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ABSTRACT

This report series defines and measures the "information activity" within the national economy. "Information activity" is defined to include those specific industries and occupations whose primary function is to produce, process, or transmit economically valuable information. Changes in the national labor force are analyzed over a 120-year span. This volume presents reports of the 25 major industries that compose the primary information sector. Each report discusses the reasoning behind considering the industry as part of the primary information sector, a breakdown of the subordinate industries that compose the larger industrial category, a narrative of the informational aspects of the industry, and a report of the final demand and value-added components. The service, manufacturing, and construction sectors of the economy are considered. (Author/DAG)

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THE INFORMATION ECONOMY: Sources and Methods for Measuring the Primary Information Sector (Detailed Industry Reports)

Dr. Marc Uri Porat

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U.S. DEPARTMENT OF COMMERCE
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Assistant Secretary for Science and Technology

OFFICE OF TELECOMMUNICATIONS
John M. Richardson, Director

May 1977

UNITED STATES DEPARTMENT OF COMMERCE
OFFICE OF TELECOMMUNICATIONS
STATEMENT OF MISSION

The mission of the Office of Telecommunications in the Department of Commerce is to assist the Department in fostering, serving, and promoting the nation's economic development and technological advancement by improving man's comprehension of telecommunication science and by assuring effective use and growth of the nation's telecommunication resources.

In carrying out this mission, the Office

- Conducts research needed in the evaluation and development of policy as required by the Department of Commerce
- Assists other government agencies in the use of telecommunications
- Conducts research, engineering, and analysis in the general field of telecommunication science to meet government needs
- Acquires, analyzes, synthesizes, and disseminates information for the efficient use of the nation's telecommunication resources.
- Performs analysis, engineering, and related administrative functions responsive to the needs of the Director of the Office of Telecommunications Policy, Executive Office of the President, in the performance of his responsibilities for the management of the radio spectrum
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FOREWORD

Physics, a discipline at the heart of our last major technological revolution, yields a quotation that is highly appropriate to the present work:

> When you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind: it may be the beginning of knowledge, but you have scarcely, in your thoughts, advanced to the stage of science.
>
> -- William Thomson, Lord Kelvin
> (1824-1907) English Physicist

Notions of yet another major revolution, one that will bring about a "post-industrial" society, have been in the air for some time now. Yet, few steps toward the measurement of this revolution's most important element -- information activities -- were taken until Dr. Porat began the investigation that is reported in these volumes. We might say, then, that this study, truly a seminal one, pushes our knowledge of an information economy closer to "the stage of science."

This report proposes a conceptual framework for defining the information activities of an advanced economy, and prescribes an objective way to quantify them. Without such definition and measurement, I cannot imagine how we can formulate sound policy for an information society. The fact that so many information policy issues are pressing upon us adds to the pertinence of the research.

It may strike some as odd that the Office of Telecommunications, an organization concerned principally with telecommunications technology, would offer a report dealing with the whole range of information activities. The explanation lies in the need to view telecommunications in the larger context of its effects on other aspects of society. Satellite networks, for example, can be an instrument for regional economic development. Retail terminals can perform banking functions. And electronic communications is steadily diminishing the volume of traditional postal delivery. Thus, it is essential to appreciate how issues internal to telecommunications influence other kinds of information activities. Conversely, ways of achieving broader policy objectives might well produce decisions affecting telecommunications services. I have in mind such goals as the provision of equal access to high-quality health care or the expansion of continuing education, both of which obviously can be facilitated by the electronic media. To the extent that telecommunications and its sister technology, computers, are at the core of the infrastructure of the information society, their relationships with the larger society are every bit as important as their internal problems.

The concepts and methods described in these volumes have begun to attract wide national and international notice. They are cited by officials of the Congress, the Executive Branch, and the regulatory agencies. They are being studied by international organizations. Yet, in spite of all the acknowledgments, this study constitutes only a point of departure toward a more complete understanding of the information society. We must devise and test alternative representations of the information economy against this one. We still have to settle on the best model, achieve comparability among models in other countries, produce trend data, and construct the methods for predicting consequences of alternative policy decisions.

I am confident that this additional work will be taken up by others. Moreover, I believe that their efforts will sharpen these concepts into a new tool, a tool of great value because of its clear relevance to the course of our world's complex societies.

John M. Richardson
Director

INTRODUCTORY NOTE

Science, commerce and technology are inextricably interconnected in American society. It is therefore fitting that this effort to clarify one aspect of their impact was a joint project of the National Science Foundation and the Department of Commerce. The National Science Foundation provided the funds needed to undertake the project, the Department of Commerce the institutional setting in which to conduct it. The bond was cemented through a common concern with telecommunications technologies and policies.

We were particularly motivated by the prospect of increasing the substance surrounding fascinating concepts about the changing nature of American society. The evident acceleration in invention and application of information technologies and the social and economic change which accompanies this development, is directly relevant to a wide range of policy concerns.

The findings of this research are provocative and concise. We trust that they will stimulate and illuminate public discussion. The report describes some of the ways in which the findings have been applied thus far. Yet it is clear that this work is an incremental contribution and that much remains to be accomplished. Work has begun in the U.S. and abroad to extend the data base developed in the project. I extend an invitation to readers to contribute their reactions to the report and their ideas on further research.

Charles N. Brownstein
Program Manager
Telecommunications Policy
Research Program
National Science Foundation, 1977.

THE INFORMATION ECONOMY Report Series totals nine volumes, each of which has its own subtitle.

77-12(1) -- THE INFORMATION ECONOMY: Definition and Measurement -- Dr. Marc Uri Porat -- 265 pp.

This volume contains the executive summary and the major findings of the study. It defines information activity and includes a formal set of National Income and Product Accounts for the primary and secondary information sectors, with input-output matrices for both of these sectors. In addition, it specifies the information-related occupations of both the primary and secondary information sectors; this includes a consideration of private and public bureaucracies. Finally, it presents lists of information policy issues pertaining to industry, government, and the home and makes two recommendations as to how the Federal government might meet the public policy issues posed by the expansion of our information activity.

77-12(2) -- THE INFORMATION ECONOMY: Sources and Methods for Measuring the Primary Information Sector (Detailed Industry Reports) -- Dr. Marc Uri Porat -- 188 pp.

This volume presents reports of the 25 major industries that compose the primary information sector. The volume's classification scheme is based on the Bureau of Economic Analysis Input-Output Matrix. Each industry is discussed in great detail. The discussions include the reasoning behind considering the industry as part of the primary information sector, a breakdown of the subordinate industries that compose the larger industrial category, a narrative of the informational aspects of the industry, and a report of the final demand and value-added components. The service, manufacturing, and construction sectors of the economy are considered.

* * * * * *

We call to the reader's attention that the most critical part of the entire report series is to be found in the first two volumes. The remaining volumes are essentially supplements to and extensions of Volumes 1 and 2.

77-12(3) -- THE INFORMATION ECONOMY: The Interindustry Transactions Matrices (1967) -- Dr. Marc Uri Porat, with the assistance of Michael R. Rubin -- 58 pp.

Volume 3 consists of input-output tables showing transactions in the 1967 economy. One table shows a breakout of 108 industries, another of 190 industries.

77-12(4) -- THE INFORMATION ECONOMY: The Technology Matrices (1967) -- Dr. Marc Uri Porat, with the assistance of Michael R. Rubin -- 117 pp.

Volume 4 includes A-coefficient matrices for the 1967 economy at both the 108 and 190 levels of detail.

77-12(5) -- THE INFORMATION ECONOMY: The "Total Effect" Matrices (1967) -- Dr. Marc Uri Porat, with the assistance of Michael R. Rubin -- 117 pp.

This volume contains the 1967 Inverse Matrices with detail at both the 108 and 190 industry levels.

Volumes 3 through 5 contain backup information to Chapters 6 and 10 of Volume 1.

77-12(6) -- THE INFORMATION ECONOMY: The Labor Income by Industry Matrix of Employee Compensation (1967) -- Dr. Marc Uri Porat, with the assistance of Michael R. Rubin -- 100 pp.

Volume 6 consists of a table of 422 occupations and 108 industries showing the wages paid by each industry to each occupation in 1967.

77-12(7) -- THE INFORMATION ECONOMY: The Labor Income by Industry Matrix of Employee Compensation (1970) -- Dr. Marc Uri Porat, with the assistance of Michael R. Rubin -- 91 pp.

Volume 7 consists of a table of 422 occupations and 108 industries showing the wages paid by each industry to each occupation in 1970.

Volumes 6 and 7 contain backup information to Chapter 7 of Volume 1.

77-12(8) -- THE INFORMATION ECONOMY: National Income, Workforce, and Input-Output Accounts -- Dr. Marc Uri Porat, with the assistance of Michael R. Rubin -- 91 pp.

This volume contains backup material to Chapters 4 and 9 of Volume 1. It consists of a number of tables, including those that show trends in the labor force over time and National Income Accounts information.

77-12(9) -- THE INFORMATION ECONOMY: User's Guide to the Complete Database -- Michael R. Rubin -- 71 pp.

This volume is a user's guide to the computer model which describes the information elements of the economy in the benchmark year 1967. The database is available on magnetic tape through the National Technical Information Service, Springfield, Virginia, Accession No. PB-264 172, titled "The Information Economy."

ACKNOWLEDGMENTS

This report was prepared with partial support of National Science Foundation grant No. APR-7609015. Any opinions, findings, conclusions, or recommendations expressed in this document are those of the author and do not necessarily reflect the views of the National Science Foundation.

A dissertation entitled The Information Economy is available from: University Microfilms, 300 N. Zeeb Road, Ann Arbor, Michigan 48106 (Attn: Dissertation copies), Accession No. 77-7147.

To Fritz Machlup and Daniel Bell I owe a deep intellectual debt for plowing the field so thoroughly and proficiently before me. After their contribution, mine was simply to harvest the crop that they had planted; and there is ample left for future researchers who wish to embark on this new line of research.

My early ideas, ill formed and overly ambitious, were skillfully and gently molded by the able hands of Professors Edwin Parker and James Rosse. They had the good sense to say both yes and no at just the right moments, and were always accessible when I needed guidance. The last and most critical year of this work was made possible through the good graces of Dr. John Richardson, Director of the Office of Telecommunications, who gave freely of his encouragement and support, and who smoothed the bureaucratic wrinkles when they seemed to mount like tidal waves. He understood the policy implications of this work before most.

Generous financial support from the National Science Foundation was the lifeblood for this project. Dr. Charles Brownstein (RANN/Division of Advanced Productivity Research and Technology) managed the project most professionally, and his advice and consent were very helpful and greatly appreciated.

Over the course of the project, I drew heavily on the talents and energies of many people, and to them I extend a special gratitude. Michael Rubin, who joined me nearly three years ago, single handedly slew the computer dragon. His all night sessions outnumbered mine by two to one, and resulted in Chapters 6, 7, & 10. Joseph Kashi assembled most of the government and labor data of Chapters 7 and 8. Deborah Semb and Barbara Mikelson delivered the National Income and Product Accounts and time series of Chapters 4 and 5.

From the thousand and one production nightmares, I was rescued by the skill and perseverance of Fran Sills. She administered endless drafts of tables and text with dispatch and poise, working many evenings and weekends at top efficiency. Her performance in this project was superb. Glynetta Perrymore endured the dark ages of word processing through five complete drafts of the text. Edith Uunila thoroughly and competently helped with the final stages of proofreading and editing.

Along the road, many kind people lent me a helping hand. At the Bureau of Economic Analysis, I was given free reign by Philip Ritz, Chief of the Interindustry Division. Carolyn Knapp and Elizabeth Spaulding helped with the more obscure procedures used in the national accounts. Howard Schreier helped with programming the final demand and value added tables.

At the Bureau of Labor Statistics, I extend my thanks to Charles Bowman and the input-output staff of the Economic Growth Project. The early labor data were provided by John Shew and Karen Hassmer, and their help is acknowledged.

Although I gratefully share the credit with my friends and colleagues, I relieve them of any responsibility for remaining errors.

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INTRODUCTION

This appendix is motivated by the conceptual material given in Chapter 3. It forms the basis for the consolidated accounts presented in Chapter 4. It also forms the basis of the Input-Output Matrix control totals in Chapter 6.

Industry Report Format

Each industry report follows a similar format. The industry classification scheme is based on the Bureau of Economic Analysis Input-Output Matrix. For an overview of BEA's 83-order matrix, the reader is referred to the Survey of Current Business (February, 1974, Vol. 54, No. 2).

The primary information sector is composed of 25 major industries at the 2-digit I-O level. This appendix includes 76 detailed industries underlying the major industries. Underlying the detailed industries are thousands of commodities and services that, as a bundle, describe the information activity in the 1967 economy.

The report formats are as follows:

(a) A 2-digit I-O industry is presented with a brief rationale why it is included in the primary information sector. Components of the industry which have been omitted are discussed.

(b) A summary of the 2-digit industry output, final demand, and value added is shown; and the information and non-information components are broken out.

(c) The 6-digit I-O industries are introduced in the section on "Detailed Industry Reports." Each detailed industry is accompanied by its 4-digit SIC description, with a list of 7-digit SIC products.

(d) A narrative on the informational aspects of the industry follows. The manufacturing sector is quite brief, whereas the service sector typically requires more lengthy explanation.

(e) The detailed report closes with a breakdown of final demand and value-added components.

* * * *

Notes on the Data

Most of the data presented in this appendix were produced by the BEA and adapted for this project. For many service industries, independent industry surveys or other Federal agency sources were used.

Final Demand

The final demand tables were produced from BEA's detailed work-tape which underlies its 484-order I-O matrix. Each I-O industry at the 2-digit level (e.g., I-O #51) is composed of several I-O industries at the 6-digit level (e.g., I-O #510100). In turn, each 6-digit I-O industry is composed of several product lines or commodities at the 7-digit Standard Industrial Classification (SIC) level. Hence, the I-O and SIC industries are not necessarily comparable unless one checks the bridge tables very carefully. (The bridge tables map the SIC scheme onto the I-O scheme.)

The BEA relies mainly on the Censuses of Manufacturing, Business, Construction, Transportation and Trade, and on Internal Revenue Service data. The BEA analysts allocate the output of all manufacturing industries at the 7-digit SIC level, and allocate the output of I-O industries at the 6-digit level. The output allocations are made to consuming industries in intermediate demand and to the various final demand sectors. The tables in this section show the informational components of final demand as one measure of GNP.

Notation (* and @) in the Final Demand Tables

In some industries, a product line at the 7-digit SIC level has been deleted from the information accounts. For example, "public conveyance seats" (SIC 2531211) were dropped from the "public furniture" industry (IO #230300) since they belong to the transportation activity, not information. Such deleted products are denoted by an * in the far left margin. In other cases, portions of the product line were allocated to information, but the proration was analyzed at a deeper level than shown in the printout. For example, only a certain portion of the security brokers' income was allocated to information. These within-line allocations are denoted by a @ sign.

Legend for Reading the Final Demand Tables

The following abbreviations appear in the heading for the final demand tables:

SIC	Standard Industrial Classification code number
INTERM	Sales of that good or service to other firms, net of final demand

%GNP	Percent of the product's sales to final demand as a ratio of total final demand ($795,388 mil.)
OUTPUT	Sum of intermediate sales plus sales to final demand
PCE	Sales to personal consumption expenditures
GCF	Sales to the gross capital formation account
INV	Inventory adjustments
EXP	Net exports: gross exports less gross imports
FED	Federal government purchases
STATE	State and local government purchases
FIN DEM	Total final demand purchases
*	Item deleted from the information accounts
@	Item partly allocated to the information accounts

The Value-Added Tables

The components of value added are shown at the 6-digit I-O level. In a few cases (Industries #11, 12, 66, 67) only data at the 2-digit I-O level are available.

The total value added in each industry agrees with the published I-O tables. The underlying detail -- showing the six components -- was estimated using unpublished BEA data. The BEA never published the underlying data since they were not fully reconciled with the National Income Accounts (NIA). However, our estimates are quite close, based on detailed prorations of industry output.

All money figures are in millions of current dollars unless otherwise specified.

SIC 4811 **Telephone Communication (Wire or Radio)**

Companies primarily engaged in furnishing telephone communication service by placing the parties in vocal conversation with each other. This industry includes domestic, international, marine, mobile, and aeronautical services. Establishments primarily engaged in providing paging and telephone answering services are classified in Major Group 73.

- Telephone cable service, land or submarine
- Telephone, wire or radio

SIC 4821 **Telegraph Communication (Wire or Radio)**

Companies primarily engaged in furnishing telegraphic communication service by transmitting nonvocal record communications intended for receipt by designated persons. This industry includes domestic, international, marine, and aeronautical services.

- Telegraph cable service, land or submarine
- Telegraph wire and radio
- Wire or cable telegraph

SIC 4899 **Communication Services, Not Elsewhere Classified**

Companies primarily engaged in providing point-to-point communication services which do not fall within the scope of either Industry 4811 or 4821.

- Cablevision service, rental to homes
- Communication services, other than telephone, telegraph, radio broadcasting, and television
- Missile tracking stations, operated on a contract basis
- Phototransmission companies
- Radio broadcasting operated by cab companies
- Radar station operation
- Stock ticker service
- Telecommunications system, operation
- Telephoto service, leasing
- Teletypewriter service, leasing
- Television antenna construction and rental to private households
- Ticker tape service, leasing
- Transradio press service

The telecommunications industry revenues amounted to $18.6 billion in 1967 for the three SIC industries listed above. Some $10.1 billion was sold to final demand, mostly in the form of home telephone service, and represents approximately 1.3% of GNP. Unfortunately, the NIA procedure is somewhat oblique in providing meaningful industry detail, so we shall resort to other data sources to explain the industry's activities.

The telephone industry's revenues are split in the accounts into two types: (i) ordinary revenues for "plain old telephone" (POT) services, and (ii) installation charges for new and reconnected equipment. Conceptually, the installation charges are a separate part of final demand -- gross capital formation -- since these charges are capitalized by the final consumers. Of POT revenues, firms consumed $8.5 billion in telephone services, and households consumed $7.6 billion. The installation charges were around $1.1 billion.

The telegraph industry's revenues are divided in the accounts between message revenues ($27 million) and money orders ($29 million), both allocated entirely to personal consumption expenditures. Business telephone, TWX. and Telex are buried in category 6600 of the detail table.

Cable television sold $139 million to consumers in 1967. This figure represents both installation charges (for first-time hookup) and the monthly service charge.

The last category, Communications services not elsewhere classified, includes some of the most interesting new industries. Stock ticker services, telephoto services, facsimile transmission, and specialized common carriers are included here. In 1967, this industry was very small indeed, accounting for only $173 million in sales with a final demand of zero dollars. However, the fastest growth in telecommunications industry is occurring in this last category, and a more detailed analysis would be quite useful. The entire industry output was allocated to information services.

* * * *

SUMMARY OF IO INDUSTRY #660000

	OUTPUT	FINAL DEMAND	VALUE ADDED
INFORMATION	18,640	10,080	16,029
NON-INFORMATION	0	0	0
INFO % GNP		1.27	2.02

IO INDUSTRY 660000: TELECOMMUNICATIONS SERVICES
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	%GNP	OUTPUT	INTERM	PCE	GCE	INV	EXPORT	FED	STATE	FIN DEM
660006	TELEPHONE SERVICE - TOTAL	0.000	18640.0	18640.0	.	.	.	.	.	.	0.0
660007	BUSINESS TELEPHONE SERVICE	0.000	8560.1	8560.1	.	.	.	.	.	.	0.0
660001	HOME TELEPHONE SERVICE	0.641	7641.0	0.0	7641.0	.	.	.	.	.	7641.0
660002	TELEGRAPH - MESSAGE REVENUES	0.003	27.4	0.0	27.4	.	.	.	.	.	27.4
660003	TELEGRAPH - MONEY ORDERS	0.004	29.4	0.0	29.4	.	.	.	.	.	29.4
660004	CABLE TELEVISION	0.017	139.0	0.0	139.0	.	.	.	.	.	139.0
660005	TELEPHONE AND TELEGRAPH INSTALL.	0.282	2242.9	0.0	.	1099.7	.	139.6	543.5	464.1	2242.9
6600	COMMUNICATION SERVICES NEC	0.000	172.8	172.8	.	.	.	.	.	.	0.0
	TOTAL FINAL DEMAND				7836.8	1099.7	0.0	139.6	543.5	464.1	10079.7
	ALLOCATED TO INFORMATION										10079.7

VALUE ADDED COMPONENTS

OMPENSATION OF EMPLOYEES	6641.0
ET INTEREST	645.0
INDIRECT BUSINESS TAXES	2330.0
BUSINESS TRANSFER PAYMENTS	51.0
CAPITAL CONSUMPTION ALLOWANCES	2279.0
PROFIT TYPE INCOME	4083.0
TOTAL VALUE ADDED	16029.0
ALLOCATED TO INFORMATION	16029.0

I-O INDUSTRY #67: RADIO AND TELEVISION BROADCASTING

SIC 4832 **Radio Broadcasting**

Stations primarily engaged in activities involving the dissemination by radio to the public of aural programs (consisting of voice and music and the like). Stations engaged in the sale of time for broadcast purposes, and the furnishing of program material or service, are also included. This industry does not include the transmission by radio, in public correspondence from point to point, of either voice or record communications (Industries 4811 and 4821).

Radio broadcasting stations

SIC 4833 **Television Broadcasting**

Stations primarily engaged in activities involving the dissemination by radio to the public of visual programs, consisting of moving or still objects, usually accompanied by an aural signal (consisting of voice and music or the like). Stations engaged in the sale of time for broadcast purposes, and the furnishing of program material or service are also included.

Subscription or close circuit television

Television broadcasting stations
Television translator stations

Communications students might be used to thinking of broadcasting as a three-billion dollar industry but according to the NIA convention, all advertising revenue generated by the broadcasting industry (or $3,071 million) has been transferred into the advertising industry, I-O #730200. Industry #67 has a total industry output of $112.7 million, with sales to final demand of $7 million, or .0009% of GNP! The $112 million was composed of only three items: (i) sales of cooperative programs by broadcasters to their affiliates or vice versa; (ii) sales of television tapes to educational institutions; and (iii) miscellaneous receipts of broadcasting services, such as those from private contracts. However, the industry generated over $1.5 billion in value added, mostly in the form of employee compensation ($1.1 billion). The entire industry was allocated to information services.

* * * *

SUMMARY OF IO INDUSTRY #670000

	OUTPUT	FINAL DEMAND	VALUE ADDED
INFORMATION	112	7	1,580
NON-INFORMATION	0	0	0
INFO % GNP		.00009	.20

IO INDUSTRY 670000: RADIO AND TELEVISION BROADCASTING
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	GENP	OUTPUT	INTERM	PCE	GCP	INV	EXPORT	FED	STATE	FIN DEM
670000	RADIO AND TELEVISION BROADCASTING	0.000	112.7	112.7	.	.	.	.	.	.	0.0
670301	REVENUE FROM COOP PROGRAMS	0.000	34.4	34.4	.	.	.	.	.	.	0.0
670302	SALES TO EDUCATION	0.001	26.1	18.9	.	.	- .	.	.	.	0.0
670303	OTHER RECEIPTS	0.000	32.2	32.2	.	.	.	.	.	7.2	7.2
6799	INDUSTRY UNALLOCATED	0.000	0.0	0.0	.	.	.	.	.	.	0.0
	TOTAL FINAL DEMAND				0.0	0.0	0.0	0.0	0.0	7.2	7.2
	ALLOCATED TO INFORMATION										7.2

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	1062.0
NET INTEREST	46.0
INDIRECT BUSINESS TAXES	31.0
BUSINESS TRANSFER PAYMENTS	.0
CAPITAL CONSUMPTION ALLOWANCES	183.0
PROFIT TYPE INCOME	257.9
TOTAL VALUE ADDED	1579.9
ALLOCATED TO INFORMATION	1579.9

* * * *

I-O INDUSTRY #69: WHOLESALE AND RETAIL TRADE

The wholesale and retail trade industries are defined as the sum of two components: (i) the commissions of merchandise agents and brokers; and (ii) the gross margins (operating expenses plus profits) of retail and wholesale establishments on the resale of goods. For our purposes, we are interested in the trade margins on the resale of "information goods" such as television and radio sets, calculators, computers, books and magazines, and so on. All commissions and brokers' fees are included as an information service since they represent payments for search costs.

Table 1 shows a summary of the trade margins and commissions allocated to information services.

TAPLE 1: SUMMARY OF THE TRADE INDUSTRY

	WHOLESALE TRADE	RETAIL TRADE
	($ Millions, 1967)	
Margins on information goods	$10,100.7	$ 9,624.6
Merchandise agents' commissions	2,467.4	0
Total information	12,568.1	9,624.6
Total trade	63,029.2	96,905.2
Info as % of total	19.94%	9.93%

Around 13.88% of the wholesale and retail trades industry was allocated to information services.

SUMMARY OF IO INDUSTRY #690000

	OUTPUT	FINAL DEMAND	VALUE ADDED
TOTAL INDUSTRY	159,934	120,815	118,265
INFORMATION	22,193	16,273	16,053
NON-INFORMATION	137,741	105,919	102,212
INFO % GNP		2.05	2.02

Detailed Industry Reports

690100 and 690200 Wholesale and Retail Trade

Commissions of Brokers and Agents

The first source of out[illegible] allocated to information services comes from the commissi[illegible]f wholesale brokers, sales representatives and agen[illegible] The census classifies a "broker" as a business which prima[illegible]ly sells merchandise on others' account -- the broker holds no physical inventory himself. The broker's fees, then, are earned for the search activity performed on behalf of both buyers and sellers. Couched in these terms, brokers are pure information specialists. The various types of brokers and agents are summarized in Table 2.

TABLE 2: COMMISSIONS OF WHOLESALE BROKERS AND AGENTS

	($ Millions, 1967)
Merchandise Agents & Brokers, TOTAL	$2,467.4
Auction companies	137.6
Merchandise brokers for buyers, sellers	449.9
Commission merchants	479.5
Import agents	40.0
Export agents	63.0
Manufacturer's agents	980.5
Selling agents	287.5
Purchasing agents, resident buyers	41.1
Statistical discrepancy to NIA	- 11.7

Source: BEA control total; Census of Business Detail, Table 2 of "Wholesale Trade - U.S." #BC67-WA1.

[illegible]de Margins

Wholesale and retail trade margins on detailed information goods are shown in Table 3. The margins can be interpreted as the gross profits of establishments such as book stores, newsstands, and television outlets.

IO INDUSTRY 690100: WHOLESALE TRADE
$ Million (Current)
VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	22735.2
NET INTEREST	395.0
INDIRECT BUSINESS TAXES	9927.2
BUSINESS TRANSFER PAYMENTS	160.0
CAPITAL CONSUMPTION ALLOWANCES	2353.4
PROFIT TYPE INCOME	7480.0
TOTAL VALUE ADDED	43050.8
19.94% ALLOCATED TO INFORMATION	8584.3

IO INDUSTRY 690200: RETAIL TRADE
$ Million (Current)
VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	42618.6
NET INTEREST	645.3
INDIRECT BUSINESS TAXES	10603.8
BUSINESS TRANSFER PAYMENTS	918.6
CAPITAL CONSUMPTION ALLOWANCES	4140.3
PROFIT TYPE INCOME	16287.6
TOTAL VALUE ADDED	75214.2
9.93% ALLOCATED TO INFORMATION	7468.8

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TABLE 3 : WHOLESALE AND RETAIL TRADE MARGINS ON INFORMATION GOODS

TRADE MARGINS ON INFORMATION GOODS
$ Million (Current)

INPUT OUTPUT IND #	SIC IND #	NAME OF PRODUCT	WHOLE-SALE MARGIN	RETAIL MARGIN
230100	2521	WOOD OFFICE FURNITURE	18.2	46.0
230100	2521011	CHAIRS	6.5	16.2
230100	2521021	SOFAS, COUCHES, SEATWERS, STOOLS	1.0	2.5
230100	2521032	EXECUTIVE DESKS	2.8	7.2
230100	2521031	CLERICAL + SECRETARIAL DESKS	2.2	5.6
230100	2521039	MODULAR SERVICE UNITS	1.2	3.1
230100	2521098	OTHER WOOD OFFICE FURNITURE	3.1	7.9
230100	2521001	WOOD OFFICE FURNITURE NSK	1.4	3.5
230100	2521	WOOD OFFICE FURNITURE UNALLOCATED	18.2	46.0
230100	2521	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
230100	2521098	CONTRACT WORK	0.0	0.0
230100	2521099	MISC RECEIPTS	0.0	0.0
230200	2522	METAL OFFICE FURNITURE	81.3	148.8
230200	2522111	CHAIRS	16.1	33.2
230200	2522151	SOFAS, COUCHES, SETTERS, STOOLS	0.4	0.8
230200	2522122	DESKS	20.9	38.2
230200	2522115	VERTICAL FILING CABINETS	19.5	35.9
230200	2522119	MECHANICAL FILING EQUIPMENT	1.8	3.3
230200	2522123	INSULATED FILING CABINETS TRAYS ETC	1.9	3.4
230200	2522124	VISIBLE EQUIPMENT, NONMECHANICAL	3.1	5.6
230200	2522125	VISIBLE EQUIPMENT, MECHANICAL	1.5	2.7
230200	2522411	TABLES + STANDS	4.9	8.9
230200	2522421	MODULAR SERVICE UNITS	2.0	3.6
230200	2522498	OTHER METAL OFFICE FURNITURE	5.1	9.4
230200	2522001	METAL OFFICE FURNITURE NSK	2.1	3.8
230200	2522	METAL OFFICE FURNITURE	81.3	148.8
230200	2522	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
230200	2522098	CONTRACT WORK	0.0	0.0
230200	2522099	MISC RECEIPTS	0.0	0.0
230300	2531	PUBLIC BUILDING FURNITURE	54.6	19.9
230300	2531125	SINGLE PUPIL UNIT DESKS	6.7	1.0
230300	2531133	TWO OR MORE PUPIL DESKS	0.6	0.1
230300	2531136	CHAIRS	3.8	0.6
230300	2531138	COMBINATION FOLDING TABLES + BENCHE	0.6	0.1
230300	2531137	STORAGE CABINETS	2.8	0.5
230300	2531139	OTHER SCHOOL FURNITURE	6.9	1.2
230300	2531211	PUBLIC CONVEYANCE SEATS	11.3	0.0
230300	2531211	CHURCH PEWS	3.2	2.4
230300	2531219	OTHER CHURCH FURNITURE	1.2	1.0
230300	2531241	FOLDING TABLES	2.0	1.6
230300	2531251	FIXED THEATRE + AUDITOREUM SEATS	2.5	2.0
230300	2531235	PORTABLE FOLDING CHAIRS	2.4	1.9
230300	2531281	STADIUM + BLEACHER SEATS	2.2	0.0
230300	2531271	LIBRARY FURNITURE	2.9	0.5
230300	2531298	OTHER PUBLIC BUILDING FURN.	2.9	2.3
230300	2531001	PUBLIC BUILDING FURNITURE NSK	2.8	0.7
230300	2531	PUBLIC BUILDING FURNITURE	21.0	0.0
230300	2531	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
230300	2531098	CONTRACT WORK	0.0	0.0
230300	2531099	MISC RECEIPTS	0.0	0.0
240200	2621	PAPER MILL PRODUCTS	492.8	17.7
240200	2621	INDUSTRY UNALLOCATED	16.8	0.0
240200	2621	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
240200	2621098	CONTRACT WORK	0.0	0.0
240200	2621099	MISC RECEIPTS	0.0	0.0

TRADE MARGINS ON INFORMATION GOODS
$ Million (Current)

INPUT OUTPUT IND #	SIC IND #	NAME OF PRODUCT	WHOLE-SALE MARGIN	RETAIL MARGIN
240400	2642	ENVELOPES	88.2	7.0
240400	2642	INDUSTRY UNALLOCATED	14.4	0.0
240400	2642	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
240400	2642098	CONTRACT WORK	0.0	0.0
240701	2641	COATED AND GLAZED PAPER	186.0	43.5
240701	2641211	OILED AND SIMILARLY TREATED PAPER	6.8	0.0
240701	2641221	PRINTED BREAD WRAPS	3.0	0.0
240701	2641231	HOUSEHOLD WAXED PAPER	4.8	15.7
240701	2641241	DELICATESSAN PAPER	2.4	0.0
240701	2641245	LOCKER INCLUDING FREEZER PAPER	1.0	0.8
240701	2641255	BISCUIT AND CRACKER INNER WRAPS	1.4	0.0
240701	2641265	CEREAL AND SIMILAR INNER WRAPS	0.8	0.0
240701	2641275	FROZEN FOOD CARTON OVERWRAPS	3.1	0.0
240701	2641281	OTHER WAXED AND WAXED LAMINATED PAP	6.4	0.0
240701	2641200	WAX AND WAX LAMINATED PAPER NSK	7.1	0.0
240701	2641312	GUMMED SEALING TAPE	13.8	4.4
240701	2641314	CORRUGATORS BOX GUMMED TAPE	2.8	0.0
240701	2641331	GUMMED FLAT PAPER	2.1	0.0
240701	2641300	GUMMED PRODUCTS NSK	1.0	0.0
240701	26414	PRESSURE SENSITIVE TAPES	36.4	22.6
240701	26415	LAMINATED OR COATED WRAPPERS	26.3	0.0
240701	26416	OTHER COATED + PROCESSED PAPER	47.5	0.0
240701	2641001	PAPER COATING + GLAZING NSK	4.9	0.0
240701	2641	UNDISTRIBUTED PAPER COATING ANG GLA	141.6	0.0
240701	2641	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
240701	2641098	CONTRACT WORK	0.0	0.0
240701	2641099	MISC RECEIPTS	0.0	0.0
260100	2711	NEWSPAPERS	8.2	569.8
260100	2711	INDUSTRY UNALLOCATED	0.0	0.0
260100	2711	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
260100	2711099	MISC RECEIPTS	0.0	0.0
260200	2721	PERIODICALS	194.6	166.0
260200	27211	FARM PERIODICALS	2.2	0.4
260200	27213	BUSINESS + PROFESSIONAL PERIODICALS	29.1	5.1
260200	27215	GENERAL PERIODICALS	115.3	130.6
260200	2727703	RELIGIOUS PERIODICALS	13.7	15.6
260200	2727705	MAGAZINE + COMIC SUPPLEMENTS	4.2	0.0
260200	2727706	PERIODICALS NEC	17.0	8.1
260200	2721001	PERIODICALS NSK	13.1	6.2
260200	2721	PERIODICALS UNALLOCATED	36.0	16.1
260200	2721	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
260200	2721098	CONTRACT WORK	0.0	0.0
260200	2721099	MISC RECEIPTS	0.0	0.0
260301	2731	BOOK PUBLISHING	229.1	337.3
260301	27311	TEXTBOOKS	75.7	145.4
260301	2731211	SUBSCRIPTION REFERENCE BOOKS	27.0	0.0
260301	2731311	LAWBOOKS	7.9	1.6
260301	2731313	MEDICAL BOOKS	4.4	2.2
260301	2731317	BUSINESS + OTHER TECHNICAL ETC. BOO	12.2	25.8
260301	2731415	BIBLES + TESTAMENTS	3.7	1.5
260301	2731423	HYMNALS + DEVOTIONALS	1.6	0.0
260301	2731426	OTHER RELIGIOUS BOOKS	4.6	9.3
260301	2731400	RELIGIOUS BOOKS NSK	1.3	1.7
260301	273150	GENERAL BOOKS	46.0	92.8
260301	2731513	BOOK CLUB BOOKS	21.0	0.0

TRADE MARGINS ON INFORMATION GOODS
$ Million (Current)

INPUT OUTPUT IND #	SIC IND #	NAME OF PRODUCT	WHOLESALE MARGIN	RETAIL MARGIN
260301	2731613	OTHER BOOKS	14.4	28.1
260301	2731641	RELIGIOUS PAMPHLETS	0.2	0.0
260301	2731649	MUSIC + OTHER PAMPHLETS	5.7	5.9
260301	2731001	BOOKS + PAMPHLETS NSK	8.4	17.0
260301	2731	BOOK PUBLISHING	156.9	307.5
260301	2731	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
260301	2731098	CONTRACT WORK	0.0	0.0
260301	2731099	MISC RECEIPTS	0.0	0.0
260400	2741	MISCELLANEOUS PUBLISHING	22.6	45.6
260400	2741311	PICTURE SOUVENIR CARDS	1.9	3.1
260400	2741331	SHEET MUSIC	1.4	2.9
260400	2741365	MAPS, CHARTS, ATLASES	1.4	2.7
260400	2741395	RACING FORMS	3.0	8.2
260400	2741398	PATTERNS	8.0	21.1
260400	2741398	OTHER MISCELLANEOUS PUBLICATIONS	4.3	2.9
260400	2741001	MISCELLANEOUS PUBLISHING NSK	2.6	4.7
260400	2741	INDUSTRY UNALLOCATED	3.9	0.0
260400	2741	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
260400	2741098	CONTRACT WORK	0.0	0.0
260400	2741099	MISC RECEIPTS	0.0	0.0
260500	2750	COMMERCIAL PRINTING	223.4	112.6
260500	275010	MAGAZINE + PERIODICAL PRINTING	0.0	0.0
260500	275020	MAGAZINE + COMIC SUPPLEMENTS	0.0	0.0
260500	275030	BANK PRINTING	21.7	0.0
260500	275040	FINANCIAL + LEGAL PRINTING	22.5	0.0
260500	275050	SCIENTIFIC + TECHNICAL CHARTS	9.8	0.0
260500	275060	TRADING STAMPS + SEALS	5.1	3.5
260500	275070	FOOD, BEVERAGE CHECKS	2.5	0.0
260500	275080	PLAYING CARDS	9.8	54.5
260500	275090	CREDIT + ID CARDS	2.3	0.0
260500	275100	PRINTING ON METAL	0.0	0.0
260500	275101	DECALCOMANIAS	9.8	7.9
260500	275102	ART REPRODUCTIONS	8.1	46.7
260500	275103	TICKET + COUPON PRINTING	4.1	0.0
260500	275104	ALL OTHER GEN. COMMERCIAL PRINT.	11.7	0.0
260500	275105	GRAVURE PLATES + CYLINDERS	0.0	0.0
260500	275106	LITHOGRAPHIC PLATES	0.0	0.0
260500	275107	FLAT LABELS	46.5	0.0
260500	275108	ROLL LABELS	9.8	0.0
260500	275109	PRESSURE SENSITIVE LABELS	15.6	0.0
260500	275201	DECAL LABELS	2.1	0.0
260500	275202	WRAPPERS, EXC. PAPER	27.0	0.0
260500	275203	PAPER WRAPPERS	12.3	0.0
260500	275204	TAGS	6.7	0.0
260500	2750	COMMERCIAL PRINTING UNALLOCATED	78.9	0.0
260500	2750	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
260500	2750098	CONTRACT WORK	0.0	0.0
260500	2750099	MISC RECEIPTS	0.0	0.0
260601	2761	MANIFOLD BUSINESS FORMS	0.1	0.0
260601	2761	INDUSTRY UNALLOCATED	0.0	0.0
260601	2761	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
260601	2761099	MISC RECEIPTS	0.0	0.0

TRADE MARGINS ON INFORMATION GOODS
$ Million (Current)

INPUT OUTPUT IND #	SIC IND #	NAME OF PRODUCT	WHOLESALE MARGIN	RETAIL MARGIN
260602	2782	BLANKBOOKS + LOOSELEAF BINDERS	36.1	54.2
260602	2782131	ALBUMS + SCRAPBOOKS	6.8	26.6
260602	2782135	DIARIES + APPOINTMENT BOOKS	0.1	0.4
260602	2782152	COLUMNAR PADS, MEMO BOOKS, MISC, BL	0.4	1.7
260602	2782144	CHECKBOOKS	17.9	0.0
260602	2782236	LOOSELEAF BINDERS	6.5	25.5
260602	2782001	BLANKBOOKS + LOOSELEAF BINDERS NSK,	4.4	0.0
260602	2782	INDUSTRY UNALLOCATED	3.2	0.0
260602	2782	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
260602	2782098	CONTRACT WORK	0.0	0.0
260602	2782099	MISC RECEIPTS	0.0	0.0
260700	2771	GREETING CARDS	41.0	274.8
260700	27711	GREETING CARDS, PUBLISHERS SALES	41.0	274.8
260700	27712	PRINTING OF GREETING CARDS FOR OTHE	0.0	0.0
260700	2771	INDUSTRY UNALLOCATED	0.9	0.0
260700	2771	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
260700	2771098	CONTRACT WORK	0.0	0.0
260700	2771099	MISC RECEIPTS	0.0	0.0
260801	2753	ENGRAVING + PLATE PRINTING	3.5	19.1
260801	2753012	SECURITY ENGRAVING	0.2	0.0
260801	2753022	SOCIAL ENGRAVING	0.3	19.1
260801	2753050	PLATES MADE FOR OTHERS	0.0	0.0
260801	2753	INDUSTRY UNALLOCATED	0.2	0.0
260801	2753	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
260801	2753098	CONTRACT WORK	0.0	0.0
260802	2789	BOOKBINDING + RELATED WORK	1.2	0.0
260802	27891	BOOKBINDING + RELATED EXC. LIBRARY	1.3	0.0
260802	2789141	LIBRARY BINDING	0.2	0.0
260802	2789	INDUSTRY UNALLOCATED	0.9	0.0
260802	2789	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
260802	2789098	CONTRACT WORK	0.0	0.0
260803	2791	TYPESETTING	1.8	0.0
260803	2791011	HOT METAL + RELATED TYPESETTING	1.5	0.0
260803	2791014	PHOTOGRAPHIC + COLD TYPESETTING	0.3	0.0
260803	2791	INDUSTRY UNALLOCATED	0.3	0.0
260803	2791	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
260803	2791098	CONTRACT WORK	0.0	0.0
260803	2791099	MISC RECEIPTS	0.0	0.0
260804	2793	PHOTOENGRAVING	1.0	0.0
260804	2793	INDUSTRY UNALLOCATED	0.0	0.0
260804	2793	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
260804	2793099	MISC RECEIPTS	0.0	0.0
260805	2794	ELECTROTYPING + STEREOTYPING	0.1	0.0
260805	2794	INDUSTRY UNALLOCATED	0.0	0.0
260805	2794	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
260805	2794099	MISC RECEIPTS	0.0	0.0

TRADE MARGINS ON INFORMATION GOODS
$ Million (Current)

INPUT IND	SIC OUTPUT IND	NAME OF PRODUCT	WHOLESALE MARGIN	RETAIL MARGIN
270404	2893	PRINTING INKS	78.6	0.0
270404	2893	INDUSTRY UNALLOCATED	0.2	0.0
270404	2893	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
270404	2893099	MISC RECEIPTS	0.0	0.0
480400	3554	PAPER INDUSTRIES MACHINES	19.9	0.0
480400	3554001	PAPER INDUSTRIES MACHINES	16.4	0.0
480400	3554001	PARTS + ATTACHMENTS	3.3	0.0
480400	3554	INDUSTRY UNALLOCATED	0.0	0.0
480400	3554	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
480400	3554098	CONTRACT WORK	0.0	0.0
480400	3554099	MISC RECEIPTS	0.0	0.0
480500	3555	PRINTING TRADES MACHINERY	43.1	0.0
480500	3555001	PRINTING TRADES MACHINES	33.2	0.0
480500	3555002	PRINTING TRADES PARTS + ATTACHMENTS	6.1	0.0
480500	3555249	ENGRAVERS MATERIALS	0.9	0.0
480500	3555275	FOUNDRY TYPE, RULES, LEADS, ETC	0.3	0.0
480500	3555279	OTHER PRINTING MACHINERY + PARTS	0.2	0.0
480500	3555599	PRINTING TRADES MACHINERY, NSK	2.4	0.0
480500	3555	INDUSTRY UNALLOCATED	0.6	0.0
480500	3555	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
480500	3555098	CONTRACT WORK	0.0	0.0
480500	3555099	MISC RECEIPTS	0.0	0.0
510101	3573	ELECTRONIC COMPUTING EQUIPMENT	99.1	0.0
510101	3573125	ELECTRONIC COMPUTING EQUIP, EXC PAR	51.6	0.0
510101	3573150	CODED MEDIA DATA PROCESSING MACHS +	25.3	0.0
510101	3573	PARTS + ATTACHMENTS	22.2	0.0
510101	3573	INDUSTRY UNALLOCATED	0.0	0.0
510101	3573	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
510101	3573098	CONTRACT WORK	0.0	0.0
510101	3573099	MISC RECEIPTS	0.0	0.0
510102	3574	CALCULATING + ACCOUNTING MACH,	136.3	28.5
510102	3574150	ACCOUNTING BOOKKEEPING MACH, CASH RE	57.5	15.3
510102	3574120	ADDING MACHINES	14.7	4.2
510102	3574160	CALCULATING MACHINES	25.3	7.0
510102	3574160	COIN + CURRENCY HANDLING, OTHER MAC	6.5	2.0
510102	3574	PARTS + ATTACHMENTS	1.3	0.0
510102	3574	INDUSTRY UNALLOCATED	20.5	0.0
510102	3574	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
510102	3574098	CONTRACT WORK	0.0	0.0
510102	3574099	MISC RECEIPTS	0.0	0.0
510200	3572	TYPEWRITERS	132.7	78.7
510200	3572002	STANDARD TYPEWRITERS	48.9	20.1
510200	3572005	PORTABLE TYPEWRITERS	20.9	36.6
510200	3572012	SPECIALIZED TYPEWRITERS	27.7	0.0
510200	3572040	PARTS MADE BY COMPLETE MACHINE	13.9	0.0
510200	3572051	PARTS MADE BY OTHER THAN COMPLETE M	1.3	0.0
510200	3572	INDUSTRY UNALLOCATED	0.0	0.0
510200	3572	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
510200	3572098	CONTRACT WORK	0.0	0.0
510200	3572099	MISC RECEIPTS	0.0	0.0

TRADE MARGINS ON INFORMATION GOODS
$ Million (Current)

INPUT IND	SIC OUTPUT IND	NAME OF PRODUCT	WHOLESALE MARGIN	RETAIL MARGIN
510300	3576	SCALES + BALANCES	13.5	12.6
510300	3576014	MOTOR TRUCK + RR TRACK SCALES	1.0	0.0
510300	3576020	INDUSTRIAL SCALES	9.5	0.0
510300	3576019	RETAIL + COMMERCIAL SCALES	2.0	0.0
510300	3576041	HOUSEHOLD BATHROOM SCALES	2.4	11.2
510300	3576045	PERSON-WEIGHING + MISC, MH SCALES	0.3	1.4
510300	3576051	MAILING + PARCEL POST SCALES	0.3	0.0
510300	3576042	ACCESSORIES + ATTACHMENTS	0.2	0.0
510300	3576044	PARTS	0.9	0.0
510300	3576	INDUSTRY UNALLOCATED	0.0	0.0
510300	3576	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
510300	3576098	CONTRACT WORK	0.0	0.0
510300	3576099	MISC RECEIPTS	0.0	0.0
510400	3579	OFFICE MACHINES, NEC	140.4	25.6
510400	3579115	DUPLICATING MACHINES	19.7	4.0
510400	3579127	AUTOGRAPHIC REGISTERS	0.7	0.1
510400	3579129	DICTATING, TRANSCRIBING + RECORDING	20.5	4.6
510400	3579131	CHECK-HANDLING MACHINES	9.8	2.3
510400	3579133	TIME RECORDING + TIME STAMP MACHS	5.2	1.0
510400	3579136	MAIL HANDLING MACHINES	28.1	6.5
510400	3579126	ALL OTHER OFFICE MACHINES NEC	33.1	7.1
510400	35792	PARTS + ATTACHMENTS	23.3	0.0
510400	3579	INDUSTRY UNALLOCATED	0.0	0.0
510400	3579	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
510400	3579098	CONTRACT WORK	0.0	0.0
510400	3579099	MISC RECEIPTS	0.0	0.0
530100	3611	ELECTRIC MEASURING INSTRUMENTS	38.7	30.7
530100	36111	ELECTRICAL INTEGRATING INSTRUMENTS	3.4	3.2
530100	36112	ELECTRICAL TESTING EQUIPMENT	23.2	24.3
530100	36113	OTHER ELECTRICAL MEASURING INST	10.2	1.3
530100	3611001	ELECTRICAL MEASURING INST, NSK	1.9	1.9
530100	3611	UNDISTRIBUTED ELEC, MEAS, INST,	13.8	0.0
530100	3611	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
530100	3611098	CONTRACT WORK	0.0	0.0
530100	3611099	MISC RECEIPTS	0.0	0.0
560100	3651	RADIO AND RECEIVING SETS	621.7	1531.5
560100	3651105	HOME-TYPE RADIO RECEIVERS	33.5	94.4
560100	3651111	HOME-TYPE RADIO-PHONO COMBINATIONS	73.6	211.8
560100	3651117	AUTOMOBILE RADIOS	34.2	36.8
560100	36512	HOUSEHOLD TELEVISION RECEIVERS	356.7	997.6
560100	3651401	MECHANICAL REPRODUCTION PHONOGRAPHS	0.2	0.6
560100	3651402	COIN OPERATED ELECTRONIC PHONOGRAPH	8.0	0.0
560100	3651404	RECORD PLAYERS	2.6	6.4
560100	3651431	HOME-TYPE RECORDERS	27.3	67.4
560100	3651462	HOME-TYPE AUDIO AMPLIFIERS	4.6	11.2
560100	3651090	PHONO'S TUNERS, SPEAKERS, AND MICRO	59.7	76.9
560100	3651467	OTHER HOME-TYPE EQUIPMENT	2.4	6.9
560100	3651435	CHASSIS FOR RADIO + TV RECEIVERS, S	1.4	0.0
560100	3651567	HOME-TYPE ELECTRONIC KITS	4.3	11.0
560100	3651390	COMMERCIAL SOUND EQPT	1.6	0.5
560100	3651097	PHONOGRAPHS, SPEAKERS, MICROPHONES,	7.0	10.0
560100	3651081	RADIO AND TV RECEIVING SETS, ETC, M	4.6	0.0
560100	3651	INDUSTRY UNALLOCATED	10.0	0.0
560100	3651	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
560100	3651098	CONTRACT WORK	0.0	0.0
560100	3651099	MISC RECEIPTS	0.0	0.0

TRADE MARGINS ON INFORMATION GOODS
$ Million (Current)

INPUT IND	SIC OUTPUT IND	NAME OF PRODUCT	WHOLESALE MARGIN	RETAIL MARGIN
560200	3692	PHONOGRAPH RECORDS	[illegible]	111.0
560200	369201	PHONOGRAPH RECORDS, ALLSPECIS	49.6	104.6
560200	369202	PRE-RECORDED TAPES	8.5	19.2
560200	3692091	RECORD BLANKS	1.1	0.0
560200	3692001	PHONOGRAPH RECORDS NSK	5.6	7.2
560200	3692	SUM OF INDUSTRY UNDISTRIBUTED	0.0	-1.5
560200	3692	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
560200	3692098	CONTRACT WORK	0.0	0.0
560200	3692099	MISC RECEIPTS	0.0	0.0
560300	3661	TELEPHONE AND TELEGRAPH APPARATUS	37.7	0.0
560300	36611	TELEPHONE SWITCHING + SWITCHBOARD E	14.1	0.0
560300	3661214	TELEPHONE CARRIER + REPEATER EQPT,	4.0	0.0
560300	3661234	TELEPHONE INSTRUMENT SETS	2.9	0.0
560300	3661261	OTHER TELEPHONE APPARATUS, AND COMP	12.0	0.0
560300	3661271	TELEGRAPH APPARATUS AND EQPT	3.9	0.0
560300	3661281	DATA SETS	0.5	0.0
560300	3661200	OTHER TELEPHONE + TELEGRAPH EQPT, N	0.2	0.0
560300	3661001	TELEPHONE + TELEGRAPH APPARATUS NSK	0.1	0.0
560300	3661	INDUSTRY UNALLOCATED	0.1	0.0
560300	3661	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
560300	3661098	CONTRACT WORK	0.0	0.0
560300	3661099	MISC RECEIPTS	0.0	0.0
560400	3662	RADIO AND TV COMMUNICATIONS EQPT,	127.5	97.8
560400	36621	COMMUNICATIONS EQPT, EXC, BROADCAST	28.0	40.4
560400	36622	RADIO AND TV BROADCAST EQPT	4.9	17.4
560400	36623	INTERCOM EQPT, ALARM AND SIGNAL SYS	3.9	0.0
560400	36624	NAVIGATION AIDS EXC, MISSILE-BORNE	20.6	0.0
560400	36625	ELECTRONIC SEARCH + DETECTION APPAR	27.9	0.0
560400	36626	ELECTRONIC COMMUNICATIONS EQPT NEC	19.2	0.0
560400	36627	SATELLITE-BORNE COMMUNICATIONS EQPT	0.7	0.0
560400	36628	MISSILE- + SPACE VEHICLE-BORNE GUID	14.2	0.0
560400	36629	MICROWAVE AND MOBILE TELEPHONE EQPT	2.8	0.0
560400	3662001	RADIO + TV COMMUNICATIONS EQPT, NSK	3.5	0.0
560400	3662	UNDIST RADIO-TV COMM, EQPT	117.8	22.1
560400	3662	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
560400	3662098	CONTRACT WORK	0.0	0.0
560400	3662099	MISC RECEIPTS	0.0	0.0
570100	3670	ELECTRON TUBES	68.0	37.2
570100	3671	ELECTRON TUBES, RECEIVING TYPE	15.5	30.6
570100	3672	CATHODE RAY PICTURE TUBES	43.6	1.6
570100	3673	ELECTRON TUBES, TRANSMITTING TYPE	20.9	0.0
570100	3670	SUM OF UNDISTRIBUTED ELECTRON TUBES	30.4	0.0
570100	3670	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
570100	3670098	CONTRACT WORK	0.0	0.0
570100	3670099	MISC RECEIPTS	0.0	0.0
570200	3674	SEMICONDUCTORS	39.6	0.0
570200	3674	INDUSTRY UNALLOCATED	12.5	0.0
570200	3674	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
570200	3674098	CONTRACT WORK	0.0	0.0
570200	3674099	MISC RECEIPTS	0.0	0.0

TRADE MARGINS ON INFORMATION GOODS
$ Million (Current)

