steps are possible however. Neither requires a marked change in policy, and both represent merely a "tuning" of existing practices.

(i) Basis of Valuation

There is some question about the basis of evaluating imports. We were not able to ascertain that the declared value bears any logical relation to the actual costs of production.

A number of declared values are possible for any item:

- The marginal cost of the tail-end run.
- Marginal cost of the tail-end plus an arbitrary mark-up.
- Average cost of the entire run.
- Average cost of the entire run plus a nominal mark-up to reflect normal profit and return-on-investment.

Obviously the actual cost of printing the Canadian run depends on a number of factors. But one of the most important is the total run size and the relative importance of the Canadian share.

We believe it is appropriate to examine in detail the basis for establishing a fair value for imports. This will eliminate unfair, predatory pricing and will strengthen competition within the industry.

(ii) Emphasizing Canadian Culture

The gradual spread and enforcement of bilingualism will gradually ensure a unique Canadian market. If all commercial advertising materials must feature both languages on each piece it will effectively eliminate tail-ending. Instead, all Canadian materials will require a special run. Under such conditions a Canadian firm could bid on a fair competitive basis.

Two other categories of imports are of much greater consequence. Books represent an import value of $133 million. Magazines amount to $71 million annually. As mentioned earlier, the substantial import of books reflects U.S. copyright law. The effect of this law could be negated by granting Canadian copyright only to books printed in this country. However, we understand that this is contrary to the spirit of the Florence agreement. Consequently, it is unlikely that there will be a significant opportunity for Canadian printers to displace this import stream.

Magazines, periodicals, etc. are in a similar position. Most are essentially U.S. publications. Some come from France and the U.K. But, in nearly all cases they are printed primarily for their domestic market. The proportion sold in Canada is small. Consequently, there is virtually no opportunity for the Canadian printer in this field.

3. Promoting Exports

Analysis of trading statistics shows that there is a net inflow of printing from the U.S. to Canada:

- Value of imports in 1971 -- $258 million.[1]
- Value of exports of printed products -- $32 million.

Yet there appears to be no inherent reason for such imbalance:

- Printing tends to be custom-oriented.
- The normal contention that "the U.S.A. is a bigger market" is not relevant for the printing industry.

[1] 1971 Statistics Canada Data.

- Larger Canadian firms already solicit orders, profitably, more than 500 miles from the plant.

- Major plants in Montreal, Toronto, Winnipeg and Vancouver are located within 500 miles (24 hour delivery) of many major U.S. markets.

- Some Canadian firms are already competing successfully with U.S. firms and are exporting to that country.

- At least one Canadian firm has successfully negotiated for "North American" anglophone printing with a multi-national corporation.

- According to our analysis of relative costs and productivity, average total costs in Canada are lower than in the U.S.A.

Despite these advantages, few Canadian printing firms are consciously export-oriented. This is due to both internal conditions within the industry and to restrictions on the entry of Canadian printed matter into the U.S.A.

At the present time the Canadian industry is prosperous. A number of owners and managers have stated that the Canadian market is generating all the work they need. They are not willing to face the added difficulties and inconveniences of selling in the U.S.A. There is also the question of awareness. The vast majority of Canadian firms have no understanding of the opportunities in the U.S.A. nor of how to exploit them.

There are also two barriers to selling in the U.S.A. Printed matter from Canada must bear a tariff ranging from zero on small leaflets, maps and books to 5% or $7\frac{1}{2}$% on greeting cards (depending on the amount of printing) to 10% on pressure sensitive labels. Some tariffs are levied on the basis of weight. Normal labels carry a duty of 9 cents per lb. and metal leaf labels 15 cents per lb. Books which are copyrighted in the U.S.A. are prohibited from entry.

There is also the question of non-tariff barriers. All printing imported to the U.S.A. from Canada must display "PRINTED IN CANADA" prominently. This is a deterrent to some consumer-oriented companies that feel they must support U.S. industry regardless of the cost of so doing.

But these problems can be circumvented. Education and aggressive action on the part of the industry coupled with inter-governmental negotiation could open a lucrative market for Canadian firms.

E. THE NEED FOR TRAINING

Success in commercial printing more than in most industries, hinges on the skills of its personnel. Every firm has access to the same source and quality of supplies as its competition. Every firm has the same choice from a wide range of equipment and machinery as its competitor -- including its competitors in the U.S.A. And, because of the terms offered by manufacturers, most firms can arrange to acquire the equipment best suited to their needs.

Under these conditions success hinges on people. The industry needs managers with vision and ability. It depends on the skills and competence of its workers. Both of these areas are a source of concern.

1. Management Training

The majority of managers in the industry have a technical background. This is reflected in the fact that about 90% of the larger firms (annual shipments in excess of $250,000) have some form of production control.

Other skills are notably absent, however. Quality control, sales forecasting and marketing, cost control and production standards are present in less than 50% of the firms surveyed.

In future we anticipate increasing competition among the medium and larger size firms, having sales in excess of

$1 million, as they seek specialized business among customers more distant from the plant. And this competition will be intensified by the increasing trend among Canadian and United States printers to seek business in the other country.

This development will put increasing premiums on management skills. Of special significance will be understanding and ability in the fields of:

- identifying market opportunities;
- market planning;
- financial management: planning and control;
- productivity improvement of labour and capital;
- production management and engineering economics;
- centralized purchasing and supply;
- inventory management.

The organization of training in these subjects, and the willingness and ability of management to learn, is crucial to the continuing viability of the commercial printing industry.

2. Technical Training

Technical skill has been the strength of the industry. Most managers claim a solid technical competence in many phases of the industry. But, even here the industry faces a threat: there is a shortage of adequate training facilities in many parts of the country.