INPUT IND	SIC OUTPUT IND	NAME OF PRODUCT	WHOLESALE MARGIN	RETAIL MARGIN
570300	3679	ELECTRONIC COMPONENTS, NEC,	153.5	77.8
570300	36792	CAPACITORS FOR ELECTRONIC APPLICATI	15.7	0.0
570300	36793	RESISTORS FOR ELECTRONIC APPLICATIO	15.9	0.0
570300	36794	COILS TRANSFORMAS, REACTORS + CHOKE	15.1	0.0
570300	3679505	MAGNETIC RECORDING MEDIA	6.0	21.6
570300	3679531	PHONO CARTRIDGES AND PICKUPS	0.8	1.0
570300	3679520	COMPLEX ELECTRONIC COMPONENTS	24.0	0.0
570300	3679535	HOME ANTENNAE	2.2	40.6
570300	3679557	AUTO ANTENNAE	0.8	4.4
570300	3679529	EARPHONE AND HEADSETS	0.7	2.4
570300	3679538	ANTENNAE ACCESSORIES	1.6	0.5
570300	3679599	ALL OTHER ELECTRONIC COMPONENTS + A	62.1	0.0
570300	3679547	PHONO NEEDLES AND CUTTING STYLI	0.6	7.3
570300	3679001	ELECTRONIC COMPONENTS NSK	8.2	0.0
570300	3679	SUM OF UNDISTRIBUTED ELECTRONIC COM	142.4	0.5
570300	3679	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
570300	3679098	CONTRACT WORK	0.0	0.0
570300	3679099	MISC RECEIPTS	0.0	0.0
580300	3693	X-RAY APPARATUS + TUBES	69.0	0.0
580300	36931	X-RAY, DIAGNOSTIC, + THERAPUTIC ELE	62.6	0.0
580300	3693049	X-RAY TUBES AND VALVES, SOLD SEPARA	6.4	0.0
580300	3693	INDUSTRY UNALLOCATED	0.3	0.0
580300	3693	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
580300	3693098	CONTRACT WORK	0.0	0.0
580300	3693099	MISC RECEIPTS	0.0	0.0
620100	3811	ENGINEERING + SCIETIFIC INSTRUM	83.5	0.0
620100	38111	AIRCRAFT, NAUTICAL INSTRUMENTS	45.4	0.0
620100	3811237	LABORATORY + SCIENTIFIC INSTRUMENTS	21.6	0.0
620100	3811301	SURVEYING + DRAFTING INSTRUMENTS	3.7	0.0
620100	3811302	LABORATORY FURNITURE	1.5	0.0
620100	3811300	SURVEYING + DRAFT INS, + FURNITURE	0.4	0.0
620100	3811999	ENGINEERING + SCIENTIFIC INS, NSK	4.9	0.0
620100	3811	SUM OF UNDISTRIBUTED	32.1	0.0
620100	3811	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
620100	3811098	CONTRACT WORK	0.0	0.0
620100	3811099	MISC RECEIPTS	0.0	0.0
620200	3821	MECHANICAL MEASURING DEVICES	103.5	11.6
620200	38211	AIRCRAFT ENGINE INSTRUMENTS	8.8	0.0
620200	3821211	GAS METERS	4.4	0.0
620200	3821231	WATER METERS	5.3	0.0
620200	3821241	GASOLINE DISPENSING METERS	1.7	0.0
620200	3821298	OTHER NONELECTRICAL INTEG. METERS	1.6	0.0
620200	3821200	INTEGRATING METERS, NSK	0.9	0.0
620200	3821001	TEMPERATURE INSTRUMENTS	8.6	0.0
620200	3821002	PRESSURE, DRAFT, + VACUUM INSTR	8.7	0.0
620200	3821003	FLOW AND LIQUID LEVEL INSTRU,	7.8	0.0
620200	3821316	HUMIDITY INSTRUMENTS	0.5	0.0
620200	3821004	CONTINUOUS PROCESS GAS + LIQUID	3.0	0.0
620200	3821005	PHYSICAL PROPERTIES TESTING EQUIP	4.8	0.0
620200	3821006	ALL OTHER INDUS, TEST EQUIP+	21.3	0.0
620200	3821333	HOUSEHOLD THERMOMETERS	1.0	0.4
620200	3821332	HOUSEHOLD BAROMETERS	0.3	1.7
620200	3821334	CLINICAL THERMOMETERS	0.7	3.2
620200	38214	MOTOR VEHICLE INSTRUMENTS	5.5	0.0
620200	3821007	NUCLEAR RADIATION DET, INSTRU,	8.5	0.0
620200	3821008	MECH, MEASURING INSTRU,	6.2	0.0
620200	3821999	MECH, MEA, DEVICES, NSK	3.5	0.3
620200	3821	UNDISTRIBUTED	42.4	0.0
620200	3821	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
620200	3821098	CONTRACT WORK	0.0	0.0
620200	3821099	MISC RECEIPTS	0.0	0.0

TRADE MARGINS ON INFORMATION GOODS
$ Million (Current)

INPUT IND	SIC OUTPUT IND	NAME OF PRODUCT	WHOLESALE MARGIN	RETAIL MARGIN
620300	3822	AUTOMATIC TEMPERATURE CONTROLS,	39.4	0.0
620300	3822	INDUSTRY UNALLOCATED	0.5	0.0
620300	3822	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
620300	3822098	CONTRACT WORK	0.0	0.0
620300	3822099	MISC RECEIPTS	0.0	0.0
620701	3871	WATCHES + CLOCKS, TOTAL	92.0	407.0
620701	3871101	HOUSEHOLD ELECTRIC CLOCKS	5.6	46.0
620701	3871119	COMMERCIAL ELECTRIC CLOCKS	0.4	0.0
620701	3871112	SPRING WOUND + WEIGHT OPERATED	3.5	28.1
620701	3871129	BATTERY POWERED CLOCKS	1.6	13.0
620701	3871102	OTHER CLOCKS + TIMERS	4.4	3.0
620701	3871103	CLOCK MOVEMENTS + TIMING MECHS,	18.1	0.0
620701	3871100	CLOCKS, N.S.K.	0.7	0.0
620701	3871[illegible]	WATCHES WITH IMPORTED MOVEMENTS	23.4	191.0
620701	3871501	JEWELED LEVER ESCAPEMENT TYPE	7.2	59.5
620701	3871502	OTHER WATCHES + CLOCK + WATCH PARTS +	12.3	69.4
620701	3871503	CLOCK + WATCH PARTS + MOVEMENTS	10.8	0.0
620701	38719	SUM OF UNDISTRIBUTED PARTS	0.0	0.0
620701	3871[illegible]	WATCHES + PARTS NSK	0.1	0.0
620701	3871999	WATCHES + CLOCKS, N.S.K.	3.9	0.0
620701	3871	SUM OF UNDISTRIBUTED	24.1	0.0
620701	3871	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
620701	3871098	CONTRACT WORK	0.0	0.0
620701	3871099	MISC RECEIPTS	0.0	0.0
630100	3811	OPTICAL INSTRUMENTS + LENSES	67.9	51.5
630100	3831131	FIELD GLASSES + TELESCOPES	4.7	23.8
630100	3831153	MICROSCOPES	6.7	26.4
630100	3831174	OPTICAL + RELATED SPECTROMETERS	11.6	4.8
630100	3831172	ALL OTHER OPTICAL INSTRUMENTS	19.4	2.5
630100	383118	LABORATORY ANALYSIS APPARATUS	9.9	4.0
630100	3831198	LENSES COMPONENTS + PARTS	9.2	0.0
630100	3831001	OPTICAL INSTRUMENTS + LENSES, N.S.K	6.4	0.0
630100	3831	SUM OF UNDISTRIBUTED	16.1	0.0
630100	3831	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
630100	3831098	CONTRACT WORK	0.0	0.0
630100	3831099	MISC RECEIPTS	0.0	0.0
630300	3861	PHOTOGRAPHIC EQUIP. + SUPPLIES	592.9	399.6
630300	386111	STILL HAND TYPE CAMERAS	27.0	67.9
630300	386112	PROCESS + OTHER STILL CAMERAS	14.0	7.1
630300	3861146	FLASH UNIT EX. STUDIO + BUILT-IN	1.4	2.4
630300	3861145	FLASH UNITS, STUDIO TYPE	0.1	0.1
630300	3861110	EXPOSURE METERS, EX. BUILT-IN	0.7	0.8
630300	3861163	SLIDE PROJECTORS	7.8	14.2
630300	3861147	OTHER STILL PROJECTORS	5.8	4.8
630300	3861178	STILL COMMERCIAL EQUIP. + ENLARGERS	18.7	13.1
630300	3861179	OTHER STILL PICTURE ACCESSORIES	22.5	12.4
630300	38612	PHOTOCOPYING EQUIPMENT	121.6	69.2
630300	3861316	8MM CAMERAS + PROJECTORS	20.4	39.0
630300	3861307	16MM CAMERAS	2.2	3.6
630300	3861326	16MM SOUND PROJECTORS	5.8	2.8
630300	3861324	16MM SILENT PROJECTORS	0.2	0.3
630300	3861192	PROJECTION SCREENS	3.0	3.0
630300	3861374	PARTS + ATTACHMENTS FOR 8 + 16MM	4.5	2.4
630300	3861301	PROCESSING EQUIP, MOTION PICTURE	4.9	2.9
630300	3861383	35MM CAMERAS + PROJECTORS	1.5	0.7
630300	3861398	ALL OTHER 35MM + LARGER EQUIP	1.9	0.4
630300	3861300	MOTION PICTURE EQUIP., N.S.K.	0.3	0.2
630300	3861[illegible]	MICROFILMING, BLUEPRINTING, ETC. E	10.5	4.7
630300	3861541	MEDICAL X-RAY FILM	32.2	0.0

TRADE MARGINS ON INFORMATION GOODS
$ Million (Current)

INPUT IND	SIC OUTPUT IND	NAME OF PRODUCT	WHOLESALE MARGIN	RETAIL MARGIN
630300	3861543	DENTAL X-RAYS	1.8	0.0
630300	3861545	INDUSTRIAL X-RAY FILM	4.6	0.0
630300	3861555	SHEET + PACK FILM	13.7	22.8
630300	3861598	OTHER FILM EXC. SHEET + PACK	138.1	144.8
630300	3861585	GRAPHIC ARTS FILM	23.4	0.0
630300	3861586	PHOTOGRAPHIC PHOTO PLATES + SUPPLES	1.5	0.0
630300	3861614	SILVER HALIDE ROLL + LINE REPROD. P	37.2	0.0
630300	3861624	SILVER HALIDE RECORDING + PHOTOCOPY	0.7	0.0
630300	3861718	BLUEPRINTING + AMMONIAPRINTING TYPE	1.0	0.0
630300	3861714	DIAZO TYPE PAPER + CLOTH	11.9	0.0
630300	3861739	OTHER TYPES	1.3	0.0
630300	3861700	SENSITIZED PAPER + CLOTH EX. SILK M	0.9	0.0
630300	3861811	PREPARED PHOTOGRAPHIC CHEMICALS	29.9	0.0
630300	3861001	PHOTO. EQUIP. + SUPPLIES, N.S.K.	20.3	0.0
630300	3861	UNDIST. PHOT EQUIP + SUPPLIES	178.4	0.0
630300	3861	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
630300	3861098	CONTRACT WORK	0.0	0.0
630300	3861099	MISC RECEIPTS	0.0	0.0
640501	3951	PENS + MECHANICAL PENCILS	41.1	117.5
640501	3951007	FOUNTAIN PENS	4.0	10.4
640501	3951019	BALL POINT PENS	21.0	73.4
640501	3951028	SOFT-TIP PENS	3.2	11.7
640501	3951041	DESK PEN SETS	0.4	1.9
640501	3951054	MECHANICAL PENCILS	3.4	12.1
640501	3951071	REFILL CARTRIDGES FOR BALL POINT PE	2.6	8.0
640501	3951063	MISC. PEN + MECHANICAL PENCIL PARTS	5.0	0.0
640501	3951001	PENS + MECHANICAL PENCILS, N.S.K.	1.0	0.0
640501	3951	INDUSTRY UNALLOCATED	0.9	0.0
640501	3951	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
640501	3951098	CONTRACT WORK	0.0	0.0
640501	3951099	MISC RECEIPTS	0.0	0.0
640502	3952	LEAD PENCILS + ART GOODS	20.9	42.7
640502	3952216	LEAD PENCILS	1.2	3.9
640502	3952123	PENCIL LEADS	1.3	4.6
640502	3952153	CRAYONS INCL. CHALK	4.6	12.5
640502	3952211	ARTISTS MATERIALS	13.8	23.7
640502	3952	INDUSTRY UNALLOCATED	7.8	0.0
640502	3952	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
640502	3952098	CONTRACT WORK	0.0	0.0
640502	3952099	MISC RECEIPTS	0.0	0.0
640503	3953	MARKING DEVICES	0.7	0.0
640503	3953	INDUSTRY UNALLOCATED	0.0	0.0
640503	3953	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
640503	3953098	CONTRACT WORK	0.0	0.0
640503	3953099	MISC RECEIPTS	0.0	0.0
640504	3955	CARBON PAPER + INKED RIBBONS	17.0	9.3
640504	3955011	INKED RIBBONS EX COMPUTER	3.9	9.3
640504	3955033	COATED CARBON PAPER	13.1	0.0
640504	3955	INDUSTRY UNALLOCATED	1.4	0.0
640504	3955	CONTRACT WORK + MISC RECEIPTS	0.0	0.0
640504	3955098	CONTRACT WORK	0.0	0.0
640504	3955099	MISC RECEIPTS	0.0	0.0

I-O INDUSTRY #70: FINANCE AND INSURANCE

The Finance and Insurance industry includes several major subindustries: banking, credit agencies, security and commodity brokers, insurance carriers, and insurance agents. Components of these industries are informational in nature, others are not.

The financial industries are fundamentally organized around intermediation -- the brokerage of money and financial assets. Money itself is nothing more than a symbolic store of value, carrying information as to the holder's claim on assets. When money is deposited in a time (saving) or demand (checking) account, it completely loses its sense of being a "commodity," and instead assumes the form of pure information: it is converted into information, stored in computer-driven data banks. Money in this form is exchanged between banks over a telecommunications network, where only information flows between the vendors of financial services.

The business of finance provides many informational services: some earn an explicit income, and others are not explicitly charged. For example, a bank may provide the following explicitly charged services:

Transactions charges on demand deposit
Transactions charges on money orders
Transactions charges on trust accounts
Transactions charges on travelers' checks
Transactions charges on funds transfers.

In addition, there are a variety of informational services which are not explicitly charged, but rather are paid out of the net interest income, for example:

Analysis of borrowers' risk
Analysis of investment portfolio
Analysis of foreign exchange rates
Analysis of macroeconomic development
Internal management and bookkeeping
Legal, political, and promotional activities
Transactions with the Federal Reserve

The Banking industry's output is defined as the sum of net interest plus service charges. I shall show that the entire output just equals the expenses of producing, processing, and transmitting financial information. About 81% of the industry output is used in providing information services, and 19% represents the cost of capital.

The Insurance industry can be conceptualized in comparable terms. The Insurance industry performs three functions: (i) a diagnostic, analytic activity in its underwriting and investment activities; (ii) a processing function in its actuarial and record-keeping activities; and (iii) a risk-pooling function derived from the phenomenon that individuals are risk averse. In this third case, the insurance firm sells a commodity called "certainty" to risk-averse individuals. The customer buys a measure of utility, or benefit, derived from the foreknowledge that should any contractually specified undesirable event occur, the customer (or victim) will be compensated by the insurance firm. The individual makes a judgment regarding the size of the damage, or disutility, that would result if a certain undesirable event should occur, and maps that judgment through some private probability estimate onto a dollar scale. The price of the insurance, or "security," should just equal, at the margin, the disutility of the event's occurrence. The contract covering the individual against a sequence of contingencies is a commodity called "certainty," and its behavior in a market context is similar to any other commodity. The buyer and seller are free to specify how large a bundle is to be transacted (i.e., how many different contingencies are included), and make a determination as to the bundle's worth. Equating the utility of owning the commodity, "certainty" with its price is the customer's problem; and equating the expected value of payout with the price is the seller's problem.

The firm, in order to sell its commodity, must engage in a large amount of diagnostic, analytical, and actuarial work. As will be shown below, around 83% of the Insurance industry's costs originate with such informational activities. The remaining 17% of the industry's costs are attributable to maintenance of the capital account. Again, total informational costs completely explain total income.

The brokerage industries, where the agents do not carry risk in the same sense as an insurance firm, are seen as "search" industries. Their market opportunity arises from the condition of market uncertainty regarding the price of stocks, bonds, and commodities -- coupled with the fact that information costs are positive and are subject to a budget constrain on the individual's time. Since acquiring information is costly, and not acquiring information is also costly, if the search specialist can economize on search costs, he can induce consumers to buy search activities from him rather than engage in those activities on an individual basis. Thus, both the cause of the market's existence and the industry's output is informational in nature. The only component which is not informational is the occasional capital gain (or loss) incurred when brokers buy and sell on their own account. As we shall show below, around 76% of the stock and commodity broker's income is generated by the search function, while 24% is generated by appreciation on the brokerage house's inventory of assets.

Occupational Structure of Finance Industries

Another way of estimating the informational share of the Finance and Insurance industries is by examining the occupational structure -- asking who is doing what, for how much money.

In 1967, the Finance and Insurance industry paid $18,988 million in employee compensation; $18,505 million was paid to information workers and $483 million was paid to non-information workers. The wage bill can be divided into 422 occupations (by using the Industry by Occupation wage matrix). Table 4 summarizes the largest occupational groups:

TABLE 4: BREAKDOWN OF EMPLOYEE COMPENSATION IN FINANCE & INSURANCE

	EMPLOYEE COMPENSATION ($ Millions, 1967)
Providing a transaction service	5,833
Insurance agents	3,484
Stock and bond brokers	1,150
Bank tellers	1,199
Internal information processing	5,329
Accountants	390
Secretaries	1,273
Typists	546
Bookkeepers	701
Statistical clerks	241
Miscellaneous clerical	635
Other clerical & machine operators	1,543
Analysis and diagnosis	7,343
Bank managers	3,556
Other managers	1,360
Estimators and investigators	292
Insurance adjustors	734
Other	1,401
Non-Information	483
Janitors and cleaners	147
Guards and watchmen	62
All others	274

Source: Industry by Occupation wage matrix, computed from BLS Industry by Occupation matrix, Census data, BLS data and unpublished data. See Appendix 7.

Table 4 shows that almost all the employee compensation was paid to information workers. This result supports the idea that finance and insurance primarily provide information services.

In 1967, around 84.07% of the Finance and Insurance industry was allocated to information services.

	OUTPUT	FINAL DEMAND	VALUE ADDED
TOTAL INDUSTRY	45,939	25,818	26,899
INFORMATION	38,620	21,079	26,031
NON-INFORMATION	13,241	4,739	868
INFO % GNP		2.65	3.27

Detailed Industry Reports

700100 Banking

SIC 60 Banking

This major group comprises institutions which are engaged in deposit banking and closely related functions, including fiduciary activities.

Major Group SIC 60 consists of the Federal Reserve banks, commercial and stock savings banks, mutual savings banks, trust companies not engaged in deposit banking, and establishments performing functions closely related to banking. The industry as a whole had a $14.4 billion output, with sales to final demand of $8.5 billion, or 1.07% of GNP. The entire output of the Banking industry is allocated to information services as will be shown by a detailed andlysis of the Banking industry's costs.

Banking and finance income can be conceptually separated into two sources: (i) income generated by the analytical, diagnostic, and managerial activities related to credit and money management; and (ii) income generated by the routine or clerical processing activities attendant to the various financial services performed by banks. Each of these incomes can be associated with specific costs incurred by banks: hiring managers and clerks, renting computers, leasing communications lines and building office space, and so on. We shall account, as accurately as possible, how the costs and revenues are related.

National Income Accounts Concepts

The National Income Accounts define the Banking industry's output as the sum of two items: (i) charges levied for explicit services performed by the bank, such as checking

account charges, money order charges, and so on; and (ii) an "imputed service charge" for financial services performed for the customer as "services furnished without payment by financial intermediaries." This convention is explained in Readings and Methods of National Income Statistics, U.S. Department of Commerce, pp. 79-83.

Banks are conceived as paying to their customers an "imputed interest" on checking account deposits plus an imputed interest higher than the nominal rate of interest on time deposits. That is, the banks are imputed to "pay out" to consumers much more in interest payments than is actually paid on passbook accounts. However, banks are also conceived as receiving from customers an "imputed service charge" for a variety of services performed without an explicit charge. In the accounts, these two payments exactly cancel out.

Unraveling the Accounts

According to the NIA, the banking industry's output was composed of the following components:

TABLE 5: OUTPUT OF THE BANKING INDUSTRY

($ Millions, 1967)

	BUSINESSES	PERSONAL CONSUMPTION	TOTAL
Explicit service charge	1,043.0	1,585.2	2,628.2
Imputed service charge	4,927.8	6,799.1	11,726.9
TOTAL	5,970.8	8,384.3	14,355.1

In order to determine whether the bank's output can be allocated to information, a detailed analysis of the Banking industry's operating expenses was performed. As we shall show next, the entire output can be allocated to various types of informational activities.

The data given the FDIC Annual Report on the income of all insured commercial banks can be unraveled to reveal the sources of income and expenses that are directly related to information services. We shall look at the industry's operating income (explicit plus implicit service charged) and expenses in a manner that is consistent with the National Income concepts.

(i) Explicit Service Charges

Table 6 shows a breakdown of the Banking industry's explicit service charges for informational-type services.

TABLE 6: EXPLICIT SERVICE CHARGES

	($ Millions, 1967)
TOTAL	2,628.2
Trust department income	820.2
Service charges on deposit accounts	987.2
Collections, commissions, fees	411.0
Other operating income	409.8

"Trust department income" is earned on the analytical and managerial activities of the trust department. The activities include money management, investment counseling, some transfers and interbank transactions, and so on. The trust department is seen as a purely informational service.

"Service charges on deposit accounts" are the explicit charges on checking accounts, including a flat monthly fee plus a variable cost. The service provided is pure information processing. We shall shortly be looking more closely at the cost of providing demand deposit services.

"Other service charges, collection and exchange charges, commissions, and fees" cover a variety of financial services which are explicitly charged by the banks. They all involve some information processing (e.g., "points" paid in closing a home mortgage) to some degree, although the cost of providing the service and the price may have little resemblance in a noncompetitive setting.

Lastly, "other operating income" includes a variety of miscellaneous items, such as income from foreign branches, revaluation adjustments, gross rentals, and so on. Inquiries to the FDIC revealed that the exact composition is not known, but that the majority of the income originates with foreign bank operations. Since the domestic banking industry is considered informational, we allocated this item (retrospectively to the information accounts.

The entire $2.6 billion shown in Table 6 can hence be allocated as a source of income from explicit informational services. In the next section, we shall unravel the cost components of providing the "imputed" or implicit service charges, and show that they can also be explained as informational processes.

(ii) Implicit Service Charges

According to National Income concepts and definitions, the following identities hold:

Implicit service charge = net interest = expenses

In 1967, the net interest component of the operating income amounted to $11.5 billion as shown in Table 7. As we shall show, the entire amount is explained by the industry's operating expenses for information labor and capital.

TABLE 7: COMPONENTS OF NET INTEREST

	($ Millions, 1967)	
NET INTEREST		11,507.0
Income interest	19,153.4	
On fees and loans	14,646.6	
On U.S. Treasury securities	2,601.9	
On other securities	1,904.9	
LESS		
Interest Paid Out	7,646.4	
On deposits	7,379.9	
On other borrowed money	266.5	

A bank, viewed as a firm, purchases various inputs to a multiple-output production function. This view was adopted in a Federal Research Board of Boston staff paper produced by Bell and Murphy.* A bank is seen as a factory which purchases information machines (computers and calculators), buys information services from other firms (leases telecommunications lines, terminals), hires production workers (clerks, tellers, machine operators), and produces a variety of financial services. For example, Bell and Murphy state,

> "The servicing of demand deposit accounts is a distinct 'production line operation.' Associated with this function are the receiving and processing of checks, involving sorting, tabulating and many other detailed operations. Tellers, bookkeeping machine operators, and many kinds of equipment are employed to produce a demand deposit account."

Their analysis of over 20 commercial banks shows the following cost breakdowns on the many services provided by financial intermediaries:

*F.W. Bell and N.B. Murphy, "Economies of Scale in Commercial Banking", Federal Reserve Bank of Boston, 1967.

TABLE 8: FUNCTIONAL COST AND EMPLOYMENT FOR THE TYPICAL COMMERCIAL BANK

FUNCTION	PERCENT OF TOTAL COST	PERCENT OF TOTAL EMPLOYEES
Explicit Services		
Demand deposits	33.7	51.1
Time deposits	6.2	6.6
Safe deposits	1.3	1.7
Analysis & Diagnosis		
Managing real estate loans	4.2	3.8
Managing installment loans	12.8	13.1
Managing business loans	6.8	6.6
Managing securities	1.3	0.8
Trust department	5.3	5.4
Business development	4.2	1.9
Administration (overhead)	10.5	---[a]
Other		
Occupancy and maintenance	13.7	9.0[a]

[a]Occupancy and administration combined.

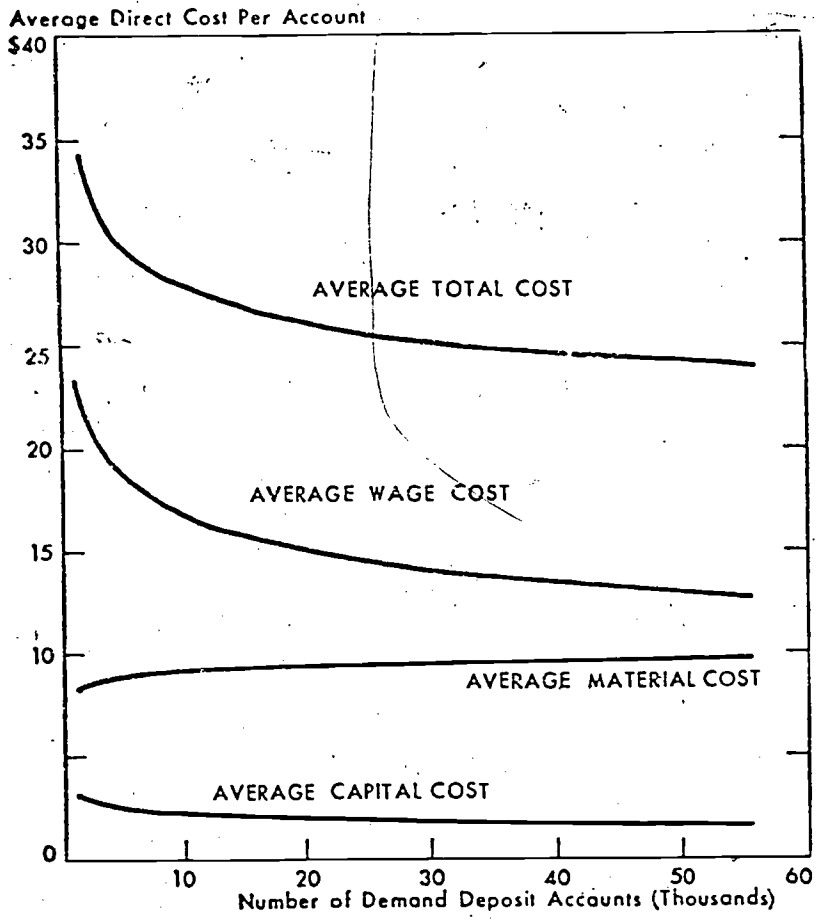
Source: Bell and Murphy, op. cit.

Since demand deposits consume over 33% of total cost and over 51% of all employees, that one service is analyzed in detail. The average annual cost of servicing a demand deposit account for a typical small bank (1000 accounts) was $35.05. The same account at a large bank (50,000 accounts) cost the typical bank $24.26, holding other variables constant, such as level of account activity and the proportion of checking accounts to total accounts. A further breakdown of costs is displayed in Figure 1.

Over a wide range of bank sizes, a demand deposit account cost a bank around $25 to maintain. If the bank performed no other services, it would have to cover the transaction costs with an explicit service charge. Obviously this accounting identity does not always hold. Many services are performed at no explicit charge, such as time deposit accounts. Often, banks offer "free" checking services to their customers as promotional loss leaders. A bank engages in a large amount of internal cross subsidy between services which are charged explicitly and those which are not; and the line between explicit and imputed service charges is not distinct.

FIGURE 1:

RELATION BETWEEN AVERAGE WAGE, CAPITAL AND MATERIAL COST, WITH THE NUMBER OF DEMAND DEPOSIT ACCOUNTS, ANNUAL BASIS, 1965



Source: Bell and Murphy, op. cit.

The 1967 cost experience of the Banking industry is shown in Table 9. The $11.5 billion earned in net income is used in operating expenses ($8.9 billion) and maintaining the capital account ($2.6 billion).

TABLE 9: OPERATING EXPENSES OF FDIC BANKS

	($ Millions, 1967)
Salaries and wages of offices and employees	4,537.9
Pensions and other employee benefits	667.3
Furniture & equipment, depreciation, rental costs, servicing, etc.	533.9
Occupancy expense of bank premises, net	873.5
Other operating expenses	2,294.7
SUB-TOTAL	8,907.3
Capital account expenses (see text)	2,599.7
Statistical adjustment	220.0
TOTAL OPERATING EXPENSES	11,727.0

Source: FDIC Annual Report, 1969, p. 276, and BEA Input-Output Worktape

As shown earlier, more than 97% of the employee compensation went to information workers, hence this entire item is allocated to information services of either an analytic or processing type. We can only guess at the exact breakdown of activities performed by these workers; but we can generally state that the entire wage bill was consumed in some sort of an informational service and that it was not explicitly charged.

The next line item, "Net occupancy expense of bank premise" includes the rental charges for the office space necessary to conduct the banking activity -- counters, tellers' stations, desks, computer facilities, files, and so on. This also includes some rental expenses on the bank vaults and safety deposit boxes; to the extent that these items serve only as warehouse space, a bank's rentals cannot be entirely allocated to informational uses. However, even if vaults consume 10% of a bank's rental space, the impact on the total allocation of the bank's output to information would only be .00638 -- a trivial amount.

The next item, "Furniture and equipment, depreciation, rental cost, and servicing," covers all the equipment necessary to support the bank's information processing activities -- facsimile machines, terminals, filing cabinets, typewriters, calculators, teletype machines, and so on. The entire cost has been allocated to informational uses.

The last item, "Other expenses," covers fees to directors, office supplies, telephone and telegraph expense, data processing services purchased from time-sharing companies, and so on. These activities are all allocated to informational uses, and together exhaust the expenses incurred by banks in the provision of both routine and analytic information services.

The Capital Account

The net interest less operating expenses leaves an "accounting excess" of $2,599.8 million which is as yet unexplained. This entire sum represents the cost of maintaining the capital account, which is the sine qua non of operating a bank.

The cost of capital is measurable in several ways. First, we look at the dividends paid out on capital holding (stock) to individuals as a measure of the income stream.

In 1967, the capital account of all commercial banks in the United States was $32,876 billion. The account includes all capital notes and debentures, preferred stock, common stock, surplus, undivided profits, and reserves. The "cost of capital" can be computed in several ways. First, we can compute an imputed interest rate of capital as the ratio of the accounting "excess" to the total capital account. This ratio is 7.91%; immediately, we see that the $2.6 billion in income not explained by direct information costs represents a payment on the capital account at approximately an 8% nominal interest rate. The disbursement of the "interest" took the form of dividends paid out to individuals (about $1,426 million), taxes paid to governments (about $1,177 million) and undivided profits.

Another way of looking at the capital account is to augment it by including nonfinancial capital assets such as buildings, furniture, fixtures, real estate, and information machines. After adjustment, the capital account becomes $45,040 million, and the new imputed nominal interest rate on capital is 5.7%.

The market rate of interest in 1967 ranged from 3.5% for high-grade municipals to 6.9% for FHA new mortgage loans. These were the high and low rates experienced in 1967; the unweighted median rate was approximately 5.5%. The imputed nominal market rate of interest on capital (adjusted) was 5.7% -- which almost exactly matches the unweighted median market rate of interest. Hence, we can conclude that the accounting "excess" was in fact payment on the capital account.

The accounting identity now reads as follows:

$$\text{proration} = \frac{S^i + o^i + P_k}{Y} = 1.0$$

where, S^i: explicit charges for information services

o^i: informational operating expenses

P_k: cost of the capital account, $r(K_t)$ where r is approximately 5.7% and K_t is the adjusted capital account

Y: NIA concept of output = service charges and net interest.

Table 10 summarizes three ways of looking at the Banking industry's accounts. Column 1 shows the National Income method; Column 2 shows the FDIC accounts; and Column 3 shows the allocation of costs and revenues to information.

TABLE 10: SUMMARY OF BANKING INDUSTRY ACCOUNTS

($ Millions, 1967)

	NATIONAL INCOME ACCOUNTS	FDIC	INFORMATION
S^i = Explicit Service Charges	2,628	2,628	2,628
Imputed Service Charges ("services furnished without payment by intermediaries")	11,727	---	---
Net Interest	---	11,507	---
o^i = Operating Expenses Incurred in Providing Information Services	---	---	8,907
P_k = Expenses of Maintaining the Capital Account (estimated)	---	---	2,600
Statistical Correction	---	220	220
Y = TOTAL	14,355	14,355	14,355

Comparisons Across Time

The accounting scheme developed above was checked across FDIC banks over a 22-year time period. To simplify the exercise somewhat, I chose a proration which omitted the capital account. The actual figures checked were:

$$r = \frac{\text{Informational service charge + Informational expenses}}{\text{Explicit service charges + Net interest}}$$

The ratio was extremely stable both across different types of banks and over time. Table 11 shows comparisons of FDIC member banks between 1947 and 1969.

TABLE 11: MEMBER BANKS OF THE FDIC ACROSS TIME

	($ Millions, 1967)		
	1947	1967	1969
A. INDUSTRY OUTPUT	2,796.7	14,135.3	19,277.3
Explicit Service Charge	574.9	2,628.2	3,521.7
Net Interest	2,221.8	11,507.1	15,755.6
B. INFORMATION COMPONENT	2,152.3	11,535.5	15,547.9
Explicit Service Charge	574.9	2,628.2	3,521.7
Informational Expenses	1,577.3	8,907.3	12,026.2
PROBATION (B/A)	.7696	.8161	.8065

The ratios varied from 77% to 82%, with the balance presumably made up by the capital account.

Comparisons Across Banks

Since the Banking industry contains banks other than members of FDIC, I checked the member banks of the Federal Reserve Board. The results of the proration are given in Table 12. The results are stable over time, and are almost identical to the FDIC group.

TABLE 12: MEMBER BANKS OF THE FEDERAL RESERVE SYSTEM ACROSS TIME

($ Millions, 1967)

	1927	1937	1957	1967
A. INDUSTRY OUTPUT	1,300	1,140	5,840	13,711
Explicit Service Charge	301	288	1,052	2,539
Net Interest	999	852	4,788	11,172
B. INFORMATION COMPONENT	994	923	4,347	11,188
Explicit Service Charge	301	288	1,052	2,539
Informational Expenses	693	635	3,295	8,649
PRORATION (B/A)	.7646	.8097	.7443	.8160

Source: Based on the Federal Reserve Board Annual Reports

There seems to be no trend to increase the informational component of the bank's operation in the aggregate. However, there has been a significant reallocation of expenses between the informational categories: banks have adopted computer-intensive techniques, machines, and labor. Hence the share of output allocated to computer-related activities has increased rapidly relative to other types of services. However, the long-run industry pattern has been to allocate between 75-85% of output to information processing activities regardless of technology, and that ratio seems quite stable.

TO INDUSTRY 700100: BANKING
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	ROW	OUTPUT	INTERM	PCE	GCE	INV	EXPORT	FED	STATE	FIN DEM
700110	BANKING	0.000	1e355.1	1e355.1	.	.	.	.	.	.	0.0
700100	CONTROL TOTAL	0.013	9872.8	9868.3	.	.	.	69.9	34.6	.	104.5
700101	BANKING EXPLICIT SERVICE CHARGE	0.197	1585.2	0.0	1585.2	.	.	.	.	.	1585.2
700102	IMPLIED SERVICE CHARGES	0.858	6791.1	0.0	6779.1	.	.	.	.	.	6799.1
7001	INDUSTRY UNALLOCATED	0.010	99.6	99.6	.	.	.	.	.	.	0.0
	TOTAL FINAL DEMAND				8364.3	0.0	0.0	69.9	34.6	0.0	8468.8
	ALLOCATED TO INFORMATION										8468.8

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	5875.0
NET INTEREST	-1268.0
INDIRECT BUSINESS TAXES	373.6
BUSINESS TRANSFER PAYMENTS	159.0
CAPITAL CONSUMPTION ALLOWANCES	589.0
PROFIT TYPE INCOME	6001.9
TOTAL VALUE ADDED	11730.5
ALLOCATED TO INFORMATION	11730.5

* * * *

700200 Credit Agencies

SIC 61 CREDIT AGENCIES OTHER THAN BANKS

> This major group comprises establishments engaged in extending credit in the form of loans but not engaged in deposit banking.

The Credit Agency industry is composed of the following:

SIC 611	Rediscount and financing institutions for credit agencies other than banks
SIC 612	Savings and loan associations
SIC 613	Agricultural credit institutions
SIC 614	Personal credit institutions
SIC 615	Business credit institutions
SIC 616	Loan correspondents and brokers

In 1967, the Credit Agency industry had an output of $2.6 billion, with sales to final demand of $2.3 billion, or some .3% of GNP. The analytic and diagnostic functions -- determining who is a good credit risk and who is not -- qualifies as an informational activity. The clerical and processing activity -- mailing and receiving monthly mortgage payments, handling savings accounts transactions, processing statements -- also qualify as informational activities.

The accounting scheme used by the NIA for the Banking industry is reflected in the treatment of the Credit Agency industry. Similarly, the scheme used previously in determining the Banking industry's informational content is also carried through the Credit Agency industry. In lieu of detailed industry data, not readily available since the industry is not as tightly regulated as the Banking industry (i.e., there is no equivalent to the FDIC as a data source), we have imputed that the Credit Agency's informational proration is the same as the Banking industry's -- 100%. This number could be verified with considerable effort, but as a source of error it is trivial since the entire industry only accounts for .24% of final demand.

IO INDUSTRY 700200: CREDIT AGENCIES
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	%GNP	OUTPUT	INTERM	PCE	GPF	INV	EXPORT	FED	STATE	FIN DEM
700200	CRED AGENCIES	0.295	2590.7	246.5	2350.0	.	.	.	-5.8	.	2344.2
7002	INDUSTRY UNALLOCATED	0.000	5.8	5.8	.	.	.	.	.	.	0.0
	TOTAL FINAL DEMAND				2350.0	0.0	0.0	0.0	-5.8	0.0	2344.2
	ALLOCATED TO INFORMATION										2344.2

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	2581.0
NET INTEREST	-5565.2
INDIRECT BUSINESS TAXES	73.2
BUSINESS TRANSFER PAYMENTS	65.0
CAPITAL CONSUMPTION ALLOWANCES	359.1
PROFIT TYPE INCOME	1697.2
TOTAL VALUE ADDED	-789.7
ALLOCATED TO INFORMATION	-789.7

*   *   *   *

700300 Security and Commodity Brokers

SIC 6211 Security Brokers, Dealers, and Flotation Companies

Establishments primarily engaged in the purchase, sale, and brokerage of securities; and those, generally known as investment bankers, primarily engaged in originating, underwriting, and distributing issues of securities.

- Bond dealers and brokers
- Distributors, security
- Floor traders, security
- Investment bankers
- Investment certificates, sale of
- Investment firm—general brokerage
- Managers or agents for mutual funds
- Mineral leases, dealers in
- Mineral royalties, dealers in
- Mortgages, buying and selling (rediscounting)
- Mutual funds, selling by independent salesmen
- Note brokers
- Oil and gas lease brokers
- Oil royalties, dealers in
- Sale of partnership shares in real estate syndicates
- Security brokers
- Security dealers
- Security flotation companies
- Security traders
- Security underwriters
- Stock brokers and dealers
- Tax certificate dealers

SIC 6221 Commodity Contracts Brokers and Dealers

Establishments primarily engaged in buying and selling commodity contracts on either a spot or future basis for their own account or for the account of others. These establishments are members, or are associated with members, of recognized commodity exchanges.

- Commodity brokers (contracts)
- Commodity dealers (contracts)
- Floor traders, commodity contract
- Futures, commodity brokers and dealers
- Traders, commodity contract

SIC 6231 Security and Commodity Exchanges

Establishments primarily engaged in furnishing space and other facilities to members for the purpose of buying, selling, or otherwise trading in stocks, bonds, or commodities.

- Commodity exchanges
- Security exchanges
- Stock exchanges

SIC 6281 Services Allied With the Exchange of Securities or Commodities

Establishments primarily engaged in furnishing services to security or commodity holders, brokers, or dealers.

- Bondholders' protective committees
- Custodian of securities
- Exchange clearing houses, commodity
- Exchange clearing houses, security
- Financial advice and service, investment
- Financial reporting
- Investment advisory services
- Investment counselors
- Investment research
- Protective committees, security holders'
- Quotation services
- Royalty owners protective associations
- Security holders' protective committees
- Stock transfer agents

The $4.9 billion Security and Commodity Brokers industry, with sales of $3 billion to final demand or .4% of GNP, is an interesting amalgam of information activities. The industry is conceptually composed of five components: the first four are informational, the last is not.

(i) Production of private information - SIC 6211 and 6281 include financial advisers, investment counselors, and financial researchers whose output is a private information-giving service to a specific client or group of clients.

(ii) The industry also performs a search function for the client, economizing on the client's search costs in purchasing a commodity called "stocks and bonds." The broker is an "information specialist" in the sense that his margin is less than or equal to the cost to the consumer of doing his own search.

(iii) The industry performs a market information system function, and helps to reduce uncertainty in the stock market by instantaneously and continuously transmitting market price information. This externality is unaccounted in the industry's revenues. Another information externality of the stock market is its influence on capital markets -- it provides information to all potential capital sources regarding the firm's financial worth at that moment, as reflected in the price of its common stock.

(iv) The stock exchange in particular, and the back room of every investment banking house, is a huge "information factory," processing hundreds of millions of transactions each year. In this sense, the industry serves as an information processing service.

(v) Some brokers trade on their own account, and a portion of the industry's output is composed of capital-gains type income on the appreciated inventory of the broker. This last component is non-informational in nature, since it only reflects a change in the value of the inventory, and does not involve search, private knowledge, or market information externalities. The distinction is quite useful, and will appear once more when we discuss the search vs. nonsearch aspects of employment agencies.

The accounting problem, then, is to distinguish the industry output in terms of the first four components discussed above -- as distinct from the fifth, or non-informational component. In 1967, the short-term capital gains on inventory -- "net gains from noncapitalized assets" in the NIA -- amounted to $1,160.3 million; this item was buried in the industry accounts under item #700300 below.

After removing the single non-informational aspect of the brokerage industry, around 76% of industry output was allocated to information services.

IO INDUSTRY 700300: SECURITY AND COMMODITY BROKERS
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	%IMP	OUTPUT	INTERM	PCE	GCE	INV	EXPORT	FED	STATE	FIN DEM
700300	SECURITY AND COMMODITY BROKERS	0.000	4872.6	4872.6	.	.	.	.	.	.	0.0
700301	UNDERWRITERS PROFITS	0.000	315.7	315.7	.	.	.	.	.	.	0.0
700302	@ALL OTHER INCOME	0.000	567.3	567.3	.	.	.	.	.	.	0.0
700303	SECURITY + COMMODITY BROKER + EXCHA	0.372	3989.6	1027.3	2820.7	.	.	.	.	141.6	2962.3
7003	INDUSTRY UNALLOCATED	0.000	195.1	195.1	.	.	.	.	.	.	0.0
	TOTAL FINAL DEMAND				2820.7	0.0	0.0	0.0	0.0	141.6	2962.3
	76.19% ALLOCATED TO INFORMATION				2149.1	0.0	0.0	0.0	0.0	107.9	2257.9

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	2027.0
NET INTEREST	-192.0
INDIRECT BUSINESS TAXES	447.4
BUSINESS TRANSFER PAYMENTS	15.0
CAPITAL CONSUMPTION ALLOWANCES	41.1
PROFIT TYPE INCOME	1314.3
TOTAL VALUE ADDED	3647.9
76.19% ALLOCATED TO INFORMATION	2779.4

* * * *

700400 Insurance Carriers

SIC 63 Insurance Carriers

This major group comprises insurance carriers of all types. Agents and brokers dealing in insurance and organizations rendering services to insurance carriers or to policy holders are classified in Major Group 64.

This industry represents all firms engaged in life insurance; accident and health insurance; fire, marine, and casualty insurance; surety insurance; title insurance; and miscellaneous insurance such as pension funds. The group of firms covered in SIC 63 are insurance carriers only, meaning that they directly underwrite risk rather than contract with a third party for risk pooling.

Output of the Insurance Industry -- NIA Concept

The National Income concept ignores premiums and benefits in computing the output of the Insurance industry. All premiums and benefits are seen as transfers within the household sector -- between those who purchase insurance and those who collect benefits. Dividents paid to policyholders are similarly seen as redistributive within the household sector; they are identical to a reduction in premium.

The output of the Insurance industry is the value of the insurance service, as imputed charge levied by the insurance firm on the consumer. This imputed service charge, exactly as in the banking case, is equal to the cost of providing the service -- factor costs (labor and capital) plus depreciation and indirect business taxes. The entire output is hence based on expenses of the Insurance industry in writing policies, adjusting claims, underwriting, and so on. We shall take a closer look at the expenses to see if the informational portion explains away industry output.

As discussed previously, insurance carriers can be conceptualized as performing two informational functions: (i) analysis and diagnosis associated with risk taking or pooling and investment, and (ii) actuarial and transactions processing. We shall relate this general conceptual scheme to the Insurance industry accounts, and offer a scheme for determining the share of industry output allocatable to information.

Fire, Casualty, and Surety

The main data source on the Fire, Casualty, and Surety Insurance industry is the 1975 Argus Fire Casualty and Surety Chart.* These three segments cover some 59% of the Insurance industry, with life insurance making up the other 41%.

Table 13 shows the detailed operating statements of the 1,331 companies reporting in 1967. Line (1) represents the premiums earned on the expired portion of policies in effect. A premium is not counted as "earned" until the coverage period has been experienced; at that point, the gross income from the outstanding policies are counted into the line (1) entry. Line (2) shows the direct payouts or claims incurred during the year. This figure is directly comparable to the line (1) entry in that they both cover the same policies for the same period of time. When a claim is entered against a policy, two types of expenses are incurred by the insurance company: (a) a non-informational expense to cover the physical damage, e.g., repairing a dent or rebuilding the burned house, and (b) an informational expense represented by several items, such as investigating the claim, appraising damage, possible legal actions taken in connection with the claim, the paper work involved, and so on.

*The National Underwriter Company, 1975 Argus Fire Casualty and Surety Chart, distributed by the North American Reinsurance Corporation, New York, New York. The National Underwriter Company, 420 East Fourth Street, Cincinatti, Ohio. See also annual charts, 1948-1975.

TABLE 13: FINANCIAL STATEMENT OF 1,331 FIRE, CASUALTY & SURETY COMPANIES

BALANCE SHEET ITEMS	($ Thousand)
INCOME FROM OPERATIONS	
(1) Premium earned	22,312,841
(2) Losses incurred (payouts & benefits)	-13,761,210
Net premiums earned	8,551,631
(3) Investment income	+ 1,376,560
TOTAL NET INCOME	9,928,191
INFORMATION CONNECTED EXPENSES	
(4) Loss processing & adjustment expenses	1,529,023
(5) Underwriting expenses	+ 6,746,299
Sub-total	8,275,322
(6) Cost of maintaining the capital account	+ 1,652,869
TOTAL EXPENSES	9,928,191
Pure Information Expenses as a % of Net Income	83.4
Addendum:	
Surplus Account	18,161,225
Imputed Internal Rate of Return on Capital	9.1

Source: Based on Argus Charts, 1967, p. 192

The non-informational component, the "loss," is presented in the Argus Charts combined with the informational item, "loss expense." From conversations with various members of the Insurance industry,* "loss expense" was judged to represent approximately 10% of the "Loss and Loss Expenses Incurred" costs. Line (2) of Table 13 therefore represents 90% of the "Loss and Loss Expenses" reported in Argus -- and covers only actual claim payouts on physical damage.

The informational portion of the Insurance industry is derived through an analysis of its expenses. The first item, line (4), shows the "Loss Processing and Adjustment Expenses" mentioned above. It is an informational item by virtue of the types of

*Insurance Information Institute, New York; Insurance Service Organizations, New York; North American Reinsurance Corporation, New York.

expenses incurred: investigations, appraisals, litigations, and clerical processing of claims. The second item on line (5), "Underwriting Expenses," covers the purely diagnostic, managerial, and actuarial activities attendant to the underwriting of a policy, and to the considerable analytic and information processing activities that are the mainstay of an insurance company's daily activity. Under line (5), the firm hires managers, accountants, lawyers, secretaries, file clerks, programmers; and purchases or leases office space, computers, and other office machines. These two items sum to the firm's "Informational Connected Expenses." In 1967, the ratio of informational expenses as percent of total industry income was 83.4%; the time series presented in Table 14 shows that this ratio is remarkably stable over the 25 years covered by the Argus Charts.

The direct expenses associated with processing information was less than total income resulting from those informational activities by about $1.7 billion. As with the Banking industry, we take this "excess" of income over information costs to simply represent the cost of maintaining the capital accounts of a financial institution.

TABLE 14: FINANCIAL STATEMENT OF FIRE CASUALTY AND SURETY COMPANIES, 1948-1974 (Selected Years Only)

($ Millions, current)

	1948	1949	1964	1965	1966	1968	1969	1970	1971	1972	1973	1974
Income from operations												
1) Premium earned	2,191	2,460	17,0 0	18,484	20,457	24,407	27,031	30,210	33,932	37,429	40,655	43,663
2) Losses incurred (payouts and benefits)	-1,130	-1,235	-11,318	-11,726	-12,435	-15,252	-17,548	-19,308	-20,584	-22,398	-25,256	-29,544
Net premiums earned	1,061	1,225	5,772	6,748	8,022	9,155	9,483	10,907	13,348	15,031	15,399	14,119
3) Investment income	70	199	1,275	1,209	1,255	1,664	1,836	2,138	2,433	2,883	3,291	3,780
INCOME FROM ALL OPERATIONS	1,131	1,424	7,047	7,957	9,277	10,189	11,319	13,045	15,781	17,914	18,690	17,899
Information connected expenses												
4) Loss process & adjust expenses	126	137	1,257	1,303	1,382	1,695	1,950	2,145	2,287	2,489	2,806	3,283
5) Underwriting expenses	838	924	5,495	5,880	6,317	7,309	7,980	8,709	9,637	10,753	11,763	12,627
INFORMATION CONNECTED EXPENSES	964	1,061	6,752	7,183	7,699	9,004	9,930	10,854	11,924	13,242	14,569	15,910
Indirectly connected expenses												
6) Cost of maint. capital account	167	363	295	774	1,578	1,185	1,389	2,191	3,857	4,672	4,121	1,989
TOTAL EXPENSES	1,131	1,424	7,047	7,957	9,277	10,189	11,319	13,045	15,781	17,914	18,690	17,899
Pure Information Expenses as % of Total Income	85.2	74.5	95.8	90.3	83.0	88.4	87.7	83.2	75.6	73.9	78.0	89.9
ADDENDUM:												
Surplus Account	1,416	1,691	17,192	17,427	16,194	20,126	17,706	19,430	23,752	29,082	26,325	20,167
Inputed internal rate of return on capital	11.8	21.5	1.7	4.4	9.7	5.9	7.8	11.3	16.2	16.1	15.7	9.9

The data support this approach in two ways. First, the return to capital can be seen as normal profit, or the sum of dividends to policyholders plus net income after dividends and taxes. Table 15 shows how the excess can essentially be explained away.

TABLE 15: EXCESS OF INSURANCE COMPANIES' INCOME OVER INFORMATIONAL EXPENSES

	($ Thousands, 1967)
Excess of operating income over directly accountable information costs	1,652,869
Cost of maintaining the capital account[a]	-1,575,760
Unexplained income	77,109

[a]This cost is the sum of two components: Dividends to policyholders, $437,723; and Net income retained after dividends and taxes, $1,138,037.

Another way of estimating the cost of capital is to take the ratio of the operating profits to the surplus account. The surplus account is the difference between the assets of the firm and its liabilities, and increases as the "premium earned" account increases. The surplus account is a cumulative record of the firm's performance, and can be seen as a stock of capital. The "excess" of income over informational expenses is clearly the firm's operating profits, and can be viewed as the income stream generated by the capital stock. The ratio of flow/stock yields a rough measure of the firm's internal interest rate on capital. In 1967, this ratio was as follows:

$$\frac{\textit{Excess of income over expenses}}{\textit{Surplus account}} = \frac{\textit{Flow}}{\textit{Stock}} = \frac{\$1,652,869}{\$18,161,225} = 9.10\%$$

Either explanation allows us to say that the entire net income (or output by NIA definition) is attributable to the sum of informational-connected expenses -- about 83%, and maintaining the capital account -- about 17%. The entire output has been allocated to information services.

Life Insurance

As stated previously, the Life Insurance industry in 1967 was responsible for some 41% of the Insurance industry's output. An analysis of the information component in the Life Insurance industry shows that it is quite similar to the other types of insurance, with around 78% of expenses allocated directly to information processing or handling activities.

The Life Insurance industry differs from other forms of insurance mainly in the extent of investment undertaken as a portion of total income. The activities of a life insurance firm can be broken into three parts: (1) "buying" risk and "selling" security on the contingency of death for the insured individual; (2) earning investment income by money management; and (3) transactions and processing services provided in the rendering of the above two activities.

In 1967, the revenues and expenses of the Life Insurance industry were reported as follows:

TABLE 16: THE LIFE INSURANCE DOLLAR: INCOME AND EXPENSES, 1967

	PERCENTAGE OF INCOME & EXPENSES[a]
INCOME FROM OPERATIONS	
Premiums received	77.9
Benefits paid	- 53.7
Additions to policy reserve	- 24.4
Net Premiums	- 0.2
Investment Income	22.1
TOTAL NET INCOME	21.9
INFORMATION CONNECTED EXPENSES	
Commissions Paid to Agents	7.2
Home and field office expenses (for underwriting & investment)	9.8
Sub-total	17.0
Cost of maintaining the capital account	4.9
TOTAL EXPENSES	21.9
Pure information expenses as % of net income	77.6

[a] The columns sum to 200% (100% income plus 100% expenses).

The first two items under informational expenses represent payments made to field agents and brokers, wages of home office managers, expenses of the actuarial activity, expenses connected with managing the firm's investments, and so on. They are purely informational in nature -- a mix of diagnostic, analytic, and processing activities.

Table 16 shows that the informational expenses of life insurance companies not including capital costs (17 cents) explain about 78% of the industry output (22 cents). That is, the NIA concept of output -- an imputed charge equal to factor cost of providing the insurance service -- explains 78% of total output. The additional 22% represents the cost of capital.

Table 17 shows that the ratio of directly accountable, informational expenses to net income has been remarkably stable over time at between 75% and 79%. As with the Banking industry, the ratio hides the fact that the technology of information processing has changed with the introduction of computers.

IO INDUSTRY 700400: INSURANCE CARRIERS
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	BENCH	OUTPUT	INTERM	PCE	GCE	INV	EXPORT	F.D	STATE	FIN DEM
700400	INSURANCE CARRIERS	0.000	18183.7	18183.7	.	.	.	.	.	.	0.0
700401	LIFE INSURANCE	0.705	5611.4	0.0	5611.4	.	.	.	.	.	5611.4
700402	LIFE + HEALTH INSURANCE - LIFE CARR	0.234	1863.3	0.0	1863.3	.	.	.	.	.	1863.3
700402	ACCIDENT + HEALTH INSURANCE - NON L.	0.070	557.2	0.0	557.2	.	.	.	.	.	557.2
700403	FIDELITY INSURANCE	0.000	51.9	51.7	0.1	.	.	.	0.1	.	0.2
700404	SURETY INSURANCE	0.000	188.3	188.2	.	.	.	.	0.1	.	0.1
700405	MFG + CONTR. LIABILITY INS. (INCL B	0.000	169.3	169.3	.	.	.	.	.	.	0.0
700406	PRODUCT LIABILITY INSURANCE	0.000	51.4	51.4	.	.	.	.	.	.	0.0
700407	WORKMENS COMPENSATION INSURANCE	0.000	875.6	875.6	.	.	.	.	.	.	0.0
700408	OTHER LIAB.	0.009	334.5	264.8	69.7	.	.	.	.	.	69.7
700409	AUTO INSURANCE	0.411	6083.8	2816.8	3267.0	.	.	.	10.5	.	3267.0
700410	MARINE INSURANCE	0.009	159.2	87.8	71.4	.	.	.	.	.	71.4
700411	TITLE INSURANCE	0.000	439.3	439.3	.	.	.	.	.	.	0.0
700412	FIRE AND EXTENDED COVERAGE INSURANC	0.033	1949.2	1694.2	255.0	.	.	.	.	.	255.3
700413	BOILER AND MACHINERY INSURANCE	0.000	54.9	54.9	.	.	.	.	.	.	0.0
700414	OTHER INSURANCE	0.035	1854.4	1525.0	.	.	.	20.5	-2.8	261.7	279.4
7004	INDUSTRY UNALLOCATED	0.000	178.1	178.1	.	.	.	.	.	.	0.0
	TOTAL FINAL DEMAND				11675.0	0.0	0.0	20.5	10.9	261.7	11974.7
	ALLOCATED TO INFORMATION										11974.7

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	7237.8
NET INTEREST	-872.8
INDIRECT BUSINESS TAXES	1108.6
BUSINESS TRANSFER PAYMENTS	2.0
CAPITAL CONSUMPTION ALLOWANCES	329.0
PROFIT TYPE INCOME	1021.6
TOTAL VALUE ADDED	8826.2
ALLOCATED TO INFORMATION	8826.2

* * * *

TABLE 17: THE LIFE INSURANCE DOLLAR: INCOME AND INFORMATIONAL EXPENSES, 1959-1973 (Selected Years Only)

	PERCENTAGE OF INCOME & EXPENSES[a]								
	1959	1960	1961	1962	1963	1964	1965	1966	1973
INCOME FROM OPERATIONS									
Premiums received	79.7	78.9	78.4	78.0	78.0	78.0	78.2	78.1	77.7
Benefits paid	-50.0	-52.5	-52.9	-52.8	-53.9	-53.2	-53.0	-53.9	-52.5
Additions to policy reserve acct.	-27.2	-25.1	-24.9	-25.2	-24.3	-24.9	-25.3	-25.3	-24.9
Net Premiums	2.5	1.3	.6	0	-.2	-.1	-.1	-.1	.3
Investment Income	20.3	21.1	21.6	22.0	22.0	22.0	21.8	21.9	22.3
TOTAL NET INCOME	22.8	22.4	22.2	22.0	21.8	21.9	21.7	21.8	22.6
INFORMATION CONNECTED EXPENSES									
Commissions paid to agents,	7.6	7.5	7.2	7.2	7.2	7.3	7.3	7.2	7.0
Home & field office expenses (for underwriting & investment)	10.0	10.2	10.1	9.9	9.7	> 7	9.6	9.6	9.9
Sub-total	17.6	17.7	17.3	17.1	16.9	17.0	16.9	16.8	16.9
Cost of maintaining the capital account	5.2	4.7	4.9	4.9	4.9	4.9	4.8	5.0	5.7
TOTAL EXPENSES	22.8	22.4	22.2	22.0	21.8	21.9	21.7	21.8	22.6
Pure information expenses as a % of Net Income	77.2	79.0	77.9	77.7	76.1	76.9	77.2	76.4	74.8

[a]The columns sum to 200% (100% income plus 100% expenses).

700500 Insurance Agents and Brokers

SIC # 1 **Insurance Agents, Brokers, and Service**

Agents primarily representing one or more insurance carriers, or brokers not representing any particular carriers, primarily engaged as independent contractors in the sale or placement of insurance contracts with carriers, but not employees of the insurance carriers they represent. This industry also includes independent organizations concerned with insurance services.

Fire insurance underwriters' laboratories
Fire loss appraisal
Insurance adjusters
Insurance advisory services
Insurance agents
Insurance brokers
Insurance claim adjustors, not employed by insurance companies
Insurance educational services
Insurance information bureaus
Insurance inspection and investigation services
Insurance loss prevention services
Insurance patrol services
Insurance professional standards services
Insurance reporting services
Insurance research services
Insurance services
Life insurance agents
Medical insurance claims, processing of: contract or fee basis
Pension and retirement plan consultants, selling and servicing pension plans to corporations
Policyholders' consulting service
Rate making organizations, insurance

Insurance agents and brokers are not risk or credit carriers. Their entire function is a search activity, bringing together buyers and sellers of insurance on the best (brokered) terms available. For this service, the insurance firms, not the consumer, pays the search and processing cost. Final demand is zero, but value added was $3.5 billion in 1967. The entire output of Industry #700500 was allocated to information services.

IO INDUSTRY 700500: INSURANCE AGENTS AND BROKERS
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	EXP	OUTPUT	INTERM	PCE	GCF	INV	EXPORT	FED	STATE	FIN DEM
700500	INSURANCE AGENTS AND BROKERS	0.000	5922.0	5922.0	.	.	.	.	.	.	0.0
7009	INDUSTRY UNALLOCATED	0.000	0.0	0.0	.	.	.	.	.	.	0.0
	TOTAL FINAL DEMAND				0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ALLOCATED TO INFORMATION										0.0

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	1729.0
NET INTEREST	-46.0
INDIRECT BUSINESS TAXES	21.4
BUSINESS TRANSFER PAYMENTS	106.0
CAPITAL CONSUMPTION ALLOWANCES	115.0
PROFIT TYPE INCOME	1561.1
TOTAL VALUE ADDED	3484.5
ALLOCATED TO INFORMATION	3484.5

* * * *

I-O INDUSTRY #71: REAL ESTATE AND RENTAL

The output of the Real Estate and Rental industry includes an amalgam of nine activities with very different economic characteristics.

TABLE 18: CATEGORIES OF THE REAL ESTATE INDUSTRY

(1)	Owner occupied dwellings
(2)	Rents on structures and land[a]
(3)	Dealers' commissions[a]
(4)	Other business receipts[a]
(5)	Other receipts[a]
(6)	Excise tax
(7)	Royalties[a]
(8)	Nonfarm dwelling rent
(9)	Farm dwelling rent

[a]Portions allocated to information services

Their relationship to each other is not apparent other than they all involve some transaction of property. We shall take a closer look at the five categories that contain informational elements.

Line (1), "Owner occupied dwellings," is an imputation of the NIA on rentals paid by homeowners. It is of no interest to the information accounts. The other eight categories appear as Industry #710200 below.

In 1967, 20.90% of the Real Estate and Rental industry was allocated to information services.

	OUTPUT	FINAL DEMAND	VALUE ADDED
TOTAL INDUSTRY	113,253	74,456	84,073
INFORMATION	23,666	3,714	15,392
NON-INFORMATION	89,587	70,774	68,681
INFO % GNP		0.47	1.94

Detailed Industry Reports

710200: Real Estate, except Owner-Occupied Dwellings

SIC 6512 Operators of Nonresidential Buildings

Bank buildings, operation of
Insurance buildings, operation of
Lessors of piers, docks, and associated buildings and facilities
Operators of commercial and industrial buildings
Operators of nonresidential buildings
Retail establishments, operation only
Theater buildings: (ownership and operation)

SIC 6531 Agents, Brokers, and Managers

Establishments primarily engaged in renting, buying, selling, managing, and appraising real estate for others.

Appraisers, real estate
Brokers, real estate
Buying agents, real estate
Cemetery management service
Escrow agents, real estate
Fiduciaries, real estate
Managers, real estate
Real estate agents engaged in real estate activities, arranging for mortgages and/or appraisal
Real estate auction
Rental agents for real estate
Selling agents for real estate

SIC 6541 Title Abstract Companies

Establishments primarily engaged in searching real estate titles. This industry does not include title insurance companies which are classified in Industry 6361.

Title abstract companies
Title and trust companies
Title reconveyance companies

IO INDUSTRY 710200: REAL ESTATE
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	IO ITEM	%GNP	OUTPUT	INTERM	PCE	GCF	INV	EXPORT	FED	STATE	FIN DEM
710200	REAL ESTATE	0.000	63555.9	63555.9	.	.	.	.	.	.	0.0
710201	[illegible] AND LAND +	0.127	[illegible]	[illegible]51.4	.	.	.	179.5	241.6	585.9	1009.0
[illegible]	DEALERS COMMISSIONS ~	0.264	[illegible]	480.0	.	2100.0	.	.	.	.	2100.0
710204	OTHER BUSINESS RECEIPTS	0.040	6867.5	6545.8	321.7	.	.	.	.	.	321.7
710205	OTHER RECEIPTS	0.000	700.7	700.7	.	.	.	.	.	.	0.0
[illegible]	EXCISE TAX	0.000	68.0	68.0	.	.	.	.	.	.	0.0
[illegible]	ROYALTIES *	[illegible]	[illegible]	4232.4	.	.	.	397.6	.	.	397.6
710210	NONFARM DWELLING RENT	2.544	20232.0	0.0	20232.0	.	.	.	.	.	20232.0
710220	FARM DWELLING RENT	0.078	617.3	0.0	617.3	.	.	.	.	.	617.3
7102	INDUSTRY UNALLOCATED	0.000	6090.7	6090.7	.	.	.	.	.	.	0.0
	TOTAL FINAL DEMAND				21171.0	2100.0	0.0	577.1	241.6	585.9	24677.6
	37.24% ALLOCATED TO INFORMATION				321.7	2100.0	0.0	577.1	229.3	485.8	3713.8

+ U.N., IMF, embassies, and other foreign organizations
* including management fees and royalties on intangibles to unaffiliated foreigners

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	3313.0
NET INTEREST	9616.0
INDIRECT BUSINESS TAXES	8335.0
BUSINESS TRANSFER PAYMENTS	116.0
CAPITAL CONSUMPTION ALLOWANCES	8856.0
PROFIT TYPE INCOME	11101.1
TOTAL VALUE ADDED	41337.1
37.24% ALLOCATED TO INFORMATION	15394.0

710201 Rents on Structures and Land

This industry includes rents paid by corporations and proprietorships for all types of structures -- office buildings, warehouses, retail outlets, garages, factories, and so on. We shall be separating out of the $27,460 million just that portion which is associated with informational activities.

A building is a special purpose capital good just like any piece of equipment. It might be useful to repeat the concept behind allocating all office buildings as information structures. An analogy is made between computers and office buildings as special purpose capital.

A computer, as a piece of capital, is clearly an information "machine." It is produced in the manufacturing sector (I-O #510101). The output of both the manufacturers and renters of computers is allocated into information goods and services (respectively) since both computers and their service (through leasing) are information outputs. However, non-information industries buy or lease computers. The output of the computer industry is not prorated to exclude purchases by non-information industries; similarly, the output of computer leasing is not prorated to exclude leases by non-information industries.

By analogy, an "office building" is an "information good" bought on capital account or leased on current account. It is an information good since it exclusively supports a variety of informational activities. It cannot be efficiently used for anything else. (If any office building space is used for retail stores or warehousing purposes, or parts of the basement allocated to parking spaces, the rentals on those portions do not appear in our figures.) The office building rentals are almost exclusively for information-related purposes. Just like the computer example, we have elected to include the output of "office building construction" (I-O #110202) on capital account, and "office building leasing" (part of I-O #710201) as current outputs of information goods and services. We therefore include office space rentals by both information and non-information industries. Consider the typology in Table 19, showing which classes of buildings are included in our information accounts.

TABLE 19: RENTALS OF INFORMATION-RELATED BUILDINGS, 1967

($ Millions)

RENTED BY	OFFICE BUILDINGS	OTHER TYPES OF BUILDINGS
Information Industries	YES (2,270)	YES (1,785)
Non-Information Industries	YES (3,762)	NO (15,755)

The real estate rentals paid by information industries include a variety of structures: office buildings, laboratories, training and education facilities, communication centers, computer centers, press rooms, electronic-assembly buildings, and so on. All types of buildings used by information industries are accounted as information structures, and their rentals are accounted accordingly.

Non-information industries also use office buildings, computer centers, and research and development laboratories. To the extent that they consume informationally-related structures, their rentals are accounted to information. However, over 80% of all rentals paid by non-information industries are for non-informational purposes -- factories, manufacturing centers, warehouses, retail stores, parking spaces, and so on. The rentals on this group are excluded from the information accounts.

Table 20 shows a complete accounting of rents paid in 1967 by type of building and type of industry. We shall spare the reader the tedium of explaining how the figures were derived other than to state that they are based on data supplied by Census, Internal Revenue Service, Dodge Digest, Building Owners and Managers Association Survey, General Services Administration, Postal Service, Defense Department, and BEA analysts. It is the most complete estimate of office rentals available.

TABLE 20: RENTS PAID FOR INFORMATION STRUCTURES BY TYPE OF INDUSTRY

	($ Millions, 1967)		
	TOTAL RENTS	INFORMATION STRUCTURES	INFO % TOTAL
TOTAL RENTS PAID ON LAND & STRUCTURES	27,401	10,437	38.0
Government:	830	715	86.1
Federal	244	229	
State and Local	586	486	
All Businesses	23,572	7,817	33.2
Information Industries			
Office buildings	2,270	2,270	
Non-office buildings	1,785	1,785	
Non-information Industries			
Office buildings	3,762	3,762	
Non-office buildings	15,755	---	
Other	1,411	1,341	95.1
Education buildings	618	618	
Other non-profit organizations	613	543	
Embassies & foreign organizations	180	180	
Adjustment to IRS rental figures by the National Income Division method	1,648	564	

Source: See text for derivation of estimates. Mostly based on the BEA Worktape and IRS, Statistics of Income.

710203 Dealers' Commissions

This line item represents income earned by real estate dealers and agents exclusively in bringing together buyers and sellers (or lessors and lessees). It is almost a pure search function, hence the entire output of $2,980 million was allocated to information services. Of that sum, $880 million was on services to other businesses and $2,100 million was capitalized as part of the real estate transaction. This is one of the few cases where an information service, i.e., search, is capitalized and treated as an investment.

* * * *

710204 Other Business Receipts

This line item represents property management fees almost exclusively. These fees are paid by homeowners to real estate management companies or agents for the purposes of administering the rent collection and repair and maintenance activities. It does not represent such non-informational items as the cost of a plumbing repair. The entire $6.8 billion activity was allocated to information services, i.e., management and transactions fees.

* * * *

710205 Other Receipts

This line item represents the mortgage fees charged by mutual savings banks. The fees ("points") are charged ostensibly to cover the transactions and processing costs of transferring title on real estate. The entire activity, therefore, was allocated to information services -- $701 million.

* * * *

71020. Royalties

This line item is a composite of several unrelated types of products. It consists of payments for both intellectual property (i.e., copyright and patent) and real property (i.e., mineral and oil rights). (See Table 21).

TABLE 21: INFORMATION AND NON-INFORMATION ROYALTY PAYMENTS

	$ MILLION	PERCENT
Intellectual property	2,165	51.3
Physical property	2,054	48.7
TOTAL	4,219	100.0

The information products sold as intellectual property include copyright (e.g., written material, music, film, television, photography) and patent rights (e.g., process, technique, formula). In 1967, domestic sales of intellectual property exceeded $2 billion.

Table 22 shows a partial breakdown of the royalty industry.* Intellectual property is divided into copyright (e.g., written material, music, film, photography) and patents. Unfortunately, we cannot show a more detailed breakdown between copyright and patent except to suggest which type of payments is most likely.

The non-information royalty payments, excluded from our accounts, include drilling and mining rights for oil, coal, minerals, metals, and uranium.

Other Items

All other items in Industry #710200 were non-informational in nature. These include rent on non-informational buildings (as before), rent on private dwellings, rent on farm property, excise taxes, and so on.

* * * *

*For a definition of the royalty and copyright industries, see William M. Blaidsdell, "Size of the Copyright Industries," May 1959, Prepared for the Subcommittee on Patents, Trademarks, and Copyrights of the Committee on the Judiciary.

TABLE 22: BREAKDOWN OF INTELLECTUAL AND PHYSICAL PROPERTY TRANSACTIONS, 1967

IO INDUSTRY	NAME	$ MILLION	C: COPYRIGHT P: PATENT	NOTES
TOTAL		4,219.2		
Intellectual Property		2,165.4		
26	Printing & publishing	606.6		
67	Radio and TV	190.7	C	
51	Computing & office	136.6	C P	Software
69	Wholesale & retail trade	114.4	C P	
27	Chemicals	82.2	P	
31	Petroleum refining	71.5	P	
29	Drugs	66.1	P	
76	Amusements	57.1	C P	Jukeboxes
56	Radio,TV,comm equipment	43.1	P	
70	Finance & insurance	34.7	C P	Software
59	Motor vehicles	34.2	P	
14	Food & products	28.7	P	
53	Electric equip	27.6	P	
48	Special industry machines	19.5	P	
18	Apparel	19.1	P	
63	Optical, photo equipment	17.4	P	
73	Business services	17.3	C P	Copy Patent Holders
66	Comm, exc radio, TV	16.7	P	
57	Electronic components	16.6	P	
24	Paper	12.7	P	
17	Textile goods	12.6	P	
32	Rubber & goods	12.5	P	
60	Aircraft & parts	11.7	P	
49	Industry machinery	11.3	P	
62	Sci & control instruments	10.6	P	
	All Others (36 industries)	499.9	C P	
Physical Property		2,053.8		
08	Crude petroleum & natural gas	1,866.1		
07	Coal mining	79.6		
09	Stone & clay mining	32.7		
10	Chemical & fertilizer mining	31.5		
05	Iron & feroalloy ores mining	27.7		
06	Nonferrous metal ores mining	16.2		

Summary of I-O Industry #710200

Around 37.04% of the industry output was allocated to informatio services. However, the final demand and value added components were individually allocated rather than computed as a simple percentage.

	OUTPUT	FINAL DEMAND	VALUE ADDED
TOTAL INDUSTRY	63,556	24,678	41,337
INFORMATION	23,541	3,712	15,392
NON-INFORMATION	39,890	20,966	25,945
INFO ÷ GNP		0.47	1.94

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I-O INDUSTRY #72: HOTELS, PERSONAL REPAIR SERVICES, EXCEPT AUTO

Industry #72 includes all hotels and lodging places, personal and repair services, barbers, and beauty shops. Together with Industry #73, "Business Services," this industry is the mainstay of what is commonly called the service sector. We shall only be interested in two types of establishments -- photographic studios and radio and television repair shops. All other personal and repair services are of a non-informational type, even though a great deal of information is necessarily "sold" or bundled into the price of the service. For example, a rug cleaning proprietor is often consulted by the client regarding the advisability of cleaning a particular carpet. The price of the service, however, is strictly for the cleaning service; the private consulting is usually "bundled" into the single price. This situation creates an incentive for fraud, since the seller always has an incentive to oversell services to (presumably) ignorant or unknowing consumers. Nowhere is this more apparent than in the automobile repair industry. We shall ignore all the hidden informational sales and merely account the two industries described below.

All hotels have been eliminated from our accounts. This decision clearly misses the revenues generated by conventions and other information-related activites (e.g., lectures).

In 1967, around 12.39% of the hotel and personal and repair service was allocated to information services.

	OUTPUT	FINAL DEMAND	VALUE ADDED
TOTAL INDUSTRY	11,408	8,974	6,886
INFORMATION	1,414	1,414	853
NON-INFORMATION	9,995	7,560	6,032
INFO % GNP		0.18	0.11

720200 Personal and Repair Services, Except Auto

SIC 7221 **Photographic Studios, Including Commercial Photography**

Establishments primarily engaged in portrait photography for the general public, or in photography for advertising agencies, publishers, and other industrial users. Service establishments primarily engaged in film developing or print processing for the trade or for the general public are classified in Industry 7395, and those engaged in motion picture film processing in Industry 7821.

Aerial map service
Aerial photography service
Commercial photography
Photographic studios, commercial and portrait

SIC 7622 **Radio and Television Repair Shops**

Establishments primarily engaged in repairing radio and television receivers, high fidelity (hi-fi) or stereophonic equipment, and tape recorders or phonographs; in installing and repairing television, amateur and citizens' band antennas; or in installing and servicing radio transmitting and receiving equipment in homes or offices, or in small boats, automobiles, or other vehicles. This industry does not include establishments primarily engaged in the installation, repair or maintenance of radio and television broadcasting equipment (as distinguished from low-powered business, amateur and personal radio communication equipment); industrial or commercial electronic devices such as diathermy, X-ray, heat-treating and welding equipment; electronic computers and similar devices (Industry 7629); or in the construction of broadcasting antennas and towers (Industry 1621).

Aircraft radio equipment repair
Intercommunication equipment repair
Public address system repair
Radio repair shops
Television repair shops

We are only interested in the two industries displayed above, photographic studios and radio and television repair shops. These two industries alone account for some $1.4 billion in sales, or around 12% of the $11.5 billion service industry. A number of smaller information repair industries appear in SIC 7699, "Repair Shops and Related Services, Not Elsewhere Classified," but since industry figures are not available, they have necessarily been omitted.

SIC 7221, Photographic Studios, includes a wide variety of commercial photography (e.g., advertising, fashion catalogues) and aerial-type photography (e.g., surveyors, forest management, city planning, crop forecasting) in addition to the more common studio photography (e.g., passport, portrait). The aerial photography industry, which in the modern version is being augmented by satellite reconnaissance, has as its primary purpose the gathering of information about the environment through visual means. The other types of photography supply information goods in a more ordinary sense.

SIC 7622, Radio and Television Repair, is the service component of the household's information capital equipment purchases. The industry has no particular characteristics to distinguish it from other repair services except that it is exclusively concerned with information machines.

IO INDUSTRY 720200: PERSONAL AND REPAIR SERVICES EXCEPT AUTO REPAIR
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	[illegible]	OUTPUT	INTERM	PCE	[illegible]	INV	EXPORT	FED	STATE	FIN DEM
720200	PERS. & REPAIR SERV. EXC. AUTO REP	[illegible]	[illegible]	[illegible]	.	.	.	.	.	.	0.0
720200	*PERS AND REPAIR [illegible] SUBTOTAL	[illegible]	[illegible]	[illegible]	.	.	.	.	.	.	0.0
720201	*DRY CLEANING [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.	.	.	.	.	1761.0
720202	*COIN OPERATED DRY CLEANING	[illegible]	[illegible]	[illegible]	[illegible]	.	.	.	.	.	[illegible]
720203	*LAUNDRIES, FAMILY & BATH	[illegible]	[illegible]	[illegible]	[illegible]	.	.	.	.	.	767.4
720204	*COIN OPERATED LAUNDRY	[illegible]	[illegible]	[illegible]	[illegible]	.	.	.	.	.	446.1
720205	*DIAPER SERVICES	[illegible]	[illegible]	[illegible]	[illegible]	.	.	.	.	.	64.2
720206	*LINEN SUPPLY	[illegible]	[illegible]	[illegible]	[illegible]	.	.	.	.	.	7.5
720207	*RUG CLEANING	[illegible]	[illegible]	[illegible]	[illegible]	.	.	.	.	.	77.4
720208	*FURNITURE CLEANING ON LOCATION	[illegible]	[illegible]	[illegible]	[illegible]	.	.	.	.	.	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.	.	.	.	.	49.4
[illegible]	*SHOE REPAIR	[illegible]	[illegible]	[illegible]	[illegible]	.	.	.	.	.	257.1
720210	*FUNERAL SERV. & CREMATORIES	[illegible]	[illegible]	[illegible]	[illegible]	.	.	.	.	.	1428.4
[illegible]	*TURKISH BATHS, REDUCING SALONS	[illegible]	[illegible]	[illegible]	[illegible]	.	.	.	.	.	37.5
720213	*COSTUME, DRESS SUIT RENTALS	[illegible]	[illegible]	[illegible]	[illegible]	.	.	.	.	.	48.8
[illegible]	*PRESSING, ALTER AND REPAIR	[illegible]	[illegible]	0.0	[illegible]	.	.	.	.	.	442.3
[illegible]	*COIN OPERATED SERVICE MACHINES	[illegible]	[illegible]	0.0	[illegible]	.	.	.	.	.	119.8
720215	*OTHER MISC. PERSONAL SERVICES	[illegible]	[illegible]	[illegible]	[illegible]	.	.	.	.	.	145.4
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.	.	.	.	.	922.3
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.	.	.	.	.	[illegible]
[illegible]	*OTHER ELECTRICAL REPAIR	[illegible]	[illegible]	[illegible]	[illegible]	.	.	.	.	.	615.7
720220	*REUPHOLSTERY & FURN. REP.	[illegible]	[illegible]	[illegible]	[illegible]	.	.	.	.	.	372.4
720221	*WATCH, CLOCK, & JEWEL REP.	[illegible]	[illegible]	[illegible]	[illegible]	.	.	.	.	.	421.7
720222	*BICYCLE REPAIR	[illegible]	6.5	[illegible]	.5	.	.	.	.	.	6.5
720223	*MUSICAL INSTR. REPAIR	[illegible]	76.2	0.0	76.2	.	.	.	.	.	76.2
720224	*LOCKSMITHS	[illegible]	[illegible]	0.0	[illegible]	.	.	.	.	.	38.0
720225	*LEATHER REPAIR	[illegible]	[illegible]	[illegible]	[illegible]	.	.	.	.	.	3.5
720226	*NET EXPORTS	[illegible]	[illegible]	0.0	.	.	.	0.4	.	.	0.4
720227	*GOVERN. OUT PURCHASES	[illegible]	[illegible]	0.0	.	.	.	.	6.2	46.8	53.0
7202	*INDUSTRY UNALLOCATED	[illegible]	414.3	[illegible]	.	.	.	.	.	.	0.0
	TOTAL FINAL DEMAND				[illegible]	0.0	0.0	0.4	6.2	46.8	8973.5
	12.39% ALLOCATED TO INFORMATION				[illegible]	0.0	0.0	0.0	0.0	0.0	1413.7

IO INDUSTRY 720200: PERSONAL AND REPAIR SERVICES EXCEPT AUTO REPAIR
$ Million (Current)
VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	4135.8
NET INTEREST	25.9
INDIRECT BUSINESS TAXES	161.6
BUSINESS TRANSFER PAYMENTS	30.9
CAPITAL CONSUMPTION ALLOWANCES	694.9
PROFIT TYPE INCOME	1836.6
TOTAL VALUE ADDED	6885.7
12.39% ALLOCATED TO INFORMATION	853.1

I-O INDUSTRY #73: BUSINESS SERVICES

The "Business Services" industry includes some of the most interesting industries from a theoretical point of view. It includes most of the search industries (employment agencies, credit reporting agencies); private information industries (business consulting, legal services, accounting services); information processing industries (data processing, computer services); it contains industries where the production and distribution are jointly provided (news syndicates); where issues of patent (patent brokers and research and development labs) and privacy (credit reporting agencies); and where technological change is redefining old industrial categories (computerized personal accounting services). Most of these industries are intimately related to computers or telecommunications. The informational revenues of this industry amounted to $46.5 billion in 1967.

Around 83.56% of the Business Services industry was allocated to information services.

	OUTPUT	FINAL DEMAND	VALUE ADDED
TOTAL INDUSTRY	55,535	9,289	29,076
INFORMATION	46,405	7,750	22,878
NON-INFORMATION	9,130	1,529	6,198
INFO % GNP		0.97	2.88

Detailed Industry Reports

730100 Miscellaneous Business Services

This industry is a collection of about 190,000 establishments performing a wide variety of services ranging from "Research and Development (R&D) to "Bronzing Baby's Shoes." Almost 60% of the industry's output was allocated to information services. Table 22 contains a summary of the industries discussed in this section.

TABLE 22: OUTPUT OF INFORMATION BUSINESS SERVICES

SIC	INDUSTRY	1967 ($ Millions)
7321	Adjustment and Collection Agencies	422.0
7321	Consumer Credit Reporting Agencies	160.7
7321	Mercantile Credit Reporting Agencies	133.6
7351	News Syndicates	168.7
7399	Camera Repair Shops	6.8
7392	Interior Decorators	206.1
7391	Commercial Research & Development	1,118.7
7397	Commercial Testing Labs	218.8
7394	Leasing & Renting (Info Machines)	3,491.6
7395	Photofinishing Labs	659.5
7393	Detective Agencies	463.9
7392	Business Management & Consulting	2,703.5
7339	Stenographic & Duplicating Svcs.	19.2
7332	Blueprinting & Photocopying Svcs.	21.0
7331	Direct Mail Advertising Services	86.2
7399	Packaging & Labeling	181.6
7372	Computer Programming & Software	200.0
7374	Data Processing Services	655.0
7379	Computer Related Services	53.0
7361	Private Employment Agencies	283.4
7398	Temporary Help Supply Services	662.8
	All other information services NEC	1,488.2
	TOTAL	13,404.3
	Total Output of Miscellaneous Business Services	22,534.0
	Information as % of Total Output	59.49%

730106	Adjustment and Collection Agencies	$422.0
730104	Consumer Credit Reporting Agencies	160.7
730105	Mercantile Credit Reporting Agencies	33.6

SIC 7321 **Consumer Credit Reporting Agencies, Mercantile Reporting and Adjustment and Collection Agencies**

Mercantile and consumer credit reporting bureaus and privately operated collection or adjustment agencies. Insurance adjustment agencies are classified in Industry 6411.

- Adjustment bureaus, except insurance adjustment agencies
- Collection agencies (accounts), except for real estate
- Consumer credit reporting bureaus
- Credit bureaus and agencies
- Credit card service for hotels, restaurants, etc. (central charge—collection by central agency)
- Credit clearing houses
- Mercantile credit reporting bureaus

These agencies perform a search function for the buyer of the service. Their role in a market context is to provide information about market participants; their production function is the purchase, storage, and access of information upon demand; their product is a piece of information. In the case of adjustment and collection agencies, the search function is accompanied by other informational activities, such as appraising goods, resale of title, etc. One of the outstanding policy problems in these industries is privacy -- who owns personal financial information?

* * * *

730107 News Syndicates $168.7

SIC 7351 **News Syndicates**

Central offices and districts and local branch offices of news syndicates.

- News correspondents, independent
- News feature syndicates
- News pictures, gathering and distributing
- News reporting services for newspapers and periodicals
- News syndicates
- News ticker service
- Press services (news syndicate)

The news syndicate is a major informational supplier of the mass media. Its distribution facilities are analogous to an information "wholesaler," selling to the newspapers, radio stations and television networks. News syndicates are rapidly adopting computerized editing and transmission techniques, as are their consumers -- the newspapers. They are one of the few industries that successfully both produce and distribute information services on a wholesale basis.

* * * *

730111 Camera Repair $6.8

SIC 7699 Repair Shops NEC (part)

Photography has been allocated to information services, and cameras to information goods. Repair is simply one of the components of the visual information goods market.

* * * *

730115 Interior Decorators $206.1

SIC 7392 Business Management, Administrative, and Consulting (part)

The output of the industry is defined by the NIA as a "net" concept. That is, if part of the interior decorator's billings represents cost of goods sold (where the decorator purchases furnishings for resale), it has been netted out. The output, then, is strictly on the provision of the information service, i.e., design and consultation.

* * * *

730125 Commercial Research and Development $1,118.7

SIC 7391 **Commercial Research and Development Laboratories**

Establishments primarily engaged in research and development activities on a fee or contract basis. Research and development laboratories of companies which manufacture the products developed from their research activities are classified as auxiliary to the manufacturing establishments served.

Agricultural research—commercial
Food research service (research and development)
Laboratories: chemical, electrical, engineering, industrial, except testing (not manufacturing)
Research laboratories, commercial

Research and development is one of the classic markets for information. Most of the activity is undertaken either by nonprofit firms, often under government grant or contract, or privately within industry. A few commercial firms contract exclusively as an R&D shop, with or without patent rights and royalty-sharing incentives. Their output is either purely an informational (e.g., a set of specifications) or an information product embodied in a piece of technology (e.g., a prototype).

* * * *

730126 Commercial Testing Labs $218.8

SIC 7397 **Commercial Testing Laboratories**

Establishments primarily engaged in testing all type of products on a fee or contract basis. Testing laboratories associated with manufacturing plants are classified as auxiliary to the manufacturing plants served.

- Automobile proving and testing ground, commercial
- Dosimetry, radiation-commercial
- Film badge service (radiation detection)
- Food research service (testing)
- Gauge calibration and certification (testing)
- Laboratories, testing
- Radiation dosimetry laboratories-commercial
- Seed testing laboratories
- X-ray inspection service, industrial

These firms produce as their output a piece of information -- namely, the result of the test. Some of these firms perform a valuable market information service, such as Consumer's Union, United Labs, and Good Housekeeping. Their certification or testing replaces to some extent the consumer's need to test for himself. Once the test knowledge has been produced (at great cost, when the test involves hundreds of samples which are destroyed in the process of the test), the results can be distributed very cheaply. Sometimes this takes the form of label information; sometimes the product is redesigned by the manufacturer before being introduced to the market; sometimes the test becomes an integral part of the firm's marketing stragegy.

* * * *

730129 Leasing and Rental of Equipment $3,491.6

7394 **Equipment Rental and Leasing Services**

Establishments primarily engaged in renting or leasing machinery and equipment. Establishments renting and leasing automobiles and trucks without drivers are classified in Group 751; those renting automobiles with drivers in Industry 4119; trucks with drivers in Industry Group 421; those renting personal service items such as lockers, clothes, and pillows in Industry 7299; and those renting amusement and recreation items such as bicycles, canoes, and beach chairs and accessories in Industry 7949.

- Airplane rental
- Cargo shipping container or van rental
- Chair rental, except beach chairs
- Coin operated machine rental
- Construction equipment rental
- Electric meter rental, auditing, and maintenance
- Electronic equipment rental and service
- Floor sanding and waxing machine rental
- Furniture rental
- Jukebox rental
- Ladder rental
- Laundry equipment: rental of coin operated machines
- Oil field equipment rental
- Oil well drilling equipment rental, machinery, drilling bits, etc.
- Pari mutuel totalizator equipment leasing to race tracks and maintaining the equipment
- Phonograph rental, automatic coin operated
- Photocopy machines, coin operated-rental
- Photocopy machine rental
- Piano rental
- Public address systems, rental of
- Rental of barricades, blinkers, etc.
- Rental of chairs (except beach chairs), dishes, silverware, tables, and banquet accessories
- Rental of radio tube testing machines
- Rental of sanitation units
- Sanding machine rental, floor
- Scaffold rental
- Toilet (portable), rental
- Tool rental
- Vending machines, rental only
- Waxing machines, rental of

This industry, corresponding to SIC 7394, contains a large number of non-information equipment, e.g., airplane rentals, oil field equipment, sanitation units, scaffolds, toilets, waxing machines, etc. But it also contains two of the fastest growing information machines in the U.S. economy -- the computer and the photo-duplicator. SIC 7394 revenue is broken down as follows:

TABLE 23: COMPONENTS OF THE MACHINE RENTALS INDUSTRY

EQUIPMENT RENTED	($ Millions, 1967)
Electronic computers	2,701.5
Desk calculators, office machines	265.3
Xerox copier rentals	524.8
Sub-total: information machines	3,491.6
Other machinery and equipment	62.3
Other light machinery & equipment	2,715.9
TOTAL	6,269.8

* * * *

730129 Photofinishing Labs $659.5

SIC 7395 **Photofinishing Laboratories**

Establishments primarily engaged in developing films and in making photographic prints and enlargements for the trade or for the general public. Establishments primarily engaged in processing motion picture film for the motion picture and television industries are classified in Industry 7821.

Developing and printing of film, except standard motion picture film
Film processing, except standard motion picture films
Photograph developing and retouching
Photographic laboratories (not manufacturing)

As stated previously, photography equipment, supplies and services have been allocated into information. Photofinishing is considered a part of the photographic (visual information) activity.

* * * *

730131 Detective Agencies and Security Services $463.9

SIC 7393 **Detective Agencies and Protective Services**

Establishments primarily engaged in providing personnel for detective, investigative, patrolling, night watching, or personal protection services. Establishments primarily engaged in installing and servicing mechanical protective devices, such as burglar and fire alarm systems are classified in Industry 7299.

Armored car services
Burglary protection service
Detective agencies
Dogs, rental of, for protective service
Fingerprint service
Investigators, private
Lie detection services
Protective services
Watching service, private

This was an ambiguous industry. The detective portion, including investigative work, was judged primarily informational in nature. But the protective services were mixed. In most cases, protective services of buildings and facilities

involve a "watching" or "checking" activity. These surveillance types of activities are increasingly being augmented by information machines: closed-circuit television, remote sensors, radio, and so on. In some cases, physical protection is required (e.g., armored car, personal bodyguards). The non-informational function was arbitrarily judged to be much smaller overall than the informational

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730132 Packaging and Labeling Service $181.6

SIC 7399 Business Services NEC (part)

This industry was included under the rationale that labels are a source of consumer information, such as product name, weight, ingredients, and promotional information. To the extent that such information is useless, misleading, irrelevant, or harmful -- as is frequently alleged by consumer groups and often confirmed by the Federal Trade Commission -- then the value added of the industry should, under some definitions, be subtracted from GNP. But it is clear that the total industry revenue originating in the labeling of goods is not sensitive to the veracity of the information -- it would not cost any less to lie than to tell the truth. In either event, labeling is an information service and belongs in part to the market information system.

* * * *

730134 "All Other Income" $6,303.9

SIC 7392 Business, Management, Administrative and Consulting Services

Establishments primarily engaged in furnishing business and management administrative and consulting services, such as business analyzing, business research, efficiency experts, fashion designing and consulting, industrial management, market research, personnel management, public relations counselors, sales engineers, statistical services, tax consultation, and traffic consultants.

Business analyzing service
Business consultants
Business economists
Business research service
Business, management, and training consulting services
Calculating service
Circuit management service for managing motion picture theaters
City planning for urban renewal, private
Computer programing service
Consultation services for transportation companies
Corporation organizers
Designing service: clothing, shoes, tools, etc.
Efficiency experts
Fashion designing and consulting service
Financial management service to business
Furniture design for others
Industrial management service
Industrial development planning service, commercial
Interior decorators consulting service—not painters or paperhangers
Management consulting service, business
Market research service
Merchandising counsels
Personnel management service
Motel management service, commercial
Planning consultants
Programed instruction service
Promotion service (business service)
Public opinion research
Public relations counselors
Radio consultants
Reorganization service (business service)
Sales advisory service
Sales engineers
Sales promotion
Statistical services, for business (except tabulating)
Surveys, for location of business establishments
Tax consultation service
Telephone solicitation service (sales development)
Textile designers
Traffic consultants

SIC 7339 **Stenographic Services; and Duplicating Services, Not Elsewhere Classified**

Establishments primarily engaged in furnishing stenographic services; and duplicating services other than printing (Major Group 27), blueprinting and photocopying (Industry 7332), and duplicating in connection with direct mail advertising (Industry 7331).

- Court reporting service
- Duplicating services, except printing, blueprinting, and photocopying
- Letter writing service
- Mimeographing services
- Multigraphing services
- Multilithing services
- Public stenographers
- Roroprinting services
- Stenographic service
- Typing service

SIC 7332 **Blueprinting and Photocopying Services**

Establishments primarily engaged in reproducing drawings, plans, maps, or other copy, by blueprinting or photocopying.

- Blueprinting services
- Photocopying services

SIC 7361 **Private Employment Agencies**

Establishments primarily engaged in providing employment service, except theatrical employment agencies (Industry 7922) and motion picture casting bureaus (Indnstry 7821).

- Chauffeur registries
- Commercial employment agencies
- Employment agencies, private: except theatrical and motion picture
- Executive placing services
- Labor contractors (employment agencies)
- Maid registries
- Model registries
- Nurses' registries
- Ship crew agencies
- Teachers' agencies

SIC 7398 **Temporary Help Supply Service**

Establishments primarily engaged in supplying temporary help, except agricultural (Industry 7319) on a contract basis to other businesses. The help supplied is on the payroll of the supplying establishment.

- Fashion show service (supply of models only)
- Labor pools
- Manpower pools
- Modeling service
- Usher service

SIC 7313 **Radio, Television, and Publishers' Advertising Representatives**

Establishments primarily engaged in soliciting advertising for newspapers, magazines, and radio and television stations on a fee basis.

- Newspaper advertising representatives (not employees of publishing companies)
- Television and radio time, sale of
- Radio representatives

This category includes a large variety of industries as shown in Table 24.

TABLE 24: OUTPUT OF ALL OTHER BUSINESS SERVICES

SIC	INDUSTRY		1967 ($ Millions)
7392	Business, Management, Administrative and Consulting		2,703.5
	Statistical & computing services	1,855.8	
	Public relations services	847.7	
7339	Stenographic and duplicating services		19.2
7332	Blueprinting and photocopying services		21.0
7331	Direct mail advertising services		86.2
7361	Private employment agencies		283.4
7398	Temporary help supply service (office & executive)		662.8
7399	Business Services N.E.C.		2,529.8
	Sign painting	119.3	
	Telephone answering services	131.1	
	All others (see SIC 7399), e.g.	2,279.4	
	Authors' agents and brokers		
	Copyright protection service		
	Charge account service		
	Correct time service		
	Directories, telephone: distribution		
	Drafting service		
	Florist telegraph service		
	Handwriting analysis		
	Hotel reservation service		
	Lecture bureaus		
	Patent brokers		
	Press clipping services		
	Photography brokers		
	Radio transcription service		
	Printing broker		
	Speaker's bureaus		
	Switchboard operation		
	Telecredit service		
	Telephone message service		
	etc.		
	TOTAL		6,305.9

Business management and consulting, a $2.7 billion industry in 1967, is the classic private information service. It exists as a primary sector substitute to the in-house management "quasi-firm" discussed in Chapter 9. The industry output is knowledge, management information, advice, and the like.

Stenographic and duplicating are also analogous to "quasi-industries," since most duplicating activities occur within firms. Their fairly modest revenues of $19.2 million have grown in the last few years with the introduction of the photoduplicating kiosk.

Direct mail services are an obvious extension of both the Advertising and Post Office industries. In time, this industry will be indistinguishable from any computer service industry.

Private employment agencies perform a classic informational function -- search. The role of information in labor markets was one of the first applications in the economics of information.

Business services, not elsewhere classified, are a very odd collection of some very interesting industries. Besides a large variety of information industries (69 in all), there are 53 decidedly non-informational industries such as "bronzing baby's shoes" and "human skeleton preparation, on material owned by others." (Apparently, if you own your own materials, the activity is not counted as part of GNP since there is no value added in one's own demise and disintegration.) The problem remains -- how do we allocate the output of SIC 7399 between information and non-information when no further data are available? The 122 industries were judged, on average, to be about equal size (i.e., any random subset bisecting the whole sample will be equal to any other sample). With this assumption, the $3.2 billion was split into two parts. The information industries, accounting for 76.8% of the number of industries, received an allocation of $2,461 million. The rest were thrown out. In passing, note that if the whole of SIC 7399 had been discarded, a shameful waste of good industries, the GNP estimate would have been understated by about .04% in final-demand terms of .19% in value-added terms.

SIC 7399 **Business Services, Not Elsewhere Classified**

Establishments primarily engaged in furnishing business services, not elsewhere classified, such as bondsmen, bottle exchanges, drafting service, fingerprint service, lecture bureaus, notary publics, patent brokers, speakers' bureaus, and telephone message service and auctioneering service (except livestock—Industry 0719). Establishments primarily engaged in furnishing detective and protective services are classified in Industry 7393; equipment rental and leasing in Industry 7394; photofinishing laboratories in Industry 7395; and trading stamp services in Industry 7396.

Agents and brokers, for artists and authors
Apparel pressing service, for the trade (except permanent pressing)
Appraisers, except real estate appraisers
Arbitration and conciliation service
Artists' agents and brokers
Assaying service
Auctioneers' offices (auctioneering service); except livestock and real estate auctioning
Authors' agents and brokers
Automobile shows, flower shows, home shows, etc.
Auto recovery service
Bail bonding (not by bonding companies)
Batik work (hand painting on textiles)
Bondsmen
Bottle exchanges
Bronzing baby shoes
Business brokers (buying and selling business enterprises)
Carding buttons on a contract basis
Charge account service (shopping plates)—collection by individual firms
Cloth cutting, bolting, or winding: for textile distributors
Contractors' disbursement control
Convention decorators
Copyright protection service
Correct time service
Corset representatives, fitting only
Cosmetic kits—lip and eye make-up (assembling and packaging)
Cotton inspection service, not connected with transportation
Cotton sampler service
Credit card service: for hotels, restaurants, etc. (collection by individual firms)
Decoration service for special events
Demonstration service, separate from sale
Directories, telephone: distribution on a contract basis
Divers, commercial
Drafting service
Drawback service, customs
Drive-a-way automobile service
Embroidering of advertising on shirts, etc.
Engrossing of diplomas, resolutions, etc.
Exhibits (building of), industrial contractors
Field warehousing
Filling pressure containers (aerosol) with hair spray, insecticides, deodorants, etc.: on a contract basis for others
Fire extinguishers, service of
Fire protection service, other than forestry
Float decoration
Florist telegraph service
Folding and refolding service: textiles, shirts, etc.
Fund raising organizations, on a fee basis
Gas system, contract conversion from manufactured to natural gas
Grinding chemicals for the trade
Handwriting analysis
Hosiery pairing, on a contract or fee basis
Hotel reservation service
Human skeleton preparation, on material owned by others
Inspection of commodities, not connected with transportation
Inventory computing service
Labeling bottles, cans, cartons, etc., for the trade (not printing)
Laminating of photographs (coating photographs with plastics)
Lecture bureaus
Lettering service
Liquidation service (business service)
Liquidators of merchandise
Lobbyists, on a contract basis
Mannequin service
Map drafting service
Marine reporting
Messenger service, except telegraph and radio
Metal slitting and shearing on a contract basis
Microfilm recording and developing service
Mounting novelty merchandise on cards: bobby pins, safety pins, buttons, etc.: on a contract basis
Music copying service
Notary publics
Packaging service
Parcel packing service
Patent brokers
Patrol of electric transmission lines
Personal property (tangible) auctioning for others, on a fee basis
Photogrammetric mapping service
Photographic library service
Photography brokers
Playwrights' brokers
Post office contract stations
Press clipping service
Printing brokers (salesman)
Process serving service
Produce weighing service, not connected with transportation
Promoters of home shows, flower shows, etc.
Racetrack cleaning, except building
Radio broadcasting music checkers
Radio transcription service
Radiographing welded joints on pipe and fittings
Railroad salvage (unclaimed freight), service only
Recording studios, not making commercial records
Repossession service
Rock and earth grinding, by portable mills
Rug binding for the trade
Salvaging of damaged merchandise, service only
Sampling of commodities, not connected with transportation
Scrap steel cutting, on a contract basis
Show card painting
Shrinking textiles for tailors and dressmakers
Sign painting and lettering shops
Silk screen designing, for printing purposes
Solvents recovery service, on a contract basis
Speakers' bureaus
Sponging textiles for tailors and dressmakers
Street banner operations
Styling wigs for the trade
Swimming pool cleaning and maintenance
Switchboard operation of private branch exchanges
Tape slitting for the trade (cutting plastic, leather, etc., into widths)
Tax collection agencies: collecting for a city, county, or state
Tax title dealers
Telecredit service
Telegraph service, florist
Telephone message service
Textile folding and packing services
Textiles, sponging or shrinking: for tailors and dressmakers
Tobacco sheeting service on a contract or fee basis
Translation services
Water softener service
Weighing foods and other commodities, not connected with transportation
Welcome wagon business
Window trimming service
Wool sorting and grading, commission
Yacht brokers

Computer and Data Processing Services

SIC 7372 Computer Programming and Other Software Services

Establishments primarily engaged in providing services in computer programming, systems design and analysis, and other computer "software".

Computer systems analysis and design
Development of computer programs or systems (software)
Programming services, computer
Systems engineering, computer related

SIC 7374 Data Processing Services

Establishments primarily engaged in providing data processing services to others. Service may consist of complete processing and preparation of reports from data supplied by the customer or may be a specialized service such as key punching or making data processing equipment available to others on an hourly or time-sharing basis. Also included are establishments primarily engaged in the management and operation of the computer and data processing facilities of others on a continuing basis.

Calculating service (computer)
Computer management contracting
Computer time sharing
Data processing service
Data punch service
Facilities management, computer
Key punch service
Leasing of computer time
Rental of computer time
Service bureaus, computer
Tabulating service

SIC 7379 Computer Related Services, Not Elsewhere Classified

Establishments primarily engaged in supplying computer [illegible] processing services, not elsewhere classified, such as rental, leasing, repair and maintenance of computers and related equipment. Computer consultants operating on a [illegible] basis are classified here. Leasing of computer and related equipment directly by the manufacturer is classified in Manufacturing; if leasing is done directly by sales [illegible] the manufacturer, the establishment is classified as Wholesale Trade. Establishments primarily engaged in finance (equity) leasing of computers and related equipment are classified in Industry 6159.

Computer and data processing equipment repair and maintenance
Computer brokers (operating for own basis)
Computer consultants
Leasing [illegible] except finance leasing [illegible] the manufacturer
Rental of computers, except finance leasing or by the manufacturer
Tape recertification service

The data processing industry in 1967 was not explicitly accounted in the SIC scheme. The industry was split among four other service industries, as shown in Table 25. By 1972, the industry had grown so large that a new code was assigned (SIC 737).

TABLE 25: THE COMPUTER INDUSTRY SIC IN 1967 AND 1972

1972 INDUSTRY		1967 INDUSTRY	
Code	Short Title	Code	Short Title
7372	Computer programming and software.....	Part 7392	Business consulting svcs
7374	Data processing services		
	Calculating svc (computer)	Part 7392	Business consulting svcs
	Data processing service...	Part 8931	Accounting, auditing and bookkeeping
7379	Computer related svcs, Nec		
	Computer consulting svcs, other than programming...	Part 7392	Business consulting svcs
	Computer leasing, except finance of by mfgr.....	Part 7394	Equipment rental & leas.
	Computer maintenance and repair.....	Part 7629	Electrical repair shops, Nec.

Source: SIC Manual, 1972, Appendix C, Section 1.

Table 26 contains industry data gathered by the Association of Data Processing Services Organization (ADAPSO) and by the Census. The ADAPSO figures were adapted to correspond to the SIC categories, and for comparison, the 1972 Census figure is also shown. The discrepancy between ADAPSO ($3,861 million) and Census ($3,440 million) estimates is due to functional and coverage differences. However, Table 26 can be used as an indication of how rapidly the industry grew between 1960 and 1973. The compound growth rate for the computer services market was 33.4% per year. Even for the shorter period, 1967-1973, the annual growth rate was 31.3%; and between 1971 and 1973 it was 24.4%. This is the fastest growing industry in the primary information sector.

* * * *

Around 59.49% of the Miscellaneous Business Services output was allocated to information services.

IO INDUSTRY 730100: MISCELLANEOUS BUSINESS SERVICES
$ Million (Current)
FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	[illegible]	OUTPUT	INTERM	PCE	GCF	INV	EXPORT	FED	STATE	FIN DEM
7301	MISC. BUSINESS SERVICES	0.000	22534.0	22534.0	.	.	.	.	.	.	0.0
730101	SERVICES TO BUILDINGS	[illegible]	1079.4	[illegible]	10.8	.	.	.	77.1	.	87.9
730102	PEST CONTROL SERVICE	[illegible]	305.8	305.6	.	.	.	.	0.2	.	0.2
730104	CONSUMER CREDIT REPORTING AGENC	0.000	160.7	160.7	.	.	.	.	.	.	0.0
730105	MERCANTILE CREDIT REPORTING AGE	0.005	133.5	133.6	.	.	.	.	.	.	0.0
730106	ADJUSTMENT & COLLECTION AGENCIE.	0.000	422.0	422.0	.	.	.	.	.	.	0.0
730107	NEWS SYNDICATES	0.001	168.7	164.0	.	.	.	4.7	.	.	4.7
730109	LAWN MOWER REPAIR	[illegible]	125.4	126.4	.	.	.	.	.	.	0.0
730110	SEWER & SEPTIC TANK REPAIR	0.000	85.3	85.8	.	.	.	.	.	.	0.0
730111	CAMERA REPAIR	0.001	6.4	0.0	6.8	.	.	.	.	.	6.8
730112	MOTORCYCLE REPAIR	[illegible]	32.5	0.0	32.5	.	.	.	.	.	32.5
730113	SPORTING GOODS REPAIR	0.010	75.8	0.0	75.8	.	.	.	.	.	75.5
730114	FARM MACHINERY REPAIR	0.000	113.8	113.8	.	.	.	.	.	.	0.0
730115	INTERIOR DECORATORS	[illegible]	[illegible]	15[illegible]	51.5	.	.	.	.	.	51.5
730116	REPAIR OF TRANSPORTATION EQUIP.	0.005	65.5	[illegible]	37.4	.	.	.	.	.	37.4
730117	REPAIR OF INDUSTRIAL MACHIY	0.000	475.2	475[illegible]	.	.	.	.	.	.	0.0
[illegible]	[illegible]	[illegible]	[illegible]	31.5		.	.	.	.	.	0.0
[illegible]	REPAIR OF [illegible]	[illegible]	[illegible]	[illegible]	.	.	.	.	.	.	[illegible]
[illegible]	ALL OTHER REPAIR SERVICES	[illegible]	[illegible]	2[illegible]	.	.	.	.	15.2	.	15.2
730121	COMM'L EQUIP. REPAIR	0.000	795.3	795.3	.	.	.	.	.	.	0.0
730122	CONSTRUCTION & MINING EQUIP REPAIR	0.000	350.0	350.0	.	.	.	.		.	0.0
730123	FURNACE CLEANING	0.000	53.0	[illegible]	.	.	.	.	.	.	0.0
730125	COMMERCIAL RESEARCH DEVELOPMENT	0.135	1110.7	9.6	.	.	.	.	1059.1	.	1059.1
730126	COMMERCIAL TESTING LABS	0.006	218.8	164.7	.	.	.	.	50.1	.	50.1
730127	[illegible] CAR SERVICE	0.000	94.8	94.8	.	.	.	.	.	.	0.0
730128	LEASING, RENTAL OF HEAVY EQUIP.	0.037	[illegible]	5975.4	.	.	.	.	293.4	.	293.4
730129	PHOTOFINISHING LABORATORIES	0.057	.5	125.0	534.2	.	.	.	0.3	.	534[illegible]
730130	WATER SOFTENING SERVICE	0.025	.1	50.2	200.9	.	.	.	.	.	200.9
730131	SECURITY SERVICES	[illegible]	[illegible]	453[illegible]	.	.	.	.	10.5	.	10.5
730132	PACKAGING, LABELING SERV.	0.000	[illegible]	[illegible]	.	.	.	.	.	.	0.0
730134	ALL OTHER INCOME	0.755	[illegible]	[illegible]	[illegible]	.	.	117.1	591.8	1160.5	2026.2
7301	INDUSTRY UNALLOCATED	0.000	2960.4	2960.4	.	.	.	.	.	.	0.0
	TOTAL FINAL DEMAND				1106.8	0.0	0.0	121.5	2097.8	[illegible]	4486.7
	59.49% ALLOCATED TO INFORMATION				712.9	0.0	0.0	94.7	1203.4	[illegible]	2982.4

IO INDUSTRY 730100: MISCELLANEOUS BUSINESS SERVICES
$ Million (Current)
VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	10514.3
NET INTEREST	92.6
INDIRECT BUSINESS TAXES	144.1
BUSINESS TRANSFER PAYMENTS	49.1
CAPITAL CONSUMPTION ALLOWANCES	1572.9
PROFIT TYPE INCOME	2926.0
TOTAL VALUE ADDED	15299.0
59.54% ALLOCATED TO INFORMATION	9109.0

TABLE 26: REVENUES OF THE U.S. COMPUTER SERVICES MARKET

($ Millions)

SIC	SHORT NAME (with ADAPSO sub-industries)	1960	1965	1967	1970	1971	1972	1972[a] Census	1973
7372	COMPUTER PROGRAMMING & OTHER SOFTWARE	50	160	200	400	467	717	971	868
	Software products	-	-	-	-	-	281	-	395
	Software services	-	-	-	-	-	436	-	473
7374	DATA PROCESSING SERVICES	60	355	655	1455	1725	2125	1889	2763
	Facilities maint.	10	50	110	500	645	799	222	977
	Network info svcs	-	5	45	345	430	577	1667	766
	Batch services	50	300	500	610	650	749		1020[b]
7379	COMPUTER RELATED SERVICES, N.E.C.	-	5	53	670	820	1019	550	1028
	Third-party leasing	-	5	50	650	775	854	-	899
	Third-party maint.	-	-	3	20	45	56	-	68
	Other[c]	-	-	-	-	-	109	-	61
	TOTAL	110	520	908	2525	3012	3861	3440[d]	4159

[a] The Census figures are included to show the discrepancy between the ADAPSO definitions and the SIC based definition. The ADAPSO market size estimate is about 12% larger than the Census.