Much of the technical strength of the industry has been based on a comprehensive apprenticeship program.

This scheme should continue. But the technical requirements of the industry are becoming more complex. Apprenticeship programs need to be complemented with more formal technical training at the local level. In this way the apprentice printer will be able to combine practical on-the-job experience with relevant classroom training.

F. THE ROLE OF TRADE ASSOCIATIONS

A number of trade associations cater to the printing industry in North America. The more important were listed, and their roles described in Volume II of this study.

The leading association of commercial printers in Canada is the Graphic Arts Industries Association. Its membership includes almost 550 of the more than 2,000 firms. The performance of this 550 appears to be significantly better than the industry average. This may be due to the existence of the Association and its educational programs. Or it may be that only the better managers are aware of, and concerned with, association activities.

Whatever the reason for this selective membership, the association has a key role to play in the ongoing development of the industry. It is the major vehicle for improving the quality of management in the commercial printing industry.

The ratio studies published by GAIA and PIA are considered helpful within the industry. They enable member firms to compare themselves with average and the best in the industry. They permit comparisons item by item including revenues, paper and supplies, factory, sales and executive payrolls, factory overhead, and administrative costs. They highlight variations in balance sheets and return on investment. In short, they enable every manager to see how his operation differs from others in the industry -- in total, and in similar sizes of company.

The next step, having created awareness, is to present a more integrated and continuing educational program. Such a program should provide for:

- Identifying needs for improved managerial skills -- by region, size or type of printing firm, and by function within the firm (general management, finance, marketing production or planning). A starting point might be the areas of concern listed in the previous section.[1]

- Setting specifications for and directing the preparation of educational material and courses calling on business schools and consultants as appropriate.

- Administering the program in various centres.

- Financing, through membership dues and attendance fees at least part of the total cost. In this way, participants will place more value on it than if it were free.

It should be emphasized that this process should be continuous. The initial definition of needs and presentation of courses is not sufficient. As managers are exposed to courses, they will gradually improve their managerial skills. In turn, with the assistance of the association, they will recognize the need for further training. This process will give rise to a new set of specifications and more challenging courses. In this way, the Association will be sure of responding to the current needs of its membership.

The GAIA is well established to sponsor such programs. Even though it lists less than 550 firms as members, it is supported by a significant cross-section of the industry. There is no other comparable vehicle for presenting educational programs to the industry -- except the normal post-secondary educational institutions. And they do not cater specifically to the printing industry.

Another meaningful role for the GAIA is seen in the need for formal technical training to complement apprenticeships. Here its responsibilities should include:

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[1] Page 74.

- Working with the provincial education authorities to agree on suitable curricula for printers.

- Arranging with local technical or post-secondary institutes to provide or qualify instructors.

- Encouraging federal and provincial authorities and leading firms to provide scholarships and bursaries for outstanding students to obtain more advanced education.

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No industry exists in a vacuum, certainly not the commercial printing industry. It has adapted itself to the unique set of problems and opportunities which it faces in Canada. And, if allowed to grow free from outside influence, it will continue to respond to these challenges.

However, if it is felt desirable in the national interest to change the industry's direction, it will be necessary to apply outside stimuli. It also will be necessary to create an environment in which the leaders of the industry feel motivated to change direction. This is the greatest challenge of all. The industry has been moulded by, and has moulded, its key leaders. They will not change overnight.

APPENDIX A

ORGANIZATIONS AND ASSOCIATIONS REFERRED TO IN THE TEXTS

Administrative Management Society
Willow Grove
Pennsylvania 19090

American Newspaper Publishers Association
750 Third Avenue
New York, New York 10017

Book Manufacturers Institute
25 West 43rd Street
New York, New York 10036

Bookbinders International Brotherhood
6 Adelaide Street East
Suite 604
Toronto, Ontario
M5C 1H6

Canadian Lithographic Institute
19 Duncan Ave.
Toronto, Ontario

Council of Printing Industries of Canada
159 Bay Street
Toronto, Ontario

Federation of Canadian Printing & Information (CNTU)
1001 St. Denis Street
Montreal, P.Q.

George Brown College of Applied Arts & Technology
P.O. Box 1015, Station B
Toronto, Ontario

Graphic Arts Industries Association
Fuller Bldg.
75 Albert Street
Ottawa, Ontario
K1P 5E7

Graphic Arts International Union
612 Sherbourne Street
Room 202
Toronto, Ontario
M4X 1L6

Graphic Arts Technical Foundation, Inc.
4615 Forbes Ave.
Pittsburg, Pennsylvania 15213

Gravure Research Institute
22 Manhasset Ave.
Manorhaven
Port Washington, N.Y. 11050

Gravure Technical Association
Lincoln Building
60 East 42nd Street
New York, N.Y. 10017

Independent Broadcasting Authority
70 Brompton Road
London SW3 IEY

International Association of Printing House Craftsmen
7599 Kenwood Road
Cincinnati, Ohio 45236

International Printing Pressmen & Assistants Union
of North America
1730 Rhode Island Ave. N.W.
Washington, D.C. 23006

International Typographic Composition Association
The Georgetown Building
2233 Wisconsin Avenue N.W.
Washington, D.C. 20007

International Typographical Union
301 South Union Blvd.
P.O. Box 2341
Colorado Springs, Colo. 80901

Lithographers & Photoengravers International Union
1900 L Street
Washington, D.C. 23006

National Association of Photo-Lithographers
230 West 41st Street
New York, N.Y. 10036

Printing Industries of America
20 Chevy Chase Circle, N.W.
Washington, D.C. 20015

Printing Industries of the Pacific
921 ICO Building
Portland, Oregon 97204

Ryerson Polytechnical Institute
50 Gould Street
Toronto, Ontario
M5B 1E8

BOFK

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