[b] Revised to include correspondent banking figures.

[c] Includes performance measurement and system security in 1972. For 1973, performance measurement moved to "software products" (SIC 7372).

[d] Includes establishments without payroll. Column entries are given only for establishments with payroll. Difference = $29.5 million.

Source: Adapted from the Association of Data Processing Services Organization (ADAPSO), The Computer Services Industry, 8th Annual Industry Report, Published by Quantum Science Corp., 851 Welch Road, Palo Alto, California. 1974, Exhibit 2, page 7.

The ADAPSO market definition includes two services which are excluded from the figures in Table 26. They are: "Education" (defined into SIC 8249) with 1972 revenues of $58 million; and "Used Computers", defined into SIC 3573 with sales of $400 million. The Census figures are based on a preliminary industry report.

730200 Advertising

SIC 7311 **Advertising Agencies**

Establishments primarily engaged in contracting for space in magazines, newspapers, periodicals, for radio and television time, or other advertising media, and placing advertising for clients on a commission or fee basis. Establishments which write advertising copy or do commercial art work, but do not place the advertising with media, are classified in Industry 8999.

Advertising agencies
Motion picture advertising

SIC 7312 **Outdoor Advertising Services**

Establishments primarily engaged in the preparation and presentation of poster displays and painted and electric spectacular displays on panels, bulletins, and frames, principally outdoors. Such establishments may construct, repair, and maintain display boards and may post advertisements. Special trade contractors primarily engaged in erecting display boards are classified in Major Group 17.

Billboard advertising
Outdoor advertising services
Poster advertising services, outdoor

SIC 7319 **Miscellaneous Advertising**

Establishments primarily engaged in furnishing advertising services, not elsewhere classified, such as advertising research service, aerial advertising, circular and handbill distribution, the distribution of samples, the composition and preparation of spot advertisements for radio and television use, and advertising in buses, trollies, etc. Establishments primarily engaged in preparing advertising copy or in commercial art work, but not placing advertising with media, are classified in Industry 8999.

Aerial advertising
Bus card advertising
Car carding service
Circular distributing service
Coupon distribution
Display advertising service, except outdoor
Handbill distribution service
Poster advertising services, except outdoor
Samples, distributing service
Shopping news—advertising and distributing service only
Spot advertisements for radio and television use, composition and preparation of

The Advertising industry, with revenues of $16.8 billion in 1967, is one of the major components of the "market information system." The SIC identifies 15 different subindustries, each specializing in a medium. The agencies place about 45% of the advertising dollar in the established media, with the remainder placed directly by firms or by individuals. The agencies presently place around 29.7% of the total advertising dollar, down from a high of 45% in 1967, and about the same as the 37.7% experienced in 1950. The trend bears out the notion that firms are developing their own in-house "quais-industries" to perform a variety of information services rather than purchase these same services from other firms.

Table 27 shows the volume of advertising placed by agencies (in the primary information sector) and by in-house advertising offices (in the secondary sector).

TABLE 27: U.S. ADVERTISING VOLUME[a]

($ Millions, Current)

YEAR	TOTAL ADVERTISING[b]	TOTAL NATIONAL ADVERTISING[b]	TOTAL AGENCY VOLUME IN U.S.[c]	AGENCY AS % OF TOTAL
1974	$26,820	$14,755	$10,636	39.7
1973	25,120	13,845	9,980	39.7
1972	23,300	13,030	9,393	40.3
1971	20,740	11,785	8,594	41.4
1970	19,600	11,460	8,389	42.8
1969	19,482	11,518	8,462	43.4
1968	18,127	10,883	8,026	44.3
1967	16,866	10,250	7,587	45.0
1966	16,670	10,213	7,476	44.8
1965	15,255	9,365	6,779	44.4
1964	14,155	8,713	6,237	44.1
1963	13,107	8,124	5,749	43.9
1962	12,381	7,661	5,337	43.1
1961	11,845	7,253	4,974	42.0
1960	11,932	7,296	4,924	41.3
1958	10,302	6,714	4,383	42.5
1956	9,905	5,926	3,900	39.4
1954	8,164	4,812	3,191	39.1
1952	7,156	4,096	2,700	37.7
1950	5,710	3,257	2,150	37.7

[a]Table provided courtesy of the American Association of Advertising Agencies

[b]Sources: Marketing/Communications through and including 1970; also includes revision of July 1968.

Advertising Age from 1971 to date, including August 1974 revision for the years 1971 through 1973.

[c]1967, 1963, 1958 and 1954 - per U.S. Census of Business. All other years interpolated or extrapolated, based on the relationship of total agency volume to total national advertising in the four Census years.

National Income Accounts Convention

The Advertising industry receives a transfer from all other industries which engage in advertising. For example, when a major retailer prints and distributes a catalogue as an advertising expense, those expenses are entered as outputs of the Advertising industry. All the advertising receipts of the Printing and Publishing industry (#26), of the Yellow Pages (#66), Radio and Television, Broadcasters (#72), and Hotels and Amusements (#76) are transferred into the industry. Also, all production and talent costs incurred by advertising (e.g., film and television segments, cartoons, photography, art work, printing, binding, and related production work) are included as an output of the industry by redefinition. These large transfer and redefinition items explain why the industry has such a small value-added component in relation to its output.

IO INDUSTRY 730200: ADVERTISING
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	COMP	OUTPUT	INTERM	PCE	GCF	INV	EXPORT	FED	STATE	FIN DEM
730200	ADVERTISING, TOTAL	0.000	16736.7	16736.7	.	.	.	.	.	.	0.0
730200	ADVERTISING INDUSTRY - SUBTOTAL	0.000	16552.0	16552.0	.	.	.	.	.	.	0.0
730201	ADVERTISING	0.018	141.6	0.0	141.6	.	.	.	.	.	141.6
730202	OTHER FINAL DEMAND	0.008	63.1	0.0	.	.	.	31.7+	1.6	30.0	63.1
7302	INDUSTRY UNALLOCATED	0.000	138.3	138.3	.	.	.	.	.	.	0.0
	TOTAL FINAL DEMAND				141.6	0.0	0.0	31.7	1.6	30.0	204.7
	ALLOCATED TO INFORMATION										204.7

+ 16.6 ads by foreign airlines
5.1 brochures and printed goods sold to foreigners

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	1142.6
NET INTEREST	10.0
INDIRECT BUSINESS TAXES	22.2
BUSINESS TRANSFER PAYMENTS	8.0
CAPITAL CONSUMPTION ALLOWANCES	85.8
PROFIT TYPE INCOME	325.1
TOTAL VALUE ADDED	1593.7
ALLOCATED TO INFORMATION	1593.7

730300 Miscellaneous Professional Services

SIC 8111 **Legal Services**

Attorneys
Counselors at law
Law offices
Legal services
Patent solicitors' offices
Referees in bankruptcy

SIC 8911 **Engineering and Architectural Services**

Establishments primarily performing services of a professional nature in the fields of engineering and architecture.

Architectural services
Boat designing
Consultants, engineering ocean mining
Engineering research
Engineers, consulting: civil, electrical, mechanical, marine, etc.—except engineering firms engaged in the sale of equipment or in contract construction
Machine design
Surveying service
Television cable engineers

SIC 8931 **Accounting, Auditing, and Bookkeeping Services**

Establishments primarily engaged in furnishing accounting, auditing, and bookkeeping services.

Accounting and tax services
Auditing services
Bookkeeping and billing services
Certified public accountants
Data processing service
Payroll Accounting Service
Punch card accounting, on a fee basis
Processing punch cards and magnetic tape for business
Tabulating service

SIC 8999 **Services, Not Elsewhere Classified**

Establishments offering services, not elsewhere classified, such as artists' studios, authors, commercial artists, lecturers, radio commentators, song writers, weather forecasters, and writers.

Actuaries, consulting
Advertising copy, writers of
Announcer, radio and television service
Artificial nucleation
Artists, including commercial and medical artists
Artists' studios
Art restoration
Authors
Chemists, consulting, not connected with business service laboratories
Christian Science Lecturers
Cloud seeding
Consultant, nuclear, not connected with business service laboratories
Entomologist, consulting, not connected with business service laboratories
Family (marriage) counseling service
Geologist, consulting (not connected with business service laboratories)
Ghost writing
Greeting cards, hand painting of
Inventors
Lecturers
Music arrangers
Newspaper columnists
Physicist, consulting, not connected with business service laboratories
Psychologists
Radio commentators
Sculptors' studios
Song writers
Stained glass artists
Tests, development of, for schools and industry
Weather forecasters
Weather modification (rain makers)
Writers

The provision of private information services in I-O industry #730300 amounted to a $16.2 billion industry in 1967. The legal profession is conceptualized as an information service in the following way: A lawyer receives information as an input (facts of the case, precedents relevant to the case, opinions), and produces as an output a well-defined information good (such as a brief, letter, contract, etc.) or service

(advice, arguing in court, telephone calls, etc.). The "black box" which transforms the information inputs into information outputs is the diagnostic, analytic, and writing processes performed by the attorney and legal staff. There is no other product or service other than informational. One view of the legal profession distinguishes between "new," original, or creative legal work -- such as complex or client-specific one-time cases -- and "routine" or more clerical types of work, such as leases, divorces, wills, or other routinized legal documents. The computer has been employed by entrepreneurs to perform the latter functions with mixed success, evidence that the distribution aspects of the law are somewhat amenable to provision by means other than one-time production. Presumably, a carefully designed computer program could anticipate most of the contingencies and "exceptions" encountered in the writing of, say, a lease. The lawyer's "creative" time would be purchased only once at high rates, whereas the customer would be able to purchase the service at something approaching marginal cost. With scale, that cost could very easily be driven down to a figure well below the current average costs. The phenomenon of computerized law underscores the concept that legal services are in fact information services.

The engineering and architectural services (SIC 8911) are similar "private information" professions. Their output is an engineering study, a design, a blueprint -- all information products. A particularly poignant problem with private information is experienced by "authors" and "music arrangers" of SIC 3999. Here the issues revolve around information as property, and the incentives for production with and without a system of copyright.

Accounting, auditing, and bookkeeping (SIC 8931) are clearly information services performing two separable functions: (a) analytic, in the private consulting by accountants, auditors, and bookkeepers; and (b) information processing, sometimes manual (e.g., small bookkeeping operations), more often automated.

The common feature underlying all professional business services is that their inputs and outputs are, in some sense, an information good or service; and the transform that converts the information inputs to information outputs is itself an informational process -- either analytical, routine processing, or more often a combination.

IO INDUSTRY 730300: MISCELLANEOUS PROFESSIONAL SERVICES
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	[illegible]	OUTPUT	INTERM	PCE	GCF	INV	EXPORT	FED	STATE	FIN DEM
730305	MISC. PROFESSIONAL SERVICES	0.000	16244.4	16244.4	.	.	.	.	.	.	0.0
730300	MISC. PROF SERVICES SUBTOTAL	0.000	11677.1	11677.1	.	.	.	.	.	.	0.0
730301	LEGAL SERVICES	0.397	3155.3	0.0	3155.3	.	.	.	.	.	3155.3
730302	ACCTS + NOTARIES	0.023	186.8	0.0	186.8	.	.	.	.	.	186.8
730303	OTHER FINAL DEMAND	0.154	1225.2	0.0	.	.	.	304.2	590.2	330.8	1225.2
7303	INDUSTRY UNALLOCATED	0.000	143.2	143.2	.	.	.	.	.	.	0.0
	TOTAL FINAL DEMAND				3342.1	0.0	0.0	3.9+	590.2	330.8	4567.3
	ALLOCATED TO INFORMATION										4567.3

+ 273.9 Engineering and contracting

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	5161.7
NET INTEREST	[illegible].0
INDIRECT BUSINESS TAXES	152.0
BUSINESS TRANSFER PAYMENTS	4.0
CAPITAL CONSUMPTION ALLOWANCES	345.0
PROFIT TYPE INCOME	6520.4
TOTAL VALUE ADDED	12183.1
ALLOCATED TO INFORMATION	12183.1

* * * *

I-O INDUSTRY #76: AMUSEMENTS

The Amusements industry includes motion pictures and approximately 70 smaller amusement industries (such as baseball and football clubs; golf courses; dog, horse, and auto racing; amusement parks; carnivals, circuses and fairs; boat and canoe rentals; swimming pools and bathing beaches, etc.). We shall only be looking at a small handful of establishments which either provide an information service as entertainment (e.g., movies), or provide an information service ancillary to the amusement (e.g., ticket agencies).

Around 50.28% of I-O #76 was allocated to information services.

	OUTPUT	FINAL DEMAND	VALUE ADDED
TOTAL INDUSTRY	9,089	6,057	5,020
INFORMATION	4,570	1,783	2,009
NON-INFORMATION	4,519	4,274	3,011
INFO % GNP		0.22	0.25

Detailed Industry Reports

760100 Motion Pictures

SIC 7813 Motion Picture Production, Except for Television

Establishments primarily engaged in the production of theatrical and non-theatrical motion pictures for exhibition, other than for television. Establishments engaged in both production and distribution are also included here.

- Audio visual program production, except for television
- Cartoon production, motion picture, except for television
- Educational motion picture production, except for television
- Industrial motion picture production, except for television
- Motion picture production (including distribution if from same establishment), except for television
- Training motion picture production, except for television

SIC 7814 Motion Picture and Tape Production for Television

Establishments primarily engaged in the production of theatrical and non theatrical motion pictures and tape for television exhibition. Establishments engaged in both production and distribution are also included here.

- Cartoon production, television
- Commercials, radio and television: record, tape or film
- Educational motion picture production, television
- Motion picture production, television (including distribution if from same establishment)
- Television film production
- Video tape production

SIC 7815 Production of Still and Slide Films

Establishments primarily engaged in the production of still films and slide films.

- Film strip production (continuous slide series, with sound track or record)

SIC 7816 **Motion Picture Film Exchanges**

Establishments primarily engaged in renting theatrical and nontheatrical film to exhibitors, other than in the field of television. Establishments engaged in both distribution and production are included in Industry 7813.

Film exchanges, motion picture
Motion picture distribution, exclusive of production, except for television
Rental of motion picture film, except film for television

SIC 7817 **Film or Tape Distribution for Television**

Establishments primarily engaged in renting theatrical and nontheatrical film or tape to exhibitors in the field of television. Establishments engaged in both distribution and production are included in Industry 7814.

Film exchange, motion picture, for television
Motion picture distribution exclusive of production for television
Rental of motion picture film for television
Tape distribution for television

SIC 7818 **Services Allied to Motion Picture Distribution**

Establishments primarily engaged in performing auxiliary services to motion picture distribution, such as film delivery service, film buying and booking agencies, and film libraries.

Booking agencies, motion picture
Film delivery, motion picture
Film purchasing agencies, motion picture
Theatrical booking agencies: motion picture

SIC 7821 **Motion Picture Service Industries**

Establishments primarily engaged in performing services independent of motion picture production but allied thereto.

Casting bureaus, motion picture
Developing and printing of commercial motion picture film
Directors, motion picture: independent
Editing of motion picture film
Film processing, motion picture
Laboratories, motion picture (service)
Motion picture consultants
Motion picture film storage
Rental and repair of motion picture equipment
Titling of motion picture film

783 MOTION PICTURE THEATERS

SIC 7832 **Motion Picture Theaters, Except Drive-in**

Commercially operated conventional or four-wall theaters primarily engaged in the indoor exhibition of motion pictures. Establishments primarily engaged in the commercial exhibition of motion pictures on an itinerant basis with portable projection and sound equipment are included in this industry.

Motion picture exhibitors, except drive-in
Theaters, motion picture, except drive-in

SIC 7833 **Drive-in Motion Picture Theaters**

Commercially operated theaters commonly known as "open air" or "drive-in", primarily engaged in the outdoor exhibition of motion pictures.

Motion picture exhibitors, drive-in
Theaters, motion picture, drive-in

The Motion Picture industry is a combination of several different information activities: (a) production, direction, filming, editing; (b) distribution of the film to exhibitors; (c) exhibiting the film to audiences; (d) search, as in booking agencies; (e) private information production, as in motion picture consultants; (f) information processing, as in developing, sound track, and other technical processing. The industry

structure, in part, reflects the different economics implied by the different informational functions, although vertical integration in the Movie industry has been a source of considerable antitrust activity and controversy.

Film exports accounted for $280 million in 1967 against a film import of $64.2 million. Television exports further accounted for $40 million. The $320 million in "cultural" exports seems quite small when compared to the over $1 billion exported as patent and management fees from the export of technology. Consumers spent $1,128 million on films in 1967.

IO INDUSTRY 760100: MOTION PICTURES
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	%GNP	OUTPUT	INTERM	PCE	GCE	INV	EXPORT	FED	STATE	FIN DEM
7800	MOTION PICTURES	0.000	3843.3	3843.3	.	.	.	.	.	.	0.0
78013	MOTION PICTURE PROD. EXC. FOR TV	0.007	496.8	551.7	.	.	-54.8	.	.	.	-54.8
78014	MOTION PICTURE + TAPE PROD FOR TV	0.000	447.9	447.9	.	.	.	.	.	.	0.0
78015	PROD. OF ANIMATED FILMS	0.005	120.4	82.3	.	.	.	+	6.6	31.5	38.1
78016	MOTION PICTURE FILM EXCHANGES	0.005	932.8	572.8	.	.	.	280.8	79.4	.	360.0
78017	FILM OR TAPE DISTRIBUTION FOR T	0.005	345.3	305.3	.	.	.	40.0	.	.	40.0
78018	SERVICES ALLIED TO MOTION PICTURES	0.000	46.6	46.6	.	.	.	.	.	.	0.0
78021	MOTION PICTURE SERVICE INDUSTRIES	0.000	328.7	327.6	.	.	.	.	1.1	.	1.1
78030	MOTION PICTURE THEATERS	0.142	1128.2	0.0	1128.2	.	.	.	.	.	1128.2
7815	INDUSTRY UNALLOCATED	0.000	48.7	48.7	.	.	0.0	.	.	.	0.0
	TOTAL FINAL DEMAND				1128.2	0.0	-54.8	320.8 +	87.1	31.5	1510.6
	ALLOCATED TO INFORMATION										1510.6

+ Television and film rentals and royalties combined

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	1038.0
NET INTEREST	31.0
INDIRECT BUSINESS TAXES	121.0
BUSINESS TRANSFER PAYMENTS	2.0
CAPITAL CONSUMPTION ALLOWANCES	201.8
PROFIT TYPE INCOME	131.0
TOTAL VALUE ADDED	1524.8
ALLOCATED TO INFORMATION	1524.8

* * * *

760200 Amusement and Recreation Services

SIC 7922 **Theatrical Producers (Except Motion Picture) and Miscellaneous Theatrical Services**

Establishments primarily engaged in providing "live" theatrical presentations, such as road companies, stock companies, summer theater, and burlesque houses. This industry also includes services allied with theatrical presentations, such as casting agencies; booking agencies for plays, artists, and concerts; scenery, lighting, and other equipment service; and theatrical ticket agencies. Theaters which are normally rented to theatrical producers, stock companies, etc., are classified as real estate operations (Industry 6512). Motion picture theaters and motion picture service industries are classified in Major Group 65.

Ballet production
Booking agencies, theatrical: except motion picture
Concert management service
Employment agencies, theatrical, radio, and television
Opera companies
Plays (road companies and stock companies)
Radio and television program producers
Rental of theatrical scenery
Repertory or stock companies, theatrical
Scenery design, theatrical
Stock companies, theatrical
Theater operation, except motion picture
Theater operation, legitimate
Theatrical companies, amateur
Theatrical equipment rental
Theatrical lighting, on a contract basis
Theatrical production, except motion picture
Ticket agencies, theatrical
Vaudeville (only) theater operation

Approximately $727 million in output of a $5.3 billion industry total originates with information services listed above. Most of the revenue originated in film or theatre-related enterprises such as producers, ticket agencies, managers and promoters, music distribution systems, and the like. Ticket agencies for sporting events are also included in that they serve as a search industry and in retail distribution of an information service.

IO INDUSTRY 760200: AMUSEMENT AND RECREATION SERVICES
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	ALLOC	OUTPUT	INTERM	PCE	GCF	INV	EXPORT	FED	STATE	FIN DEM
7900/	AMUSEMENT AND RECREATION SERVICES	0.000	924.3	924.3	.	.	.	.	.	.	0.0
791101 *	PUBLIC DANCE HALLS	0.308	23.3	0.0	23.3	.	.	.	.	.	23.3
792/01	PROD. OF MOTION P.P. RADIO + T.V.	0.000	99.0	99.0	.	.	.	.	.	.	0.0
792202	AGENTS, CONCERT BUREAUS	0.000	111.7	111.7	.	.	.	.	.	.	0.0
792/03	STAGE THEATRICAL SERVICES	0.000	21.8	21.8	.	.	.	.	.	.	0.0
79210A	PRODUCERS LEGIT. THEATERS	0.026	210.3	0.0	210.3	.	.	.	.	.	210.3
792215	TICKET AGENCIES	0.301	6.0	0.0	6.0	.	.	.	.	.	6.0
792220 *	STOCK AND REPERTORY CO.	0.004	30.2	0.0	30.2	.	.	.	.	.	30.2
792231 *	DANCE BANDS, ORCHESTRAS	0.000	104.3	103.8	0.5	.	.	.	.	.	0.5
792232	ENTERTAINERS, RADIO AND T.V.	0.000	157.1	157.1	.	.	.	.	.	.	0.0
792233 *	SYMPHONY ORCHESTRAS, CLASSICAL	0.000	86.9	0.0	99.9	.	.	.	.	.	99.9
7933 *	BOWLING AND BOWLING ALLEYS	0.000	728.8	0.0	728.8	.	.	.	.	.	728.8
7941 *	SPORTS CLUBS	0.024	71.0	4.0	67.0	.	.	.	.	.	67.0
7942 *	POOLS	0.076	54.5	4.0	50.5	.	.	.	.	.	43.5
7943 *	PROFESSIONAL ATHLETIC CLUBS	0.004	33.2	0.0	33.2	.	.	.	.	.	33.2
7944 *	SKATING RINKS	0.000	46.1	0.0	46.1	.	.	.	.	.	46.1
7945 *	PUBLIC GOLF COURSES	0.017	98.3	0.0	98.3	.	.	.	.	.	98.3
7946 *	COIN-OPERATED AMUSEMENT DEVICES	0.000	239.4	0.0	239.4	.	.	.	.	.	239.4
7947 *	SPORTING CLUBS	0.005	36.6	0.0	36.6	.	.	.	.	.	36.6
7948 *	AMUSEMENT PARKS	0.019	152.2	0.0	152.2	.	.	.	.	.	152.2
7949 *	GOLF AND COUNTRY CLUBS FOR PROFIT	0.022	177.3	0.0	177.3	.	.	.	.	.	177.3
794901 *	PARI-MUTUEL RACING STAKES	0.000	107.1	107.1	.	.	.	.	.	.	0.0
794902 *	HORSE RACING ADMISSIONS	0.004	39.8	0.0	39.8	.	.	.	.	.	39.8
794903 *	DOG RACING ADMISSIONS	0.001	5.1	0.0	5.1	.	.	.	.	.	5.1
794904 *	THOROUGHBRED RACING ADMISSIONS	0.006	48.6	0.0	48.6	.	.	.	.	.	48.6
794905 *	STAND. BRED HORSE RACING ADMISSIONS	0.003	25.3	0.0	25.3	.	.	.	.	.	25.3
794906 *	QUARTER TRACK CHARGE-OUTS	0.007	56.2	0.0	56.2	.	.	.	.	.	56.2
794907 *	QUARTER TRACK CHARGEBACKS	0.047	397.7	0.0	397.7	.	.	.	.	.	397.7
794908 *	STATE RECEIPTS	0.007	35.6	35.6	.	.	.	.	.	.	0.0
794909 *	STATE SHARE PARI-MUT. RECEIPTS-HORSE	0.041	394.4	0.0	394.4	.	.	.	.	.	334.4
794910 *	STATE SHARE PARI-MUT. RECEIPTS-DOG R	0.004	32.8	0.0	32.8	.	.	.	.	.	32.8
794911 *	MUSIC DISTRIBUTION SYSTEMS	0.000	65.0	65.0	.	.	.	.	.	.	0.0
794912 *	PROFESSIONAL SPT. OF AMUSEMENT DE	0.008	65.1	0.0	65.1	.	.	.	.	.	65.1
794913 *	PARK-ANIMALS CIRCUSES	0.007	54.9	0.0	54.9	.	.	.	.	.	54.9
794914 *	FAIRS	0.004	34.3	0.0	43.4	.	.	.	.	-9.1	34.3
794915	TICKET AGENCIES (SPORTS)	0.002	12.0	0.0	12.0	.	.	.	.	.	12.0
794916 *	OTHER COM. AMUSEMENTS	0.058	462.8	0.0	462.8	.	.	.	.	.	462.8
794917 *	SKATING RINKS	0.004	33.4	0.0	33.4	.	.	.	.	.	33.4
794918 *	BOAT, SAILE RENTALS	0.003	26.1	0.0	26.1	.	.	.	.	.	26.1
794919 *	BATHING BEACHES	0.003	21.5	0.0	21.5	.	.	.	.	.	21.5
794920 *	RIDING ACADEMIES	0.003	20.7	0.0	20.7	.	.	.	.	.	20.7
794921 *	OTHER COMMERCIAL RECREATION	0.011	84.0	0.0	84.0	.	.	.	.	.	84.0
794922 *	TOURIST ATTRACTIONS	0.004	30.9	0.0	30.9	.	.	.	.	.	30.9
794923 *	OTHER RECREATION	0.008	61.7	0.0	61.7	.	.	.	.	.	61.7
799318 *	OTHER AMUSEMENTS	0.007	53.1	0.0	53.1	.	.	.	.	.	53.1
79950	* NONPROFIT GOLF AND COUNTRY CLUB	0.023	185.9	0.0	185.9	.	.	.	.	.	185.9
79951	* NONPROFIT THEATRICAL	0.016	131.1	0.0	131.1	.	.	.	.	.	131.1
79952	* OTHER AMATEUR SPORTS	0.009	71.0	0.0	71.0	.	.	.	.	.	71.0
79953	* COLLEGE UNIVERSITY FOOTBALL	0.004	33.0	0.0	33.0	.	.	.	.	.	33.0
79954	* RECREATIONAL SERVICES	0.006	45.1	0.0	45.1	.	.	.	.	.	45.1
79955	* MISCELLANEOUS RECREATION ACTIVITIES	0.004	42.2	9.1	33.1	.	.	.	.	.	33.1
797.6	* AMUSEMENT AND RECREATION SERVICES	0.001	10.9	0.0	.	.	.	10.9	.	.	10.9
7986	* MISCELLANEOUS AMUSEMENTS	0.011	87.3	0.0	.	.	.	.	87.0	0.3	87.3
7986	* INDUSTRY UNALLOCATED	0.000	0.0	0.0	.	.	.	.	.	.	0.0
	TOTAL FINAL DEMAND				4462.3	0.0	0.0	10.9	87.0	-8.8	4531.4
	13.868 ALLOCATED TO INFORMATION				272.4	0.0	0.0	0.0	0.0	0.0	272.4

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	2057.0
NET INTEREST	82.0
INDIRECT BUSINESS TAXES	680.0
BUSINESS TRANSFER PAYMENTS	12.0
CAPITAL CONSUMPTION ALLOWANCES	403.0
PROFIT TYPE INCOME	261.4
TOTAL VALUE ADDED	3495.4
13.868 ALLOCATED TO INFORMATION	484.5

I-O INDUSTRY #77: MEDICAL, EDUCATIONAL SERVICES, AND NONPROFIT ORGANIZATIONS

I-O Industry #77 encompasses three large, and somewhat unrelated service industries. Together, they account for some 6% of GNP in sales to final demand and over 4% of value added.

The Medical Industry

The Medical industry is divided in the BEA scheme into three smaller industries: (i) doctors and dentists who practice in their offices, a $13.7 billion industry in 1967; (ii) other medical and health services, including veterinarians, medical laboratories, and sanitoria, a $4.4 billion industry; and (iii) hospitals, with an output of $10.8 billion. We shall only be considering portions of the physician's offices and medical labs, and completely eliminating hospitals.

The health care activity is a composite of various tasks, some information producing, processing, or distributing in nature, and others decidely in the "craft" or personal service tradition. The non-exhaustive typology in Table 28 illustrates the conceptual scheme underlying the analysis.

Hospitals and dentists' offices were summarily excluded on the grounds that they are mostly engaged in the provision of a "craft" or personal service, with the informational activities being ancillary in nature.

A hospital's primary purpose is a personal service -- albeit with strong informational component. But since most major medical centers connected with universities perform a vast amount of "knowledge production" in the form of medical research and diagnosis, we feel that eliminating hospitals as an "information industry" severely understates the size of the sector. Future research should specifically address this point. Chapter 9, containing a discussion on the secondary information sector, will partially account for the in-house knowledge activities of hospitals, but the accounting will understate the true portion of hospital income earned on informational activities. For example, a recent time-budget study conducted by a Stanford research team found that around 60% of a nurse's time is spent in such obvious informational activities as "writing in the file," reading doctor's instructions, or gathering information on a patient's temperature, blood pressure, and so on. The remaining 40% of the time was spent on actual patient care, i.e., feeding, clothing, changing bandages, administering medicine, tending to bedding needs, and so on. In addition, every hospital supports extensive diagnostic facilities, laboratories, training, and administrative facilities. The latter, involving the clerical and financial processing, is almost entirely an information processing function.

TABLE 28: TYPOLOGY OF INFORMATION IN THE HEALTH INDUSTRY

Craft or personal service	
Surgery	Administering medicine
Setting broken bones	Fitting IUD's
Cleaning wounds	Giving physical therapy
Applying bandages	Hospital feeding, bathing etc
Information producing or receiving	
Research	Taking histories
Diagnosis	Consulting with other doctors
Information processing	
Administrative information:	
Clerical	
Accounting	
Insurance forms	
Research and diagnostic	
Computer processing	
Instrument-controlled processing	
Information distribution or giving	
Diet counseling	Patient education
Preventative health care education	Post-surgical care counseling

The Education Industry

The Education industry in I-O #77 includes only private institutions -- prep schools, parochial schools, colleges, universities, academies, and so on. All public educational activities are accounted as part of final demand (State and local governments). By comparison, public education cost the nation some $39,512 million (5% of GNP), and private education was $7,957 million (1% of GNP).

Our scheme considerably understates the size of the educational activity as previously defined by Machlup. Table 29 shows a comparison between the Machlup concept of "education" and that used in the NIA.

Whereas Machlup counts the implicit cost of students' time (as foregone wages) in the scheme -- a notion consistent with the human capital concept -- this cost is ignored by the NIA. We decided to understate the education sector and remain consistent with the NIA. A portion of Machlup's education sector, such as training-on-the-job and in the armed forces, will be picked up by the secondary information sector accounts in Chapter 9. However, education in the home and the opportunity costs of students' time are ignored.

TABLE 29: COMPARISON OF MACHLUP AND NATIONAL INCOME CONCEPT OF EDUCATION

	($ Millions, 1958)	
	MACHLUP CONCEPTS	NATIONAL INCOME CONCEPTS
Education in the home	4,432	0
Training on the job	3,054	0
Education in the church	2,467	0
Education in the armed forces	3,410	0
Elementary & secondary schools		
Monetary expenditures	16,054	16,054
Implicit costs	17,285	0
Colleges & universities		
Monetary expenditures	4,443	4,443
Implicit costs	8,314	0
Commercial, vocational and residential	253	253
Federal programs n.e.c.	342	342
Public libraries	140	0
TOTAL EDUCATION	60,194	21,092

Source: Machlup, ibid, pp. 104-105 and 354.

Nonprofits

All nonprofit organizations, except clubs, fraternal organizations, and social welfare organizations, are basically informational conduits. Political organizations, labor unions (net of strike and health benefit payouts), and professional associations perform a variety of informational services on behalf of their membership.

Nonprofit organizations pose a particular problem in one respect -- how should religion and religious activities be allocated? The church is seen as an auxiliary of the school and the psychiatrist's couch, and in some instances as a communication medium between mortals and the unknown. All charitable or health functions of the church (clinics, food programs, day-care centers, emergency relief, bazaars, bingo games, recreational centers, etc.) are not included in the definition of "religious organizations."

Other nonprofit organizations were much easier to allocate. For example, political organizations engaged in political education and organizing activities (e.g., voter registration drives, passing out campaign literature) were allocated to "information services." The Elks, Moose, and other social clubs were entirely omitted from the information accounts.

The role of information technology in the services sector is implied in several instances. A discussion on the role of the computer in the physician's office is provided in the context of discussing time budget analysis. Educational services are already users of computers and teaching aids in the delivery of educational services; in fact, the Educational Technology industry has developed an identity (though not an SIC number) of its own in recent years. The connection between political campaigns and computers, mailing houses, radio, television, and telecommunications is clear.

Around 51.9% of Industry #77 was allocated to informational services.

	OUTPUT	FINAL DEMAND	VALUE ADDED
TOTAL INDUSTRY	48,366	45,819	33,897
INFORMATION	25,113	25,684	17,615
NON-INFORMATION	23,253	20,135	16,282
INFO % GNP		3.23	2.05

Detailed Industry Reports

770100 Doctors and Physicians

Industry 770100 accounted for some $13.5 billion in sales to final demand, or 1.7% of GNP. We immediately exclude "Dentists' Offices" from the analysis since it is seen as primarily a "craft," with the informational component ancillary in nature. The informational activities that are attendant to a dentist's office practice (e.g., scheduling, billing, diagnostic X-rays) will be partially accounted in the "secondary" industry scheme.

Physicians and osteopaths accounted for about $9.9 billion in sales to final demand, with more than $9.5 billion sold to consumers -- $45 spent on the average by every U.S. resident. As we shall demonstrate, approximately 59% of a physician's time is spent in information giving or receiving activities. Of this time, the largest portion (42%) is spent on informational activities within the physician's office, and the other 27% is a composite of activities that include paper work, reading, teaching, and consulting.

Many occupations consist of multifaceted informational activities, and much of the productivity literature counts on the existence of detailed knowledge regarding the functional

uses of a worker's time. For example, the impact of office automation on a secretary's time is sensitive to the relative amount of time spent in writing memoranda and letters, filing, and making coffee. Obviously, the last function is totally insensitive to information technology. The allocation of physician's income between informational and non-informational activities resulted from a very detailed and expensive time-budget study. The details of the study are discussed in the next section to illustrate how difficult it is to determine time allocation.

Concept of the Time Budget

Time budgets have been estimated and analyzed since "efficiency experts" ran rampant in the early 1920's. The methodology of the time-budget study is usually as simple as it is tedious. The most common method involves placing an observer -- sometimes unobtrusive, sometimes not -- in the working situation. The observer is trained to remember exactly what the subject is doing at given-time intervals, say every five minutes. The information is then entered on coding sheets which contain an exhaustive set of categories that are relevant to the particular profession under study. The purpose of time-budget studies is usually to allow an analyst, at some later time, to recommend ways in which the allocation of time can be made more "efficient". For our purposes, such a data base simply facilitates the allocation of time by function or activity type.

Conceptually, the output of Industry #770100, hence the value added, can be allocated on the basis of the time budget if we accept the notion that the various activities generate somewhat equivalent profits and wages.

The office-based physician's use of time has been studied by several researchers, and hence offers one of the most comprehensive sources of time-budget analysis of any occupation.*

Detailed time budgets have been used in secondary studies that focused directly on the informational components of office-based physicians' practices. For example, a recent study by

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*(See Massey and Whitehead, "Measurement of Time Spent Educating Patients in Physician's Office", Report #2796; "Evaluation of an Automated Medical History in Office Practice", Report #2741; "Development and Deployment of Computer Aids in the Physician's Office", Report #2512; "An Assessment of the Utility of Computer Aids in the Physician's Office", Report #3096. Bolt, Beranek and Newman, Boston, Mass. Supported by Contract No. HSM 110-71-244 from the Division of Health Care Information Systems and Technology, U.S. Public Health Service and the National Center for Health Services Research, DHEW).

Bolt, Beranek and Newman, Inc. (BBN)* looked at the potential of the computer in taking medical histories, dispensing patient education, supplying continuing medical education to physicians and staff, aiding in diagnoses and routine clerical, file-keeping, and accounting applications.* These studies start with the assumption that a large portion of a physician's practice is informational. The question is whether information processing techniques can improve the physician's productivity.

An annual survey conducted by Medical Economics asked precisely the question of interest: How does the physician allocate time between 10 major categories of activity? The "1971 Continuing Survey" was mailed to 9,594 self-employed M.D.'s under the age of 65 on a sampling procedure designed by Clark-O'Neill Inc. with the help of the American Medical Association. After discarding incomplete questionnaires, the survey developed an analysis based on 4.395 physicians' practices -- a sample of 45.8%. Two tables are reported: (i) participation rate in each activity by type of practice, and (ii) median range (± one S.D.) of hours per week devoted to the activity. Table 30 is a composite of those two tables, produced by weighting the median range and computing means. The major source of error in the table originates not with the weighting procedure, but with the possible error introduced in self-reporting by the physicians. Unfortunately, there is no cross-check of independent survey which can corroborate the data presented below.

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*See Bolt, Beranek, and Newman, Inc., Report #2471, "The CAPO Project, Phase I - Evaluation of an Automated Medical History in Office Practice"; Report #2512 "Phase II - Development and Deployment of Computer Aids in the Physician's Office"; Report #2796, "Measurement of Time Spent Educating Patients in a Physician's Office; Report #3096, "Final Summary Report on the CAPO Project."

TABLE 30:

AVERAGE NUMBER OF HOURS PER WEEK ALLOCATED TO DIFFERENT ACTIVITIES BY TYPE OF PROFESSION

Weighted by participation rate of different physicians
(Hours Per Week)

PROFESSIONAL ACTIVITY	G.P.	INTERNIST	SURGEON	OBG	PED	WEIGHTED AVERAGE HOURS PER WEEK
1. Seeing office patients	35.5	31.2	16.5	26.5	36.5	29.2
2. Hospital rounds and consultations	10.5	16.3	17.0	9.4	9.8	12.6
3. In operating, delivery and labor rooms	3.3	0	14.0	14.4	0.3	6.4
4. Professional reading and writing	4.1	4.1	3.7	3.2	3.8	3.8
5. House calls	2.6	2.0	0.6	0	0.7	1.2
6. Paper work, except insurance	2.1	2.5	2.4	1.5	1.1	1.9
7. Teaching in hospitals or medical school	0.1	1.2	1.0	0.8	1.0	0.8
8. Hospitals and other practice connected meetings	2.0	2.7	2.7	2.2	2.2	2.4
9. Working on insurance forms	1.5	1.2	2.1	0.9	0.9	1.3
10. Other professional activities	0.6	1.4	0.9	0.4	1.0	0.9
TOTAL HOURS/WEEK	62.3	62.6	60.9	59.3	57.3	60.5

Source: Owens, A., "Time Well Spent? New Norms Will Help You See", Medical Economics, December 6, 1971, pp. 79-87, based on Tables 1 and 2.

The single largest allocation of time for all types of physicians (except surgeons) is "seeing office patients," averaging 29.24 hours per week -- 47% of the physician's time. Hence, we shall concentrate mainly on what happens inside a physician's office. We shall later be allocating the ten major activities into either informational types (e.g., "working on insurance forms") or non-informational types (e.g., "house calls"). The following section concentrates on the office visit, since that proration is the most critical as a source of error.

Information in the Physician's Office

This section presents two methods for allocating the time spent in the average physician's office between information and non-information-type activities.

Method 1: The NAMCS Study

The physician's office was studied extensively by the National Center for Health Statistics, U.S. Department of Health, Education, and Welfare, under the National Ambulatory Medical Care Survey (NAMCS). Ambulatory care is simply defined as "health services rendered to individuals under their own cognizance, at a time when they are not in a hospital or other health care institution." Approximately 80% of all physician-patient contacts take place in the doctor's office, 13% at the hospital clinics and emergency rooms, and 7% at homes, jobs, or elsewhere. Hence, in terms of accurately allocating the informational component of physician-patient contacts, the relevant data to be analyzed are the duration of visit by type of treatment -- what was done, and for how long.*

The NAMCS broke down the physician's activities into 10 major "contact types": taking histories, ordering lab tests, giving immunization shots, performing office surgery, etc. Following the conceptual scheme outlined previously, the 10 categories were allocated into either informational or non-informational categories. Table 31 summarizes the NAMCS data in a format designed to reveal the informational activities.

Table 31 shows that around 80% of the physician's time is spent in either information acquiring or giving activities: 20% of the time is spent in either the craft or physical service aspects of medicine.

About 25% of the time is spent in prescribing drugs -- and allocated to information. Drug therapy is informational in several respects: (i) diagnosing the ailment; (ii) matching the ailment to the general treatment; (iii) selecting the exact generic medicine and dose; (iv) prescribing medicines; (v) often communicating the prescription directly to a pharmacist, and (vi) instructing the patient regarding the drug's use and possible side effects. In fact, several of these components are sensitive to information technology --

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*HEW, NAMCS, Background and Methodology, page 1, DHEW Publication No. (hra) 74-1335).

selection of drugs, direct communication with the pharmacy -- and the diagnostic phase itself seems to be augmentable by computers. The most noteworthy operational example is the Poison File maintained by many hospitals, and produced by the Poison Control Center.

TABLE 31: OFFICE PHYSICIAN'S ACTIVITY AND DURATION

TYPE OF CONTACT	NUMBER OF CONTACTS (millions)	% OF TOTAL CONTACTS	DURATION IN MINUTES (millions)	% OF TOTAL DURATION
INFORMATIONAL		76.57		80.20
Information-receiving				
Taking direct patient histories	231.7	20.21	3,489.4	21.01
Ordering laboratory tests & diagnosis	126.5	11.04	2,118.6	12.75
Ordering X-ray diagnosis	45.8	4.00	716.3	4.31
Information-giving				
Psychiatric counseling	28.1	2.45	889.3	5.35
Other counseling (self-care, preventative medicine, sex, family etc.)	127.0	11.08	1,956.6	11.78
Writing prescriptions for drug therapy	318.6	27.79	4,152.6	25.00
NON-INFORMATIONAL		23.44		19.80
Office surgery	57.6	5.03	802.8	4.83
Administratering immunization shots	119.8	10.45	1,201.2	7.23
No contact made or reported	34.4	3.00	373.4	2.25
Other or unspecified contact	56.8	4.96	911.9	5.49
		100.00		100.00

Source: Courtesy DHEW, National Ambulatory Care Survey, based on summary table produced on request by the NAMCS staff showing type of contact by duration in five minute intervals.

The end product of a prescription is the taking of a drug -- a non-informational activity. Should drug prescriptions, then, be counted as a non-informational activity? The problem is analogous to an architect providing an information product (the blueprint designs) to a client. The information product -- a blueprint -- is sold to the client, who in turn uses its contents to purchase a non-information product (a building) from a non-information vendor (a contractor). In our scheme, a blueprint and the architect are classified as information services. We are inclined, therefore, to include drug therapy prescriptions and prescribers as information services. (Note that blueprints are also increasingly

sensitive to information technology. Many advanced architectural firms use computers to analyze structural requirements and perform cost analysis on alternative designs. In state-of-the-art, computer graphics are being used to actually help design buildings visually.)

To illustrate the point, consider the service and product flows embodied in the following two markets:

Information service worker or firm	Architect	Physician
	(produces a ..)	
Information product	Blueprint	Prescription
	(which is sold to the consumer, who buys..)	
Non-information product	Warehouse	Drug
	(from a non-information firm..)	
Non-information service	Construction Company	Pharmacist

In the sense portrayed above, the prescription is clearly understandable as an information product, even though its ultimate use is not fulfilled until the drug has been purchased and consumed. It represents an information-rich "buy" order -- from the consumer to the pharmacist -- so rich, in fact, that an intermediate information expert must be consulted (the physician). The State intervenes in a peculiar way in these types of markets by requiring the consumer to purchase information (or certification) before the non-information good can be consumed.

In summary, the NAMCS study reveals that 80% of the physician's office time is spent in informational activities. Two assumptions are necessary in order to translate this figure into the NIA. First, the data are based on the 1974 NAMCS survey -- and we assume that the distribution of a physician's time between 1967 and 1974 did not change markedly. In fact, there has been some shift in the practice towards more intensive and lengthy acquisition of diagnoses, lab tests, X-rays, and so on. This shift has come about partly in response to the rapid increase in both the frequency and severity of malpractice suits, and partly in the increasing number and quality of diagnostic equipment and techniques.

The physicians, when faced with a high probability of a disastrous lawsuit sometime during their careers, engage in "excessive" information-acquiring behavior. It has been noted by the press that doctors, in 1975, behave as though they are preparing a court brief when faced with a potentially complicated case, and rely on an inordinate amount of information-gathering activities. Much of this information is unnecessary, and amounts to posturing by a risk-averse doctor. Second, as we have discussed previously, we impute that each of the ten activities listed in Table 31 earn an equivalent income and allocate the support staff's time in an equivalent fashion. This imputation may tend to understate the extent of informational activities for several reasons: (i) telephone calls and consultation are usually not billed by the physician, and do not appear in the survey; (ii) all the information-giving activities that occur during non-informational tasks (e.g., medical education during immunization shots) are unaccounted in the NAMCS report.

Method 2: The Wisconsin Study

A study similar to the NAMC was performed by Golladay, Hansen, and Smith under a contract from the U.S. Department of Health, Education, and Welfare.* The major differences between the NAMCS and the Wisconsin study are summarized below:

TABLE 32: TWO TIME BUDGET STUDIES OF PHYSICIAN'S OFFICES

	METHOD 1 NAMCS	METHOD 2 WISCONSIN
Method of data gathering	Self-reporting by physicians	Trained Observers
Number of activities reported in time budget	10	344
Sample size	1103	60

*See Contract No. HEW-OS-72-183, with support from the Robert Wood Johnson Foundation. The relevant reports are: Golladay, Hansen, Smith et.al., "The Empirical Study of Efficient Health Manpower Utilization", University of Wisconsin, May 1975; Smith Miller and Golladay, "An Analysis of the Optimal Use of Inputs in the Production of Medical Services", Journal of Human Resources, Vol. VII, No. 2, Spring 1972.

The NAMCS can be seen as an overview of the industry, trading off broad coverage for some loss of information; and the Wisconsin study offers an in-depth look at a much smaller population. The 344 categories in the Wisconsin study were separated according to their information-giving, information-receiving, and non-informational nature.

Table 33 shows the major category titles used in the Wisconsin study. A few detailed activities within the major category were selected for illustrative purposes. Generally, the informational tasks were readily identifiable. A conceptual problem arose in determining whether all diagnostic activities should be counted as information-receiving since some of the diagnostic activities were heavily "craft oriented" such as tapping on chest cavities, and taking blood samples and throat cultures. Similarly, the physical examination posed some problems because of the heavy "craft" nature of that procedure. The conceptual scheme outlined previously prevailed on the side of inclusion, since the physical examination and the diagnostic procedure have no useful end in themselves other than in yielding information about the patient's condition.

Table 33 shows that around 85% of the physician's direct, patient-contact time is spent in informational activities. Approximately 40% of the patient-contact time was spent in gathering information, another 38% was spent in giving information to the patient, and the remaining 7% was spent in processing information.

TABLE 33: ACTIVITY AND SUMMARY OF TIME DISTRIBUTION BY DETAILED TASK

	INFORMATION: GIVING (G) RECEIVING (R) PROCESSING (P)	CONTACTS @ 30-SECOND INTERVALS	% OF TOTAL TIME
TOTAL -- 344 detailed tasks in 17 major groups		269,210	100.0
INFORMATION-GIVING, -RECEIVING, AND -PROCESSING: 234 detailed tasks		229,273	85.2
PHYSICAL EXAMINATION: Inspect, test, examine systems: e.g. test hearing, examine abdomen, inspect nose, take vital measurements	R	51,545	19.2
HISTORICAL DATA: Take history of present illness, past medical history, review problem list, review of systems, family history, social history, administer questionnaire, review questionnaire, administer computer history, developmental questioning	R	40,784	15.2
COMPLETE VISIT/PREPARE FOR NEXT VISIT: Discuss follow-up, refer to others, documentation, record keeping	G	38,663	14.4
VERBAL/BEHAVIORAL/SOCIAL COUNSELING: Explain, advise, instruct, counsel; therapeutic listening	G	38,047	14.2
PRESCRIBE AND DISCUSS MEDICATION: Discuss side effects, schedule, rationale for use; as distinct from administering drug	G	13,353	5.0
ANALYSIS/DECISION/PLANNING: Read reference material, consultation, conference, review algorithm logic	R,G	13,209	4.9
PATIENT CONTACT/TRIAGE: Registration, record preparation, introduction and greeting	R	10,017	3.7
DIRECT PATIENT AID - INSTRUCTION: Instruct patient regarding procedure	G	8,302	3.1
DIAGNOSTIC PROCEDURES: Test and measure, e.g., X-ray, EKG, psychometric testing, hearing test, etc.	R	5,909	2.2
DIETARY/NUTRITIONAL: Discuss/advise patient on weight control, nutrition, infancy feeding, pregnancy diet, etc.	G	3,445	1.3
SUPPORT ACTIVITIES - BUSINESS & ADMINISTRATION: Clerical handling of patient care records and data; billing, scheduling, etc.	P	3,041	1.1
ALL OTHER: Developmental counseling, instructing other staff members, continuing education, teaching, etc.		2,958	1.1
NON-INFORMATIONAL ACTIVITIES: 110 detailed activities		39,937	14.8
DIRECT PATIENT AID: Assist or prepare patient, prepare equipment, restrain/hold patient, etc.		16,324	3.1
OFFICE SURGERY: General procedures, such as administering local anesthesia, examine/clear lacerations, wounds; suture, drain joint, remove mole, remove foreign matter from ears, catherization		9,634	0.5
COLLECT SPECIMENS: Biopsy, pap smear, throat culture, stool sample, etc.		5,536	2.1
ADMINISTER MEDICATION: As distinct from prescribing or discussing medication; e.g., antibiotic, immunization, desensitization shots		2,872	1.1
ALL OTHER: Assist staff member, follow-up, emergency care, home visits, clinical support activities (sterilize and maintain equipment, clean examining room)		4,571	1.7

Source: Courtesy Professor Ken Smith and the Health Economics Research Cent
Wisconsin) A tabulation of the full sample showing

The output of Industry #770100 comes not only from physicians, but also from the other medical, paramedical, clerical, and technical staffs that are employed in the "Offices of Physicians" industry. Henoe, prorating value added strictly as a function of the physician's use of time may create a conceptual and accounting problem. To motivate the problem more concretely, Table 34 shows the workforce hired by the Physician's Office industry. Physicians only make up about 35% of the total workforce. It might therefore introduce a serious error to infer from the distribution of a physician's time how the industry output is to be allocated. A physician typically hires a nurse or a technician to perform precisely those physical crafts or personal-service tasks which the physician has no comparative advantage in performing -- thus allowing the physician to specialize in the area where a comparative advantage exists -- namely diagnosis, analysis, conseling, and other informational activities. On the other hand, a closer examination of the other 65% of the workers in the industry reveals that at least 60% could also be classified as information workers (e.g., technologists, who perform machine-based diagnosis, other medical doctors and secretaries, bookkeepers, receptionists, etc.). Together with physicians, the information workers include about 74% of the total workforce, and are entirely supported by the physician's income.

TABLE 34:

DISTRIBUTION OF WORKFORCE IN THE "OFFICES OF PHYSICIANS" INDUSTRY ADAPTED TO SHOW INFORMATION WORKERS

	EMPLOYMENT 1970	NUMBER OF WORKERS PER PHYSICIAN
TOTAL	564,906	3.06
Information (or allocated)	473,776	2.57
Physicians, M.D.'s	184,581	1.00
Other Professionals, Paraprofessionals	87,105	0.47
RNS	55,928	
Dietitians	2,342	
Technologists	20,813	
Psychologists	1,095	
Writers	177	
Accountants	555	
Lawyers	292	
Personnel	570	
Office managers	5,809	
Other	476	
Clerical	202,090	1.10
Medical secretaries	39,336	
Other secretaries	48,689	
Bookkeepers	19,576	
Receptionists	70,342	
File clerks	2,712	
Typists	6,150	
Other	15,285	
Non-Information	91,130	0.49
Craftsmen	1,216	
Health aides	39,514	
Nurses, aides, orderlies	4,902	
Practical nurses	14,591	
Gardeners	1,153	
Dental assistants	1,873	
Janitors	5,909	
Cleaners	13,010	
Maids	1,296	
Other services	15,170	
All other non-information workers	7,844	

Summary of I-O #770100

The preceding section offered a detailed look at the informational component within the physician's office. The survey data are summarized in Table 35. From the Wisconsin studies, it was determined that 85.4% of the physician's patient-contact time involves informational activity. Line 1 of Table 35 shows the allocation in an average physician's week. In the office, nearly 26 hours a week are spent in giving and receiving information.

Line 2, "Hospital rounds and consultation" mixes personal service and an information service. The hospital rounds usually involve supportive pre- and post-operative care in which information transfers are minimal but where the physician is offering a feeling of comfort or assurance. Consulting, however, usually involves discussions with other physicians about a patient's case. Aside from the gross fee-splitting charades, most of this activity is diagnostic in nature -- doctors giving each other the benefit of their knowledge and experience. Without additional data, I allocated the 6.4 hours equally between information and non-information.

Line 3, "In the operating, delivery and labor rooms" was excluded from information, since it involves only skilled craft-type activities.

Line 4, "Professional reading and writing" is intuitively obvious as an information activity.

Line 5, "House calls" was excluded since I cannot determine the service component from the informational component without more data.

Lines 7-9, including paper work, teaching, meetings, and working on insurance forms are all included as informational overhead.

Line 10, "Other professional activites," is probably a euphemism for playing golf and having coffee breaks. The average doctor admits to less than one hour a week of this activity. It is not informational.

In all, Table 35 shows that 68.6% of the average physician's week is spent in informational activities. This figure is weighted by type of practice, income, and participation rate in each activity. Physicians make up around 74% of I-O Industry #770100. Hence around 51% of the "Physicians and Dentists" industry can be allocated to information.

TABLE 35:

AVERAGE NUMBER OF HOURS PER WEEK ALLOCATED TO DIFFERENT ACTIVITIES BY TYPE OF PROFESSION

Weighted by: (a) participation rate of physicians; (b) distribution of physicians to different professional specialties; and (c) distribution of net income to each specialty. This table is a summary of five surveys using comparable data.

(Hours per Week)

PROFESSIONAL ACTIVITY	G.P.	INTERNIST	SURGEON	OBG	PED	AVG	INFO
1. Seeing office patients	32.6	30.3	16.3	30.0	42.2	30.3	25.9
2. Hospital rounds and consultations	9.6	15.9	16.6	10.6	11.3	12.8	6.4
3. In operating, delivery, labor rooms	3.0	0	13.7	16.2	0.4	6.7	0
4. Professional reading and writing	3.7	4.0	3.6	3.6	4.4	3.9	3.9
5. House calls	2.1	1.9	0.6	0	0.8	1.1	0
6. Paper work, except insurance	1.9	2.4	2.3	1.7	1.3	1.9	1.9
7. Teaching in hospital or medical school	0.1	1.2	0.9	0.9	1.1	0.8	0.8
8. Hospital and other practice-connected meetings	1.8	2.6	2.6	2.5	2.5	2.4	2.4
9. Working on insurance forms	1.4	1.2	2.1	1.0	1.1	1.4	1.4
10. Other professional activities	0.5	1.4	0.9	0.4	1.2	0.9	0
TOTAL	57.0	61.0	59.6	66.9	66.3	62.2	42.7

INFORMATION AS A PORTION OF TOTAL TIME SPENT (INFO/AVERAGE) = .6865

Source: For (a): Medical Economics, op.cit., December 6, 1971, pp. 79-87
For (b): Medical Economics, November 11, 1974, p. 240, based on a survey conducted by Clark-O'Neill Inc. and the A.M.A. comparing the survey sample of 11,235 with the universe statistics.
For (c): Medical Economics, ibid. p. 238.

For the allocation of "Seeing office patients" to information, see discussion on the Wisconsin time budget analysis. An allocation ratio of .854 was used.

As an afterword, I would like to salute the casual manner in which Machlup treated the medical industry. After relying on five separate data bases, which cost (in the aggregate) close to $500,000 to develop, I developed an allocation of 50.85% as informational in nature. Machlup, on the other hand, reports without elaboration,

> "We are interested only in the production of knowledge or, in this case, in the sale of medical advice, prescriptions and information...however, no breakdown of receipts is available...We have decided that only half of the payments to physicians and surgeons are for advice and information."

Close enough.

IO INDUSTRY 770100: DOCTORS AND DENTISTS
$ Million (Current)

FINAL DEMAND COMPONENTS

SEC	NAME OF ITEM	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
801	DOCTORS AND DENTISTS	0.000	13704.6	13704.6	.	.	.	.	.	.	0.0
8011	PHYSICIANS AND OSTEOPATHS	0.991	10152.1	203.0	9531.0	.	.	.	48.8	367.9	9968.3
8012	DENTISTS SERVICES	0.023	3366.6	0.0	3219.7	.	.	.	3.3	123.6	3366.6
8013	CHIROPRACTOR SERVICES	0.023	185.9	0.0	182.2	.	.	.	.	3.7	185.9
8014	INDUSTRY UNALLOCATED	0.000	0.0	0.0		.	.	.	.	.	0.0
	TOTAL FINAL DEMAND				12933.7	0.0	0.0	0.0	52.1	495.2	13501.0
	50.59% ALLOCATED TO INFORMATION				6543.6	0.0	0.0	0.0	33.5	252.6	6829.7

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	1969.4
NET INTEREST	66.0
INDIRECT BUSINESS TAXES	117.3
BUSINESS TRANSFER PAYMENTS	0.5
CAPITAL CONSUMPTION ALLOWANCES	312.8
PROFIT TYPE INCOME	8356.5
TOTAL VALUE ADDED	10822.5
ALLOCATED TO INFORMATION	5474.7

* * * *

770400 Other Medical and Health Services

This industry includes veterinarian services, nursing homes, and laboratories. The information component of medical health services was judged to be only in the research, diagnostic, and discovery functions of the laboratories. All other medical services were allocated to services, not information, although there is a large component of information in operating a nursing home or veterinary office.

Around 8.05% of the industry's output was allocated to information services.

IO INDUSTRY 770300: OTHER MEDICAL AND HEALTH SERVICES
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	MCMP	OUTPUT	INTERM	PCE	GCE	INV	EXPORT	FED	STATE	FIN DEM
8000	OTHER MEDICAL AND HEALTH SERVICES	0.000	4281.8	4281.8	.	.	.	.	.	.	0.0
800072	* VETERINARIAN SERVICES	0.091	517.0	111.1	405.9	.	.	.	.	.	405.9
800073	MEDICAL AND DENTAL LABORATORIES	0.009	496.1	427.2	68.9	.	.	.	.	.	68.9
800092	* NURSING HOME CARE	0.217	1729.3	0.0	897.7	.	.	.	28.3	803.5	1729.3
800099	* OTHER MEDICAL SERVICE	0.167	1339.2	9.5	1268.5	.	.	.	1.8	57.4	1329.7
8000	INDUSTRY UNALLOCATED	0.000	0.0	0.0	.	.	.	.	.	.	0.0
	TOTAL FINAL DEMAND				2641.0	0.0	0.0	0.0	30.1	862.9	3534.0
	9.65% ALLOCATED TO INFORMAT.ON				34.5	0.0	0.0	0.0	0.0	0.0	34.1

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	1682.5
NET INTEREST	21.3
INDIRECT BUSINESS TAXES	28.3
BUSINESS TRANSFER PAYMENTS	.0
CAPITAL CONSUMPTION ALLOWANCES	96.0
PROFIT TYPE INCOME	1071.1
TOTAL VALUE ADDED	2899.2
9.65% ALLOCATED TO INFORMATION	279.7

* * * *

770400 *Educational Services*

SIC 8211. **Elementary and Secondary Schools**

Elementary and secondary schools below university grade (ordinarily grades 1 through 12), including denominational and sectarian. Nursery schools, kindergartens, and military academies are also included.

- Academies
- Boarding schools
- Day nurseries
- Day schools
- Finishing schools
- High schools (junior and senior)
- Kindergartens
- Military academies
- Nursery schools
- Preparatory schools
- Schools, elementary and secondary
- Schools for feeble-minded
- Sectarian schools
- Seminaries, below university grade
- Schools and training centers for retarded children, elementary and secondary grades
- Vocational high schools

SIC 8221 **Colleges, Universities, and Professional Schools**

Colleges, universities, and professional schools granting academic degrees and requiring for admission at least a high school diploma or equivalent general academic training.

- Colleges
- Professional schools: dental, engineering, law, medical, etc.
- Theological seminaries
- Universities

SIC 8222 **Junior Colleges and Technical Institutes**

Junior colleges and technical institutes requiring for admission at least a high school diploma or equivalent general academic training, and granting associate academic degrees, certificates, or diplomas. Schools having junior college grades in conjunction with secondary grades are classified in Industry 8211.

- Junior colleges
- Technical institutes
- Community colleges (junior)

SIC 8231 **Libraries and Information Centers**

- Circulating libraries
- Lending libraries
- Libraries
- Rental of books
- Centers for documentation

SIC 8241 **Correspondence Schools**

Establishments primarily engaged in furnishing educational courses by mail. Offices maintained for the sale of correspondence courses are included.

Correspondence schools, including branch offices and solicitors

SIC 8242 **Vocational Schools, Except Vocational High Schools**

Noncollegiate schools offering specialized trade or commercial courses, but not academic training. Beauty schools are classified in Industry 7231 and barber schools in Industry 7241.

Aviation schools
Banking schools (training in banking)
Business colleges and schools (not of college grade)
Commercial art schools
Commercial schools, not of college grade
Data processing school
Flying instruction
Nurses schools, practical
Secretarial schools, not of college grade
Trade schools
Vocational schools, except vocational high schools

SIC 8299 **Schools and Educational Services, Not Elsewhere Classified**

Specialized nondegree granting schools, not elsewhere classified, such as music schools, child guidance clinics, dramatic schools, language schools, and Civil Service and other short term examination preparatory schools. Dancing schools are classified in Industry 7911.

Art schools, except commercial
Baton instruction
Bible schools, not operated by churches
Ceramic schools
Charm schools
Child guidance clinics
Civil service schools
Diction schools
Dramatic schools
Hypnosis schools
Language schools
Modeling (clothes) schools
Music schools
Personal development schools
Public speaking schools
Reading schools
Tutoring schools
Vocational counseling

All education activities are allocated to information services. Machlup offers a variety of reasons why these activities are "knowledge producing," plus some warnings that there might be a large degree of consumption value in education aside from any human capital formation that might be going on. This idea is again captured in recent work by Spence (1973),* Stiglitz (1974),** and others under the heading of "signalling" or screening incentives in acquiring education aside from either the consumption or human capital portions.

Education serves at least three separate, but not easily separable, functions: (i) education is fun for its own sake, and there are recreational social aspects in education; (ii) education offers human and intellectual development -- or human capital formation; and (iii) the resulting certification serves as a self-reinforcing screen on the job market, with incentives for its purchase beyond the social optimum.

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* Spence, A.M. (1973), "Job Market Signalling", Quarterly Journal of Economics, V. 87.

**Stiglitz, J.E. (1974) "Equilibrium Wage Distributions", IMSSS Tech. Report #154, November 1974.

There is no empirical way to distinguish between these three components. Should a theorist offer one, the industry can be redefined to throw the first category into the "Entertainment" industry, and retain the other two as informational phenomena.

The Education industry covers only private schools, academies, parochial institutions, and so on. The public education system appears as a final demand purchase by Federal, State, and local governments, and is discussed separately in Chapter 8.

IO INDUSTRY 770400: EDUCATIONAL SERVICES
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	ROW	OUTPUT	INTERN	PCE	GCE	INV	EXPORT	FED	STATE	FINAL D
8200	EDUCATIONAL SERVICES	0.300	7959.9	7959.9	.	.	.	.	.	.	0.0
822011	ELEMENTARY AND SECONDARY SCHOOLS	0.259	2038.7	0.0	2038.7	.	.	.	.	.	2038.7
822012	HIGHER EDUCATION	0.370	2958.3	0.0	2958.3	.	.	.	.	.	2958.3
822021	NURSERY SCHOOLS	0.031	248.9	0.0	248.9	.	.	.	.	.	248.9
822022	OTHER EDUCATION	0.151	1203.0	0.0	1203.0	.	.	.	.	.	1203.0
822023	HIGHER EDUCATION	0.033	260.6	1.1	.	.	.	.	135.1	124.8	259.9
822024	OTHER EDUCATION	0.001	9.5	0.5	.	.	.	.	8.9	.	8.9
82301	RESEARCH AND DEVELOPMENT	0.155	1233.4	0.0	.	.	.	.	1216.9	15.5	1232.4
8200	INDUSTRY UNALLOCATED	0.000	0.0	0.0	.	.	.	.	.	.	0.0
	TOTAL FINAL DEMAND				6458.9	0.0	0.0	0.0	1358.9	139.3	7957.1
	ALLOCATED TO INFORMATION										7957.1

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	4902.0
NET INTEREST	11.0
INDIRECT BUSINESS TAXES	20.0
BUSINESS TRANSFER PAYMENTS	.0
CAPITAL CONSUMPTION ALLOWANCES	42.0
PROFIT TYPE INCOME	195.0
TOTAL VALUE ADDED	5170.0
ALLOCATED TO INFORMATION	5170.0

* * * *

770500 Nonprofit Organizations

SIC 8611 **Business Associations**

Nonprofit membership organizations engaged in promoting business interests.

Better Business Bureaus
Boards of trade, other than security and commodity exchanges
Business associations, other than civic and social
Chambers of Commerce
Contractors' associations
Dairy herd improvement associations
Growers' associations, not engaged in contract buying or selling
Growers' marketing advisory services
Industrial standards committees
Junior Chambers of Commerce
Manufacturers' institutes
Merchants' associations, not engaged in credit investigations
Public utility associations
Real estate boards
Shipping and Steam Ship Company Associations
Trade associations

SIC 8621 **Professional Membership Organizations**

Nonprofit membership organizations of professional persons for the advancement of the interests of their profession.

Bar associations
Dental associations
Engineering associations
Medical associations
Professional membership organizations
Scientific membership associations

SIC 8631 **Labor Unions and Similar Labor Organizations**

Nonprofit membership organizations of workers for the advancement of labor interests.

Employees' associations, for the advancement of labor interests
Labor organizations
Labor unions
Trade unions, local or national

SIC 8651 **Political Organizations**

Nonprofit membership organizations established to promote the interests of a national, state, or local political party or candidate.

Political organizations and clubs

SIC 8921 **Nonprofit Educational and Scientific Research Agencies**

Nonprofit establishments primarily engaged in research. Nonprofit associations organized for the primary purpose of the dissemination of information for the public health or welfare are included in this industry. This industry does not include commercially operated research agencies.

Archeological expeditions
Brookings Institution
Cancer associations
Carnegie Institute
National Bureau of Economic Research
Planned parenthood associations
Research agencies, scientific and educational: nonprofit
Retarded children's association
Tuberculosis associations

The "Nonprofit Organizations" include museums; art galleries; business, professional, political, social and civil organizations; religious and charitable organizations; and nonprofit research and development. A nonprofit organization was allocated to information only if its primary function is to produce or distribute information to its membership (or society), or to process and transact information services on behalf of its membership.

The output of labor unions is "net dues," or membership dues and fees less strike, health, and unemployment benefits. The output of the industry in informational terms is: employment search, contract negotiations, claims and litigation, labor

education, political information, and so on. The output of professional associations is the dues and fees collected from members. In informational terms, the output covers: publication of scholarly or professional journals (including reader's fees, mailing, printing, etc.), organizing professional meetings (for exchange of ideas and procurement of jobs), and acting as a political lobby. Clubs and fraternal organizations were excluded (e.g., Elks, Moose) on the grounds that the information exchange is ancillary to the recreation aspects. Political organizations' output include all legal donations and contributions, and is inferred to include preference-gathering activity, persuasion, advertising, and so on. Religious organizations are specified in the accounts to exclude all charitable and medical activities, and only cover establishments used "for worship or for promotion of religious activities." After some debate as to whether sermons and prayers constituted information transfer, the industry was retained. Charitable organizations such as Goodwill Industries and the Salvation Army were excluded. Foundations and nonprofit research and development establishments were included on the grounds that they either fund or directly produce new knowledge. Nonresearch-type foundations (e.g., Heart Foundation) are distinguished in the accounts from the education-type foundations; the former are eliminated.

About 80% of the nonprofit organizations were allocated to information services.

IO INDUSTRY 770500: NONPROFIT ORGANIZATIONS
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF IOSN	MAKE	OUTPUT	INTERM	PCE	GCF	INV	EXPORT	FED	STATE	FIN DEM
770500	NONPROFIT ORGANIZATIONS	[illegible]	11920.8	11920.8	.	.	.	.	.	.	0.0
770501	NONPROFIT ORGANIZATIONS, MUTUAL	[illegible]	1588.7	1588.7	.	.	.	.	.	.	0.0
770521	NET PAYMENTS TO LABOR UNIONS	0.1173	977.0	0.0	977.0	.	.	.	.	.	977.0
770522	DUES AND FEES TO PROFESSIONAL ASSOC	0.0711	84.0	0.0	84.0	.	.	.	.	.	84.0
770523	CLUBS AND FRATERNAL ASSOCIATIONS	0.1221	959.0	0.0	959.0	.	.	.	.	.	959.0
770524	POLITICAL ORGANIZATIONS	0.0028	32.0	0.0	32.0	.	.	.	.	.	32.0
770525	RELIGIOUS ORGANIZATIONS	0.4667	5325.0	0.0	5325.0	.	.	.	.	.	5325.0
770526	PHILANTHROPIC ORGANIZATIONS	0.1167	1329.0	0.0	1329.0	.	.	.	.	.	1329.0
770529	*SOCIAL WELFARE ORGANIZATIONS	0.0147	167.0	0.0	10.9	.	.	.	.	156.1	167.0
770527	MUSEUMS AND GALLERIES	0.0123	140.1	0.0	140.1	.	.	.	.	.	140.1
770528	FOUNDATIONS, FOR EDUCATION AN	0.0393	449.0	0.0	449.0	.	.	.	.	.	449.0
770599	GOVERNMENT PURCHASES	0.1187	691.3	0.0	.	.	.	.	640.1	50.9	691.0
7705	INDUSTRY UNALLOCATED	0.0063	28.2	28.2	.	.	.	.	.	.	0.0
	TOTAL FINAL DEMAND				9361.1	0.0	0.0	0.0	640.1	50.9	10032.1
80.31%	ALLOCATED TO INFORMATION				7253.1	0.0	0.0	0.0	640.1	50.9	7744.1

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	7904.8
NET INTEREST	.0
INDIRECT BUSINESS TAXES	.0
BUSINESS TRANSFER PAYMENTS	.0
CAPITAL CONSUMPTION ALLOWANCES	.0
PROFIT TYPE INCOME	.0
TOTAL VALUE ADDED	7904.8
80.31% ALLOCATED TO INFORMATION	6348.3

* * * *

I-O INDUSTRY #78: FEDERAL GOVERNMENT ENTERPRISES

This industry includes all Federal government agencies which maintain separate accounting records, engage in the sale of goods and services, and cover at least 50% of their operating expenses by such sales. Agencies which have private market counterparts have been transferred into the appropriate producing industry. There were about 36 "firms" operating as Federal government enterprises, including the Commodity Credit Corporation, electric utilities, Army-Air Force Post Exchanges, FDIC, Federal Farm Mortgage Corporation, Federal Housing Administration, the TVA, and the St. Lawrence Seaway. The only enterprise that we shall be allocating to the primary information sector is the U.S. Postal Service.

Around 76.66% of the Federal government enterprises were allocated to information services.

	OUTPUT	FINAL DEMAND	VALUE ADDED
TOTAL INDUSTRY	5,886	1,841	4,616
INFORMATION	4,512	1,581	3,640
NON-INFORMATION	1,374	260	976
INFO % GNP		0.20	0.46

Detailed Industry Reports

780100 Post Office

The U.S. Postal Service performs two functions: (i) it distributes information items such as personal communication, business communication, advertisements, and so on; and (ii) it transports merchandise. We shall be only interested in the first function.

The definitions of class of mail are found in the U.S. Postal Service Manual. First class mail is exclusively reserved for personal and business communication -- all "merchandise" shipments in first class are disallowed. Second class mail exclusively covers magazines, newspapers, newsletters, and other "newsworthy" material. Third class mail is reserved for catalogs, advertising brochures, books (less than 1 pound), circulars, and so on. Some sample merchandise of a promotional nature may be found in this class, but its share of revenue is trivial. Fourth class includes mostly parcel post -- merchandise -- plus catalogs, special book rate shipments,

and educational materials. A Post Office revenue analysis* shows that approximately 87.5% of Fourth class mail is allocated to transportation. Using these figures, the 1967 postal revenues are allocated as follows:

TABLE 35: INFORMATION DISTRIBUTION BY CLASS OF MAIL

($ Millions 1967)

	TOTAL	INFORMATION
First class	3,190	3,190
Second class	160	160
Third class	719	719
Fourth class	831	104
Other revenue	341	339
TOTAL	5,241	4,512
INFORMATION AS % OF TOTAL		86.1

Components of First Class Mail

First class mail has been studied quite carefully by the U.S. Postal Service due to increased recent competition from other carriers and from telecommunication networks. A report by the RMC Corporation in 1972 shows that households and businesses are the heaviest senders and receivers of mail, with government and nonprofits playing a much smaller part in mail communications. The flow of mail is shown in Table 36 in a modified "Input-Output" format (household, business, government, and nonprofit), the following were judged to have the highest growth rates in the next few years:

HOUSEHOLDS: paying credit card bills

BUSINESS: business-to-business correspondence;
business-to-household correspondence;
financial statements to households;
credit card bills to households;
checks and credits to households;
bills and statements to business;
payments to business

GOVERNMENT: all mail

*U.S. Postal Service, Revenue and Cost Analysis, Report R-48.

TABLE 36: FLOW OF POSTAL COMMUNICATION, 1972

(Billions of Pieces)

SENT BY	RECEIVED BY: HOUSEHOLDS	BUSINESS	GOVERNMENT	NONPROFIT	TOTAL
Households	11.49	8.46	.60	.20	20.75
Correspondence	11.49	1.96	.20	.07	13.72
Transactions	--	6.50	.40	.13	7.03
Business	15.88	11.40	.50	.05	27.83
Correspondence	2.41	5.25	.20	.03	7.89
Transactions	10.74	5.95	.28	.02	16.99
Advertising	2.73	0.20	.02	--	2.95
Government	3.10	.70	.09	--	3.89
Correspondence	1.80	.40	.08	--	2.28
Transactions	.80	.30	.01	--	1.11
Advertising	.50	--	--	--	.50
Nonprofit	1.68	.10	.02	--	1.80
Correspondence	.88	.04	.01	--	.93
Transactions	.30	.04	--	--	.34
Advertising	.50	.02	.01	--	.53
Total	32.15	20.66	1.21	.25	54.27
Correspondence	16.58	7.65	.49	.10	24.82
Transactions	11.84	12.79	.69	.15	25.47
Advertising	3.73	0.22	.03	--	3.98

-- Less than 10 million

Source: RMC Research Corporation, Report UR-221, 1973.

The detailed composition of First class mail is shown in Table 37. Since the study was primarily concerned with technical substitution impacts on the U.S. Postal Service's demand, some effort was expended in isolating both the projected demand growth by transaction and the elasticity of substitution between different technological delivery systems. Checking account transactions between businesses and between households seemed to be the fastest growing sectors, and severe competition from electronic mail and EFTS vendors is expected. The U.S. Postal Service in the 1980's will be heavily engaged in electronic communication. With perseverance, competitive pressure, and luck, it could become a prodigious information industry.

TABLE 37: DETAILED COMPOSITION OF FIRST CLASS MAIL

(PERCENT)

	1968	1972
Total Household Mail	31.55	38.23
Greeting cards	11.41	9.69
Letters to friends/relatives	9.51	7.24
Other personal	0.95	4.24
Pay bills to business	6.27	11.98
Response to advertising	--	1.38
Other business	2.85	2.23
To nonprofit associations	n/a	0.37
To government	0.59	1.11
Total Government Mail	9.88	7.17
Federal sent	n/a	5.23
State and local sent	n/a	1.93
Total Nonprofit Mail	n/a	3.32
Total Business Mail to Households	26.05	29.26
Bills	23.20	14.72
Financial statements		2.78
Advertising	1.52	5.03
Checks and credits	n/a	2.28
Other	1.33	4.44
Total Business Mail to Business and Government	32.51	22.02
TOTAL	100.02	100.00

Source: RMC Research Corporation, Report UR-221, 1973. The 1968 data were estimated by the RMC Research Corporation. The 1972 data were estimated by A.D. Little, Inc.

IO INDUSTRY 780100: POST OFFICE REVENUE
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	%GNP	OUTPUT	%INTERM	PCE	GCR	INV	EXPORT	FED	STATE	FIN DEM
9510	POST OFFICE REVENUE	[illegible]	5243.9	5243.8	.	.	.	.	.	.	0.0
9510001	FIRST-CLASS POSTAGE REVENUE	0.151	3190.1	1989.1	957.0	.	.	6.7	.	227.3	1201.0
9510002	SECOND-CLASS POSTAGE REVENUE	0.000	159.9	156.2	3.7	.	.	.	.	.	3.7
9510003	THIRD-CLASS POSTAGE REVENUE	0.006	719.1	673.9	44.6	.	.	.	.	0.6	45.2
9510004	FOURTH-CLASS POSTAGE REVENUE	0.020	831.4	671.7	157.8	.	.	.	.	1.9	159.7
9510005	OTHER POST OFFICE REVENUE	0.041	338.9	8.9	58.3	.	.	.	271.3	.	329.6
9510006	OTHER POST OFFICE REVENUE	0.000	1.8	0.0	1.8	.	.	.	.	.	1.8
9510	INDUSTRY UNALLOCATED	0.000	0.0	0.0	.	.	.	.	.	.	0.0
	TOTAL FINAL DEMAND				1223.2	0.0	0.0	16.7	271.3	229.8	1741.0
	86.09% ALLOCATED TO INFORMATION				1085.2	0.0	0.0	16.7	271.3	228.0	1601.3

SUMMARY OF IO #78: FEDERAL GOVERNMENT ENTERPRISES
VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	5783.0
NET INTEREST	0.0
INDIRECT BUSINESS TAXES	67.0
BUSINESS TRANSFER PAYMENTS CAPITAL CONSUMPTION ALLOWANCES PROFIT TYPE INCOME	-1234.0
TOTAL VALUE ADDED	4616.0
76.66% ALLOCATED TO INFORMATION	3539.0

I-O INDUSTTY #23: OTHER FURNITURE AND FIXTURES

This industry covers all furniture and fixtures not consumed by households: wood and metal office furniture, public building furniture, wood and metal partitions and fixtures, and venetian blinds. Of this grab bag, I shall only be interested in furniture which primarily is used in an office context. For example, filing cabinets are only used for one purpose -- information storage and retrieval -- and can hence be thought of as "special purpose" informational durable goods. Similarly, school and office desks are used in some information activity.

This classification scheme is consistent with the treatment of "office buildings" and "school buildings" as allocated to information structures. These items can be seen as low technology cousins of the computer or the telephone, since they are used to produce, process, store, or communicate verbal and written messages.

Around 38.24% of the Furniture industry's output was allocated to information durable goods.

	OUTPUT	FINAL DEMAND	VALUE ADDED
TOTAL INDUSTRY	2,644	2,251	1,273
INFORMATION	1,011	1,000	528
NON-INFORMATION	1,633	1,251	745
INFO % GNP		0.13	0.07

Detailed Industry Reports

230100 Wood Office Furniture

SIC 2521 **Wood Office Furniture**

Establishments primarily engaged in manufacturing wood office furniture, whether padded, upholstered or plain.

Benches, office: wood
Bookcases, office: wood
Cabinets, office: wood
Chairs, office: wood—padded, upholstered, and plain
Desks, office: wood
Filing boxes, cabinets, and cases: wood
Furniture, office: wood—padded, upholstered, or plain
Stools, office: wood
Tables, office: wood

This industry produces the various furniture and equipment found in offices. It is self-explanatory once we include office activities as primarily information processing in nature.

IO INDUSTRY 230100: WOOD OFFICE FURNITURE
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	NOMF	OUTPUT	INTERM	PCE	GCF	INV	EXPORT	FED	STATE	FIN DEM
2521	WOOD OFFICE FURNITURE	0.000	160.2	160.2	.	.	.	.	.	.	0.0
2521011	CHAIRS	0.000	55.7	55.7	.	.	.	.	.	.	0.0
2521021	SOFAS, COUCHES, SEATHERS, STOOLS	0.000	8.4	8.4	.	.	.	.	.	.	0.0
2521032	EXECUTIVE DESKS	0.000	20.7	20.7	.	.	.	.	.	.	0.0
2521033	CLERICAL & SECRETARIAL DESKS	0.000	19.2	19.2	.	.	.	.	.	.	0.0
2521039	MODULAR SERVICE UNITS	0.000	15.6	15.6	.	.	.	.	.	.	0.0
2521099	OTHER WOOD OFFICE FURNITURE	0.000	27.3	27.3	.	.	.	.	.	.	0.0
2521001	WOOD OFFICE FURNITURE ASE	0.000	12.2	12.2	.	.	.	.	.	.	0.0
2521	WOOD OFFICE FURNITURE UNALLOCATED	0.000	160.2	0.0	.	122.3	2.8	0.8	8.2	26.1	160.2
2521	CONTRACT WORK + MISC RECEIPTS	0.000	1.2	1.2	.	.	.	.	.	.	0.0
2521003	CONTRACT WORK	0.000	0.7	0.7	.	.	.	.	.	.	0.0
2521004	MISC RECEIPTS	0.000	0.5	0.5	.	.	.	.	.	.	0.0
	TOTAL FINAL DEMAND				0.0	122.3	2.8	0.8	8.2	26.1	160.2
	ALLOCATED TO INFORMATION										160.2

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	45.4
NET INTEREST	.3
INDIRECT BUSINESS TAXES	.7
BUSINESS TRANSFER PAYMENTS	.1
CAPITAL CONSUMPTION ALLOWANCES	2.3
PROFIT TYPE INCOME	25.0
TOTAL VALUE ADDED	73.8
ALLOCATED TO INFORMATION	73.8

* * * *

230200 Metal Office Furniture

SIC2522 Metal Office Furniture

Establishments primarily engaged in manufacturing metal office furniture, whether padded or plain. Establishments primarily engaged in manufacturing safes and vaults are classified in Industry 3492.

Benches, office: metal
Bookcases, office: metal
Cabinets, office: metal
Chairs, office: metal—padded or plain
Desks, office: metal
File drawer frames: metal
Filing boxes, cabinets, and cases: metal
Furniture, office: metal—padded or plain
Stools, office: rotating—metal
Tables, office: metal
Wall cases, office: metal

This industry includes most of the familiar office furniture, such as vertical file cabinets, metal desks, tables, and so on. The entire industry output was allocated to information durable goods.

IO INDUSTRY 230200: METAL OFFICE FURNITURE
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	BENCH	OUTPUT	INTERN	PCE	GCF	INV	EXPORT	FED	STATE	FIN DEM
2522	METAL OFFICE FURNITURE	0.000	592.0	592.0	.	.	.	.	.	.	0.0
2522111	CHAIRS	0.235	139.6	139.6	.	.	.	.	.	.	0.0
2522191	SOFAS, COUCHES, SETTEES, STOOLS	0.169	1.0	1.0	.	.	.	.	.	.	0.0
2522[illegible]	DESKS	[illegible]	157.8	157.8	.	.	.	.	.	.	0.0
2522319	VERTICAL FILING CABINETS	[illegible]	144.2	144.2	.	.	.	.	.	.	0.0
2522319	MECHANICAL FILING EQUIPMENT	0.093	13.0	13.0	.	.	.	.	.	.	0.0
2522323	INSULATED FILING CABINETS TRAYS ETC	0.103	13.5	13.5	.	.	.	.	.	.	0.0
2522324	VISIBLE EQUIPMENT, NONMECHANICAL	0.000	22.1	22.1	.	.	.	.	.	.	0.0
2522326	VISIBLE EQUIPMENT, MECHANICAL	0.000	10.7	10.7	.	.	.	.	.	.	0.0
2522411	TABLES & STANDS	0.000	33.3	33.3	.	.	.	.	.	.	0.0
2522421	MODULAR SERVICE UNITS	0.000	14.3	14.3	.	.	.	.	.	.	0.0
2522499	OTHER METAL OFFICE FURNITURE	0.000	37.0	37.0	.	.	.	.	.	.	0.0
2522051	METAL OFFICE FURNITURE NSK	2.702	15.1	15.1	.	.	.	.	.	.	0.0
2522	METAL OFFICE FURNITURE	2.007	592.0	3.9	.	444.8	8.5	9.0	30.9	95.0	588.1
2522	CONTRACT WORK & MISC RECEIPTS	0.007	5.0	5.0	.	.	.	.	.	.	0.0
2522299	CONTRACT WORK	0.000	0.6	0.6	.	.	.	.	.	.	0.0
2522300	MISC RECEIPTS	0.000	4.4	4.3	.	.	.	0.1	.	.	0.1
	TOTAL FINAL DEMAND				0.0	444.8	8.5	9.0	30.9	95.0	588.2
	ALLOCATED TO INFORMATION										588.2

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	249.4
NET INTEREST	1.6
INDIRECT BUSINESS TAXES	6.6
BUSINESS TRANSFER PAYMENTS	.6
CAPITAL CONSUMPTION ALLOWANCES	16.6
PROFIT TYPE INCOME	52.5
TOTAL VALUE ADDED	327.3
ALLOCATED TO INFORMATION	327.3

* * * *

230300 Public Building Furniture

SIC 2531 Public Building and Related Furniture

Establishments primarily engaged in manufacturing furniture for schools, theaters, assembly halls, churches, and libraries. Establishments primarily engaged in manufacturing seats for public conveyances, as well as seats for automobiles and aircraft, are included in this industry. Establishments primarily engaged in manufacturing stone furniture are classified in Industry 3281, and concrete furniture in Industry 3272.

Aircraft seats
Automobile seats
Benches for public buildings
Blackboards, wood
Bleacher seating, portable
Chairs, portable folding: wood or metal
Church furniture, except stone or concrete
Furniture: assembly hall, church, library, school, theater, and other public building
Pews, church
Railroad seats
Seats, automobile and aircraft
Seats for public conveyances
Spring units for seats, made from purchased wire

We are only interested in public building furniture used in the provision of an informational service or activity, e.g., school desks, autitorium seats, library furniture. Omitted from the accounting are a variety of non-informational furniture such as public conveyance seats (transportation),

stadium seats and bleachers (entertainment services) and church pews (undetermined). In all, some 61% of the industry's output was allocated to informational durable goods.

IO INDUSTRY 230300: PUBLIC BUILDING FURNITURE
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	MMP	OUTPUT	INTERM	PCE	GCF	INV	EXPORT	FED	STATE	FIN DEM
2531	PUBLIC BUILDING FURNITURE	0.000	425.8	426.8	.	.	.	.	.	.	0.0
2531125	SINGLE PUPIL UNIT DESKS	0.001	43.7	34.3	.	9.4	.	.	.	.	9.4
2531133	TWO OR MORE PUPIL DESKS	0.000	4.9	3.8	.	1.1	.	.	.	.	1.1
2531154	CHAIRS	0.001	29.5	23.2	.	6.3	.	.	.	.	6.3
2531173	COMBINATION FOLDING TABLES & BENCHE	0.020	4.5	3.5	.	1.0	.	.	.	.	1.0
2531174	STORAGE CABINETS	0.001	21.7	17.0	.	4.7	.	.	.	.	4.7
2531179	OTHER SCHOOL FURNITURE	0.001	54.1	42.5	.	11.6	.	.	.	.	11.6
2531211	PUBLIC CONVEYANCE SEATS	0.000	87.7	87.7	.	.	.	.	.	.	0.0
2531231	CHURCH PEWS	0.003	25.1	0.0	.	25.1	.	.	.	.	25.1
2531239	OTHER CHURCH FURNITURE	0.001	9.3	0.0	.	9.3	.	.	.	.	9.3
2531241	FOLDING TABLES	0.002	15.9	0.0	.	15.9	.	.	.	.	15.9
2531251	FIXED THEATRE & AUDITOREUM SEATS	0.002	19.7	0.0	.	19.7	.	.	.	.	19.7
2531265	PORTABLE FOLDING CHAIRS	0.002	18.9	0.0	.	18.9	.	.	.	.	18.9
2531281	GRANDSTAND & BLEACHER SEATS	0.000	17.2	17.2	.	.	.	.	.	.	0.0
2531271	CHAIRS, FIXED-TYPE	0.001	27.6	23.7	.	4.9	.	.	.	.	4.9
2531294	OTHER PUBLIC BUILDING FURN.	0.003	22.9	0.0	.	22.9	.	.	.	.	22.9
2531301	PUBLIC BUILDING FURNITURE NEC	0.001	22.0	13.6	.	7.1	.	1.3	.	.	8.4
2531	PUBLIC BUILDING FURNITURE	0.025	161.8	0.0	.	-22.6	15.0	.	7.1	162.3	161.8
2531	CONTRACT WORK & MISC RECEIPTS	0.010	0.1	0.1	.	.	.	.	.	.	0.0
2531094	CONTRACT WORK	0.000	0.7	0.7	.	.	.	.	.	.	0.0
2531099	MISC RECEIPTS	0.000	0.6	0.6	.	.	.	.	.	.	0.0
	TOTAL FINAL DEMAND				0.0	135.3	15.0	1.3	7.1	162.3	321.0
	60.6% ALLOCATED TO INFORMATION				0.0	81.4	15.0	1.3	7.1	162.3	247.1

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	179.0
NET INTEREST	1.0
INDIRECT BUSINESS TAXES	3.7
BUSINESS TRANSFER PAYMENTS	.4
CAPITAL CONSUMPTION ALLOWANCES	7.5
PROFIT TYPE INCOME	17.0
TOTAL VALUE ADDED	208.6
60.6% ALLOCATED TO INFORMATION	126.5

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I-O INDUSTRY #24: PAPER AND ALLIED PRODUCTS

Industry #24 includes all paper and allied paper products except containers and boxes. At the 4-digit SIC level, these industries include pulp mills, paper mills, paperboard mills, envelopes, sanitary paper products, wallpaper, building paper, and converted paper. The information component of I-O #24 is limited only to those paper products which are used in conveying written or printed messages, such as in books, magazines, newspapers, and letters. All paper products which are primarily used for non-informational purposes have been "cleaned" out of this industry (e.g., facial tissue, lining paper, napkin stock, rope or jute paper, toilet tissue, towels, and so on).

Around 28.74% of the Paper industry's output was allocated to information nondurable goods.

	OUTPUT	FINAL DEMAND	VALUE ADDED
TOTAL INDUSTRY	16,733	2,673	6,193
INFORMATION	4,809	768	1 539
NON-INFORMATION	11,924	1,905	4,654
INFO % GNP		0.10	0.19

Detailed Industry Reports

240200 Paper Mill Products

SIC **2621** **Paper Mills, Except Building Paper Mills**

Establishments primarily engaged in manufacturing paper (except building paper-Industry 2661) from wood pulp and other fibers, and which may also manufacture converted paper products. Pulp mills combined with paper mills, and not separately reported, are also included in this industry; where separately reported, they are classified in Industry 2611. Establishments primarily engaged in manufacturing converted paper products from purchased paper stock are classified in Groups 264 or 265.

Bag paper, made in paper mills
Bristol board, made in paper mills
Capacitor paper, made in paper mills
Cleansing tissue stock
Condensor paper, made in paper mills
Facial tissue stock, made in paper mills
Glassine wrapping paper, made in paper mills
Greaseproof wrapping paper, made in paper mills
Ground wood paper
Hanging paper (wallpaper stock), made in paper mills
Kraft wrapping paper, made in paper mills
Lining paper, made in paper mills
Manila wrapping paper, made in paper mills
Milk filter disks, made in paper mill
Napkin stock, paper
News tablet paper, made in paper mills
Paper, except building paper: absorbent, blotting, bond, book, catalog, cigarette, cover, filter, lithograph, matrix, offset, tissue, wrapping, etc.—made in paper mills
Paper mills, except building paper mills
Parchment paper
Poster paper, made in paper mills
Printing paper
Rope and jute wrapping paper, made in paper mills
Rotogravure paper
Shipping sack paper, made in paper mills
Tagboard, made in paper mills
Text paper
Thin paper, made in paper mills.
Toilet tissue stock
Toweling paper, made in paper mills
Writing paper, made in paper mills

The Census of Manufacturers presents a detailed breakdown of paper products produced in mills, and the job of separating the information from other products is quite straightforward. There is no problem retaining newsprint, coated paper, and book paper, or throwing out packaging paper, toilet tissue, and paper towels. Table 38 reveals that 56% of the industry can be allocated as an information good.

TABLE 38: BREAKDOWN OF THE PAPER MILL INDUSTRY OUTPUT

($ Millions, 1967)

IO CODE	SIC PRODUCT CODE	PRODUCT NAME	VALUE
240200	2621100	Newsprint	321.8
	2621200	Publication & printing	151.4
	2621230	Body stock	41.2
	2621250	Other groundwood	
	2621300	Coated printing paper	818.1
	2621400	Book paper, uncoated	613.3
	2621500	Bleached bristols	218.2
	2621600	Writing and related	986.0
		INFORMATION PAPER PRODUCTS	3150.0
	2621	TOTAL PAPERMILL PRODUCTS	5574.5
		INFO AS % OF TOTAL OUTPUT	56.6

Source: Census of Manufacturers, 1967, Table 6A

IO INDUSTRY 240200: PAPER MILLS, EXCEPT BUILDING PAPER
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	%CNP	OUTPUT	INTERM	PCE	GCE	INV	EXPORT	FED	STATE	FIN DEM
2621	PAPER MILL PRODUCTS	0.034	5857.2	5583.6	29.0	•	•	126.3	31.0	91.6	273.6
2621	INDUSTRY UNALLOCATED	0.016	218.7	88.6	•	•	130.1	•	•	•	130.1
2621	CONTRACT WORK + MISC RECEIPTS	0.000	28.7	28.7	•	•	•	•	•	•	0.0
2621098	CONTRACT WORK	0.000	3.7	3.7	•	•	•	•	•	•	0.0
2621099	MISC RECEIPTS	0.001	25.0	20.0	•	•	•	5.0	•	•	5.0
	TOTAL FINAL DEMAND				29.0	0.0	130.1	126.3	31.0	91.6	408.7
56.51%	ALLOCATED TO INFORMATION				16.4	0.0	73.5	71.4	18.0	51.7	231.0

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	1512.3
NET INTEREST	57.1
INDIRECT BUSINESS TAXES	60.1
BUSINESS TRANSFER PAYMENTS	5.6
CAPITAL CONSUMPTION ALLOWANCES	400.2
PROFIT TYPE INCOME	14.2
TOTAL VALUE ADDED	2049.5
56.51% ALLOCATED TO INFORMATION	1158.2

* * * *

240400 Envelopes

SIC **2642 Envelopes**

Establishments primarily engaged in manufacturing envelopes of any description from purchased paper and paperboard. Establishments primarily engaged in manufacturing papeteries (boxed stationery) are classified in Industry 2649.

Envelopes, printed or unprinted: paper, glassine, cellophane, and pliofilm—made of purchased materials

The Envelope industry's output in 1967 was $446.1 million, of which $85.2 million was sold to final demand. All envelopes are counted as information goods as they are primarily used in mailing letters rather than packaging or some other non-information use.

IO INDUSTRY 240400: ENVELOPES
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	VALUE	OUTPUT	INTERM	PCE	GCE	INV	EXPORT	FED	STATE	FIN DEM
2642	ENVELOPES	0.207	446.1	391.2	8.8	.	.	0.4	12.4	33.3	54.9
2642	INDUSTRY UNALLOCATED	0.204	52.3	22.0	.	.	30.3	.	.	.	30.3
2642	CONTRACT WORK + MISC RECEIPTS	0.000	5.1	5.1	.	.	.	.	.	.	0.0
2642098	CONTRACT WORK	0.000	5.1	5.1	.	.	.	.	.	.	0.0
	TOTAL FINAL DEMAND				8.8	0.0	30.3	0.4	12.4	33.3	85.2
	ALLOCATED TO INFORMATION										85.2

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	188.3
NET INTEREST	1.3
INDIRECT BUSINESS TAXES	3.5
BUSINESS TRANSFER PAYMENTS	.3
CAPITAL CONSUMPTION ALLOWANCES	9.8
PROFIT TYPE INCOME	5.7
TOTAL VALUE ADDED	208.9
ALLOCATED TO INFORMATION	208.9

* * * *

240701 Coated and Glazed Papers

SIC 2641 Paper Coating and Glazing

Establishments primarily engaged in manufacturing coated, glazed, or varnished paper from purchased paper. Establishments primarily engaged in manufacturing carbon paper are classified in Industry 3955 and photographic and blueprint paper in Industry 3861.

Bread wrappers, waxed or laminated: made from purchased materials
Cellophane adhesive tape, made from purchased materials
Coated paper (except photographic, carbon, and abrasive paper): coated book, cloth lined, fancy, gummed, glazed, waxed, oiled, metallic covered, and enameled—made from purchased paper
Condenser paper, made from purchased paper
Eyelets, cloth and paper: made from purchased materials
Fly paper, made from purchased paper
Gummed tape, cloth and paper base: made from purchased materials
Labels, gummed: unprinted, cloth and paper base—made from purchased materials
Litmus paper
Masking tape, made from purchased materials
Soap impregnated papers and paper wash cloths made from purchased materials
Tar paper, except building or roofing: made from purchased paper
Thermoplastic coated paper, made from purchased paper
Towelettes, pre-moistened, made from purchased materials
Transfer paper, gold and silver: made from purchased paper
Waxed paper, made from purchased paper
Wrapping paper, waterproof: made from purchased materials

Most of the industry's output was in the form of non-information paper goods, such as bread wrappers, delicatessen paper, frozen food cartons, scotch tape, and other special purpose laminated papers. The information goods component was exclusively in SIC 2641, coated printing papers (e.g., magazines and brochures) plus a few items in the gummed paper stock, such as bumper stickers and labels.

IO INDUSTRY 240701: PAPER COATING AND GLAZING
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	COMP	OUTPUT	INDREV	PCE	GCE	INV	EXPORT	FED	STATE	FIN DEM
24e1	COATED AND GLAZED PAPER	0.000	1191.9	1191.9	-	-	-	-	-	-	0.0
24e1211*	OILED AND SIMILARLY TREATED PAPER	0.000	41.3	41.3	-	-	-	-	-	-	0.0
24e1221*	PRINTED BREAD WRAPS	0.000	18.3	18.3	-	-	-	-	-	-	0.0
24e1231*	HOUSEHOLD WAXED PAPER	0.004	29.4	0.0	29.4	-	-	-	-	-	29.4
24e1241*	DELICATESSEN PAPER	0.000	14.4	14.4	-	-	-	-	-	-	0.0
24e1245*	LOCKER INCLUDING FREEZER PAPER	0.000	6.1	4.6	1.5	-	-	-	-	-	1.5
24e1255*	BISCUIT AND CRACKER INNER WRAPS	0.000	8.7	8.7	-	-	-	-	-	-	0.0
24e1265	MINERAL AND SIMILAR INNER WRAPS	0.000	5.1	5.1	-	-	-	-	-	-	0.0
24e1275*	FROZEN FOOD CARTON OVERWRAPS	0.000	22.3	22.3	-	-	-	-	-	-	0.0
24e1281	OTHER WAXED AND WAXED LAMINATED PAP	0.000	35.0	35.0	-	-	-	-	-	-	0.0
24e1293*	AA AND AAA LAMINATED PAPER NSK	0.000	6.9	4.9	-	-	-	1.9	-	-	1.9
24e1312*	GUMMED SEALING TAPE	0.101	83.9	75.5	8.4	-	-	-	-	-	8.4
24e1314*	CORRUGATED BOX GUMMED TAPE	0.000	16.9	16.9	-	-	-	-	-	-	0.0
24e1331*	GUMMED FLAT PAPER	0.000	12.5	12.5	-	-	-	-	-	-	0.0
24e1300	GUMMED PRODUCTS NSK	0.000	5.3	3.3	-	-	-	2.7	-	-	2.7
24e14	PRESSURE SENSITIVE TAPES	0.007	340.7	287.0	42.2	-	-	11.5	-	-	53.7
24e15	LAMINATED OR COATED (EXCEPT)	0.000	165.4	165.1	-	-	-	0.3	-	-	0.3
24e18	OTHER COATED & PROCESSED PAPER	0.042	287.9	274.2	-	-	-	13.7	-	-	13.7
24e100	PAPER COATING & GLAZING NSK	0.133	29.9	29.6	-	-	-	0.3	-	-	0.3
24e1	UNDISTRIBUTED PAPER COATING AND GLA	0.003	859.2	834.8	-	-	9.8	-	15.1	-	24.6
24e1	CONTRACT WORK & MISC RECEIPTS	0.000	19.3	19.3	-	-	-	-	-	-	0.0
24e1098	CONTRACT WORK	0.000	12.6	12.6	-	-	-	-	-	-	0.0
24e1099	MISC RECEIPTS	0.000	6.7	5.4	-	-	-	1.3	-	-	1.3
	TOTAL FINAL DEMAND				81.9	0.0	9.8	31.7	15.1	0.0	137.6
	30.93% ALLOCATED TO INFORMATION				25.3	0.0	2.9	9.8	4.7	0.0	42.5

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	344.7
NET INTEREST	3.6
INDIRECT BUSINESS TAXES	12.2
BUSINESS TRANSFER PAYMENTS	1.2
CAPITAL CONSUMPTION ALLOWANCES	34.4
PROFIT TYPE INCOME	170.6
TOTAL VALUE ADDED	556.7
30.85% ALLOCATED TO INFORMATION	171.6

I-O INDUSTRY #26: PRINTING AND PUBLISHING

The Printing and Publishing industry includes the following: newspapers; periodicals; book printing and publishing; miscellaneous publishing; commercial printing; manifold business forms, bankbooks, and binders; greeting card publishing; and miscellaneous printing services. There are few conceptual problems in the first few industries -- the news media, book publishers, and the like -- since they are clearly producers and distributors of knowledge, news, educational information, market information (in the advertising content), and so on. I have omitted from this industry a variety of commercial printing products which are not information carriers such as printing on metal, printing cellophane bags, decalcomanias, playing cards, seals, and printing designs on toilet paper.

Around 95.36% of the Printing and Publishing industry's output was allocated to information nondurable goods.

	OUTPUT	FINAL DEMAND	VALUE ADDED
TOTAL INDUSTRY	10,780	5,760	10,991
INFORMATION	10,280	5,493	10,224
NON-INFORMATION	500	267	767
INFO % GNP		0.72	1.29

Detailed Industry Reports

260100 Newspapers

SIC 2711 **Newspapers: Publishing, Publishing and Printing**

Establishments primarily engaged in publishing newspapers, or in publishing and printing newspapers. These establishments carry on the various operations necessary for issuing newspapers, including the gathering of news and the preparation of editorials and advertisements, but may or may not perform their own printing. Commercial printing is frequently carried on by establishments engaged in publishing and printing newspapers, but, even though the commercial printing may be of major importance, such establishments are included in this industry. Establishments not engaged in publishing newspapers, but which print or lithograph newspapers for publishers, are classified in Industry 2751 or Industry 2752. News syndicates are classified in Service Industries (Industry 7351).

Commercial printing and newspaper publishing combined
Job printing and newspaper publishing combined
Newspaper branch offices, editorial and advertising
Newspapers: publishing and printing, or publishing only (with or without commercial printing)

The Newspapers industry sold $1,454 million to final demand, mostly in the form of personal consumption expenditures. The advertising revenue generated by newspaper classified and display ads was transferred into the Advertising industry. This practice follows National Income Accounting convention. The industry final demand, then, is composed only of subscription and newsstand sales; the industry generated $3,210 million in value added, or .4% of GNP.

IO INDUSTRY 260100: NEWSPAPERS
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	%GNP	OUTPUT	INTERM	PCE	GCE	INV	EXPORT	FED	STATE	FIN DEM
2711	NEWSPAPERS	0.183	1459.0	6.6	1443.6	.	.	3.0	1.4	4.4	1452.4
2711	INDUSTRY UNALLOCATED	0.000	1.8	0.0	.	.	0.0	.	.	.	1.8
251	CONTRACT WORK + MISC RECEIPTS	0.000	2.1	2.1	.	.	.	.	.	.	0.0
2711096	MISC RECEIPTS	0.000	2.1	2.0	.	.	.	0.1	.	.	0.1
	TOTAL FINAL DEMAND				1443.6	0.0	1.8	3.1	1.4	4.4	1456.1
	ALLOCATED TO INFORMATION										1456.1

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	2288.7
NET INTEREST	3.3
INDIRECT BUSINESS TAXES	27.3
BUSINESS TRANSFER PAYMENTS	13.4
CAPITAL CONSUMPTION ALLOWANCES	183.6
PROFIT TYPE INCOME	694.2
TOTAL VALUE ADDED	3210.5
ALLOCATED TO INFORMATION	3210.5

* * * *

260200 Periodicals

SIC **2721** **Periodicals: Publishing, Publishing and Printing**

Establishments primarily engaged in publishing periodicals, or in preparing, publishing, and printing periodicals. These establishments carry on the various operations necessary for issuing periodicals, but may or may not perform their own printing. Establishments not engaged in publishing periodicals, but which print or lithograph periodicals for publishers, are classified in Industry 2751 or Industry 2752.

Comic books: publishing and printing, or publishing only
Magazines: publishing and printing, or publishing only
Periodicals: publishing and printing, or publishing only
Statistical reports (periodicals), publishing of
Trade journals, publishing of

The Periodicals industry's 1967 output of $1,008 million was entirely allocated to information. Sales to final demand totaled $850.1 million, or some .1% of GNP, and included a variety of publications ranging from comic books to academic journals. As with the Newspaper industry, all advertising revenues have been transferred out of the Periodical industry and into advertising. The industry generated $1.1 billion in value added.

IO INDUSTRY 260200: PERIODICALS
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	%GNP	OUTPUT	INTERM	PCE	GCE	INV	EXPORT	FED	STATE	FIN DEM
2721	PERIODICALS	0.000	1008.7	1008.7	.	.	.	.	.	.	0.0
27211	FARM PERIODICALS	0.000	11.3	9.3	2.0	.	.	.	.	.	2.0
27213	BUSINESS + PROFESSIONAL PERIODICALS	0.002	149.6	134.6	15.0	.	.	.	.	.	15.0
27215	GENERAL PERIODICALS	0.005	593.5	0.0	593.5	.	.	.	.	.	593.5
2721723	RELIGIOUS PERIODICALS	0.000	70.6	0.0	70.6	.	.	.	.	.	70.6
2721725	MAGAZINE + COMIC SUPPLEMENTS	0.000	11.5	11.5	.	.	.	.	.	.	0.0
2721726	PERIODICALS NEC	0.000	87.7	87.7	.	.	.	.	.	.	0.0
2721091	PERIODICALS NSK	0.000	67.5	67.5	.	.	.	.	.	.	0.0
2721	PERIODICALS UNALLOCATED	0.021	176.9	10.9	69.0	.	7.0	63.0	1.0	26.0	166.0
2721	CONTRACT WORK + MISC RECEIPTS	0.000	9.3	9.3	.	.	.	.	.	.	0.0
2721099	CONTRACT WORK	0.000	5.4	5.4	.	.	.	.	.	.	0.0
2721099	MISC RECEIPTS	0.000	3.9	0.9	.	.	.	3.0	.	.	3.0
	TOTAL FINAL DEMAND				750.1	0.0	7.0	66.0	1.0	26.0	850.1
	ALLOCATED TO INFORMATION										850.1

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	933.9
NET INTEREST	1.2
INDIRECT BUSINESS TAXES	17.9
BUSINESS TRANSFER PAYMENTS	4.4
CAPITAL CONSUMPTION ALLOWANCES	57.1
PROFIT TYPE INCOME	136.5
TOTAL VALUE ADDED	1151.0
ALLOCATED TO INFORMATION	1151.0

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260301 Book Publishing

SIC **2731** **Books: Publishing, Publishing and Printing**

Establishments primarily engaged in publishing only, or in publishing and printing books and pamphlets. Establishments primarily engaged in printing or in printing and binding (but not publishing) books and pamphlets are classified in Industry 2732.

Book clubs, publishing
Books: publishing and printing, or publishing only

Pamphlets: publishing and printing, or publishing only

The Book Publishing industry, with a $2,326 million output and a $2,033 million sales to final demand, accounted for .3% of final demand in 1967, a rather small amount considering the ubiquity and centrality of publishing as an information activity. The new data-based Publishing industry is not considered part of the Publishing industry, but shows up in the Miscellaneous Business Services (I-O #730100).

IO INDUSTRY 260301: BOOK PUBLISHING
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	[illegible]	OUTPUT	INTERM	PCE	GCF	INV	EXPORT	FED	STATE	FIN DEM
2731	BOOK PUBLISHING	0.000	2326.2	2326.2	.	.	.	.	.	.	0.0
27311	TEXTBOOKS	0.003	931.6	[illegible]	.	.	.	27.5	.	.	27.5
2731241	SUBSCRIPTION REFERENCE BOOKS	0.026	[illegible]	10.0	176.2	.	.	[illegible]	.	.	206.3
2731311	[illegible]	0.000	77.8	77.8	.	.	.	.	.	.	0.0
2731313	MEDICAL BOOKS	0.000	43.1	43.1	.	.	.	.	.	.	0.0
2731317	BUSINESS & OTHER TECHNICAL, ETC. BOO	0.009	119.3	59.6	59.7	.	.	.	.	.	59.7
2731415	BIBLES & TESTAMENTS	0.000	36.7	36.7	.	.	.	.	.	.	0.0
2731423	HYMNALS & [illegible]	0.000	15.4	15.4	.	.	.	.	.	.	0.0
2731425	OTHER RELIGIOUS BOOKS	0.000	45.4	45.4	.	.	.	.	.	.	0.0
2731400	RELIGIOUS BOOKS NSK	0.001	12.9	8.4	.	.	.	4.5	.	.	4.5
[illegible]	[illegible]	0.000	451.7	451.7	.	.	.	.	.	.	0.0
2731911	BOOK CLUB BOOKS	0.026	204.0	0.0	[illegible]	.	.	.	.	.	[illegible]
2731513	OTHER BOOKS	0.001	141.2	137.1	.	.	.	4.1	.	.	4.1
2731641	RELIGIOUS PAMPHLETS	0.000	2.4	2.4	.	.	.	.	.	.	0.0
2731645	MUSIC & OTHER PAMPHLETS	0.002	56.5	42.4	14.1	.	.	.	.	.	14.1
2731000	BOOKS & PAMPHLETS NSK	0.000	43.2	43.2	.	.	.	.	.	.	0.0
2731	BOOK PUBLISHING	0.164	1604.3	98.3	681.6	.	127.0	66.1	3.9	627.1	1505.7
2731	CONTRACT WORK & MISC RECEIPTS	0.000	27.6	27.6	.	.	.	.	.	.	0.0
2731298	CONTRACT WORK	0.000	16.5	16.5	.	.	.	.	.	.	0.0
2731049	MISC RECEIPTS	0.000	11.1	5.6	.	.	.	5.5	.	.	5.5
	TOTAL FINAL DEMAND				1137.6	0.0	127.0	137.4	3.9	627.1	2033.4
	ALLOCATED TO INFORMATION										2033.4

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	448.2
NET INTEREST	3.6
INDIRECT BUSINESS TAXES	8.3
BUSINESS TRANSFER PAYMENTS	3.4
CAPITAL CONSUMPTION ALLOWANCES	24.2
PROFIT TYPE INCOME	304.7
TOTAL VALUE ADDED	792.4
ALLOCATED TO INFORMATION	792.4

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260302 Book Printing

SIC **2732 Book Printing**

Establishments primarily engaged in printing only or in printing and binding books and pamphlets, but not engaged in publishing. Establishments primarily engaged in publishing, or in publishing and printing books and pamphlets are classified in Industry 2731. Establishments engaged in both printing and binding books, but primarily binding books printed elsewhere, are classified in Industry 2789.

Books: printing, printing and binding—not publishing
Books, music: printing, printing and binding—not publishing
Pamphlets: printing, or printing and binding—not publishing

This industry is distinguished from the previous two in that its expenses are almost entirely incurred in the processing of information goods rather than the production of original information. It is the manufacturing arm of the Publishing industry. Of a $896.7 million gross output, sales to final demand accounted for only $39.6 million, or less than .01% of GNP and value added amounted to $389 million of .5% of GNP. By comparison, the Government Printing Office in fiscal year 1967 spent $20.7 million on obligations of $23.3 million.

TO INDUSTRY 260302: BOOK PRINTING
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	VONP	OUTPUT	INTERM	PCE	GCE	INV	EXPORT	FED	STATE	FIN DEM
2732	BOOK PRINTING	0.005	896.7	850.5	.	.	.	.	26.6	13.0	62.8
2732	INDUSTRY UNALLOCATED	0.000	414.7	417.3	.	.	-2.6	.	.	.	-2.6
2732	CONTRACT WORK - MISC RECEIPTS	0.000	3.8	3.8	.	.	.	.	.	.	0.0
2732088	CONTRACT WORK	0.000	1.0	1.0	.	.	.	.	.	.	0.0
2732099	MISC RECEIPTS	0.000	1.8	1.8	.	.	.	.	.	.	0.0
	TOTAL FINAL DEMAND				0.0	0.0	-2.6	0.0	26.6	13.0	37.0
	ALLOCATED TO INFORMATION										39.6

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	315.6
NET INTEREST	1.2
INDIRECT BUSINESS TAXES	4.2
BUSINESS TRANSFER PAYMENTS	2.8
CAPITAL CONSUMPTION ALLOWANCES	29.3
PROFIT TYPE INCOME	35.8
TOTAL VALUE ADDED	388.9
ALLOCATED TO INFORMATION	388.9

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260400 Miscellaneous Publishing

SIC 2741 **Miscellaneous Publishing**

Establishments primarily engaged in miscellaneous publishing activities, not elsewhere classified, whether or not engaged in printing. Establishments primarily engaged in offering financial, credit, or other business services, and which may publish directories as part of this service, are not included in this industry but are classified in Service Industries.

Atlases: publishing and printing, or publishing only
Book, music: publishing and printing or publishing only
Catalogs: publishing and printing, or publishing only
Directories: publishing and printing, or publishing only (not subscription services)
Globe covers (maps): publishing and printing, or publishing only
Guides: publishing and printing, or publishing only (not subscription services)
Maps: publishing and printing, or publishing only
Patterns, paper: publishing and printing, or publishing only
Race track programs: publishing and printing, or publishing only
Shopping news: publishing and printing, or publishing only
Technical manuals and papers: publishing and printing, or publishing only
Telephone directories: publishing and printing, or publishing only

One of the largest items in 260400 is "patterns," a curious specimen since the information embodied in the tissue is literally destroyed in the act of consumption. Another large item is the information good par excellence -- the telephone directory and the catalog. These two products are quite vulnerable to impact by computer technology; but not coincidentally, they are now treated as free goods by providers of services (retail, utilities) and are hardly ever sold at marginal cost. The impact of the computer will be towfold: (i) some catalogs will become unnecessary or less necessary as computers take on the job of, say, dispensing telephone numbers or describing merchandise, and (ii) some private markets may form as the computerized catalog service becomes more versatile and powerful, up to the level of an information storage and retrieval information utility.

IO INDUSTRY 260400: MISCELLANEOUS PUBLISHING
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	MARG	OUTPUT	INTERM	PCE	GOF	INV	EXPORTS	FED	STATE	FIN DEM
2761	MISCELLANEOUS PUBLISHING	0.000	177.7	177.7							0.0
2761311*	PICTURE SOUVENIR CARDS	0.001	19.5	9.9	9.2			0.4			9.6
2761331	SHEET MUSIC	0.001	11.0	2.1	8.6			0.3			8.9
2761365	MAPS, CHARTS, ATLASES	0.001	11.1	0.0	8.3			2.8			11.1
2761399	RACING FORMS	0.003	24.6	0.0	24.6						24.6
2761396	PATTERNS	0.008	62.9	0.0	62.9						62.9
2761398	OTHER MISCELLANEOUS PUBLICATIONS	0.001	35.0	26.2	8.8						8.8
2761691	MISCELLANEOUS PUBLISHING NSK	0.002	20.8	5.0	14.2			1.6			15.8
276-I	INDUSTRY UNALLOCATED	0.000	28.0	26.1			-0.6		0.6	1.9	1.9
276-	CONTRACT MDA + MISC RECEIPTS	0.000	13.8	13.8							0.0
276108*	CONTRACT MDA	0.000	1.8	1.8							0.0
2761099	MISC RECEIPTS	0.000	12.2	12.0				0.2			0.2
	TOTAL FINAL DEMAND				136.6	0.0	-0.6	9.3	0.6	1.9	143.8
	91.17% ALLOCATED TO INFORMATION				127.4	0.0	-0.6	4.9	0.6	1.9	134.2

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	280.5
NET INTEREST	1.5
INDIRECT BUSINESS TAXES	14.5
BUSINESS TRANSFER PAYMENTS	2.1
CAPITAL CONSUMPTION ALLOWANCES	9.8
PROFIT TYPE INCOME	76.8
TOTAL VALUE ADDED	385.2
91.17% ALLOCATED TO INFORMATION	351.2

* * * *

260500 Commercial Printing

SIC 2751 Commercial Printing, Except Lithographic

Establishments primarily engaged in commercial or job printing, except lithographic. This industry includes general printing shops, as well as shops specializing in printing newspapers and periodicals for others, and those which specialize in gravure, rotogravure, and screen printing. Establishments primarily engaged in printing books, without publishing, are classified in Industry 2732, and greeting cards in Industry 2771. Establishments primarily engaged in printing from lithographic plates are classified in Industry 2752.

Bags, cellophane, printing of
Bread wrappers, printing of
Business forms, except manifold: printing of
Calendars, printing of
Cards, printing of
Catalogs, printing only
Circulars, printing of
Color printing (not lithography)
Coupons, printing of
Decalcomanias (dry transfers), screen process
Directories, printing only
Embossing on paper
Engraving, plateless
Envelopes, printing of
Facsimile, letters, printing of
Fashion plates, printing of
Flexographic printing
Gummed labels and seals except Christmas, Easter, etc., seals: printing or embossing only
Imprinting
Labels, printing or embossing only
Letters, circular and form: printing of
Magazines, printing only
Maps, printing only
Menus, printing of
Music, sheet: printing only
Newspapers, printing only
Periodicals, printing only
Photogravure printing
Playing cards, except lithographed
Post cards, picture: printing of
Posters, printing of
Printing, commercial or job: except lithography and offset
Printing: gravure, photogravure, rotary photogravure, and rotogravure
Printing, letterpress: screen and flexographic
Printing, screen: except on textiles
Ready prints
Rotogravure printing plates and cylinders
Schedules, transportation: printing of
Screen printing, except on textiles
Screen printing on glass, metal, plastic and paper
Seals, except Christmas, Easter, etc. seals: printing or embossing only
Souvenir cards, printing of
Stationery, printing of
Tags, except Christmas, Easter, etc.: printing or embossing only
Telephone directories, printing only
Thermography
Tickets, printing of
Trading stamps, printing of
Visiting cards, printing of
Wrappers, printing of

SIC 2752 Commercial Printing, Lithographic

Establishments primarily engaged in printing by the lithographic process. The greater part of the work in this industry is performed on a job or custom basis; but in some cases lithographed calendars, maps, posters, decalcomanias, etc., are made for sale. Offset printing, photo-offset printing, and photolithographing are also included in this industry. Establishments primarily engaged in lithographing books and pamphlets, without publishing, are classified in Industry 2732, and greeting cards in Industry 2771.

Advertising posters, lithographed
Atlases, lithographed
Billheads, lithographed
Bread wrappers, lithographing only
Business forms, except manifold: lithographed
Calendars, lithographed
Cards, lithographing only
Circulars, lithographed
Color cards, paint offset printing
Color lithography
Coupons, lithographing of
Decalcomanias (dry transfers), lithographed
Fashion plates, lithographed
Labels, lithographed
Letters, circular and form: lithographed
Lithographic plates or stones, preparation of
Lithographing on metal or paper
Lithoplates, grained or otherwise prepared
Maps, lithographing only
Menus, lithographed
Offset printing
Photo-lithographing
Photo-offset printing
Planographing
Playing cards, lithographed
Post cards, picture: lithographed
Posters, lithographed
Printing from lithographic plates
Printing, offset
Printing, photo-offset
Schedules transportation: lithographed
Seals, except Christmas, Easter, etc., lithographed
Souvenir cards, lithographed
Tags, except Christmas, Easter, etc. lithographed
Tickets, lithographed
Trading stamps, lithographed
Transferring designs (lithographing)
Transfers, decalcomania and dry, lithographed
Visiting cards, lithographed
Wrapping, lithographing of

The Commercial Printing industry contains a wide variety of non-informational goods, such as playing cards, printing on metal, wrappers (although it may be argued that the label information on commodities could contain a great deal of consumer information as required by law). Of the $3,229 million industry output, $2,491 million -- or some 77.15% -- was allocated to information.

A large amount of offset and lithography is done within firms, in commercial printing "quasi-industries." Most of this type of printing activity will be accounted for in Chapter 9.

IO INDUSTRY 260500: COMMERCIAL PRINTING
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	SCRAP	OUTPUT	INTERM	PCE	GCF	INV	EXPORT	FED	STATE	FIN DEM
2750	COMMERCIAL PRINTING	0.000	3229.0	3229.0	.	.	.	.	.	.	0.0
275310	*MAGAZINE + PERIODICAL PRINTING	0.303	1002.8	980.8	.	.	.	.	22.0	.	22.0
275320	MAGAZINE + COMIC SUPPLEMENTS	0.000	144.2	144.2	.	.	.	.	.	.	0.0
275393	BANK PRINTING	0.000	171.5	171.5	.	.	.	.	.	.	0.0
275343	FINANCIAL + LEGAL PRINTING	0.000	177.7	177.7	.	.	.	.	.	.	0.0
275393	SCIENTIFIC + TECHNICAL CHARTS	0.000	77.1	77.1	.	.	.	.	.	.	0.0
275393	**TRADING STAMPS + SEALS	0.000	40.1	35.2	4.9	.	.	.	.	.	4.9
275373	FOOD, BEVERAGE CHECKS	0.000	19.6	19.6	.	.	.	.	.	.	0.0
275393	*PLAYING CARDS	0.010	77.1	0.1	76.9	.	.	0.1	.	.	77.0
275393	CREDIT + ID CARDS	0.000	18.4	18.4	.	.	.	.	.	.	0.0
275393	*PRINTING ON METAL	0.307	291.0	291.0	.	.	.	.	.	.	0.0
275393	*SPECIALTIES	0.272	45.6	32.9	10.9	.	.	2.0	.	.	12.9
275393	*ART REPRODUCTIONS	0.000	64.0	0.0	64.0	.	.	.	.	.	64.0
275393	TICKET + COUPON PRINTING	0.000	32.6	32.6	.	.	.	.	.	.	0.0
275394	ALL OTHER GEN. COMMERCIAL PRINT.	0.000	92.5	65.4	.	.	.	27.1	.	.	27.1
275395	GRAVURE PLATES + CYLINDERS	0.000	22.8	22.8	.	.	.	.	.	.	0.0
275396	LITHOGRAPHIC PLATES	0.000	100.5	100.5	.	.	.	.	.	.	0.0
275397	FLAT LABELS	0.000	345.0	345.0	.	.	.	.	.	.	0.0
275398	ROLL LABELS	0.000	77.5	77.5	.	.	.	.	.	.	0.0
275399	PRESSURE SENSITIVE LABELS	0.000	123.2	123.2	.	.	.	.	.	.	0.0
275400	DECAL LABELS	0.000	10.8	10.8	.	.	.	.	.	.	0.0
275401	*WRAPPERS, EXC. PAPER	0.000	213.0	213.0	.	.	.	.	.	.	0.0
275403	*PAPER WRAPPERS	0.000	97.2	97.2	.	.	.	.	.	.	0.0
275404	TAGS	0.000	52.6	52.6	.	.	.	.	.	.	0.0
2753	COMMERCIAL PRINTING UNALLOCATED	0.047	1047.2	676.0	.	.	101.7	.	151.1	118.3	371.2
2759	CONTRACT WORK + MISC RECEIPTS	0.000	29.8	29.8	.	.	.	.	.	.	0.0
275908	CONTRACT WORK	0.000	2.8	2.8	.	.	.	.	.	.	0.0
275909	MISC RECEIPTS	0.000	26.8	25.4	.	.	.	1.4	.	.	1.4
	TOTAL FINAL DEMAND				156.7	0.0	101.7	32.6	173.2	118.3	580.5
	77.15% ALLOCATED TO INFORMATION				0.0	0.0	101.7	27.1	173.2	118.3	420.3

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	2556.1
NET INTEREST	5.9
INDIRECT BUSINESS TAXES	40.5
BUSINESS TRANSFER PAYMENTS	3.3
CAPITAL CONSUMPTION ALLOWANCES	209.5
PROFIT TYPE INCOME	391.0
TOTAL VALUE ADDED	3206.3
77.15% ALLOCATED TO INFORMATION	2473.7

* * * *

260502 Manifold Business Forms

SIC 2761 **Manifold Business Forms**

Establishments primarily engaged in designing and printing, by any process, special forms for use in the operation of a business, in single and multiple sets, including carbonized or interleaved with carbon or otherwise processed for multiple reproduction.

Autographic register forms, printed
Business forms, manifold
Continuous forms, office and business: carbonized or otherwise processed for multiple reproduction
Fanfold forms
Sales books
Strip forms (manifold business forms)
Unit sets (manifold business forms)

The manifold business form is rapidly becoming a computer-related product. Multiple forms printing by computer now accounts for most of the market; and in many cases, the reproduction of computer files replaces the need to use manifold forms.

IO INDUSTRY 260601: MANIFOLD BUSINESS FORMS
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	MAKE	OUTPUT	INTERM	PCE	GOV	INV	EXPORT	FED	STATE	FIN DEM
2761	MANIFOLD BUSINESS FORMS	0.000	3.5	2.8	.	.	.	0.7	.	.	0.7
27..	INDUSTRY UNALLOCATED	0.000	2.8	0.0	.	.	2.8	.	.	.	2.8
2761	CONTRACT WORK + MISC RECEIPTS	0.000	0.7	0.7	.	.	.	.	.	.	0.0
2761099	MISC RECEIPTS	0.000	0.7	0.7	.	.	.	.	.	.	0.0
	TOTAL FINAL DEMAND				0.0	0.0	2.8	0.7	0.0	0.0	3.5
	ALLOCATED TO INFORMATION										3.5

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	417.2
NET INTEREST	1.2
INDIRECT BUSINESS TAXES	8.3
BUSINESS TRANSFER PAYMENTS	.7
CAPITAL CONSUMPTION ALLOWANCES	35.0
PROFIT TYPE INCOME	50.2
TOTAL VALUE ADDED	512.6
ALLOCATED TO INFORMATION	512.6

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260802 Blankbooks and Loose-Leaf Binders

SIC 2782 **Blankbooks, Loose Leal Binders and Devices**

Establishments primarily engaged in manufacturing blankbooks, loose leaf devices, and library binders; and in ruling paper.

Account books
Albums
Blankbook making
Chart and graph paper, ruled
Checkbooks
Diaries
Inventory blankbooks
Ledgers and ledger sheets
Library binders, loose leaf
Loose leaf devices and binders
Loose leaf forms and fillers, pen ruled or printed only
Memorandum books, printed
Paper ruling
Pass book: bank, etc.
Receipt books
Record albums
Sample books
Scrapbooks

Account books and columnar ledgers are increasingly being generated as computer printout rather than as preprinted tabular sheets. In 1967, the accounting sheets sales were $10.2 million. The largest item in this industry is loose-leaf binders.

IO INDUSTRY 260602: BLANKBOOKS AND LOOSELEAF BINDERS
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	MAKE	OUTPUT	INTERN	PCE	GCE	INV	EXPORT	FED	STATE	FIN DEM
2782	BLANKBOOKS + LOOSELEAF BINDERS	0.000	210.3	210.3	.	.	.	.	.	.	0.0
2782131	ALBUMS + SCRAPBOOKS	0.005	39.4	0.0	39.4	.	.	.	.	.	39.4
2782135	DIARIES + APPOINTMENT BOOKS	0.107	0.6	0.0	0.6	.	.	.	.	.	0.6
2782192	COLUMNAR PADS, MEMO BOOKS, MISC, BL	0.000	2.5	0.0	2.5	.	.	.	.	.	2.5
2782194	CHECKBOOKS	0.000	103.3	103.3	.	.	.	.	.	.	0.0
2782236	LOOSELEAF BINDERS	0.005	37.7	0.0	37.7	.	.	.	.	.	37.7
2782001	BLANKBOOKS + LOOSELEAF BINDERS NSK,	0.003	24.8	23.1	.	.	.	1.7	.	.	1.7
2782	INDUSTRY UNALLOCATED	0.002	19.8	0.1	.	.	19.7	.	.	.	19.7
2783	CONTRACT WORK + MISC RECEIPTS	0.000	3.1	3.1	.	.	.	.	.	.	0.0
2782098	CONTRACT WORK	0.000	2.3	2.3	.	.	.	.	.	.	0.0
2782099	MISC RECEIPTS	0.000	0.8	0.7	.	.	.	0.1	.	.	0.1
	TOTAL FINAL DEMAND				80.2	0.0	19.7	1.8	0.0	0.0	101.7
	ALLOCATED TO INFORMATION										101.7

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	199.7
NET INTEREST	.4
INDIRECT BUSINESS TAXES	3.8
BUSINESS TRANSFER PAYMENTS	.3
CAPITAL CONSUMPTION ALLOWANCES	10.7
PROFIT TYPE INCOME	14.8
TOTAL VALUE ADDED	229.7
ALLOCATED TO INFORMATION	229.7

* * * *

260700 Greeting Cards

SIC 2771 Greeting Card Publishing

Establishments primarily engaged in the designing, publishing, and printing by any process of greeting cards for all occasions.

Birthday cards, except hand painted: printed, engraved, lithographed, etc.
Christmas cards, seals, and tags, except hand painted: printed, engraved, lithographed, etc.
Easter cards, except hand painted: printed, engraved, lithographed, etc.
Greeting cards, except hand painted: printed, engraved, lithographed, etc.
Seals, except hand painted: Christmas, birthday, Valentine, Easter, etc.
Tags, Christmas, Easter, Valentine, etc., except hand painted
Valentines, except hand painted: printed, engraved, lithographed, etc.

Mass produced personal communications products? Why not? Consumers purchased $385 million in 1967 -- nearly $2 for each person.

IO INDUSTRY 260700: GREETING CARD PUBLISHING
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	MAKE	OUTPUT	IMPORTS	PCE	GOF	INV	EXPORT	FED	STATE	FIN DEM
2771	GREETING CARDS	0.000	467.8	467.8	.	.	.	.	.	.	0.0
27711	GREETING CARDS, PUBLISHERS SALES	0.049	395.7	9.2	384.7	.	.	1.8	.	.	386.5
27712	PRINTING OR GREETING CARDS FOR OTHE	0.000	45.7	45.7	.	.	.	.	.	.	0.0
2771	INDUSTRY UNALLOCATED	0.000	62.1	26.5	.	.	35.6	.	.	.	35.6
2771	CONTRACT WORK & MISC RECEIPTS	0.000	19.8	19.8	.	.	.	.	.	.	0.0
2771098	CONTRACT WORK	0.000	19.0	19.0	.	.	.	.	.	.	0.0
2771099	MISC RECEIPTS	0.000	0.8	0.7	.	.	.	0.1	.	.	0.1
	TOTAL FINAL DEMAND				384.7	0.0	35.6	1.9	0.0	0.0	422.2
	ALLOCATED TO INFORMATION										422.2

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	198.5
NET INTEREST	.7
INDIRECT BUSINESS TAXES	15.5
BUSINESS TRANSFER PAYMENTS	.3
CAPITAL CONSUMPTION ALLOWANCES	10.9
PROFIT TYPE INCOME	70.9
TOTAL VALUE ADDED	296.8
ALLOCATED TO INFORMATION	296.8

260801 Engraving and Plate Printing

SIC **2753** **Engraving and Plate Printing**

Establishments primarily engaged in engraving and etching steel, copper, wood, or rubber plates; in using these plates to print stationery, visiting and other cards, invitations, maps, etc.; and in making woodcuts for use in printing illustrations, posters, etc. Engraving for purposes other than printing is classified in Industry 3479.

Announcements, engraved
Bank notes, engraved
Calendars, engraved
Cards, except greeting cards: engraving of
Currency, engraving of
Embossing plates for printing
Engraving on copper, steel, wood, or rubber plates, for printing purposes
Engraving on textile printing rolls
Engraving, steel line, for printing purposes
Etching on copper, steel, wood, or rubber plates, for printing purposes
Halftones, engraved
Invitations, engraved
Maps, engraved
Plate printing
Post cards, picture: engraved
Printing from engraved and etched plates
Security certificates, engraved
Stationery, engraved
Stock certificates, engraved
Souvenir cards, engraved
Visiting cards, engraved
Woodcuts for use in printing illustrations, posters, etc.

This industry represents one of the last non-electronic portions of an otherwise highly computerized printing process.

IO INDUSTRY 260801: ENGRAVING AND PLATE PRINTING
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	ABSV	OUTPUT	INPUT	PCE	GOV	INV	EXPORT	FED	STATE	FIN DEM
2753	ENGRAVING & PLATE PRINTING	0.000	108.9	108.9	.	.	.	.	.	.	0.0
2753012	SECURITY ENGRAVING	0.00%	27.1	27.1	.	.	.	.	.	.	0.0
2753022	SOCIAL ENGRAVING	0.00%	31.8	0.0	31.8	.	.	.	.	.	31.8
2753050	PLATES MADE FOR OTHERS	0.000	-9.1	-9.1	.	.	.	0.3	.	.	0.3
2753	INDUSTRY UNALLOCATED	-0.30%	3.3	3.1	.	.	0.6	.	-33.8	2.4	-33.8
2753	CONTRACT WORK & MISC RECEIPTS	0.000	0.5	0.5	.	.	.	.	.	.	0.0
2753098	CONTRACT WORK	0.000	0.5	0.5	.	.	.	.	.	.	0.0
	TOTAL FINAL DEMAND				31.8	0.0	0.6	0.3	-33.8	2.4	1.3
	ALLOCATED TO INFORMATION										1.3

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	71.9
NET INTEREST	.2
INDIRECT BUSINESS TAXES	.8
BUSINESS TRANSFER PAYMENTS	.0
CAPITAL CONSUMPTION ALLOWANCES	4.2
PROFIT TYPE INCOME	7.4
TOTAL VALUE ADDED	84.5
ALLOCATED TO INFORMATION	84.5

* * * *

260802 Bookbinding and Related Work

SIC 2789 **Bookbinding and Related Work**

Establishments primarily engaged in edition, trade, job, and library bookbinding; in book or paper bronzing, gilding, and edging; in map and sample mounting; and other services related to bookbinding. Establishments primarily binding books printed elsewhere are classified in this industry, but those primarily binding books printed in the same establishment are classified in Group 273.

Beveling of cards
Book gilding, bronzing, edging, deckling, embossing, and gold stamping
Bookbinding: edition, job, library, and trade
Bronzing books, cards, or paper
Display mounting
Edging books, cards, or paper
Magazines, binding only
Mounting of maps and samples, for the trade
Pamphlets, binding only
Paper bronzing, gilding, edging, and deckling
Paper cutting, except die cutting
Rebinding books, magazines, or pamphlets
Repairing books (bookbinding)
Swatches and samples, mounting for the trade
Trade binding services

Bookbinding is a straightforward manufacturing activity. It is included only because it is involved in book production on a contract basis.

IO INDUSTRY 260802: BOOKBINDING AND RELATED WORK
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	MISC	OUTPUT	INTERM	PCE	GCF	INV	EXPORT	FED	STATE	FIN DEM
2789	BOOKBINDING & RELATED WORK	0.000	337.7	337.7	.	.	.	.	.	.	0.0
27891	BOOKBINDING & RELATED EXC. LIBRARY	0.000	291.0	291.0	.	.	.	.	.	.	0.0
2789141	LIBRARY BINDING	0.000	46.5	46.5	.	.	.	.	.	.	0.0
2789	INDUSTRY UNALLOCATED	0.000	329.8	153.1	.	.	2.7	.	.	50.0	52.7
2789	CONTRACT WORK & MISC RECEIPTS	0.000	16.0	16.0	.	.	.	.	.	.	0.0
2789098	CONTRACT WORK	0.000	16.0	16.0	.	.	.	.	.	.	0.0
	TOTAL FINAL DEMAND				0.0	0.0	2.7	0.0	0.0	50.0	52.7
	ALLOCATED TO INFORMATION										52.7

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	193.4
NET INTEREST	.4
INDIRECT BUSINESS TAXES	1.5
BUSINESS TRANSFER PAYMENTS	.1
CAPITAL CONSUMPTION ALLOWANCES	7.8
PROFIT TYPE INCOME	3.6
TOTAL VALUE ADDED	206.8
ALLOCATED TO INFORMATION	206.8

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2791, 3, 4, 5 *Typesetting, Photoengraving, Electrotyping and Stereotyping*

SIC **2791** **Typesetting**

Establishments primarily engaged in typesetting for the trade, including advertisement typesetting.

Advertisement typesetting
Composition, hand: for the printing trade
Composition, machine: linotype, monotype, etc.—for the printing trade
Photocomposition
Typesetting, for the printing trade
Typographic composition

SIC **2793** **Photoengraving**

Establishments primarily engaged in preparing photoengraved plates (halftones and line cuts). These establishments do not, as a rule, print from the plates which they make, but prepare them for use by others.

Halftones (photoengraving plates)
Linecuts (photoengraving plates)
Photoengraving for the trade

SIC **2794** **Electrotyping and Stereotyping**

Establishments primarily engaged in preparing electrotype and stereotype plates. These establishments do not, as a rule, print from the plates which they make, but prepare them for use by others.

Electrotype plates
Electrotyping for the trade
Stereotype plates
Stereotyping for the trade

These three industries represent the fixed costs in the printing industry; once the type has been set or the plate produced, the variable costs are only in the paper, ink, and labor.

IO INDUSTRY 260803: TYPESETTING
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	%CAP	OUTPUT	INTERM	PCE	GCE	INV	EXPORT	FED	STATE	FIN DEM
2701	TYPESETTING	0.000	241.8	241.8	.	.	.	.	.	.	0.0
2701011	HOT METAL + RELATED TYPESETTING	0.000	194.8	194.8	.	.	.	.	.	.	0.0
2701014	PHOTOGRAPHIC + COLD TYPESETTING	0.000	46.4	46.4	.	.	.	.	.	.	0.0
2791	INDUSTRY UNALLOCATED	0.000	0.4	0.0	.	.	0.4	.	.	.	0.4
2793	CONTRACT WORK + MISC RECEIPTS	0.000	1.9	1.9	.	.	.	.	.	.	0.0
2791098	CONTRACT WORK	0.000	0.6	0.6	.	.	.	.	.	.	0.0
2791099	MISC RECEIPTS	0.000	1.3	1.3	.	.	.	.	.	.	0.0
	TOTAL FINAL DEMAND				0.0	0.0	0.4	0.0	0.0	0.0	0.4
	ALLOCATED TO INFORMATION										0.4

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	246.6
NET INTEREST	.5
INDIRECT BUSINESS TAXES	1.7
BUSINESS TRANSFER PAYMENTS	.2
CAPITAL CONSUMPTION ALLOWANCES	12.0
PROFIT TYPE INCOME	39.4
TOTAL VALUE ADDED	299.4
ALLOCATED TO INFORMATION	299.4

IO INDUSTRY 260804: PHOTOENGRAVING
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	%CAP	OUTPUT	INTERM	PCE	GCE	INV	EXPORT	FED	STATE	FIN DEM
2703	PHOTOENGRAVING	0.000	137.8	136.0	.	.	.	1.8	.	.	1.8
2791	INDUSTRY UNALLOCATED	0.000	1.1	0.0	.	.	1.1	.	.	.	1.1
2793	CONTRACT WORK + MISC RECEIPTS	0.000	1.9	1.8	.	.	.	0.1	.	.	0.1
2793099	MISC RECEIPTS	0.000	1.4	1.3	.	.	.	.	.	.	0.0
	TOTAL FINAL DEMAND				0.0	0.0	1.1	1.9	0.0	0.0	3.0
	ALLOCATED TO INFORMATION										3.0

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	148.9
NET INTEREST	.3
INDIRECT BUSINESS TAXES	1.0
BUSINESS TRANSFER PAYMENTS	.1
CAPITAL CONSUMPTION ALLOWANCES	6.3
PROFIT TYPE INCOME	25.2
TOTAL VALUE ADDED	181.8
ALLOCATED TO INFORMATION	181.8

IO INDUSTRY 260805: ELECTROTYPING AND STEREOTYPING
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	COMP	OUTPUT	INTERM	PCE	GCE	INV	EXPORT	FED	STATE	FIN DEM
2794	ELECTROTYPING + STEREOTYPING	0.000	43.1	43.7	.	.	.	0.4	.	.	0.4
2794	INDUSTRY UNALLOCATED	0.000	-0.2	0.0	.	.	-0.2	.	.	.	-0.2
2794	CONTRACT WORK + MISC RECEIPTS	0.000	0.7	0.7	.	.	.	.	.	.	0.0
2794099	MISC RECEIPTS	0.000	0.7	0.7	.	.	.	.	.	.	0.0
	TOTAL FINAL DEMAND				0.0	0.0	-0.2	0.4	0.0	0.0	0.2
	o ALLOCATED TO INFORMATION										0.2

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	36.9
NET INTEREST	.1
INDIRECT BUSINESS TAXES	.3
BUSINESS TRANSFER PAYMENTS	.0
CAPITAL CONSUMPTION ALLOWANCES	1.6
PROFIT TYPE INCOME	5.3
TOTAL VALUE ADDED	44.2
ALLOCATED TO INFORMATION	44.2

I-O INDUSTRY #48: SPECIAL INDUSTRY MACHINERY

Five major types of capital equipment are included in this industry: food products machines, textile machines, wood-working machines, and paper and printing machines. As a group, they accounted for $3.2 billion in gross capital formation, or some 3% of the total investment in 1967. Of interest here are the paper and printing machines only.

Around 17.82% of the special machinery industry's output was allocated to information durable goods.

	OUTPUT	FINAL DEMAND	VALUE ADDED
TOTAL INDUSTRY	5,113	4,165	2,386
INFORMATION	911	742	448
NON-INFORMATION	4,203	3,423	1,938
INFO % GNP		0.09	0.06

Detailed Industry Reports

480400 Paper Industries Machines

SIC 3554 **Paper Industries Machinery**

Establishments primarily engaged in manufacturing machinery for the pulp, paper, and paper product industries. Establishments primarily engaged in manufacturing printing trades machinery are classified in Industry 3555.

- Bag and envelope making machinery (paper machinery)
- Box making machines, for paper boxes
- Coating and finishing machinery, paper
- Corrugating machines for paper
- Cutting and folding machines, paper
- Die cutting and stamping machinery (paper converting machinery)
- Folding machines, paper: except office machines
- Fourdrinier machines (paper manufacturing machinery)
- Paper mill machinery: embossing calenders, friction calenders, super-calenders, platers, dampeners; drying, folding, slitting, pasting, sizing, rewinding, waxing, creping machines, etc.
- Paper product machines, except printing machines
- Pulp mill machinery: pulp washers, deckers, tube thickeners, grinding machines, pulp causticizers, chippers, shredders, conditioners, presses, thickeners, centrifugals, etc.
- Sandpaper manufacturing machines

Pulp and paper machinery can be used for both manufacturing information and non-information paper products. Therefore the allocation method used in this industry was entirely mechanical. I carried forward the allocation ratio, 28.74% that was calculated for the informational portion of the paper industry (I-O #24). The assumption behind the allocation is that equal increments of capital are needed to produce each additional

dollar of an information-carrying paper (e.g., newsprint) as opposed to other kinds of paper (e.g., bread wrappers). If the output/capital ratio is in fact <u>not</u> similar for the two classes of products, then the allocation will be biased by overstating the less capital-intensive product.

Since gross capital formation is a final-demand component, all purchases of machinery of capital account are a part of GNP.

IO INDUSTRY 480400: PAPER INDUSTRIES MACHINERY
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	[illegible]	OUTPUT	INFORM	PCE	GCF	INV	EXPORT	FED	STATE	FIN DEM
3554	PAPER INDUSTRIES MACHINES	0.000	560.4	560.2	.	.	.	.	.	.	0.0
3554[illegible]1	PAPER INDUSTRIES MACHINES	0.099	469.5	0.0	.	436.1	.	33.2	0.2	.	469.5
3554[illegible]1	PARTS & ATTACHMENTS	0.005	93.3	56.3	.	.	.	37.0	.	.	37.0
3554	INDUSTRY UNALLOCATED	0.000	-6.6	[illegible]	.	-1.7	-0.9	.	.	.	-2.6
3554	CONTRACT WORK & MISC RECEIPTS	0.000	35.9	35.9	.	.	.	.	.	.	0.0
3554[illegible]	CONTRACT WORK	0.000	9.1	9.1	.	.	.	.	.	.	0.0
[illegible]554099	MISC RECEIPTS	0.000	26.8	24.7	.	.	.	1.8	0.3	.	2.1
	TOTAL FINAL DEMAND				0.0	434.4	-0.9	72.0	0.5	0.0	506.0
	28.74% ALLOCATED TO INFORMATION				0.0	124.5	-0.3	20.7	0.1	0.0	145.4

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	170.3
NET INTEREST	1.8
INDIRECT BUSINESS TAXES	4.0
BUSINESS TRANSFER PAYMENTS	.7
CAPITAL CONSUMPTION ALLOWANCES	17.3
PROFIT TYPE INCOME	19.0
TOTAL VALUE ADDED	213.1
28.74% ALLOCATED TO INFORMATION	61.3

* * * *

480500 Printing Trades Machinery

SIC 3555 **Printing Trades Machinery and Equipment**

Establishments primarily engaged in manufacturing machinery and equipment used by the printing and bookbinding trades. Establishments primarily engaged in manufacturing textile printing machinery are classified in Industry 3552.

Advertising and newspaper mats.
Blocking wood, for engravers
Blocks, engravers': wood
Bookbinders' machines: gold stamping, gluing, edging, sanding, cutting, perforating, corner cutting, back forming, headbanding, lining-up machinery, etc.
Bronzing and dusting machines, for the printing trade
Chases and galleys, printers'
Copy holders, printers'
Electrotyping machines
Engraving machinery and equipment (printing trades machinery)
Envelope printing presses
Etching machines (printing trades machinery)
Foundry type, for printing
Gelatin rolls, used in printing
Gravure presses
Intertype machines
Leads, printers'
Linotype machines
Lithographic stones
Mallets, printers'
Mats, advertising and newspaper (matrices)
Monotype machines
Offset plates
Paper ruling and sewing machines (bookbinders' machinery)
Photoengraving machines
Planes, printers'
Plates, metal: engravers'
Presses, printing
Printers' machines and equipment
Printers' plates, of all materials
Rollers, printers'
Rules, printers'
Slugs, printers'
Stereotyping machines
Sticks, printers'
Type cases, printers'
Type casting, founding, and melting machines
Type: lead, steel, brass, copper faced, etc.
Typesetting machines: intertypes, linotypes, monotypes, etc.
Typographic numbering machines

This industry is mostly composed of printing press and bookbinding equipment sales. The industry was not prorated according to the printing and publishing allocation (95.36%) since most print shops do not use specialized printing equipment for the non-information printing.

Sales to final demand of $638.9 million mostly originate in gross capital formation ($488 million).

IO INDUSTRY 480500: PRINTING TRADES MACHINERY
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	%COMP	OUTPUT	INTERM	PCE	GCF	INV	EXPORT	FED	STATE	FIN DEM
3555	PRINTING TRADES MACHINERY	0.070	713.0	713.0	.	.	.	.	.	.	0.0
3555001	PRINTING TRADES MACHINES	0.066	524.1	0.0	.	453.7	.	55.7	14.7	.	524.1
3555002	PRINTING TRADES PARTS & ATTACHMENTS	[illegible]	97.2	66.5	.	.	.	30.7	.	.	30.7
[illegible]	[illegible] MATERIALS	[illegible]	13.6	9.2	.	.	.	4.4	.	.	4.4
[illegible]	[illegible] TYPE, RULES, LEADS, ETC	[illegible]	4.9	4.9	.	.	.	.	.	.	0.0
[illegible]	OTHER PRINTING MACHINERY & PARTS	[illegible]	3.9	1.1	.	2.8	.	.	.	.	2.8
3555000	PRINTING TRADES MACHINERY, NSK	0.003	38.1	10.5	.	27.6	.	.	.	.	27.6
3555	INDUSTRY UNALLOCATED	0.005	42.4	0.0	.	.	35.0	.	1.9	5.9	42.4
3555	CONTRACT WORK & MISC RECEIPTS	[illegible]	26.9	26.9	.	.	.	.	.	.	0.0
3555098	CONTRACT WORK	0.000	6.7	6.7	.	.	.	.	.	.	0.0
3555099	MISC RECEIPTS	0.001	20.2	13.7	.	3.9	.	2.3	0.3	.	6.5
	TOTAL FINAL DEMAND				0.0	488.0	35.0	93.1	16.8	5.9	638.9
	ALLOCATED TO INFORMATION										638.9

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	275.1
NET INTEREST	3.0
INDIRECT BUSINESS TAXES	5.0
BUSINESS TRANSFER PAYMENTS	.8
CAPITAL CONSUMPTION ALLOWANCES	24.4
PROFIT TYPE INCOME	78.7
TOTAL VALUE ADDED	387.0
ALLOCATED TO INFORMATION	387.0

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I-O INDUSTRY #51: OFFICE, COMPUTING, AND ACCOUNTING MACHINES

The Office Machine industry, including computers, typewriters, calculators, and related products, forms the core of the information investment goods industries. The entire industry at the 2-digit I-O level has been allocated to information durable goods.

	OUTPUT	FINAL DEMAND	VALUE ADDED
TOTAL INDUSTRY	6,161	5,023	2,750
INFORMATION	6,161	5,023	2,750
NON-INFORMATION	0	0	0
INFO % GNP		0.63	0.63

Detailed Industry Reports

SIC 3573 **Electronic Computing Equipment**

Establishments primarily engaged in manufacturing electronic computers and/or major logical components intended for use in electronic computer systems. Included are general-purpose electronic analog computers as well as electronic digital copnters. The electronic computers may be used for data processing or may be incorporated as components into control equipment for industrial use, and as components of equipment used in weapons and weapons systems, space and oceanographic exploration, transportation and other systems. Electronic computer systems contain high speed arithmetic and program control units, on-line information storage devices and input/output equipment. Examples of input/output equipment are converters (card and/or tape), readers and printers. Examples of storage devices are magnetic drums and disks, magnetic cores and magnetic film memories. In addition to providing technical manuals necessary for the operation and maintenance of the equipment, establishments in this industry usually furnish general-purpose computer programs and basic operating systems programs needed for effective use of the computer system. Establishments primarily producing rebuilt electronic computers are also included in this industry. Establishments primarily engaged in manufacturing desk calculators, cash registers, accounting machines and similar equipment, typically electrical or mechanical, are classified in Industry 3574; electrical and electronic test equipment in Industry 3611; industrial controls, including electronic, in Industry 3622; and industrial process instruments in Industry 3821.

Analog computers
Card punching, sorting, and tabulating machines
Computing machines, including electronic
Converters, digital and analog
Data computing and correcting systems, electronic
Digital computers
Electronic computing machines
Film reader and digital storage phototheodolite devices
Gun data computers
Magnetic ink readers (input device)
Office machine control panels
Paper tape readers (input device)
Recorders, tape: for data computers
Scanners, optical (input devices)
Speed computers
Strip printer (computer peripheral equipment)
Tabulating machines
Tape transport systems for electronic computers

510101 Electronic Computing Equipment

The computing industry by 1967 had grown to $4 billion in sales, but accounted for only .4% of GNP in final-demand terms. Very few facets of business or personal lives are now untouched by the computer, and the growth in industry output reflects only a small part of the industry's impact on the economy.

In 1969, Burnett estimated that one out of every 40 establishments with a net worth over $20,000 had a computer installation. (See Table 39). Burnett's methodology is quite crude, being limited by the data, but his results are reproduced since an attempt was made to relate them to the SIC scheme. He projects that by 1980, the penetration ratio for manufacturing firms will be around 10% (penetration means owning an in-house computer facility, not merely tied to a time-sharing service).

As of 1969, the ten most computer-intensive industries, other than data processing or computer manufacturing, are:

TABLE 39: COMPUTER PENETRATION OF THE TEN LARGEST INDUSTRIES

	INDUSTRY	PENETRATION
SIC 19	Ordnance	.640
SIC 21	Tobacco	.350
SIC 29	Petroleum & Refined Prod.	.237
SIC 36	Machinery, Electrical	.139
SIC 38	Prof, Sci, Control Instruments	.102
SIC 37	Transportation Equipment	.090
SIC 31	Leather & Products	.072
SIC 28	Chemical & Allied	.059
SIC 30	Rubber & Plastic	.059
SIC 35	Machinery, Exc Electrical	.057
ALL MANUFACTURERS		.052

Source: Burnett (1969) ibid.

TABLE 40: PERCENTAGE OF COMPUTER INSTALLATIONS BY MAJOR SIC CLASSIFI(

SIC	Classification	Computer Count	(% of U.S. Total)	Universe (all rati
All	U.S. Total	19,357	(100.000)	3,600,000
01-09	Agriculture, Forestry, & Fisheries	56	(.29)	21,000
10-14	Mining Industries	170	(.88)	17,000
1511-1799	Contracting	98	(.51)	250,000
19-3999	Manufacturing Industries	6,498	(33.56)	246,000
19	Ordnance	32	(.165)	180
20	Food	639	(3.30)	25,000
21	Tobacco	35	(.180)	350
22	Textile Mill Products	201	(1.03)	6,500
23	Apparel	249	(1.28)	16,700
24	Lumber & Wood Products	64	(.330)	16,700
25	Furniture & Fixtures	68	(.351)	11,400
26	Paper & Allied	187	(.966)	5,800
27	Printing & Publishing	521	(2.69)	32,400
28	Chemical & Allied	524	(2.70)	12,800
29	Petroleum Refining & Allied	227	(1.17)	1,900
30	Rubber & Plastics	141	(.728)	4,300
31	Leather & Leather Products	72	(.372)	3,700
32	Stone, Clay, and Glass	144	(.744)	12,900
33	Primary Metal Industries	354	(1.83)	6,500
34	Fabricated Metal Industry	301	(1.55)	22,700
35	Machinery Except Electrical	977	(5.05)	32,900
36	Machinery, Electrical	948	(4.90)	8,900
37	Transportation Equipment	432	(2.23)	5,900
38	Prof. & Scien & Control Inst	244	(1.26)	4,800
39	Misc Manufacturing Industries	138	(.713)	13,800
40-49	Transp. Comm & Utilities	1172	(6.05)	90,000
50	Wholesale Trade	1232	(6.36)	230,000
52-59	Retailers	792	(4.09)	1,300,000
60-65	Finance	2967	(15.33)	300,000
70-79	Svcs,Business (non-computer)	398	(2.05)	250,000
7399	Svcs,Business (computer main)	1768	(9.11)	7,000
80-93	Services, Social	4206	(21.77)	430,000
82	Services, Educational	1830	(9.53)	110,000
91-93	Services, Governmental	1910	(9.84)	40,000
-	Services Other	466	(2.40)	280,000

Source: Burnett, E. (1969) "Computers in Use, Analyzed by Standard
Computers and Automation, September 1969.

IO INDUSTRY 510101: ELECTRONIC COMPUTING EQUIPMENT
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	MISC	CAP	INTERM	PCE	GOV	INV	EXPORT	FED	STATE	FIN DEM
3573	ELECTRONIC COMPUTING EQUIPMENT	0.000	4093.5	4093.5	.	.	.	.	.	.	0.0
3573125	ELECTRONIC COMPUTING EQUIP, EXC PAR	0.265	2114.9	0.0	.	1807.2	.	307.7	.	.	8114.9
3573150	COLED MEDIA DATA PROCESSING MACHS	0.119	1038.9	0.0	.	633.5	.	42.8	.	.	676.3
35*33	PARTS + ATTACHMENTS	0.119	940.6	794.5	.	.	.	146.1	.	.	137.1
3573	ADJSTMT UNALLOCATED	0.000	11.2	11.2	.	-104.3	102.5	.	277.0	7.3	18.1
3573	CONTRACT WORK + MISC RECEIPTS	0.000	128.2	128.2	.	.	.	.	.	.	0.0
3573098	CONTRACT WORK	0.000	3.2	3.2	.	.	.	.	.	.	0.0
3573099	MISC RECEIPTS	0.000	125.0	30.2	.	.	.	11.6	83.2	.	94.8
	TOTAL FINAL DEMAND				0.0	2342.4	102.5	478.2	360.2	7.3	3290.2
	ALLOCATED TO INFORMATION										3290.2

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	731.4
NET INTEREST	19.4
INDIRECT BUSINESS TAXES	16.1
BUSINESS TRANSFER PAYMENTS	7.2
CAPITAL CONSUMPTION ALLOWANCES	65.5
PROFIT TYPE INCOME	736.4
TOTAL VALUE ADDED	1576.0
ALLOCATED TO INFORMATION	1576.0

* * * *

510102 Calculating and Accounting Machines

SIC 3574 Calculating and Accounting Machines, Except Electronic Computing Equipment

Establishments primarily engaged in manufacturing desk calculators, adding and accounting machines, cash registers, and similar equipment, except electronic computers. Establishments primarily engaged in manufacturing electronic computing equipment are classified in Industry 3573; typewriters in Industry 3572; and office duplicating machines and devices, autographic registers, and other office machines in Industry 3579.

Accounting machines
Adding machines
Billing machines
Bookkeeping machines
Calculating machines
Cash registers and parts
Change making machines
Coin counters
Cost finding machines
Credit account registers
Estimating machines
Multiplying machines
Registers, credit account
Ticket counting machines
Voting machines

This group includes both mechanical and electronic calculating machines, although the technology is quickly abandoning the mechanical variety. By 1980, this industry should be almost entirely composed of electronic equipment.

IO INDUSTRY 510102: CALCULATING AND ACCOUNTING MACHINERY
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	[illegible]	OUTPUT	INTERM	PCE	[illegible]	INV	EXPORT	FED	STATE	FIN DEM
3574	CALCULATING & ACCOUNTING MACH.	[illegible]	7[illegible].0	7[illegible].0	.	.	.	.	.	.	0.0
3574150	ACCOUNTING BOOKKEEPING MACH, CASH RE	0.042	332.8	0.0	.	295.5	.	36.3	.	.	332.8
3574120	ADDING MACHINES	0.011	8[illegible].3	0.0	.	81.0	.	4.3	.	.	85.3
3574140	CALCULATING MACHINES	[illegible]	147.0	0.0	.	136.4	.	10.6	.	.	147.0
3574160	COIN & CURRENCY HANDLING, OTHER MAC	[illegible]	37.7	0.0	.	37.7	.	.	.	.	37.7
35743	PARTS & ATTACHMENTS	[illegible]	187.6	120.5	.	.	0.	58.[illegible]	8.2	.	67.1
3574	INDUSTRY UNALLOCATED	[illegible]	129.1	120.3	.	-86.5	4.6	.	38.9	67.8	8.8
3574	CONTRACT WORK & MISC RECEIPTS	[illegible]	14.0	14.0	.	.	.	.	.	.	0.0
3574098	CONTRACT WORK	[illegible]	2.2	2.2	.	.	.	.	.	.	0.0
3574099	MISC RECEIPTS	[illegible]	11.8	0.8	.	.	.	3.1	7.9	.	11.0
	TOTAL FINAL DEMAND				0.0	465.1	4.6	113.2	55.0	67.8	649.7
	ALLOCATED TO INFORMATION										689.[illegible]

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	261.0
NET INTEREST	5.2
INDIRECT BUSINESS TAXES	4.5
BUSINESS TRANSFER PAYMENTS	2.1
CAPITAL CONSUMPTION ALLOWANCES	27.8
PROFIT TYPE INCOME	108.0
TOTAL VALUE ADDED	408.6
ALLOCATED TO INFORMATION	408.6

* * * *

510200 Typewriters

SIC **3572** **Typewriters**

Establishments primarily engaged in manufacturing typewriters and parts.

Typewriters and parts

Typewriters are obvious information-processing tools. However, as the distinction between a typewriter and a terminal vanishes, this industry will experience a shift in its composition of "specialized typewriters" (3572012) into the Electronic Computing industry.

IO INDUSTRY 510200: TYPEWRITERS
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	[illegible]	OUTPUT	INFORM	PCE	GPF	INV	EXPORT	FED	STATE	FIN DEM
3572	TYPEWRITERS	[illegible]	[illegible]	[illegible]	.	.	.	.	.	.	0.0
3572002	STANDARD TYPEWRITERS	[illegible]	264.6	[illegible]	25.2	226.7	.	12.5	.	.	264.6
3572005	PORTABLE TYPEWRITERS	[illegible]	80.3	0.0	71.1	7.9	.	1.3	.	.	80.3
3572012	SPECIALIZED TYPEWRITERS	[illegible]	106.2	0.0	..	104.2	.	2.0	.	.	106.2
3572040	PARTS MADE BY COMPLETE MACHINE	0.002	55.[illegible]	36.8	.	.	.	16.1	2.6	.	18.7
3572051	PARTS MADE BY OTHER THAN COMPLETE M	0.000	4.8	4.8	.	.	.	.	.	.	0.0
3572	INDUSTRY UNALLOCATED	0.002	14.3	0.0	.	-104.2	14.7	.	40.1	63.7	14.3
3572	CONTRACT WORK + MISC RECEIPTS	0.000	7.5	7.5	.	.	.	.	.	.	0.0
3572098	CONTRACT WORK	0.000	1.5	1.5	.	.	.		.	.	0.0
3572099	MISC RECEIPTS	0.000	6.0	5.0	.	.	.	1.0	.	.	1.0
	TOTAL FINAL DEMAND				96.3	232.6	14.7	32.9	42.7	63.7	484.9
	ALLOCATED TO INFORMATION										484.9

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	278.7
NET INTEREST	4.6
INDIRECT BUSINESS TAXES	3.2
BUSINESS TRANSFER PAYMENTS	1.4
CAPITAL CONSUMPTION ALLOWANCES	26.[illegible]
PROFIT TYPE INCOME	83.5
TOTAL VALUE ADDED	397.8
ALLOCATED TO INFORMATION	397.8

* * * *

510300 *Scales and Balances*

SIC 3576 Scales and Balances, Except Laboratory

Establishments primarily engaged in manufacturing weighing and force measuring machines and devices of all types, except those regarded as scientific apparatus for laboratory and experimental work which are classified in Industry 3811.

- Baby scales
- Balances, including coin operated, automatic computing, and precision
- Bathroom scales
- Industrial scales
- Motor truck scales
- Railroad track scales
- Scales, including coin operated and electronic scales
- Weighing machines and apparatus, including automatic computing, coin operated, etc.

Scales, balances, and similar measuring instruments were included in the original Machlup accounting as "devices for the automatic initiation of information." Their purpose, as pieces of technology used in production processes, is to generate process information. Scales used in the home, such as baby and bathroom scales, accounted for 10.4% of the total industry sales. Some 65% of the industry output was purchased on capital account by other industries, primarily transportation.

IO INDUSTRY 510300: SCALES AND BALANCES
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	INFO %	OUTPUT	INFO $	PCE	GPDI	INV	EXPORT	FED	STATE	FIN DEM
3576	SCALES & BALANCES	[illegible]	135.0	135.0	.	.	.	.	.	.	0.0
3576010	MOTOR TRUCK & RR TRACK SCALES	[illegible]	20.4	[illegible]	.	17.9	.	3.5	.	.	20.4
3576020	INDUSTRIAL SCALES	[illegible]	59.8	[illegible]	.	53.7	.	5.5	.	.	59.8
3576030	RETAIL & COMMERCIAL SCALES	[illegible]	21.3	[illegible]	.	20.1	.	1.2	.	.	21.3
3576041	HOUSEHOLD BATHROOM SCALES	[illegible]	15.0	[illegible]	14.0	.	.	1.0	.	.	15.0
3576045	PERSONWEIGHING & MISC. NH SCALES	[illegible]	2.0	[illegible]	1.8	.	.	0.2	.	.	2.0
3576051	MAILING & PARCEL POST SCALES	[illegible]	3.5	[illegible]	.	3.3	.	0.2	.	.	3.5
3576052	ACCESSORIES & ATTACHMENTS	[illegible]	2.5	[illegible]	.	1.7	.	0.8	.	.	2.5
[illegible]	PARTS	[illegible]	[illegible]	[illegible]	.	.	.	3.1	0.7	.	3.9
3576	INDUSTRY UNALLOCATED	[illegible]	[illegible]	[illegible]	.	-11.1	2.5	.	5.1	4.8	1.1
3576	CONTRACT WORK & MISC RECEIPTS	[illegible]	[illegible]	[illegible]	.	.	.	.	.	.	0.0
3576038	CONTRACT WORK	[illegible]	[illegible]	[illegible]	.	.	.	.	.	.	0.0
3576039	MISC RECEIPTS	0.000	1.6	[illegible]	.	.	.	0.3	2.0	.	2.3
	TOTAL FINAL DEMAND				15.8	87.6	2.5	13.2	7.8	4.8	131.7
	ALLOCATED TO INFORMATION										131.7

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	50.0
NET INTEREST	.9
INDIRECT BUSINESS TAXES	.4
BUSINESS TRANSFER PAYMENTS	.1
CAPITAL CONSUMPTION ALLOWANCES	3.8
PROFIT TYPE INCOME	23.3
TOTAL VALUE ADDED	78.5
ALLOCATED TO INFORMATION	78.5

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510400 Office Machines, Not Elsewhere Classified

SIC 3579 Office Machines, Not Elsewhere Classified

Establishments primarily engaged in manufacturing office machines and devices, not elsewhere classified. Establishments primarily engaged in manufacturing computing machines are classified in Industry 3573, cash registers in Industry 3574, typewriters in Industry 3572, and photocopy and microfilm equipment in Industry 3861.

- Addressing machines
- Addressograph plates
- Canceling machinery, post office
- Check protectors (machines)
- Check writing, endorsing, or signing machines
- Coin wrapping machines
- Dating devices and machines, except rubber stamps
- Dictating machines, all types
- Duplicating machines
- Embossing machines, for store and office use
- Envelope stuffing, sealing, and addressing machines
- Gummed tape moisteners, for store and office use
- Letter folding, stuffing, and sealing machines
- List finders, automatic
- Mailing machines
- Manifolding machines: mimeographs, multigraphs, etc.
- Meters, postage
- Moisteners, gummed tape: for store and office use
- Numbering machines, office and store: mechanical
- Paper cutters and trimmers (hand office equipment)
- Pencil sharpeners
- Perforators (office machines)
- Postage meters
- Punches, paper: hand
- Registers, autographic
- Sealers, for gummed tape: hand
- Seal presses, notarial, etc.—hand
- Shorthand machines
- Slip sheeting machines
- Sorters, filing: office
- Staple removers
- Stapling machines, hand or power
- Teaching machines, electrically or electronically activated
- Time clocks and time recording devices
- Time stamps, containing clock mechanisms

The special-purpose office machine has proliferated recently as firms set up their own in-house information centers, hire machine operators, and go into competition with outside vendors of specialized services. This collection of machines is the precursor of the "automated office" concept -- an early realization by the business community that information-intensive techniques are a useful method of increasing office productivity of clerical or routine tasks.

The information "quasi-firms" that now exist within all firms now have their own accounting identity (e.g., "the duplicating division" and "the mail room"), hire their own skilled labor, and even charge the parent firm for their services.

A subset of the Office Machine industry is closely related to computers, especially the check-writing and addressograph machines. In some cases, these functions are entirely handled by a computer, with the only change being that the operator installs a different type of paper in the printer and loads a new software package. By 1980, the distinction between these special-purpose office machines and more general purpose office-oriented minicomputers will become quite blurred.

IO INDUSTRY 510400: OFFICE MACHINES, NEC.
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	IMP	OUTPUT	INTERM	PCE	GCE	INV	EXPORT	FED	STATE	FIN DEM
3579	OFFICE MACHINES NEC	0.000	***0.1	***0.1	.	.	.	.	.	.	0.0
3573115	DUPLICATING MACHINES	0.077	59.1	0.0	.	51.3	.	7.8	.	.	59.1
3579127	AUTOGRAPHIC REGISTERS	0.000	2.0	0.0	.	2.0	.	.	.	.	2.0
3579129	DICTATING, TRANSCRIBING + RECORDING	0.008	61.6	0.0	.	55.2	.	3.4	.	.	61.6
3573131	CHECK-HANDLING MACHINES	0.004	29.5	0.0	.	29.6	.	0.9	.	.	29.5
3579133	TIME RECORDING + TIME STAMP MACHS	0.022	15.6	0.0	.	12.1	.	3.4	.	.	15.5
3573134	MAIL HANDLING MACHINES	0.011	84.3	0.0	.	82.5	.	1.6	.	.	84.3
3573128	ALL OTHER OFFICE MACHINES NEC	0.013	99.6	0.0	.	90.1	.	9.5	.	.	99.6
35792	PARTS + ATTACHMENTS	0.004	70.3	22.2	.	.	.	43.0	4.8	.	47.8
3599	INDUSTRY UNALLOCATED	0.102	18.4	0.0	.	-100.6	25.6	.	56.7	36.9	18.4
3599	CONTRACT WORK + MISC RECEIPTS	0.070	14.5	14.5	.	.	.	.	.	.	0.0
3579098	CONTRACT WORK	0.000	1.5	1.5	.	.	.	.	.	.	0.0
3579099	MISC RECEIPTS	0.001	15.0	6.8	.	.	.	2.3	5.9	.	8.2
	TOTAL FINAL DEMAND				0.0	224.4	25.6	72.2	67.4	36.9	426.1
	ALLOCATED TO INFORMATION										426.1

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	240.8
NET INTEREST	-3.4
INDIRECT BUSINESS TAXES	3.6
BUSINESS TRANSFER PAYMENTS	2.0
CAPITAL CONSUMPTION ALLOWANCES	23.2
PROFIT TYPE INCOME	16.1
TOTAL VALUE ADDED	289.1
ALLOCATED TO INFORMATION	289.1

I-O INDUSTRY #53: ELECTRIC INDUSTRIAL EQUIPMENT AND APPARATUS

Industry #53 is composed of a wide variety of non-information machinery, including transformers, motors and generators, welding apparatus, and so on. The industry also includes electrical measuring instruments which, following Machlup, are included as information goods. These "information machines" have no other purpose than to yield process or physical state information.

As testing equipment becomes more sophisticated (i.e., using LSI components), their affinity to computers becomes obvious. In fact, many measuring applications are now computer oriented to such an extent that the instrument could as easily be called a special-purpose computer. This phenomenon makes process control a natural byproduct: the measurements and the adjustments are both automated.

Around 14.32% of the Electric Equipment industry was allocated to information durable goods.

	OUTPUT	FINAL DEMAND	VALUE ADDED
TOTAL INDUSTRY	9,034	4,474	4,543
INFORMATION	1,294	1,054	669
NON-INFORMATION	7,805	3,420	3,874
INFO % GNP		0.13	0.08

Detailed Industry Reports

530100 Electric Measuring Instruments

SIC 3611 **Electric Measuring Instruments and Test Equipment**

Establishments primarily engaged in manufacturing pocket, portable, panelboard, and graphic recording instruments for measuring electricity, such as voltmeters, ammeters, watt meters, watt-hour meters, demand meters, and other meters and indicating instruments. This industry also includes establishments primalily engaged in manufacturing analyzers for testing the electrical characteristics of internal combustion engines, radio apparatus, etc.

Ammeters
Ampere-hour meters
Analyzers for testing electrical characteristics of internal combustion engines, radio apparatus, etc.
Audio-frequency oscillators
Audio meters
Automotive instruments, electric
Bleed control cabinets (engine testers)
Bridges: Kelvin, Wheatstone, vacuum tube, megohm, etc.
Current measuring equipment
Demand meters, electric
Digital test equipment for electronic and electrical circuits and equipment
Electron tube test equipment
Electrical power measuring equipment
Electronic test equipment for testing electrical characteristics
Energy measuring equipment, electrical
Field strength and intensity measuring equipment, electrical
Frequency meters, electric
Galvanometers
Ignition testing instruments
Impedance measuring equipment
Indicating instruments, electric
Instrument relays, all types
Instruments, electric: for testing the electrical characteristics of internal combustion engines, radios, etc.
Instruments for measuring electrical quantities
Instrument transformers
Integrating instruments, electrical measuring
Kelvin bridges (electrical measuring instruments)
Laboratory standards, electric: resistance, inductance, and capacitance standards, and shunts
Measuring equipment for electronic and electrical circuits and equipment
Measuring instruments and meters, electric
Megohm bridges (electrical measuring instruments)
Meters, electric: pocket, portable, panelboard, and graphic recording
Meters, power factor and phase angle
Microwave test equipment
Multimeters
Ohmmeters
Oscillators, audio frequency and radio frequency (instrument types)
Oscillographs and oscilloscopes
Potentiometric measuring instruments
Power measuring equipment, electrical
Pulse (signal) generators
Radar testing instruments, electric
Radio apparatus analyzers, for testing electrical characteristics
Radio frequency measuring equipment
Radio meters
Radio set analyzers, electrical
Radio tube checkers, electrical
Reflectometers, sliding shorts
Resistance measuring equipment
Semiconductor test equipment
Signal generating equipment: audio, RF, and microwave
Spark plug testing instruments, electric
Spectrum analyzers
Standards and calibration equipment for electrical and electronic test and measuring equipment, except laboratory
Standing wave ratio, measuring equipment
Telephone cable pressurization unit
Test equipment for electronic and electrical circuits and equipment
Test sets, ignition harness
Tube testers
Vacuum tube bridges (electrical measuring instruments)
Voltage measuring equipment
Voltmeters and digital command units
Volt-ohm milliammeters
Watt-hour meters, electric
Watt hour and demand meters, combined
Watt-hour and time switch meters, combined
Watt meters
Waveform measuring and/or analyzing equipment
Wheatstone bridges (electrical measuring instruments)

All electrical measuring instruments listed above were defined as information producing or processing. Hence, the entire output of industry #530100 was allocated to information durable goods.

IO INDUSTRY 530100: ELECTRIC MEASURING INSTRUMENTS
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	[illegible]	[illegible]	OUTPUT	[illegible]	PCE	[illegible]	[illegible]	EXPORT	[illegible]	STATE	[illegible]
3611	[illegible]	[illegible]	1229.3	1219.3	.	.	.	.	.	.	0.0
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.	68.2	.	4.8	.	.	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	1150.7	.	498.0	.	82.7	.	.	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	42.2	.	[illegible]	.	73.3	.	.	100.0
[illegible]	[illegible]	[illegible]	[illegible]	22.8	.	30.[illegible]	.	.	.	.	38.1
[illegible]	UNDISTRIBUTED ELEC. MEAS. INST.	[illegible]	634.5	227.6	.	.	19.8	.	190.1	13.0	231.9
3611	CONTRACT WORK + MISC RECEIPTS	[illegible]	64.2	64.2	.	.	.	.	.	.	0.0
[illegible]	CONTRACT WORK	[illegible]	6.9	[illegible]	.	.	.	.	.	.	0.0
[illegible]	MISC RECEIPTS	[illegible]	57.3	26.8	.	.	.	5.4	27.3	.	32.7
	TOTAL FINAL DEMAND				0.0	624.0	19.8	166.2	228.4	13.0	1054.4
	ALLOCATED TO INFORMATION										1054.4

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	502.0
NET INTEREST	23.4
INDIRECT BUSINESS TAXES	8.0
BUSINESS TRANSFER PAYMENTS	1.7
CAPITAL CONSUMPTION ALLOWANCES	30.5
PROFIT TYPE INCOME	103.0
TOTAL VALUE ADDED	668.6
ALLOCATED TO INFORMATION	668.6

I-O INDUSTRY #56: RADIO, TELEVISION, & COMMUNICATIONS EQUIPMENT

Industry #56 includes radio and television sets, phonograph records, telephone and telegraph apparatus, and radio and television communications equipment. The radio and television set is the household's basic investment in telecommunications equipment. After a period of unparalleled growth (1950-1960), over 95% of all households now own at least one television set, and 98% own one radio.

	OUTPUT	FINAL DEMAND	VALUE ADDED
TOTAL INDUSTRY	15,905	13,722	7,812
INFORMATION	15,905	13,722	7,812
NON-INFORMATION	0	0	0
INFO % GNP		1.73	0.98

Detailed Industry Reports

560102 Radio and Receiving Sets

SIC 3651 **Radio and Television Receiving Sets, Except Communication Types**

Establishments primarily engaged in manufacturing electronic equipment for home entertainment. This industry also includes establishments primarily engaged in manufacturing public address systems, and music distribution apparatus except records. Establishments primarily engaged in manufacturing records are classified in Industry 3652; radio and television receiving type tubes in Industry 3671; and television receiving type cathode ray tubes in Industry 3672.

Amplifiers: radio, public address, or musical instrument
Audio electronic systems, except communications
Coin operated phonographs
FM and AM tuners
Home recorders
Juke boxes
Loudspeakers, electrodynamic and magnetic
Microphones
Music distribution apparatus, except records
Musical instrument amplifiers
Phonograph needles
Phonographs and radio combinations
Phonographs and parts, except cabinets and records
Pickup heads, phonograph
Pillows, stereo
Public address systems
Radio receiving sets
Recording machines, music and speech: except office type and recording equipment for electronic computers, telemetry, etc.
Speaker monitors
Sound reproducing equipment: except motion picture
Speaker systems
Stylii, phonograph record cutting
Television receiving sets
Turntables for phonographs
Video triggers (remote control TV devices)

Around 82% of the industry's output was purchased by households; the rest of the output was capitalized by firms (e.g., restaurants and hotels purchasing television sets), exported (2%) or purchased by government (3%).

IO INDUSTRY 560100: RADIO AND TV RECEIVING SETS
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	[illegible]	OUTPUT	INTERM	PCE	GCF	INV	EXPORT	FED	STATE	FIN DEM
3651	RADIO AND RECEIVING SETS	[illegible]	4122.9	4122.9	.	.	.	.	.	.	0.0
3651035	HOME-TYPE RADIO RECEIVERS	[illegible]	219.9	0.0	216.1	.	.	3.8	.	.	219.9
3651111	HOME-TYPE RADIO-PHONO COMBINATIONS	[illegible]	484.6	0.0	482.3	.	.	2.3	.	.	482.6
3651117	AUTOMOBILE RADIOS	[illegible]	224.7	192.9	27.4	.	.	4.5	.	.	31.9
36512	HOUSEHOLD TELEVISION RECEIVERS	[illegible]	2340.2	23.7	2261.6	34.4	.	21.2	.	.	2317.2
3651471	MECHANICAL REPRODUCTION PHONOGRAPH	[illegible]	1.4	0.0	1.4	.	.	.	.	.	1.4
3651472	COIN OPERATED ELECTRONIC PHONOGRAPH	[illegible]	52.5	0.0	.	41.7	.	10.8	.	.	52.5
3651478	RECORD PLAYERS	[illegible]	14.9	0.0	14.5	.	.	2.4	.	.	14.9
3651431	HOME-TYPE RECORDERS	[illegible]	179.2	2.5	154.1	7.2	.	15.1	.	.	176.6
3651452	HOME-TYPE AUDIO AMPLIFIERS	[illegible]	31.2	0.0	25.2	.	.	5.0	.	.	31.2
3651033	PHONOS TUNERS, SPEAKERS, AND MICRO	[illegible]	391.4	190.0	174.0	20.4	.	7.0	.	.	201.4
3651467	OTHER HOME-TYPE EQUIPMENT	[illegible]	15.7	0.0	15.7	.	.	.	.	.	15.7
3651433	CHASSIS FOR RADIO + TV RECEIVERS, S	[illegible]	9.3	9.3	.	.	.	.	.	.	0.0
3651567	HOME-TYPE ELECTRONIC KITS	[illegible]	28.1	0.0	25.2	.	.	2.9	.	.	28.1
3651990	COMMERCIAL SOUND EQPT	[illegible]	10.5	0.5	1.3	6.9	.	1.8	.	.	10.0
3651097	PHONOGRAPHS, SPEAKERS, MICROPHONES,	[illegible]	51.1	17.3	22.7	3.9	.	7.2	.	.	33.8
3651001	RADIO AND TV RECEIVING SETS, ETC., N	[illegible]	37.2	37.2	.	.	.	.	.	.	0.0
3651.	INDUSTRY UNALLOCATED	[illegible]	110.2	4.2	460..	.	86.4	.	38.3	23.6	106.0
3651	CONTRACT WORK + MISC RECEIPTS	[illegible]	83.5	83.6	.	.	.	.	.	.	0.0
3651098	CONTRACT WORK	[illegible]	4.4	4.4	.	.	.	.	.	.	0.0
3651099	MISC RECEIPTS	[illegible]	59.2	12..	.	.	.	3.1	43.8	.	46.9
	TOTAL FINAL DEMAND				3379.2	114.5	86.4	87.1	82.1	23.6	3770.9
	ALLOCATED TO INFORMATION										3770.9

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	937.1
NET INTEREST	28.3
INDIRECT BUSINESS TAXES	16.9
BUSINESS TRANSFER PAYMENTS	2.4
CAPITAL CONSUMPTION ALLOWANCES	50.1
PROFIT TYPE INCOME	181.0
TOTAL VALUE ADDED	1215.8
ALLOCATED TO INFORMATION	1215.8

* * * *

560200 Phonograph Records

SIC **3652** **Phonograph Records**

Establishments primarily engaged in manufacturing phonograph records and pre-recorded magnetic tape. Establishments primarily engaged in manufacturing electronic equipment for home entertainment, except records and pre-recorded magnetic tape, are classified in Industry 3651.

Phonograph records (including preparation of the master)
Pre-recorded magnetic tape
Record blanks, phonograph
Recording studios and preparing master records or tapes

About 79% of the industry's output is consumed by households; about 4% is exported. The tiny export figure of $11.1 million is an example of how a relatively insignificant information product in dollar terms can nonetheless have a large cultural impact on the importing country.

IO INDUSTRY 560200: PHONOGRAPH RECORDS
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	W/P	OUTPUT	INTERM	PCE	GCF	INV	EXPORT	FED	STATE	FIN DEM
3652	PHONOGRAPH RECORDS	[illegible]	272.1	272.1	.	.	.	.	.	.	0.0
365201	PHONOGRAPH RECORDS, ALL SPEEDS	[illegible]	[illegible]	0.0	184.8	.	.	8.9	2.8	8.3	206.8
365202	PRERECORDED TAPES	[illegible]	35.9	0.0	[illegible]	.	.	1.4	.	.	35.9
3652091	RECORD BLANKS	[illegible]	4.7	4.7	.	.	.	0.2	.	.	0.2
3652001	PHONOGRAPH RECORDS NSK	[illegible]	23.6	10.8	[illegible]	.	.	.	.	.	12.8
3652	SUM OF INDUSTRY UNDISTRIBUTED	[illegible]	1.1	0.0	[illegible]	.	20.7	.	.	0.0	1.1
3652	CONTRACT WORK + MISC RECEIPTS	0.000	1.4	1.4			.	.	.	.	0.0
3652098	CONTRACT WORK	0.000	0.5	0.5	.	.	.	.	.	.	0.0
3652099	MISC RECEIPTS	0.000	0.9	0.9	.	.	.	0.4	.	.	0.4
	TOTAL FINAL DEMAND				[illegible]	0.0	20.7	11.1	2.4	8.3	257.2
	ALLOCATED TO INFORMATION										257.2

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	45.8
NET INTEREST	3.7
INDIRECT BUSINESS TAXES	2.5
BUSINESS TRANSFER PAYMENTS	.4
CAPITAL CONSUMPTION ALLOWANCES	8.9
PROFIT TYPE INCOME	47.9
TOTAL VALUE ADDED	109.2
ALLOCATED TO INFORMATION	109.2

* * * *

560300 Telephone and Telegraph Apparatus

SIC 3661 Telephone and Telegraph Apparatus

Establishments primarily engaged in manufacturing wire telephone and telegraph equipment, and parts especially designed for telephone and telegraph use.

- Autotransformers for telephone switchboards
- Carrier equipment, telephone and telegraph
- Communication headgear, telephone
- Data sets, telephones and teletype writers
- Electronic secretary
- Headsets, telephone
- PBX equipment, dial and manual
- Repeater equipment, telephone and telegraph
- Switchboards, underwater: telephone and telegraph
- Telegraph station equipment and parts, wire
- Telegraph office switching equipment
- Telephone central office equipment, dial and manual
- Telephone sets, all types
- Telephone station equipment and parts, wire
- Telephones, sound powered (no battery)
- Telephones, underwater
- Teletypewriters
- Telewriters

This $2 billion capital goods industry experienced an average growth rate of 10.4% between 1958-1970. Nearly $1.8 billion, or .2% of GNP, was sold to final demand. The industry has also been a strong exporter as less developed countries allocate resources to the development of the communication infrastructure. The largest single item in this industry, telephone apparatus, includes all domestic and business telephones and data sets. As medium and small businesses acquire data-processing capabilities, the requirements of specialized telephone equipment will grow rapidly.

IO INDUSTRY 560300: TELEPHONE AND TELEGRAPH APPARATUS
$ Million (Current)

FINAL DEMAND COMPONENTS

STC	NAME OF ITEM	SHIP	OUTPUT	INDUSTRY	PCE	GCE	INV	EXPORT	FED	STATE	FIN DEM
3661	TELEPHONE AND TELEGRAPH APPARATUS	0.000	2313.3	2313.3	.	.	.	.	.	.	0.0
366111	TELEPHONE SWITCHING + SWITCHBOARD E	0.407	952.5	0.0	.	792.7	.	1.0	58.8	.	852.5
3661214	TELEPHONE CARRIER + REPEATER EQPT.	0.191	244.3	0.0	.	265.2	.	3.8	.	.	269.0
3661274	TELEPHONE INSTRUMENT SETS	0.022	177.0	0.0	.	163.0	.	1.8	12.2	.	177.0
3661291	OTHER TELEPHONE APPARATUS AND COMP	0.115	729.6	605.6	.	54.8	.	19.0	50.1	.	124.0
3661271	TELEGRAPH APPARATUS AND EQPT	0.323	234.2	47.4	.	139.8	.	20.3	28.3	.	188.4
3661281	DATA SETS	0.000	29.7	0.0	.	28.3	.	.	1.4	.	29.7
3661273	OTHER TELEPHONE + TELEGRAPH EQPT, N	0.000	9.4	4.8	.	4.5	.	.	.	.	4.6
3661021	TELEPHONE + TELEGRAPH APPARATUS MAR	0.000	8.8	0.8	.	8.0	.	.	.	.	8.0
3691	INDUSTRY UNALLOCATED	0.000	32.8	-49.2	.	.	78.0	.	3.6	0.2	81.8
3661	CONTRACT WORK + MISC RECEIPTS	0.000	95.9	95.9	.	.	.	.	.	.	0.0
3691098	CONTRACT WORK	0.000	0.5	0.5	.	.	.	.	.	.	0.0
3661098	MISC RECEIPTS	0.000	95.4	17.4	.	28.1	.	1.5	52.4	.	80.0
	TOTAL FINAL DEMAND				0.0	1455.8	78.0	47.4	204.8	0.2	1786.0
	ALLOCATED TO INFORMATION										1786.0

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	1074.9
NET INTEREST	5.6
INDIRECT BUSINESS TAXES	18.4
BUSINESS TRANSFER PAYMENTS	.6
CAPITAL CONSUMPTION ALLOWANCES	115.3
PROFIT TYPE INCOME	280.0
TOTAL VALUE ADDED	1494.8
ALLOCATED TO INFORMATION	1494.8

* * * *

560400 Radio and Television Communications Equipment

SIC **3662** **Radio and Television Transmitting, Signaling, and Detection Equipment and Apparatus**

Establishments primarily engaged in manufacturing (1) radio and television broadcasting equipment; (2) electric communication equipment and parts, except telephone and telegraph; (3) electronic field detection apparatus, light and heat emission operating apparatus, object detection apparatus and navigational electronic equipment, and aircraft and missile control systems; and (4) high energy particle accelerator systems and equipment designed and sold as a complete package for radiation therapy, irradiation, radiographic inspection, and research (linear accelerators, betatrons, dynamotrons, Vandergraff generators, resonant transformers, insulating core transformers, etc.); (5) high energy particle electronic equipment and accessories sold separately for the construction of linear accelerators, cyclotrons, synchrotrons, and other high energy research installations (transmitters/modulators, accelerating waveguide structures, pulsed electron guns, vacuum systems, cooling systems, etc.); (6) other electric and electronic communication and signaling products, not elsewhere classified. Establishments primarily engaged in manufacturing transmitting tubes are classified in Industry 3673.

Accelerating waveguide structures
Aircraft control systems, electronic
Air traffic control systems and equipment, electronic
Amplifiers: other than radio, public address, and musical instrument
Antenna, radar and communications
Antenna, television transmitting

Atom smashers (particle accelerators)
Betatrons
Broadcasting equipment, radio and television
Burglar alarm apparatus, electric
Cleaning equipment, ultrasonic
Communication equipment, mobile and micro-wave
Communication equipment and parts, electronic: except telephone and telegraph
Control receivers
Countermeasure simulators, electric
Cyclotrons
Detection apparatus: electronic and magnetic field, and light and heat emission
Digital encoders
Direction finders, radio
Door opening and closing control devices, radio and photoelectric cell operated
Dynamotrons
Electron beam metal cutting, forming and welding machines
Electron beam welders
Electron linear accelerators
Electronic control, detection, or communication systems
Electronic field detection apparatus
Electrostatic particle accelerators
Fire alarm apparatus, electric
Flight simulators (training aids), electronic
Heat emission operating apparatus
Highway signals, electric
Hydrophones
Inertial guidance systems
Infra-red object detection equipment
Intercommunicating systems, electric
Laser systems and equipment, except scientific and engineering instruments
Light and heat emission operating apparatus
Linear accelerators
Loran equipment
Magnetic field detection apparatus
Marine horns, electric
Maser equipment, all types
Micro-wave communication equipment
Missile control systems
Missile fuel management systems
Mobile communication equipment
Navigational electronic equipment
Object detection apparatus (radar)
Particle accelerators—high voltage
Photographic control systems, electronic
Phototransmission equipment
Pulsed electron guns
Radar equipment
Radio antenna (transmitting and receiving) and ground equipment
Radio compasses
Radio receiver networks
Radio telephone and telegraph equipment, except tubes
Railroad signaling devices, electric
Receiver-transmitter units
RF power amplifiers, sold separately for use in ranges, etc.
Satellites
Signaling apparatus, electric
Signals: railway, highway, and traffic—electric
Sirens, electric: vehicle, marine, industrial, and air raid
Sonar equipment
Sound signaling devices, electrical
Target signals, synthetic: to operate radar receivers and repeaters
Telemetering equipment, electronic
Television antenna (transmitting) and ground equipment
Television closed circuit equipment
Television monitors
Time recorders
Traffic signals, electric
Training devices, electronic
Transmitting apparatus, radio and television: except tubes
Transponders
Ultrasonic cleaning equipment
Ultrasonic generators sold separately for inclusion in tools, welding equipment, dental equipment, service equipment, etc.
Ultrasonic welding machines and equipment
Underwater sound equipment
Weapon simulators

All the equipment listed above was included as "information machines." Included here are a variety of sophisticated and expensive equipment, such as satellites and avionics. Communication and intelligence satellites will undoubtedly become a separate industry in time. As Intelsat, Domsat, Marisat, and various private firms (G.E., Hughes, AT&T, IBM/Aetna, etc.) increase their satellite activities, the growth in their share of GNP will climb dramatically.

Avionics is also increasing at a phenomenal rate, both in ubiquity and cost. One pound of avionics now costs over $1,200 -- including all research and development, manufacturing, installation, and maintenance.

This industry will continue to expand heavily in the next decade.

IO INDUSTRY 560400: RADIO AND TV COMMUNICATION EQUIPMENT
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	%INF	OUTPUT	INTERM	PCE	GPDI	INV	EXPORT	FED	STATE	FIN DEM
3662	RADIO AND TV COMMUNICATIONS EQPT.	0.000	7057.5	7057.0	.	.	.	.	.	.	0.0
36621	COMMUNICATIONS EQPT. EXC. BROADCAST	0.016	1671.1	1541.9	26.9	.	.	102.3	.	.	129.2
36622	RADIO AND TV BROADCAST EQPT	0.015	411.2	294.7	25.5	.	.	90.0	.	.	115.5
36623	INTERCOM EQPT, ALARM AND SIGNAL SYS	0.003	239.5	204.8	.	.	.	35.7	.	.	35.7
36624	NAVIGATION AIDS EXC. MISSILE/SPACE	0.008	1235.1	1177.0	.	.	.	[illegible]	.	.	58.2
36625	ELECTRONIC SEARCH + DETECTION APPAR	0.024	1671.2	1603.3	.	.	.	[illegible]	.	.	67.9
36626	ELECTRONIC COMMUNICATIONS EQPT NEC	0.004	1140.7	1117.2	.	.	.	31.5	.	.	31.5
36627	SATELLITE+GROUND COMMUNICATIONS EQPT	0.000	44.6	44.6	.	.	.	.	.	.	0.0
36628	MISSILE + SPACE VEHICLE-BORNE GUID	0.000	848.9	648.9	.	.	.	.	.	.	0.0
36629	MICROWAVE AND MOBILE TELEPHONE EQPT	0.006	165.8	120.7	.	.	.	45.1	.	.	45.1
3662001	RADIO + TV COMMUNICATIONS EQPT, NSK	0.000	196.9	196.9	.	.	.	.	.	.	0.0
3662	UNDIST RADIO-TV COMM. EQPT	0.815	7372.0	892.7	.	1,394.2	417.0	.	4641.2	86.9	6479.3
3662	CONTRACT WORK + MISC RECEIPTS	0.000	1074.5	1074.9	.	.	.	.		.	0.0
3662098	CONTRACT WORK	0.000	79.0	79.0	.	.	.	.	.	.	0.0
3662099	MISC RECEIPTS	0.093	995.5	277.0	.	32.5	.	13.0	671.5	.	717.9
	TOTAL FINAL DEMAND				52.4	1366.[illegible]	417.0	434.6	5312.7	86.9	7470.3
	ALLOCATED TO INFORMATION										7470.3

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	4450.3
NET INTEREST	20.1
INDIRECT BUSINESS TAXES	47.6
BUSINESS TRANSFER PAYMENTS	1.3
CAPITAL CONSUMPTION ALLOWANCES	175.9
PROFIT TYPE INCOME	236.7
TOTAL VALUE ADDED	4991.9
ALLOCATED TO INFORMATION	4991.9

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I-O INDUSTRY #57: ELECTRONIC COMPONENTS AND ACCESSORIES

This industry includes electron tubes, semiconductors, and other electronic components. With a few very minor exceptions, these products are used in computers, communications and testing equipment -- all information goods. The entire industry's output is therefore allocated to information. The rule for inclusion does not ordinarily extend to all information goods' inputs. For example, the sheet metal used in computer manufacturing is not classified as an information good. But in this case, the components are exclusively produced for installation in information machines, and their function is exclusively to process information.

The entire output of the Electronic Components and Accessories industry's output was allocated to information durable goods.

	OUTPUT	FINAL DEMAND	VALUE ADDED
TOTAL INDUSTRY	7,312	1,435	3,643
INFORMATION	7,312	1,435	3,643
NON-INFORMATION	0	0	0
INFO & GNP		0.18	0.46

Detailed Industry Reports

570100 Electron Tubes

SIC 3671 **Radio and Television Receiving, Type Electron Tubes, Except Cathode Ray**

Establishments primarily engaged in manufacturing radio and television receiving type electron tubes, except cathode ray tubes. Establishments primarily engaged in manufacturing television receiving type cathode ray tubes are classified in Industry 3672; transmitting tubes in Industry 3673; X-ray tubes in Industry 3693; and electronic equipment for home entertainment, except tubes, in Industry 3651.

Electron tubes, radio and television receiving; except cathode ray tubes

SIC 3672 **Cathode Ray Picture Tubes**

Establishments primarily engaged in manufacturing television receiving type cathode ray tubes. Establishments primarily engaged in manufacturing other radio and television receiving type electron tubes are classified in Industry 3671; and transmitting tubes in Industry 3673.

Cathode ray television receiving type tubes
Picture tube reprocessing
Television receiving type tubes, cathode ray

SIC 3673 **Transmitting, Industrial, and Special Purpose Electron Tubes**

Establishments primarily engaged in manufacturing transmitting, industrial, and special purpose electron tubes. Establishments primarily engaged in manufacturing radio and television transmitting equipment are classified in Industry 3662; radio and television receiving tubes in Industry 3671; television receiving type cathode ray tubes in Industry 3672; and X-ray tubes in Industry 3693.

Cathode ray tubes, except television receiving type
Electron beam (beta ray) generator tubes
Electron tubes: transmitting, industrial, and special purpose
Gas and vapor tubes
Geiger Mueller tubes
Industrial electron tubes
Klystron tubes
Light sensing and emitting tubes
Magnetrons
Transmitting electron tubes
Tubes designed for operating above the X-ray spectrum (with shorter wave length)
Vacuum capacitors, relays, and switches

These three industries are unique in the information sector in that they all experienced a decline in gross output in recent years. Cathode-ray tubes continue to be a strong product since they are used in television sets, oscilloscopes, and terminals.

IO INDUSTRY 570100: ELECTRON TUBES
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	WORK	OUTPUT	INTERM	PCE	GCE	INV	EXPORT	FED	STATE	FIN DEM
3670	ELECTRON TUBES	0.000	1e23.3	1e23.3	.	.	.	.	.	.	0.0
3671	ELECTRON TUBES, RECEIVING TYPE	0.224	274.1	217.3	47.8	.	.	13.0	.	.	60.8
3672	CATHODE RAY PICTURE TUBES	0.101	785.2	764.0	2.8	.	.	18.8	.	.	21.2
3673	ELECTRON TUBES, TRANSMITTING TYPE	0.224	574.9	346.1	.	.	.	28.5	.	.	28.5
3675	SUM OF UNDISTRIBUTED ELECTRON TUBES	0.224	531.2	345.2	.	.	-14.1	.	199.2	2.9	186.0
3670	CONTRACT WORK & MISC RECEIPTS	0.000	35.0	35.0	.	.	.	.	.	.	0.0
3670098	CONTRACT WORK	0.000	5.0	5.0	.	.	.	.	.	.	0.0
3670099	MISC RECEIPTS	0.002	30.0	18.4	.	.	.	2.1	11.5	.	13.6
	TOTAL FINAL DEMAND				50.6	0.0	-14.1	62.2	210.7	2.9	312.1
	ALLOCATED TO INFORMATION										312.1

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	391.4
NET INTEREST	12.3
INDIRECT BUSINESS TAXES	8.7
BUSINESS TRANSFER PAYMENTS	1.5
CAPITAL CONSUMPTION ALLOWANCES	49.4
PROFIT TYPE INCOME	322.2
TOTAL VALUE ADDED	785.5
ALLOCATED TO INFORMATION	785.5

* * * *

570200 Semiconductors

SIC 3674 Semiconductors and Related Devices

Establishments primarily engaged in manufacturing semiconducto related solid state devices, such as semiconductor diodes and stacks, incl rectifiers, integrated microcircuits (semiconductor networks), trans solar cells, and light sensitive semiconductor (solid state) devices.

Computer logic modules: flip flops, gates, inverters, triggers, emitter followers, magnetic shifts, registers
Controlled rectifiers, solid state
Diodes, solid state (germanium, silicon, etc.)
Electronic devices, solid state
Fuel cells, solid state
Hall effect devices
Infrared sensors, solid state
Light sensitive devices, solid state
Magnetohydrodynamic (MHD) devices
Modules, solid state
Molecular devices, solid state
Monolithic integrated circuits (solid state)
Nuclear detectors, solid state
Parametric diodes
Photoelectric cells, solid state (electronic eye)
Photovoltaic devices, solid state
Rectifiers, solid state
Semiconductor circuit networks (solid state integrated circuits)
Semiconductors (transistors, diodes, etc.)
Solar cells
Solid state electronic devices
Strain gages, solid state
Stud bases or mounts for semiconductor devices
Switches, silicon control
Thermionic devices, solid state
Thermoelectric devices, solid state
Transistors
Tunnel diodes
Ultraviolet sensors, solid state
Variable capacitance diodes
Zener diodes

With an average growth rate of 15.9% in value of shipments and 18.0% in capital expenditures during the period 1958-1970, the Semiconductor industry is one of the fastest growing members of the information goods sector. This industry is experiencing some of the fiercest competition seen in high technology fields. New techniques in LSI promise a proliferation of lucrative products in the next ten years.

IO INDUSTRY 570200: SEMICONDUCTORS
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	SCRAP	OUTPUT	INTERM	PCE	GCF	INV	EXPORT	FED	STATE	FIN DEM
3674	SEMICONDUCTORS	0.323	1233.1	1045.4	.	.	.	146.8	38.1	.	184.9
3674	INDUSTRY UNALLOCATED	0.005	261.2	220.8	.	.	42.4	.	.	.	42.4
3674	CONTRACT WORK + MISC RECEIPTS	0.000	19.9	19.9	.	.	.	.	.	.	0.0
3674099	CONTRACT WORK	0.000	0.3	0.3	.	.	.	.	.	.	0.0
3674099	MISC RECEIPTS	0.001	19.6	8.1	.	.	.	5.0	6.5	.	11.5
	TOTAL FINAL DEMAND				0.0	0.0	42.4	151.8	44.6	0.0	238.8
	ALLOCATED TO INFORMATION										238.8

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	540.2
NET INTEREST	10.9
INDIRECT BUSINESS TAXES	8.5
BUSINESS TRANSFER PAYMENTS	1.8
CAPITAL CONSUMPTION ALLOWANCES	54.0
PROFIT TYPE INCOME	62.0
TOTAL VALUE ADDED	677.4
ALLOCATED TO INFORMATION	677.4

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570300 Electronic Components, Not Elsewhere Classified

SIC 3679 Electronic Components and Accessories, Not Elsewhere Classified

Establishments primarily engaged in manufacturing specialty resistors for electronic end products; electronic inductors, transformers, and capacitors; and other electronic components, not elsewhere classified. Establishments primarily engaged in manufacturing resistors, inductors, and transformers for telephone and telegraph apparatus are classified in Industry 3661; electric lamps in Industry 3641; and semiconductor (solid state) and related devices in Industry 3674.

Antenna, receiving: automobile, home, portable
Attenuators
Baluns
Capacitors, electronic: fixed and variable
Cores, magnetic
Circuit boards, television and radar: electric-printed
Coils, chokes and other electronic inductors
Coil winding, electronic
Commutators, electronic
Condensers, for electronic end products
Constant impedance transformers
Cryogenic cooling devices (cryostats, etc.) for infrared detectors, masers, etc.
Crystals and crystal assemblies, radio
Delay lines
Electronic circuits, except semiconductor or solid state
Electronic tube parts, except glass blanks
Filters, electronic
Harness assemblies, for electronic use: wire and cable
Headphones, radio
Hermetic seals, for electronic equipment
IF amplifiers, sold separately
Impedance conversion units, high-frequency
Inductors, electronic
Loads, electronic
Magnetic recording tape
Oscillators, except laboratory type
Passive repeaters
Phonograph needle cartridges
Piezoelectric crystals
Printed circuits
Pulse forming networks
Quartz crystals for electronic application
Recording heads, for speech and musical equipment
Recording and playback heads, magnetic
Rectifiers, electronic, except solid state
Relays, for electronic use
Rheostats, for electronic end products
Resistors, for electronic end products
Resonant reed devices, electronic
Sockets, electronic tube
Solenoids for electronic applications
Step positioners for transmitting equipment
Switches, electronic applications
Switches, stepping
Tape, magnetic recording, including paper tape
Thermistors
Transducers, electrical
Transformers, electronic types
Tube retainers, electronic
Tube spacer—mica
Tube transformer assemblies, used in firing electronic tubes
Varistors
Video triggers
Voice controls
Wave guides and fittings

All the components included in this industry are for electronic (as distinct from electrical transmission) applications, mostly in computers, communications, instrumentation, and high-fidelity equipment.

TO INDUSTRY 570300: ELECTRONIC COMPONENTS, NEC.
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	RATIO	[illegible]	PCE	GCE	INV	EXPORT	FED	STATE	FIN DEM
3679	ELECTRONIC COMPONENTS, NEC,	0.010	4521.8	.	.	.	.	.	.	0.0
367901	CAPACITORS FOR ELECTRONIC APPLICATI	0.003	459.3	438.4	.	.	11.8	.	.	19.8
367903	RESISTORS FOR ELECTRONIC APPLICATIO	0.004	453.2	422.8	.	.	39.8	.	.	30.8
367904	COILS TRANSFORMERS REACTORS & CHOKE	0.001	446.5	435.1	.	.	11.4	.	.	11.4
3679935	MAGNETIC RECORDING MEDIA	0.012	174.8	80.0	34.7	10.5	43.8	.	.	84.8
3679931	PHONO CARTRIDGES AND PICK-UP	0.021	24.4	15.9	1.5	.	7.1	.	.	8.6
3679923	COMPLEX ELECTRONIC COMPONENTS	0.330	702.5	702.5	.	.	.	.	.	0.0
3679936	HOPE ANTENNAE	0.038	94.9	0.0	94.9	.	.	.	.	94.9
3679937	AUTO ANTENNAE	0.003	24.3	22.0	2.3	.	.	.	.	7.3
3679929	EARPHONE AND HEADSETS	0.001	20.3	16.3	4.0	.	.	.	.	4.0
3679938	ANTENNAE ACCESSORIES	0.000	45.4	44.4	1.0	.	.	.	.	1.0
3679909	ALL OTHER ELECTRONIC COMPONENTS & A	0.025	2810.1	1792.8	.	.	37.3	.	.	37.3
3679947	PHONO NEEDLES AND CUTTING STYLI	0.002	18.8	2.1	11.9	.	4.8	.	.	16.7
3679901	ELECTRONIC COMPONENTS NSK	0.000	240.1	240.1	.	.	.	.	.	0.0
3679	SUM OF UNDISTRIBUTED ELECTRONIC COM	0.061	4193.0	3711.0	.	119.8	.	361.2	10.0	482.0
3679	CONTRACT WORK & MISC RECEIPTS	0.000	88.4	88.4	.	.	.	.	.	0.0
3679008	CONTRACT WORK	0.000	29.8	29.8	.	.	.	.	.	0.0
3679089	MISC RECEIPTS	0.004	58.6	28.3	.	.	5.1	23.2		28.3
	TOTAL FINAL DEMAND			120.3	18.3	119.8	158.0	384.4	10.0	601.8
	ALLOCATED TO INFORMATION									601.8

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	1776.0
NET INTEREST	34.7
INDIRECT BUSINESS TAXES	25.8
BUSINESS TRANSFER PAYMENTS	3.6
CAPITAL CONSUMPTION ALLOWANCES	120.5
PROFIT TYPE INCOME	219.3
TOTAL VALUE ADDED	2179.9
ALLOCATED TO INFORMATION	2179.9

Industry #58 includes storage batteries, engine equipment, and X-ray apparatus. Only the X-ray equipment is allocated to information, since the equipment serves no purpose other than to yield diagnostic data and information about patients. To the extent that X-ray equipment is used therapeutically in radiation treatment, this sector will be overstated. Unfortunately, the Census of Manufacturers' 7-digit data do not distinguish between diagnostic and therapeutic applications; on industry sales of only $208 million and final demand of $195 million, the error cannot exceed about .01% of GNP.

Around 8.07% of the Miscellaneous Electrical Machinery and Equipment industry was allocated to information durable goods.

	OUTPUT	FINAL DEMAND	VALUE ADDED
TOTAL INDUSTRY	2,713	1,281	1,306
INFORMATION	219	195	111
NON-INFORMATION	2,505	,086	1,195
INFO % GNP		0.02	0.01

Detailed Industry Reports

580300 X-ray Apparatus and Tubes

SIC 3693 **Radiographic X-ray, Fluoroscopic X-ray, Therapeutic X-ray, and Other X-ray Apparatus and Tubes; Electromedical and Electrotherapeutic Apparatus**

Establishments primarily engaged in manufacturing radiographic X-ray, fluoroscopic X-ray, and therapeutic X-ray apparatus and tubes for medical, industrial, research and control applications. This industry also includes establishments primarily engaged in manufacturing electromedical and electrotherapeutic apparatus except electrotherapeutic lamp units for ultra-violet and infra-red radiation (Industry 3641). Establishments primarily engaged in manufacturing radio receiving type tubes are classified in Industry 3671; television receiving cathode ray tubes in Industry 3672; and transmitting tubes in Industry 3673.

Arc lamp units, electrotherapeutic: except infra-red and ultra-violet
Cardiographs
Electrocardiographs
Electroencephalograph
Electromedical apparatus
Electrotherapeutic apparatus, except infra-red and ultra-violet
Fluoroscopes
Fluoroscopic X-ray apparatus and tubes: for medical, industrial, research, and control applications
Lamps, X-ray
Radiographic X-ray apparatus and tubes: for medical, industrial, research, and control applications
Radium equipment
Therapeutic X-ray apparatus and tubes: for medical, industrial, research, and control applications
X-ray apparatus and tubes: for medical, industrial, research, and control applications
X-ray generators

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IO INDUSTRY 580300: X-RAY APPARATUS AND TUBES
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	COMP	OUTPUT	INPUT	PCE	GCF	INV	EXPORT	FED	STATE	FIN DEM
3693	X-RAY APPARATUS + TUBES	0.000	228.0	228.0	.	.	.	.	.	.	0.0
3693I	X-RAY, DIAGNOSTIC, + THERAPUTIC ELE	0.823	187.1	4.8	.	133.3	.	26.8	10.2	11.9	182.2
3693048	X-RAY TUBES AND VALVES, SOLD SEPARA	0.001	14.4	10.3	.	.	.	1.1	1.0	2.0	4.1
3693	INDUSTRY UNALLOCATED	0.001	7.2	0.0	.	.	7.2	.	.	.	7.2
3693	CONTRACT WORK + MISC RECEIPTS	0.000	10.3	13.7	.	.	.	.	.	.	0.0
3693098	CONTRACT WORK	0.000	1.6	1.6	.	.	.	.	.	.	0.0
3693099	MISC RECEIPTS	0.000	8.1	7.8	.	.	.	1.3	.	.	1.3
	TOTAL FINAL DEMAND				0.0	133.3	7.2	29.2	11.2	13.9	194.8
	ALLOCATED TO INFORMATION										194.8

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	123.2
NET INTEREST	1.1
INDIRECT BUSINESS TAXES	1.2
BUSINESS TRANSFER PAYMENTS	.1
CAPITAL CONSUMPTION ALLOWANCES	3.4
PROFIT TYPE INCOME	-17.9
TOTAL VALUE ADDED	111.1
ALLOCATED TO INFORMATION	111.1

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I-O INDUSTRY #62: SCIENTIFIC AND CONTROLLING INSTRUMENTS

Industry #62 includes a variety of scientific equipment: engineering and scientific instruments; mechanical measuring devices; automatic temperature controls; surgical and medical instruments; dental equipment and supplies; and watches, clocks, and their parts.

The non-informational equipment in this industry (the surgical, medical and dental equipment and supplies) accounted for 42% of the total output. The rest, some $2.1 billion in sales to final demand, was included as informational durable goods: controlling instruments, automatic pilots, gyroscopes and thermostats. Their function is purely informational in that they register the discrepancy between the system state and the desired goal, and transmit that information back to a controlling agent (which may also be a machine). Instruments are included as information goods since their only use is to inform the user about the physical state of the system. Watches and clocks have been included for similar reasons. Some overstatement of this sector may occur where watches and clocks have an ornamental, decorative, or bullion value beyond their information-giving function. However, as will be explained later, most of the non-informational value of watches and clocks is in the casing material, which was eliminated from the accounting of output.

Around 57.54% of the Scientific and Controlling Instruments industry's output was allocated to information durable goods.

	OUTPUT	FINAL DEMAND	VALUE ADDED
TOTAL INDUSTRY	5,514	3,282	2,625
INFORMATION	3,173	2,187	1,744
NON-INFORMATION	2,341	1,095	881
INFO & GNP		0.27	0.22

Detailed Industry Reports

620100 Engineering and Scientific Instruments

SIC 3811 Engineering, Laboratory, and Scientific and Research Instruments and Associated Equipment

Establishments primarily engaged in manufacturing laboratory, scientific, and engineering instruments such as nautical, navigational, aeronautical, surveying, drafting, and instruments for laboratory work and scientific research (except optical instruments—Industry 3831). Establishments primarily engaged in manufacturing surgical and medical instruments are classified in Industry 3841; dental instruments and equipment in Industry 3843; mechanical measuring and controlling instruments in Industry 3821; machinists' precision measuring tools in Industry 3545; instruments for indicating, measuring, and recording electrical quantities and characteristics in Industry 3611; watches and clocks in Industry 3871; and measuring and dispensing pumps in Industry 3586.

Acceleration indicators
Aeronautical instruments, electric (except instruments for indicating, measuring, and receiving electrical quantities): gyropilots, flight and bank indictors, drift meters, altimeters, etc.
Air speed indicators (aeronautical instruments)
Aircraft flight instruments
Angle-of-attack indicators
Angle-of-yaw indicators
Autoclaves, laboratory
Automatic pilots, aircraft
Bacteriological laboratory instruments and apparatus: except medical, optical and dental
Binnacles (compass housings)
Blood testing apparatus
Bunsen burners
Calibration tapes, for physical testing machines
Centrifuges, laboratory
Chemical laboratory apparatus: gas analysis, calorimeters, petroleum analysis, water and sewage testing, etc.
Clinical laboratory instruments, except medical and dental
Coal testing apparatus
Compasses and accessories (navigational instruments)
Degaussing equipment
Distilling apparatus, laboratory
Drafting instruments and machines
Driftmeters
Dust sampling and analysis equipment
Environmental testing equipment
Fathometers
Flight instruments, aeronautical
Furnaces, laboratory: except dental
Glide slope indicators
Gyrocompasses
Gyro gimbals
Gyroscopes
Haemoglobinometers
Horizon flight indicators
Hydrogen ion equipment, colorimetric
Incubators, laboratory
Indicator testers, turntable
Integrators (mathematical instruments)
Laboratory equipment: chemical fume hoods, distillation racks, benches, and cabinets
Laboratory testing and scientific instruments, except electric
Laser beam alignment devices
Laser scientific and engineering instruments
Machmeters
Magnetic idealization generators
Meteorological instruments, except optical
Micromanipulator
Microtomes
Nautical instruments
Navigational instruments
Omni-bearing indicators
Pathological laboratory instruments and apparatus
Pellicle mirrors
Photogrammetry equipment
Photopitometers
Physics laboratory apparatus and instruments
Pictorial deviation indicators
Pipettes, hemocytometer
Pi tapes (metal periphery direct reading diameter tapes)
Pitometers
Planimeters
Plotting instruments, drafting and map reading
Position indicators for landing gear, cowl flaps, stabilizers, etc.
Radio magnetic indicators
Rate-of-climb indicators
Seismographs
Seismometers
Seismoscopes
Sextants
Shadowgraphs
Slide rules
Standards and calibrating equipment, laboratory
Surveying instruments and accessories: alidades, transits, levels, theodolites, plumb bobs, rods, chains, tapes, etc.
T squares (drafting)
Taffrail logs
Templates, drafting
Time interval measuring equipment, electric (laboratory type)
Time measuring and counting equipment, electric (laboratory type)
Vacuum pumps, laboratory
Work tables, laboratory

The $1 billion Instruments industry accounts for some .1% of sales to final demand, mostly in the form of gross capital formation, exports, and defense purchases. Many of the instruments included in this industry are now treated as peripherals to computer-controlled processes. Some, such as automatic pilots, are actually on-board minicomputers. As microprocessors gain more widespread usage, many of the instruments listed will begin to resemble automatic calculators or computers which can communicate with each other, with a larger computer, or with a human operator.

IO INDUSTRY 620100: ENGINEERING AND SCIENTIFIC INSTRUMENTS
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	MAKE	OUTPUT	INTERN	PCE	GCE	INV	EXPORT	FED	STATE	FIN DEM
3811	ENGINEERING + SCIETIFIC INSTRUM	0.000	1110.6	1110.6	.	.	.	.	.	.	0.0
38111	AIRCRAFT, NAUTICAL INSTRUMENTS	0.010	591.4	512.7	.	.	.	79.1	.	.	79.1
3811237	LABORATORY + SCIENTIFIC INSTRUMENTS	0.012	281.6	186.7	.	24.1	.	70.8	.	.	94.9
3811301	SURVEYING + DRAFTING INSTRUMENTS	0.006	47.8	0.0	.	43.4	.	4.4	.	.	47.8
3811372	LABORATORY FURNITURE	0.012	97.4	0.0	.	95.7	.	1.7	.	.	97.4
3811393	SURVEYING + DRAFT INS. + FURNITURE	0.000	0.0	0.0	.	.	.	.	.	.	0.0
3811499	ENGINEERING + SCIENTIFIC INS. ASK	0.001	84.4	84.8	.	9.6	.	.	.	.	9.6
3811	SUM OF UNDISTRIBUTED	0.050	439.6	38.2	.	-50.7	41.6	.	357.3	53.2	401.4
3811	CONTRACT WORK + MISC RECEIPTS	0.000	49.6	49.6	.	.	.	.	.	.	0.0
3811098	CONTRACT WORK	0.000	10.6	10.6	.	.	.	.	.	.	0.0
3811099	MISC RECEIPTS	0.003	39.0	17.9	.	.	.	6.1	15.0	.	21.1
	TOTAL FINAL DEMAND				0.0	122.1	41.6	162.1	372.3	53.2	751.3
	ALLOCATED TO INFORMATION										-751.3

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	490.2
NET INTEREST	7.0
INDIRECT BUSINESS TAXES	6.3
BUSINESS TRANSFER PAYMENTS	1.4
CAPITAL CONSUMPTION ALLOWANCES	29.0
PROFIT TYPE INCOME	-54.8
TOTAL VALUE ADDED	479.1
ALLOCATED TO INFORMATION	479.1

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620200 Mechanical Measuring Devices

SIC 3821 **Mechanical Measuring and Controlling Instruments, Except Automatic Temperature Controls**

Establishments primarily engaged in manufacturing industrial process instruments, for indicating, recording, measuring and controlling temperature (except automatic temperature controls-Industry 3822), pressure and vacuum, fluid flow and liquid level, mechanical motion, rotation, humidity, density, acidity, alkalinity, and combustion; dial pressure gauges; physical property testing apparatus such as hardness, tension, compression, torsion, ductility, and elasticity testing apparatus.

Accelerometers
Amplifiers for nuclear applications
Barometers, mercury and aneroid types
Cable testing machines
Combustion indicating, recording, and controlling instruments
Condensate meters
Controls, liquid level
Controls, revolution and timing instruments
Count rate meters, nuclear radiation
Dial pressure gauges
Diaphragms for gas meters
Dynamometers
Electro gamma ray loggers
Fatigue testing machines, industrial: mechanical
Fire detector systems, non-electric
Fluid amplifier (control device)
Fuel densitometers, aircraft engine
Fuel gauging equipment, electrical and mechanical
Fuel mixture indicators, aircraft engine
Fuel system instruments, aircraft
Fuel totalizers, aircraft engine
Gasoline dispensing meters
Gauges, except electric, motor vehicle: oil pressure, water temperature, etc.
Gauges for measuring pressure, flow, liquid level, humidity, density, acidity, alkalinity, combustion, etc.
Geiger counters
Governors: gas
Hardness testing equipment
Heat regulators
Humidity instruments
Humidity plug indicators
Hydraulic pressure indicators
Hydrometers
Hydrostatic controls, except automatic temperature controls
Hygrometers
Instrumentation for reactor controls, auxiliary
Integrating meters, nonelectrical type
Ion chambers
Kinematic test and measuring equipment
Liquid scintillation spectrometers
Magnetic compasses, portable type
Measuring instruments, mechanical: except electrical and optical measuring instruments, watches, and clocks
Measuring wheels
Meters: gas, liquid, tallying, and mechanical measuring — except electrical instruments, watches, and clocks
Mine detectors, electronic
Moisture density meters
Needle gauge dials
Nuclear radiation detection and monitoring instruments
Oil pressure gauges, motor vehicle
Oxygen regulators
Parking meters
Pedometers
Personnel dosimetry devices
Physical properties testing and inspection equipment
Pressure and vacuum indicators, aircraft engine
Pressure measuring instruments: Bourdun tube, bellows and diaphram types
Pressure transducers
Pulse analyzers, nuclear monitoring
Pump testing units
Pyrometers, radiation and optical
Radiac equipment (radiation measuring and detecting)
Registers, fare: for street cars, buses, etc.
Registers, lineal tallying
Revolution counters and timers
Salinity indicators
Sample changers, nuclear radiation
Scalers, nuclear radiation
Scintillation detectors
Speedometers
Stress, strain, and flaw detecting and measuring equipment
Strip chart recorders, electronic
Synchronizers, aircraft engine
Tachometers
Taximeters
Telegraph distortion analyzers
Testers for checking hydraulic controls on aircraft
Testing machines: abrasion, shearing strength, tensile strength, torsion, etc.
Thermomagnetic oxygen analyzer
Thermometers, all types
Thickness gauging instruments, ultrasonic
Thrust power indicators, aircraft engine
Timers, revolution
Toll booths, automatic
Torsion testing machines
Turbine flow meters
Turnstiles, equipped with counting mechanisms
Ultrasonic testing equipment
Viscosimeters
Water meters
Water temperature gauges, motor vehicle
X-Y plotters

The same type of rule applies here as for the Electronic Instruments: that the primary purpose of these products is information giving. Several seemingly non-information products, such as parking meters and fare registers, are presently undergoing a technological change that involves computer technology. For example, several new rapid transit systems are experimenting with magnetic computer card substitutes to handle billing instead of the conventional coin meters.

IO INDUSTRY 620200: MECHANICAL MEASURING DEVICES
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	%IMP	OUTPUT	INTERM	PCE	GCF	INV	EXPORT	FED	STATE	FIN DEM
3821	MECHANICAL MEASURING DEVICES	0.300	1403.6	1403.6	.	.	.	.	.	.	0.0
38211	AIRCRAFT ENGINE INSTRUMENTS	0.001	120.0	108.1	.	.	.	11.9	.	.	11.9
3821711	GAS METERS	0.006	61.3	0.0	.	59.6	.	1.7	.	.	61.3
3821731	WATER METERS	0.009	73.7	0.0	.	73.7	.	.	.	.	73.7
3821741	GASOLINE DISPENSING METERS	0.000	22.7	22.7	.	.	.	.	.	.	0.0
3821790	OTHER NONELECTRICAL INTEG. METERS	0.079	23.2	0.0	.	21.2	.	.	.	.	21.2
3821230	INTEGRATING METERS, NSK	0.021	11.5	3.8	.	.	.	7.7	.	.	7.7
3821001	TEMPERATURE INSTRUMENTS	0.001	115.8	104.2	.	11.6	.	.	.	.	11.6
3821002	PRESSURE, DRAFT, & VACUUM INSTR	0.007	117.2	59.6	.	58.6	.	.	.	.	58.6
3821003	FLOW AND LIQUID-LEVEL INSTRU.	0.007	104.5	46.9	.	47.5	.	10.1	.	.	57.6
3821316	HUMIDITY INSTRUMENTS	0.000	6.3	2.7	.	3.6	.	.	.	.	3.6
3821004	CONTINUOUS PROCESS GAS + LIQUID	0.012	39.8	21.1	.	2.9	.	15.9	.	.	18.7
3821025	PHYSICAL PROPERTIES TESTING EQUIP	0.006	63.9	0.0	.	20.9	.	43.0	.	.	63.9
3821026	ALL OTHER FOCUS, TEST EQUIP.	0.026	285.6	80.4	.	92.2	.	113.2	.	.	205.4
3821313	MERCHANDISE THERMOMETERS	0.002	13.8	0.0	13.8	.	.	.	.	.	13.8
3821332	HOUSEHOLD BAROMETERS	0.001	4.1	0.0	4.1	.	.	.	.	.	4.1
3821334	CLINICAL THERMOMETERS	0.001	9.2	2.1	0.9	.	.	.	.	0.2	7.1
38214	MOTOR VEHICLE INSTRUMENTS	0.001	73.8	64.9	.	.	.	8.9	.	.	8.9
3821037	NUCLEAR RADIATION DET. INSTRU.	0.013	114.5	8.4	.	85.0	.	21.1	.	.	106.1
3821008	MECH. MEASURING INSTRU.	0.002	83.0	68.1	.	.	.	14.9	.	.	14.9
3821979	MECH. MEA. DEVICES - NSK	0.003	47.2	26.1	1.8	15.2	.	5.1	.	.	21.1
3821	UNDISTRIBUTED	0.015	585.5	462.8	.	.	30.0	.	74.0	13.7	117.7
3821	CONTRACT WORK + MISC RECEIPTS	0.000	67.6	67.6	.	.	.	.	.	.	0.0
3821048	CONTRACT WORK	0.000	12.7	12.7	.	.	.	.	.	.	0.0
3821099	MISC RECEIPTS	0.002	54.9	42.3	.	.	.	7.9	2.7	.	12.6
	TOTAL FINAL DEMAND				25.8	491.9	30.0	263.4	76.7	13.9	901.5
	ALLOCATED TO INFORMATION										901.5

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	702.6
NET INTEREST	11.0
INDIRECT BUSINESS TAXES	10.4
BUSINESS TRANSFER PAYMENTS	2.2
CAPITAL CONSUMPTION ALLOWANCES	48.8
PROFIT TYPE INCOME	-43.6
TOTAL VALUE ADDED	731.4
ALLOCATED TO INFORMATION	731.4

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620300 Automatic Temperature Controls

SIC 3822 **Automatic Temperature Controls**

Establishments primarily engaged in manufacturing automatic temperature controls activated by pressure, temperature, level, flow, time, or humidity (including pneumatic controls) of the type principally used as components of air conditioning, refrigeration, and comfort heating, or as components of household appliances. Establishments primarily engaged in manufacturing industrial electric controls are classified in Industry 3622.

Gauges for measuring temperature
Switches, thermostatic
Temperature controls, automatic
Thermostats

The state-of-the-art in Automatic Temperature Controls is represented in building environment-control systems. These small computer-based systems can control several tens of thousands of sensing units through a network, and can be used to control air conditioners, heaters, and lights as environmental conditions change. They are advertised by the major vendors as saving a sizable fraction of a utility bill, as well as substituting information technology for the more familiar night watchman whose primary duty is to turn lights off.

IO INDUSTRY 620300: AUTOMATIC TEMPERATURE CONTROLS
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	CONP	OUTPUT	INTERM	PCE	GCF	INV	EXPORT	FED	STATE	FIN DEM
3822	AUTOMATIC TEMPERATURE CONTROLS.	0.006	519.2	488.1	.		.	24.2	5.9	.	30.1
3822	INDUSTRY UNALLOCATED	0.000	2.1	0.0	.	.	2.1	.	.	.	2.1
3822	CONTRACT WORK + MISC RECEIPTS	0.000	11.7	11.7	.	.	.	.	.	.	0.0
3822098	CONTRACT WORK	0.000	1.7	1.7	.	.	.	.	.	.	0.0
3822099	MISC RECEIPTS	0.000	10.0	8.7	.	.	.	1.0	0.3	.	1.3
	TOTAL FINAL DEMAND				0.0	0.0	2.1	25.2	6.2	0.0	33.5
	ALLOCATED TO INFORMATION										31.5

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	329.1
NET INTEREST	4.7
INDIRECT BUSINESS TAXES	4.1
BUSINESS TRANSFER PAYMENTS	.8
CAPITAL CONSUMPTION ALLOWANCES	22.5
PROFIT TYPE INCOME	-19.3
TOTAL VALUE ADDED	341.9
ALLOCATED TO INFORMATION	341.9

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620701 Watches and Clocks

SIC 3871 **Watches, Clocks, Clockwork Operated Devices, and Parts Except Watchcases**

Establishments primarily engaged in manufacturing clocks (including electric), watches, mechanisms for clockwork operated devices, and clock and watch parts. This industry includes establishments primarily engaged in assembling clocks and watches from purchased movements and cases. Establishments primarily engaged in manufacturing watchcases are classified in Industry 3872, glass crystals in Industry 3231, and unbreakable crystals in Industry 3079.

Chronographs
Chronometers, electronic or spring wound
Clock materials and parts, except crystals and jewels
Clocks, assembling of
Clocks, including electric
Mechanisms for clockwork operated devices
Movements, watch or clock
Timers for industrial use, clockwork mechanism only (electric or spring wound)
Watches and parts: except watchcases, crystals, and jewels

The jewelry or decorative value of a watch or clock is most likely to reside in its case or container, be it gold, silver, or wood. The cases are manufactured by another industry (SIC 3872). Only the assembly of watches or watch movements is included here. Watches are considered as information-giving devices, similar to instruments.

IO INDUSTRY 620701: WATCHES AND CLOCKS
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	[illegible]	OUTPUT	INTERM	PCE	GCF	INV	EXPORT	FED	STATE	FIN DEM
3871	WATCHES & CLOCKS, TOTAL	0.000	748.4	[illegible]	.	.	.	.	.	.	0.0
3871101	HOUSEHOLD ELECTRIC CLOCKS	[illegible]	45.9	0.0	45.9	.	.	.	.	.	45.9
3871115	COMMERCIAL ELECTRIC CLOCKS	[illegible]	[illegible]	3.1	.	.	.	.	.	.	0.0
387112	SPRING WOUND & WEIGHT OPERATED	0.004	29.1	3.0	[illegible]	0.6	.	0.4	.	.	20.1
3871125	BATTERY POWERED CLOCKS	[illegible]	12.9	0.0	12.9	.	.	.	.	.	12.8
3871172	OTHER CLOCKS & TIMERS	[illegible]	36.5	36.5	.	.	.	.	.	.	0.0
3871173	CLOCK MOVEMENTS & TIMING MECHS.	[illegible]	149.1	[illegible]	.	.	.	3.7	.	.	3.7
3871100	CLOCKS, N.S.K.	[illegible]	6.1	[illegible]	.	.	.	.	.	.	0.0
38714	WATCHES WITH IMPORTED MOVEMENTS	[illegible]	[illegible]	0.0	[illegible]	.	.	.	.	.	[illegible]
3871551	JEWELED LEVER ESCAPEMENT TYPE	[illegible]	[illegible]	0.0	56.4	.	.	.	.	.	56.4
3871552	OTHER WATCHES & CLOCK & WATCH PARTS	0.006	97.9	32.2	65.7	.	.	.	.	.	65.7
3871503	CLOCK & WATCH PARTS & MOVEMENTS	0.003	89.1	87.1		.	.	2.0	.	.	2.0
38715	SUM OF UNDISTRIBUTED PARTS	0.000	[illegible]	0.0		.	.	.	.	.	0.0
387151	WATCHES & PARTS NSK	0.000	[illegible]	0.8	.	.	.	.	.	.	0.0
3871990	WATCHES & CLOCKS, N.S.K.	0.000	[illegible]	29.1	.	.	.	[illegible]	.	.	3.7
3871	SUM OF UNDISTRIBUTED	0.013	[illegible]	[illegible]	.	.	[illegible]	.	93.0	3.5	100.5
3871	CONTRACT WORK & MISC RECEIPTS	0.000	22.2	22.2	.	.	.	.	.	.	0.0
3871054	CONTRACT WORK	0.000	3.0	3.0	.	.	.	.	.	.	0.0
3871090	MISC RECEIPTS	0.000	[illegible]	13.0	.	.	.	0.4	.	.	0.4
	TOTAL FINAL DEMAND				[illegible]	0.6	4.0	10.2	93.0	3.5	501.1
	ALLOCATED TO INFORMATION										501.1

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	113.2
NET INTEREST	5.3
INDIRECT BUSINESS TAXES	3.3
BUSINESS TRANSFER PAYMENTS	.8
CAPITAL CONSUMPTION ALLOWANCES	16.0
PROFIT TYPE INCOME	53.4
TOTAL VALUE ADDED	192.0
ALLOCATED TO INFORMATION	192.0

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I-O INDUSTRY #63: OPTICAL, OPTHALMIC & PHOTOGRAPHIC EQUIPMENT

The information components of this industry are composed of optical instruments and photographic equipment. The former is considered in the class "instrument," a product whose primary function is information giving, i.e., visual. The latter is considered an information good since it captures visual information -- images -- on a variety of media.

Around 65.35% of the Optical, Opthalmic, and Photographic Equipment industry's output was allocated to information durable goods.

	OUTPUT	FINAL DEMAND	VALUE ADDED
TOTAL INDUSTRY	5,391	2,926	2,683
INFORMATION	3,523	2,550	2,454
NON-INFORMATION	1,868	376	229
INFO % GNP		0.32	0.31

Detailed Industry Reports

630100 Optical Instruments and Lenses

SIC 3831 **Optical Instruments and Lenses**

Establishments primarily engaged in the production of optical lenses and prisms, and in manufacturing optical instruments such as microscopes, telescopes, field and opera glasses; and optical measuring and testing instruments such as refractometers, spectronieters, spectroscopes, colorimeters, polariscopes. Establishments primarily engaged in manufacturing eyeglass lenses, frames, or fittings are classified in Industry 3851; and those engaged in manufacturing sighting and fire control instruments, but not engaged in manufacturing optical components, in Industry 1941.

Binoculars
Bomb sights, made in optical plants
Borescopes
Chromatographic equipment, (laboratory type)
Chronoscopes
Cinetheodolites
Colorimeters (optical instruments)
Contour projectors
Directors: antiaircraft, naval, torpedo—made in optical plants
Dynalens
Electron microprobes
Electron paramagnetic spin type apparatus, made in optical plants
Fire control equipment, military: made in optical plants
Flack spotting instruments (fire control equipment), made in optical plants
Glasses, field or opera
Gun sights, made in optical plants
Height finders (fire control equipment), made in optical plants
Laboratory analysis instruments, optical
Lens coating
Lens grinding, except ophthalmic
Lenses, optical: photographic, magnifying, projection, and instrument
Magnifying instruments, optical: Coddington, triplet, lupes, and microscopes
Meteorological instruments, optical
Microprojectors
Microscopes, except corneal
Nephelometers
Nuclear magnetic resonance type apparatus, made in optical plants
Optical comparators
Optical elements and assemblies, except ophthalmic: lenses, prisms, optical flats, lens mounts, optical reflectors and mirrors
Optical measuring instruments
Perimeters (optical instruments)
Periscopes
PH meters
Photographic lenses
Photometers, made in optical plants
Photomicrographic apparatus
Phototheodolites
Polariscopes
Polarizers
Prisms optical
Projection lenses
Range finders (fire control equipment), made in optical plants
Reflectors, optical
Reflectoscopes
Refractometers
Searchlight mirrors and reflectors, made in optical plants
Sighting and fire control equipment, made in optical plants
Spectrographs
Spectrometers and spectroscopes, optical instruments
Spyglasses
Telescopes: elbow, panoramic, sighting, fire control, etc.
Telescopic sights, made in optical plants
Titrometers
Torpedo directors, made in optical plants
Triplet magnifying instruments, optical
Turbidometers

Chronoscopes, colorimeters, laboratory analysis equipment, and microscopes are representative optical instruments. Eyeglasses, SIC 3851, are not included as information goods for two reasons: (i) they are medical corrective devices, analogous to a splint or a drug, and (ii) the jewelry or decorative aspects are impossible to distinguish from the "visual correction value."

IO INDUSTRY 630100: OPTICAL INSTRUMENTS AND LENSES
$ Millions (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	SCRAP	OUT	INTERM	PCE	GCE	INV	EXPORT	FED	STATE	FIN DEM
3811	OPTICAL INSTRUMENTS + LENSES	0.000	470.7	470.7	.	.	.	.	.	.	0.0
3811131	FIELD GLASSES + TELESCOPES	0.004	7.4	0.0	.1	7.7	.	0.7	.	.	31.4
3811153	MICROSCOPES	0.006	3.9	0.0	.5	29.1	.	2.3	.	.	45.9
3811174	OPTICAL + RELATED SPECTROMETERS	0.010	79.5	0.0	.	79.5	.	.	.	.	79.5
3811172	ALL OTHER OPTICAL INSTRUMENTS	0.008	132.5	72.1	.	42.5	.	17.9	.	.	80.4
3811119	LABORATORY ANALYSIS APPARATUS	0.009	67.8	0.0	.	67.8	.	.	.	.	67.8
3811198	LENSES COMPONENTS + PARTS	0.001	62.7	54.7	.	.	.	8.0	.	.	8.0
3811001	OPTICAL INSTRUMENTS + LENSES, N.S.K	0.000	43.6	43.6	.	.	.	0.3	.	.	0.3
3811	SUM OF LADISTRIBUTERS	0.210	122.7	44.8	.	.	7.4	.	55.2	15.3	77.9
3811	CONTRACT WORK + MISC RECEIPTS	0.000	9.4	9.4	.	.	.	.	.	.	0.0
3811098	CONTRACT WORK	0.000	1.2	1.2	.	.	.	.	.	.	0.0
3811099	MISC RECEIPTS	0.001	8.2	3.3	.	.	.	1.2	3.7	.	4.9
	TOTAL FINAL DEMAND				37.5	228.6	7.4	30.4	58.9	15.3	376.1
	ALLOCATED TO INFORMATION										376.1

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	173.1
NET INTEREST	.5
INDIRECT BUSINESS TAXES	1.9
BUSINESS TRANSFER PAYMENTS	.9
CAPITAL CONSUMPTION ALLOWANCES	14.1
PROFIT TYPE INCOME	31.0
TOTAL VALUE ADDED	221.5
ALLOCATED TO INFORMATION	221.5

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630300 Photographic Equipment and Supplies

SIC3861 **Photographic Equipment and Supplies**

Establishments primarily engaged in manufacturing (1) photographic apparatus, equipment, parts, attachments, and accessories, such as still and motion picture cameras and projection apparatus; photocopy and microfilm equipment; blueprinting and diazotype (white printing) apparatus and equipment; and other photographic equipment; and (2) sensitized film, paper, cloth, and plates, and prepared photographic chemicals for use therewith. Establishments primarily engaged in manufacturing photographic paper stock (unsensitized), and paper mats, mounts, easels and folders for photographic use are classified in Major Group 26; photographic lenses in Industry 3831; photographic glass in Major Group 32; chemicals for technical purposes, not specifically prepared and packaged for use in photography, in Major Group 28; and photographic flash, flood enlarger and projection lamps in Industry 3641.

Blueprint cloth or paper, sensitized
Blueprint reproduction machines and equipment
Brownprint paper and cloth, sensitized
Brownprint reproduction machines and equipment
Cabinets, cassette film transfer
Cameras, still and motion picture: all types—aerial, view, commercial, amateur, scientific, process, and special purpose
Densitometers
Developers, prepared photographic: not made in chemical plants
Developing machines and equipment, still or motion picture
Diazo (whiteprint) paper and cloth, sensitized
Diazotype (whiteprint) reproduction machines and equipment
Driers, photographic
Editing equipment, motion picture: rewinds, viewers, titlers, splicers, etc.
Enlargers, photographic
Exposure meters, photographic
Film, sensitized: motion picture, X-ray, still camera, and special purpose—roll, packs, sheet, and cut
Fixers, prepared photographic; not made in chemical plants
Flashlight apparatus for photographers, except bulbs
Graphic arts plates, sensitized
Hangers: photographic film, plate, and paper
Heat sensitized paper made from purchased paper
Holders: photographic film, plate, and paper
Lantern slide plates, sensitized
Lens shades, camera
Light meters, photographic
Metallic emulsion sensitized paper and cloth, photographic
Microfilm equipment: camera, projectors, readers, etc.
Motion picture apparatus and equipment: cameras, projectors, sound-on-film recorders, sound reproducing equipment, screens, splicers, rewinds, reels, editors, etc.
Photo composing machines
Photocopy equipment, all types
Photoflash equipment, except lamps
Photographic chemicals prepared: not made in chemical plants
Photographic equipment and accessories
Photographic instruments, electronic
Photographic paper and cloth, sensitized: all types
Photo reconnaissance systems
Photostat machines
Plates, photographic: sensitized
Printing equipment, photographic
Printing frames, photographic
Processing equipment, photographic
Projectors, still and motion picture: silent and sound
Range finders, photographic
Reels, film
Screens, projection
Sensitometers, photographic
Shutters, camera
Splicers, motion picture film
Stands, camera and projector
Stereopticons
Tanks: photographic developing, fixing, and washing
Toners, prepared photographic: not made in chemical plants
Trays, photographic printing and processing
Tripods, camera and projector
Washers, photographic print and film
X-ray photographic equipment, except X-ray machines and tubes: film developing equipment, intensifying screens, etc.
X-ray plates, sensitized

The $3 billion Photographic Equipment and Supplies industry divides its output evenly between personal consumption expenditures ($675 million) and gross capital formation ($693 million) with the balance going to government (452 million) and exports ($283 million). Photography is treated as an "activity" in that supplies such as trays, tripods, and reels are also included.

IO INDUSTRY 630300: PHOTOGRAPHIC EQUIPMENT AND SUPPLIES
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	MSMP	OUTPUT	INTERM	PCE	GCE	INV	EXPORT	FED	STATE	FIN DEM
3881	PHOTOGRAPHIC EQUIP. + SUPPLIES	0.320	3052.1	3052.1	.	.	.	.	.	.	0.0
388111	STILL HAND TYPE CAMERAS	0.047	137.7	0.0	109.6	12.2	.	9.1	2.9	4.1	137.7
388112	PROJECTS + OTHER STILL CAMERAS	0.039	71.5	0.0	.	41.9	.	3.3	24.2	2.1	71.5
388114	FLASH UNIT EX. STUDIO + BUILT-IN	0.001	7.2	0.0	5.2	1.8	.	.	.	0.2	7.2
388115	FLASH UNITS, STUDIO TYPE	0.000	0.5	0.0	.	0.4	.	0.1	0.1	.	0.5
388116	EXPOSURE METERS EX. BUILT-IN	0.030	3.6	0.0	1.2	1.8	.	0.3	0.3	0.1	3.6
388119	SLIDE PROJECTORS	0.005	40.1	0.0	31.2	7.6	.	.	.	1.1	40.1
388117	OTHER STILL PROJECTORS	0.004	29.8	0.0	.	29.0	.	.	.	0.8	29.8
388118	STILL CAM SPECIAL EQUIP. + ENLARGERS	0.012	95.4	0.0	.	78.4	.	.	14.1	2.9	95.4
388119	OTHER STILL PICTURE ACCESSORIES	0.051	116.9	24.9	21.8	19.1	.	27.9	17.7	3.5	97.0
3882	PHOTOCOPYING EQUIPMENT	0.178	821.9	0.0	.	412.1	.	50.2	141.1	18.4	821.8
388116	8MM CAMERAS + PROJECTORS	0.013	104.2	0.0	93.5	.	.	4.1	3.5	3.1	104.2
388117	16MM CAMERAS	0.001	11.5	0.0	0.4	8.4	.	0.3	1.9	0.5	11.5
388118	16MM SOUND PROJECTORS	0.004	29.4	0.0	.	16.5	.	1.9	3.0	8.2	29.4
388119	16MM SILENT PROJECTORS	0.000	1.2	0.0	0.6	0.6	.	.	.	.	1.2
388119	PROJECTION SCREENS	0.002	15.4	0.0	5.1	5.2	.	2.4	2.1	0.6	15.4
388119	PARTS + ATTACHMENTS FOR 8 + 16MM	0.001	22.8	11.1	3.8	3.8	.	.	2.9	1.4	11.7
388121	PROCESSING EQUIP., MOTION PICTURE	0.023	29.2	0.5	.	17.7	.	.	8.7	0.8	25.2
388123	35MM CAMERAS + PROJECTORS	0.001	7.5	0.5	.	4.2	.	1.0	1.2	0.2	7.0
388129	ALL OTHER 35MM + LARGER EQUIP	0.001	9.6	3.8	.	2.9	.	.	3.4	0.5	6.8
388130	MOTION PICTURE EQUIP., N.E.C.	0.010	1.3	12.1	0.6	0.3	.	.	0.2	0.1	1.2
388140	MICROFILMING, BLUEPRINTING, ETC., E	0.029	53.5	12.0	.	29.3	.	9.4	10.6	1.3	53.6
388141	MEDICAL X-RAY FILM	0.027	164.8	123.5	.	.	.	.	11.7	41.8	53.3
388142	DENTAL X-RAYS	0.000	9.4	9.2	.	.	.	.	0.1	0.1	0.2
388143	INDUSTRIAL X-RAY FILM	0.020	23.7	23.1	.	.	.	.	.	0.6	0.6
388155	SHEET + ROLL FILM	0.067	70.3	13.7	54.9	.	.	.	.	1.7	56.6
388193	OTHER FILM EXCL SHEET + PACK	0.249	706.1	347.9	348.0	.	.	.	.	10.3	358.3
388195	GRAPHIC ARTS FILM	0.000	119.9	119.9	.	.	.	.	.	.	0.0
388196	PHOTOGRAPHIC PHOTO PLATES + SUPPLES	0.000	7.4	7.4	.	.	.	.	.	.	0.0
388194	SILVER HALIDE ROLL + LINE REPROD. P	0.022	192.4	174.4	.	.	.	18.0	.	.	18.0
388194	SILVER HALIDE RECORDING + PHOTOCOPY	0.003	3.4	0.1	.	.	.	3.3	.	.	3.3
388198	BLUEPRINTING + DIAZO/DIAZOTYPE	0.000	5.2	5.2	.	.	.	.	.	.	0.0
388194	DIAZO TYPE PAPER + CLOTH	0.000	61.2	61.2	.	.	.	.	.	.	0.0
388199	OTHER TYPES	0.000	0.5	0.5	.	.	.	.	.	.	0.0
388197	SENSITIZED PAPER + CLOTH EX. SIL. H	0.000	2.7	2.7	.	.	.	.	.	.	0.0
388111	PREPARED PHOTOGRAPHIC CHEMICALS	0.000	153.0	153.0	.	.	.	.	.	.	0.0
388199	PHOTO, EQUIP. + SUPPLIES, N.E.C.	0.000	103.6	103.6	.	.	.	.	.	.	0.0
3841	UNDIST. PHOT EQUIP + SUPPLIES	0.319	939.4	631.1	.	.	70.0	171.8	69.6	24.5	308.3
3841	CONTRACT WORK + MISC RECEIPTS	0.000	218.8	218.8	.	.	.	.	.	.	0.0
388199	CONTRACT WORK	0.000	11.9	11.9	.	.	.	.	.	.	0.0
388199	MISC RECEIPTS	0.002	206.9	192.2	.	.	.	12.0	2.5	.	14.7
	TOTAL FINAL DEMAND				675.7	693.4	70.0	282.9	323.0	128.7	2174.3
	ALLOCATED TO INFORMATION										2174.3

IO INDUSTRY 630300: PHOTOGRAPHIC EQUIPMENT AND SUPPLIES
$ Million (Current)
VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	1001.5
NET INTEREST	2.5
INDIRECT BUSINESS TAXES	18.9
BUSINESS TRANSFER PAYMENTS	4.6
CAPITAL CONSUMPTION ALLOWANCES	175.7
PROFIT TYPE INCOME	1028.8
TOTAL VALUE ADDED	2232.0
ALLOCATED TO INFORMATION	2232.0

* * * *

I-O INDUSTRY #64: MISCELLANEOUS MANUFACTURING

Industry #64 includes a large assortment of products such as jewelry, musical instruments, games, artificial flowers, sporting goods, and so on. The only products of interest here are pens and pencils, carbon paper, signs, and advertising displays.

Around 8.88% of the Miscellaneous Manufacturing industry's output was allocated to information nondurable goods.

	OUTPUT	FINAL DEMAND	VALUE ADDED
TOTAL INDUSTRY	7,969	5,692	3,771
INFORMATION	708	517	771
NON-INFORMATION	7,261	5,175	3,000
INFO. % GNP		0.07	1.00

Detailed Industry Reports

640501 Pens and Mechanical Pencils

SIC 3951 **Pens, Pen Points, Fountain Pens, Ball Point Pens, Mechanical Pencils, and Parts**

Establishments primarily engaged in manufacturing pens, pen points, fountain pens, ball point pens, refill cartridges, and parts for pens and mechanical pencils.

Cartridges, refill: for ball point pens
Fountain pens and fountain pen desk sets
Meter pens
Nibs (pen points): gold, steel, or other metal
Pen points: gold, steel, or other metal
Pencils and pencil parts, mechanical
Penholders and parts
Pens and pen parts: fountain, stylographic, and ball point

Pens and pencils are simple information tools -- maybe the first artifacts of the most primitive "information sector." Some overstatement may occur where a pen is sold as a luxury gift rather than as a writing device. On sales to final demand of $174 million, error could not exceed .005% of GNP.

IO INDUSTRY 640501: PENS AND MECHANICAL PENCILS
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	[illegible]	OUT	INTRM	PCE	GCP	INV	EXPORT	FED	STATE	FIN DEM
3951	PENS & MECHANICAL PENCILS	[illegible]	193.5	19 .8	.	.	.	.	.	.	0.0
[illegible]	FOUNTAIN PENS	[illegible]	[illegible]	[illegible]	[illegible]	.	.	5.6	.	.	18.6
[illegible]	BALL POINT PENS	[illegible]	97.5	0.0	92.5	.	.	[illegible].0	.	.	97.5
[illegible]	SOFT-TIP PENS	[illegible]	14.7	0.0	14.7	.	.	.	.	.	14.7
[illegible]	DESK PEN SETS	[illegible]	4.2	0.0	[illegible]	.	.	1.9	.	.	4.2
[illegible]	MECHANICAL PENCILS	[illegible]	15.[illegible]	0.0	15.3	.	.	0.6	.	.	15.9
[illegible]	REFILL CARTRIDGES FOR BALL POINT PE	[illegible]	11.9	0.0	10.1	.	.	1.8	.	.	11.9
[illegible]	MISC. PEN & MECHANICAL PENCIL PARTS	[illegible]	23.2	18.1	.	.	.	5.1	.	.	5.1
[illegible]	PENS & MECHANICAL PENCILS, N.S.K.	[illegible]	4.7	4.5	.	.	.	0.2	.	.	0.2
3951-	INDUSTRY UNALLOCATED	[illegible]	7.4	2.7	.	.	4.7	.	.	.	4.7
3951	CONTRACT WORK & MISC RECEIPTS	[illegible]	3.3	3.3	.	.	.	.	.	.	0.0
3951098	CONTRACT WORK	[illegible]	[illegible].6	0.6	.	.	.	.	.	.	0.0
3951099	MISC RECEIPTS	[illegible]	2.7	1.8	.	.	.	0.9	.	.	0.9
	TOTAL FINAL DEMAND				147.9	0.0	4.7	21.1	0.0	0.0	173.7
	ALLOCATED TO INFORMATION										173.7

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	82.6
NET INTEREST	.6
INDIRECT BUSINESS TAXES	1.5
BUSINESS TRANSFER PAYMENTS	.1
CAPITAL CONSUMPTION ALLOWANCES	4.9
PROFIT TYPE INCOME	23.1
TOTAL VALUE ADDED	112.8
ALLOCATED TO INFORMATION	112.8

* * * *

640502 Lead Pencils and Art Goods

SIC 3952 Lead Pencils, Crayons, and Artists' Materials

Establishments primarily engaged in manufacturing lead pencils, pencil leads, and crayons; materials and equipment for art work, such as airbrushes, drawing tables and boards, palettes, sketch boxes, pantographs, artists' colors and waxes, pyrography goods, drawing inks, and drafting materials. Establishments primarily engaged in manufacturing mechanical pencils are classified in Industry 3951, and drafting instruments in Industry 3811.

- Artists' materials, except drafting instruments: air brushes, canvas, colors and sizes, drawing tables and boards, easels, pantographs, sketching boxes, palettes, pyrography goods, drawing ink, wax, and drafting materials
- Burnishers and cushions, gilders'
- Canvas, artists': prepared on frames
- Canvas board, artists'
- Chalk: carpenters', blackboard, marking, artists', tailors', etc.
- Crayons: carpenters', school, marking, artists', tailors' and blackboard—chalk, gypsum, charcoal, fusains, pastel, and wax
- Drafting materials, except instruments
- Easels, artists'
- Enamels, china painting
- Eraser guides and shields
- Frames for artists' canvases
- Frisket paper (artists' material)
- Gold or bronze mixtures, powders, paints, and sizes: artists'
- Ink, drawing: black and colored
- Lettering instruments, artists'
- Maulsticks, artists'
- Modeling clay
- Paints, artists'
- Paints for burnt wood or leather work, platinum
- Paints, for china painting
- Pantographs, for drafting
- Pastels, artists'
- Pencil holders
- Pencil lead: black, indelible, or colored
- Pencils and pencil parts, except mechanical
- Pyrography materials
- Sketching boxes, artists'
- Tracing cloth (drafting material)
- Walnut oil, artists'
- Water colors, artists'

Fortunately, the issue of whether art is information need not be solved here. Most of the industry's output is not in art goods, but ordinary lead pencils.

IO INDUSTRY 640502: LEAD PENCILS AND ART GOODS
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	REQ	OUTPUT	INTERM	PCE	GCE	INV	EXPORT	FED	STATE	FIN DEM
3952	LEAD PENCILS + ART GOODS	0.000	66.3	66.3	.	.	.	.	.	.	0.0
395210	LEAD PENCILS	0.000	5.1	0.0	4.8	.	.	0.2	.	.	5.0
3952123	PENCIL LEADS	0.000	5.5	1.2	3.2	.	.	1.1	.	.	4.3
3952155	CRAYONS INCL. CHALK	0.002	15.3	3.7	10.9	.	.	0.9	.	0.0	15.6
3952211	ARTISTS MATERIALS	0.004	50.1	28.4	24.4	.	.	1.3	.	0.0	26.9
3952	INDUSTRY UNALLOCATED	0.003	33.5	6.9	-1.4	.	2.0	.	.	23.1	24.6
3952	CONTRACT WORK + MISC RECEIPTS	0.000	1.4	1.4	.	.	.	.	.	.	0.0
3952070	CONTRACT WORK	0.000	0.5	0.5	.	.	.	.	.	.	0.0
3952090	MISC RECEIPTS	0.000	0.9	0.8	.	.	.	0.1	.	.	0.1
	TOTAL FINAL DEMAND				44.9	0.0	2.0	3.4	0.0	23.1	79.3
	ALLOCATED TO INFORMATION										79.3

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	55.6
NET INTEREST	.3
INDIRECT BUSINESS TAXES	.9
BUSINESS TRANSFER PAYMENTS	.1
CAPITAL CONSUMPTION ALLOWANCES	3.1
PROFIT TYPE INCOME	3.2
TOTAL VALUE ADDED	63.2
ALLOCATED TO INFORMATION	63.2

* * * *

640503 Marking Devices

SIC **3953** **Marking Devices**

Establishments primarily engaged in manufacturing rubber and metal hand stamps, dies, and seals; steel letters and figures; and stencils for use in painting or marking.

Dies (hand seals)
Figures, metal
Hand stamps, stencils, and brands
Markers, felt tip
Irons, marking or branding
Letters (marking devices), metal
Numbering stamps, with rubber type: hand
Pads, inking and stamping
Paper stencils
Printing dies, rubber
Screens, textile printing
Seals, hand (dies)
Stamps, hand: time, date, post-marking, cancelling, and shoe and textile marking—metal or rubber
Stencil machines (marking devices)
Stencils for use in painting and marking: metal, cardboard, etc.

On sales of $4.9 million, no discussion is necessary.

IO INDUSTRY 640503: MARKING DEVICES
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	WORK	OUTPUT	INTERM	PCE	GCE	INV	EXPORT	FED	STATE	FIN DEM
3953	MARKING DEVICES	0.000	4.9	2.6	.	.	.	2.3	.	.	2.3
3953	INDUSTRY UNALLOCATED	0.000	2.6	0.1	.	.	2.3	.	.	.	2.3
3953	CONTRACT WORK + MISC RECEIPTS	0.000	2.6	2.6	.	.	.	.	.	.	0.0
3953098	CONTRACT WORK	0.000	1.0	1.0	.	.	.	.	.	.	0.0
3953099	MISC RECEIPTS	0.000	1.6	1.5	.	.	.	0.1	.	.	0.1
	TOTAL FINAL DEMAND				0.0	0.0	2.3	2.4	0.0	0.0	4.9
	ALLOCATED TO INFORMATION										4.9

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	70.9
NET INTEREST	.4
INDIRECT BUSINESS TAXES	1.1
BUSINESS TRANSFER PAYMENTS	.1
CAPITAL CONSUMPTION ALLOWANCES	3.2
PROFIT TYPE INCOME	9.8
TOTAL VALUE ADDED	85.5
ALLOCATED TO INFORMATION	85.5

* * * *

640504 Carbon Paper and Inked Ribbons

SIC 3955 **Carbon Paper and Inked Ribbons**

Establishments primarily engaged in manufacturing carbon paper for business machines, sales books, etc; spirit or gelatin process and other stencil paper; and inked ribbons for business machines.

Carbon paper for typewriters, sales books, etc.
Ribbons, inked: typewriter, adding machine, cash register, etc.
Stencil paper for typewriters
Stencil paper, gelatin or spirit process

Interestingly, one of the fastest growing items here are inked ribbons for high-speed computer printers.

IO INDUSTRY 640504: CARBON PAPER AND INKED RIBBONS
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	SCRP	OUTPUT	INTERM	PCE	GCF	INV	EXPORT	FED	STATE	FIN DEM
3955	CARBON PAPER & INKED RIBBONS	0.000	48.3	48.3	.	.	.	.	.	.	0.0
3955011	INKED RIBBONS EX COMPUTER	0.400	10.5	2.1	5.8	.	.	7.8	.	.	8.4
3955033	COATED CARBON PAPER	0.500	35.8	32.7	.	.	.	2.9	.	.	2.9
3955	INDUSTRY UNALLOCATED	0.400	4.0	2.0	.	.	1.0	.	.	.	1.0
3955	CONTRACT WORK & MISC RECEIPTS	0.000	1.5	1.5	.	.	.	.	.	.	0.0
3955088	CONTRACT WORK	0.333	0.8	0.8	.	.	.	.	.	.	0.0
3955099	MISC RECEIPTS	0.000	0.7	0.4	.	.	.	0.3	.	.	0.3
	TOTAL FINAL DEMAND				5.8	0.0	1.0	5.8	0.0	0.0	11.0
	ALLOCATED TO INFORMATION										11.0

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	60.9
NET INTEREST	.4
INDIRECT BUSINESS TAXES	1.0
BUSINESS TRANSFER PAYMENTS	.1
CAPITAL CONSUMPTION ALLOWANCES	3.1
PROFIT TYPE INCOME	6.6
TOTAL VALUE ADDED	72.1
ALLOCATED TO INFORMATION	72.1

* * * *

641100 Signs and Advertising Displays

SIC **3993 Signs and Advertising Displays**

Establishments primarily engaged in manufacturing electrical, mechanical, cutout, or plate signs and advertising displays, including neon signs and advertising novelties. Sign painting shops doing business on a custom basis are classified in Industry 7399. Establishments primarily engaged in manufacturing electric signal equipment are classified in Industry 3662, and lighting fixtures in Industry 3642.

Advertising displays, except printed
Advertising novelties
Cutouts and displays, window and lobby
Displays, paint process
Letters for signs, metal
Name plates, metal: except engraved, etched, etc.
Neon signs
Score boards, electric
Signs: electrical, mechanical, embossed, painted, stamped, cutout, and silk screen—not made in custom sign painting shops

This industry is considered part of the advertising activity in market. Some signs of purely decorative or artistic origin are included, and overstate the output of the industry. The error is trivial.

IO INDUSTRY 641100: SIGNS AND ADVERTISING DISPLAY
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	SCRP	OUTPUT	INTERM	PCE	GCE	INV	EXPORT	FED	STATE	FIN DEM
3993	SIGNS AND ADVERTISING DISPLAYS	0.000	364.8	364.8	.	.	.	.	.	.	0.0
3993111	LUMINOUS TUBING + BULB SIGNS	0.028	220.5	0.0	.	220.5	.	.	.	.	220.5
349321	METAL SIGNS	0.000	100.7	99.0	.	.	.	1.7	.	.	1.7
3993293	OTHER SCREEN PRINTED SIGNS + DISPLA	0.000	30.8	30.8	.	.	.	.	.	.	0.0
3993295	OTHER SIGNS + DISPLAYS	0.000	10.4	10.4	.	.	.	.	.	.	0.0
3993	SIGNS + ADVERTISING DISPLAYS	0.000	142.6	140.3	.	.	0.4	.	2.4	-0.5	2.3
3993	CONTRACT WORK + MISC RECEIPTS	0.000	66.9	66.9	.	.	.	.	.	.	0.0
3993098	CONTRACT WORK	0.000	17.3	17.3	.	.	.	.	.	.	0.0
3993099	MISC RECEIPTS	0.003	49.6	28.5	.	20.1	.	0.1	0.1	.	21.1
	TOTAL FINAL DEMAND				0.0	241.4	0.4	1.8	2.5	-0.5	245.6
	ALLOCATED TO INFORMATION										243.6

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	366.9
NET INTEREST	2.3
INDIRECT BUSINESS TAXES	3.9
BUSINESS TRANSFER PAYMENTS	.3
CAPITAL CONSUMPTION ALLOWANCES	13.9
PROFIT TYPE INCOME	50.3
TOTAL VALUE ADDED	437.6
ALLOCATED TO INFORMATION	437.6

I-O INDUSTRY #82: OFFICE SUPPLIES

Industry #82 is a "dummy industry" in that it does not correspond to any particular SIC code. Rather it is an agglomeration of products transferred into I-O #82 from ten different industries which produce office supplies shown in Table 41.

TABLE 41: COMPONENTS OF THE OFFICE SUPPLY "DUMMY" INDUSTRY

PRODUCT	TRANSFERRED FROM IO #
Stationary, index cards, machine tapes, pressure sensitive tapes	24
Business forms, sales books, ledgers, blankbooks, etc.	26
Glues, pastes, liquid inks	27
Rubber bands, erasers, stationary sundries	32
Glass stationer's wares	35
Office type wire staples	37
Paper clips and scissors	42
Pencil sharpeners, staplers, tape dispensers	51
Sensitized blueprint and diazo type paper	63
Carbon paper, crayons, hand stamps, inked ribbons, pens, pencils, etc.	64

Source: Bureau of Economic Analysis, "Definitions and Conventions of the 1967 Input-Output Study", October 1974.

The entire industry is allocated to information nondurables since these goods are the indispensable widgets of any paper-shuffling enterprise. From casual observation of bureaucratic behavior, they tend to be free-access resources and hence available to the consumer at zero cost. On sales of $470 million to final demand, this means that each information worker consumed roughly $10 of supplies per year.

IO INDUSTRY 820000: OFFICE SUPPLIES
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	[illegible]	OUTPUT	[illegible]	PCE	GOV	INV	EXPORT	FED	STATE	FIN DEM
9613	OFFICE SUPPLIES	0.039	2606.9	2137.0	.	.	.	.	175.7	294.0	469.7
	TOTAL FINAL DEMAND				0.0	0.0	0.0	0.0	175.7	294.0	469.7
	ALLOCATED TO INFORMATION										469.7

VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	0.0
NET INTEREST	0.0
INDIRECT BUSINESS TAXES	0.0
BUSINESS TRANSFER PAYMENTS	0.0
CAPITAL CONSUMPTION ALLOWANCES	0.0
PROFIT TYPE INCOME	0.0
TOTAL VALUE ADDED	0.0
ALLOCATED TO INFORMATION	0.0

* * * *

I-O INDUSTRY #11: NEW CONSTRUCTION

The output of the New Construction industry is accounted on an activity basis as opposed to the more standard establishment basis. The difference between an establishment and an activity can be appreciated from Figure 2. Instead of accounting the industries across the rows (by SIC) BEA chose to present the construction sector as an activity that consumes many heterogeneous construction trades as inputs (reading down the column). The activity basis is conceptually identical to our approach towards the information sector -- that better sense of economic activity can be gained by looking at functional aggregations rather than discrete industries.

FIGURE 2: CONSTRUCTION DISPLAYED AS AN ACTIVITY

	Activities			
Establishments	Office Buildings	School Buildings	New Industrial Buildings	...
General contraction (SIC 1511) Plumbing (SIC 1711) Painting (SIC 1751) Carpentering (SIC 1751) o o				...
Activity Outputs	3,763	6,439	6,539	...

For our purposes, we shall only be interested in five types of construction activities: (i) new office buildings; (ii) new education buildings; (iii) new telephone and telegraph facilities; (iv) new oil and gas exploration; and (v) portions of military construction. These buildings, as described elsewhere (see Industry #720100 -- Real Estate), are used primarily or exclusively for informational activities. The first, office buildings, may be used in the provision of a primary information service (e.g., the Brookings Institute building or allocated portions of bank buildings), or by non-information industries (e.g., auto manufacturers) which use the office building to conduct all their analytic, managerial, clerical, research, and accounting-type activities. School buildings and communication facilities are simply considered as special purpose capital goods used in the provision of an information service -- hence, "information structures." New oil and gas exploration yields knowledge about stocks of energy resources. Lastly, certain military buildings such as the Pentagon, defense computer centers, and communication buildings are primarily informational.

The output of an activity is defined as the "value put-in-place" of new buildings or the portions of new buildings constructed during the 1967 calendar year. This value measure includes all materials, payrolls, overhead, architectural and engineering costs, excavation, and demolition directly associated with the project.

Around 15.24% of the Construction industry's output was allocated to information structures, as follows:

	OUTPUT	FINAL DEMAND	VALUE ADDED
TOTAL INDUSTRY	79,889	79,889	31,856
INFORMATION	12,180	12,180	4,855
NON-INFORMATION	67,709	67,709	27,001
INFO % GNP		1.53	0.61

Detailed Industry Reports

110200 New Construction, Nonresidential Building

I-O Industry #110200 contains nine smaller industries shown in Table 42. Only two types of new construction are considered "information structures" -- new office buildings and new education buildings. Although other types of buildings clearly supply ancillary informational activities (e.g., research wings of hospitals), they were not included in the information accounts.

TABLE 42: BREAKDOWN OF THE NEW CONSTRUCTION INDUSTRY

IO #	OUTPUT = F.D.	%	VALUE ADDED	NAME
110201	6,539	24.3	2,467	New industrial buildings
110202*	3,763	13.9	1,411	New office buildings
110203	745	2.7	274	New warehouses
110204	423	1.5	152	New garages & service stations
110205	2,692	10.0	1,015	New stores and restaurants
110206	1,046	3.8	386	New religious buildings
110207*	6,439	23.9	2,462	New education buildings
110208	1,935	7.1	721	New hospital buildings
110209	3,306	12.2	1,238	New non-farm buildings
TOTAL	26,888	100.0	10,152	

* Allocated to information structures

New office buildings are mostly allocated to gross capital formation (75%) and governments (25%). Portions of office buildings that are not used for informational activities -- warehouse space, street-level retail outlets, underground garages, and so on -- are not counted as office space.

New education buildings include all structures used by schools, such as classrooms, administrative buildings, and laboratories. Buildings used in conjunction with education, such as dormitories, warehouses, garages, and sports stadiums were excluded from the accounts.

* * * *

110301 New Telephone and Telegraph Buildings

These buildings are used exclusively in the provision of telephone and telegraph services -- switch rooms, computer centers, business activities, and the like. The warehouses and garages used by the telephone company were excluded from these accounts. The entire output was allocated to information structure.

* * * *

110500 New Construction, All Other

The New Construction industry contains the seven subindustries shown below:

110501	New farm residential buildings
110502	New farm service facilities
110503	New oil and gas wells
110504	New oil and gas exploration -- operators; contractors
110505	New military facilities
110506	New conservation and development facilities
110507	Other new non-building facilities.

The only subindustries which contain "information components" are I-O #110504 and #110505.

The exploration services are a clear case of "information for sale" where the quality of the product is unknown until well after delivery. The expected value of drilling a dry well without foreknowledge versus the expected value of drilling a well with the aid of a forecasting service (profits of the well less fixed cost of the information service) gives the break-even

value of the exploration service. Couched in this manner, the value of the exploration service can be determined using the decision analysis method. However, there exist severe incentive problems in the production of this particular sort of information. Consider the incentives of an entrepreneur who owns (or intends to bid on) a drilling franchise. If the oil field is larger than one plot (i.e., spans a number of plots, each owned by a different entrepreneur), then the information bought by the first firm becomes a "public good" to the other firms since they could each receive costless information regarding the expected yield of the commonly drilled oil field. Should the first firm hide the information from the others? This solution would be both impractical and inefficient. It would be impractical because the firm which bought the information would be voluntarily enjoined from acting on its inside knowledge lest its very actions serve as a signal to the other firms. That is, without revealing the information per se, the firm will have revealed enough of the information by its observable actions to undermine the secrecy strategy. The other firms, can, by simple observation, gather intelligence inductively. The knowledgeable firm would inform the others in the following ways: where to drill (by the location of the rig), how much to drill (by the size and type of the capital equipment brought in), and possibly the expected value of the well (by related financial behavior, such as attempting to buy neighboring franchises, actions on the capital markets, the behavior of insider trading, etc.). The strategy would be inefficient, in addition, since each firm would have to duplicate the information-gathering efforts already purchased by the first firm -- information which could be shared by all.

In the sense that exploration is a public goods problem, disincentives in its private supply might be expected. Each firm would perceive its marginal private cost as exceeding its private benefit in cases where resources were commonly held. Only if one firm became a monopolist would the full incentive to produce private information be appreciated. Hence, society will experience a less than optimal amount of exploration unless some public subsidy were forthcoming or unless a monopoly were granted. The existence of the U.S. Geological Survey of the Department of the Interior serves precisely as a public subsidy to exploration. The provision of detailed resource maps, often augmented by either special studies (e.g., satellite exploration) or industry-sponsored research (e.g., American Petroleum Institute) reduce the private cost of exploration as an effort to induce the private collection of what is normally a public good. It is for this reason also that the exploration costs are understated in the National Accounts -- the output of SIC 1382 ignores three major sources of funds: Federal support through institutions like the Geological Survey; private industry-wide funds, commonly shared; and within-firm exploration services that are not purchased from an "information specialist."

The procedure outlined in Chapter 9 will partially account for the within-firm production and consumption of information services, one of which (in the Petroleum industry) is clearly the exploration services. From an accounting standpoint, it is quite difficult to identify the joint and unique costs of performing the exploration. That is, a drill bit may be jointly used for both the exploration effort and the actual drilling effort; similarly, an airplane may be used for the transportation of executives and for aerial exploration. Hence, a significant understatement of the information-gathering activities within oil, natural gas, and mining firms is expected. (There exists no unique SIC for the exploration services sold to mining firms; all such information gathering is presumed to occur within the firm.)

The exploration services are capitalized by the purchasing firm; hence, the entire output of the industry is sold to a final demand component -- gross private domestic capital formation. This is the one of very few instances where an information service is capitalized. Research and development, installation fees on equipment, royalties and copyrights, software services developed in house, commission on structures are some of the others.

Oil and gas exploration services amounted to $243.0 million in 1967, all sold on the gross capital formation account. The entire amount was allocated to information structures.

* * * *

Military construction includes a variety of information and non-information buildings. Included as informational are: training centers, research and development facilities, administrative buildings, and communication centers. Non-informational military buildings include structures for maintenance and supply, hospitals, and residences.

The 1967 military construction activity was $695 million, of which around 14% was allocated to information.

* * * *

IO INDUSTRY 110202: NEW OFFICE BUILDINGS
IO INDUSTRY 110207: NEW EDUCATIONAL BUILDINGS
IO INDUSTRY 110301: NEW TELEPHONE AND TELEGRAPH
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	MAKE	OUTPUT	INTERM	PCE	GOV	INV	EXPORT	FED	STATE	FIN DEM
		0.000	.	0.0	.	.	.	.	.	.	0.0
1512	NEW OFFICE BLDGS	0.473	3763.0	0.0	.	2805.9	.	15.1	199.0	743.0	3763.0
1512	INDUSTRY UNALLOCATED	0.000	0.0	0.0	.	.	.	.	.	.	0.0
	TOTAL FINAL DEMAND				0.0	2805.9	0.0	15.1	199.0	743.0	3763.0
	ALLOCATED TO INFORMATION										3763.0
1517	NEW EDUCATION BLDGS	0.810	6439.0	0.0	.	987.0	.	.	22.0	5430.0	6439.0
1517	INDUSTRY UNALLOCATED	0.000	0.0	0.0	.	.	.	.	.	.	0.0
	TOTAL FINAL DEMAND				0.0	987.0	0.0	0.0	22.0	5430.0	6439.0
	ALLOCATED TO INFORMATION										6439.0
1601	NEW TELEPHONE & TELEGRAPH	0.206	1638.0	0.0	.	1638.0	.	.	.	.	1638.0
1601	INDUSTRY UNALLOCATED	0.000	0.0	0.0	.	.	.	.	.	.	0.0
	TOTAL FINAL DEMAND				0.0	1638.0	0.0	0.0	0.0	0.0	1638.0
	ALLOCATED TO INFORMATION										1638.0

SUMMARY INDUSTRY NO. 11: CONSTRUCTION, TOTAL
$ Million (Current)
VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	25096.0
NET INTEREST	189.0
INDIRECT BUSINESS TAXES	483.0
BUSINESS TRANSFER PAYMENTS	88.0
CAPITAL CONSUMPTION ALLOWANCES	1477.0
PROFIT TYPE INCOME	4524.0
TOTAL VALUE ADDED	31856.0
ALLOCATED TO INFORMATION	4855.0

* * * *

I-O INDUSTRY #12: MAINTENANCE AND REPAIR CONSTRUCTION

The conceptual definition underlying this industry mirrors that given for the Construction industry proper. Maintenance and repair is simply an extension of the construction activity. It includes the carpenters who move partitions inside office buildings and knock down walls in others. Industry #120201 includes maintenance and repair of office and school buildings; Industry #120204 includes telephone and telegraph buildings.

Around 26.7% of the industry's output was allocated to information structures.

	OUTPUT	FINAL DEMAND	VALUE ADDED
TOTAL INDUSTRY	23,391	5,695	13,719
INFORMATION	6,260	1,423	3,710
NON-INFORMATION	17,151	4,272	10,009
INFO % GNP		0.18	0.47

IO INDUSTRY 120201: REPAIR AND MAINTENANCE OTHER BUILDINGS
IO INDUSTRY 120204: REPAIR AND MAINTENANCE TELEPHONE AND TELEGRAPH
$ Million (Current)

FINAL DEMAND COMPONENTS

SIC	NAME OF ITEM	%INF	OUTPUT	INTERM	PCE	GCE	INV	EXPORT	FED	STATE	FIN DEM
1721	R + M OTHER BLDGS	0.179	7167.0	5743.2	:	:	:	:	186.5	1237.3	1423.8
1721	INDUSTRY UNALLOCATED	0.000	1035.4	1035.4	:	:	:	:	:	:	0.0
	TOTAL FINAL DEMAND ALLOCATED TO INFORMATION				0.0	0.0	0.0	0.0	186.5	1237.3	1423.8
1724	R + M TELEPHONE + TELEGRAPH	0.000	517.0	517.0	:	:	:	:	:	:	0.0
1724	INDUSTRY UNALLOCATED	0.000	0.0	0.0	:	:	:	:	:	:	0.0
	TOTAL FINAL DEMAND ALLOCATED TO INFORMATION				0.0	0.0	0.0	0.0	0.0	0.0	0.0

SUMMARY OF IO #12: REPAIR AND MAINTENANCE CONSTRUCTION
VALUE ADDED COMPONENTS

COMPENSATION OF EMPLOYEES	11763.0
NET INTEREST	0.0
INDIRECT BUSINESS TAXES	97.0
BUSINESS TRANSFER PAYMENTS CAPITAL CONSUMPTION ALLOWANCES PROFIT TYPE INCOME	1860.0
TOTAL VALUE ADDED	13719.0
26.76% ALLOCATED TO INFORMATION	3710.0

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This report series defines and measures the "information activity" within the national economy. "Information activity" is defined to include those specific industries and occupations whose primary function is to produce, process or transmit economically valuable information. Changes in the national labor force are analyzed over a 120-year span. Information activities have grown dramatically over the last several decades, until they employed 46% of the labor force in 1970. National Income and Product accounts are analyzed to determine the contribution of the information activities to wages and capital expenditures. Information workers earned 53% of total wages in 1970; 46% of value added was derived from information activities in 1967. Input-Output tables have been constructed which show the detailed structure of the information economy.

Volumes 1 and 2 summarize the findings. Volumes 3, 4, and 5 set forth the Input-Output tables. Volumes 6 through 8 detail the workforce and National Income accounts. Volume 9 describes the database available on computer readable magnetic tape.

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