



PLACE IN RETURN BOX to remove this checkout from your record.
TO AVOID FINES return on or before date due.

DATE DUE	DATE DUE	DATE DUE
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

MSU is An Affirmative Action/Equal Opportunity Institution

c:\crl\date\due.pm3-p.1

**PURCHASES BY AMERICAN BUSINESSES AND GOVERNMENTS:
TYPES AND DOLLAR MAGNITUDES BY INDUSTRIES**

Volume I

By

Michael E. Heberling

A DISSERTATION

**Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of**

DOCTOR OF PHILOSOPHY

Department of Management

1991

ABSTRACT

PURCHASES BY AMERICAN BUSINESSES AND GOVERNMENTS: TYPES AND DOLLAR MAGNITUDES BY INDUSTRIES

By

Michael E. Heberling

This research estimated the total dollar magnitude spent for purchases by American businesses and governments for the year 1982. In addition, this research established the inter-industry relationships of purchases (materials and supplies, energy, resales, buildings and equipment, and other items) to revenues and other cost elements, such as wages and salaries. The estimate for total business and government purchases in 1982 came to \$4.2 trillion. To put this figure in context, gross national product (GNP) in 1982 was \$3.0 trillion.

The dollar magnitude of purchases were researched in 11 industries: agriculture, mineral, construction, manufacturing, transportation, communication, utilities, wholesale, retail, service, and governments (financial institutions were excluded). Data on revenues, purchases, plus wages and salaries were collected for each industry. By simultaneously collecting these three pieces of information, the probability of "double-counting" purchases was minimized.

The primary sources of information were government documents and 1982 economic census. Private sources were

used to supplement missing government data.

Materials and supplies, and resale purchases collectively accounted for 75% of all the business and government purchases. In relation to all industry revenues, purchases accounted for 61% of the expenditures. At 20%, wages and salaries were a distant second. Purchases exceeded wages and salaries in 10 of the 11 industries. The only exception was the service industry. The most purchase intensive industries in terms of a purchase/wages and salaries dollar ratio were: utilities (12.0-to-1), wholesale trade (11.2-to-1), and agriculture (8.5-to-1).

The dollar magnitude of purchases were highly concentrated by commodity and within industries. In manufacturing, just four 4-digit Standard Industrial Classification (SIC) industries accounted for 25% of all the manufacturing purchases: 1. petroleum refining, 2. motor vehicles, 3. meat packing plants, and 4. steel mills. At the 2-digit SIC level, four industries accounted for 50% of all the manufacturing purchases: 1. food, 2. petroleum, 3. motor vehicles, and 4. chemicals.

This research showed that business (non-capital) purchases made up the largest single category of spending in the U.S. economy, exceeding personal consumption purchases by over \$1 trillion. Business purchases accounted for approximately 41% of the total business/economic activity, while personal consumption accounted for only 22%.

Copyright by
MICHAEL E. HEBERLING
1991

To Barbara

ACKNOWLEDGEMENTS

I would like to initially express my gratitude to the United States Air Force for giving me the opportunity of a lifetime. I am also grateful to the Management Department of Michigan State University for accepting me into their doctoral program.

I was honored to have had Dr. John H. Hoagland serve as my dissertation chairman. I consider it a rare privilege to have studied purchasing under an educator of such national stature. He was always very conscientious in his role as chairman. I would also like to thank Dr. Joseph Carter and Dr. Lloyd Rinehart for agreeing to serve on my dissertation committee.

Recognition is in order for two of my fellow doctoral students. Laura Ghosh and Lee Buddress were always very supportive. I will always cherish their friendship.

I have reserved the best for last. I could not have completed the doctoral program without the help of my wife Barbara. She was always supportive, especially during the two most difficult periods: the first term and after the proposal defense. After five years of neglect, I can now return to my proper role as husband and father.

TABLE OF CONTENTS

List of Tables.....	ix
List of Figures.....	xvi
List of Exhibits.....	xvi
CHAPTER 1: INTRODUCTION.....	1
CHAPTER 2: LITERATURE REVIEW.....	14
CHAPTER 3: RESEARCH METHODOLOGY.....	45
CHAPTER 4: AGRICULTURE (SIC 01-02).....	65
CHAPTER 5: MINERAL INDUSTRIES (SIC 10-14).....	73
CHAPTER 6: CONSTRUCTION INDUSTRIES (SIC 15-17).....	84
CHAPTER 7: MANUFACTURING (SIC 20-39).....	95
CHAPTER 8: TRANSPORTATION CARRIERS (SIC 40-45).....	264
CHAPTER 9: COMMUNICATIONS (SIC 48).....	279
CHAPTER 10: UTILITIES (SIC 49).....	285
CHAPTER 11: WHOLESALE TRADE (SIC 50-51).....	292
CHAPTER 12: RETAIL TRADE (SIC 52-59).....	307
CHAPTER 13: SERVICE INDUSTRIES (70-81).....	320
CHAPTER 14: GOVERNMENTS (SIC 91-97).....	332
CHAPTER 15: TOTAL MAGNITUDE OF BUSINESS AND GOVERNMENT PURCHASES	343
CHAPTER 16: COMPARATIVE MAGNITUDES - INDUSTRIAL CONCENTRATION OF PURCHASES.....	349
CHAPTER 17: COMPARATIVE MEASURES - PURCHASES VERSUS REVENUES, AND WAGES AND SALARIES.....	378

CHAPTER 18: PURCHASES IN THE CONTEXT OF TOTAL BUSINESS/ECONOMIC ACTIVITY.....	388
CHAPTER 19: CONCLUSIONS AND RECOMMENDATIONS.....	408
LIST OF REFERENCES.....	425

LIST OF TABLES

Table 3-1: TYPES OF PURCHASES (Millions \$) AND BY PERCENT OF TOTAL PURCHASES.....	55
Table 3-2: REVENUES AND EXPENDITURES (Millions \$) AND AS A PERCENT OF REVENUES, plus PURCHASE/WAGE AND SALARY RATIO.....	56
Table 4-1: AGRICULTURE: TYPES OF PURCHASES (Millions \$) AND BY PERCENT OF TOTAL PURCHASES.....	66
Table 4-2: AGRICULTURE: REVENUES AND EXPENDITURES (Millions \$) AND AS A PERCENT OF REVENUES, plus PURCHASE/WAGE AND SALARY RATIO.....	67
Table 5-1: MINERAL INDUSTRIES: TYPES OF PURCHASES (Millions \$).....	74
Table 5-2: MINERAL: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES.....	75
Table 5-3: MINERAL INDUSTRIES: REVENUES AND EXPENDITURES (Millions \$).....	76
Table 5-4: MINERAL INDUSTRIES: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE AND SALARY RATIO.....	77
Table 6-1: CONSTRUCTION: TYPES OF PURCHASES (Millions \$).....	85
Table 6-2: CONSTRUCTION: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES.....	86
Table 6-3: CONSTRUCTION: REVENUES AND EXPENDITURES (Millions \$).....	87
Table 6-4: CONSTRUCTION: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE AND SALARY RATIO..	88
Table 7A-1: FOOD MANUFACTURING: TYPES OF PURCHASES (Millions \$).....	101
Table 7A-2: FOOD MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES.....	104
Table 7A-3: FOOD MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$), plus PURCHASE MANUFACTURING RANK.....	107
Table 7A-4: FOOD MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE & SALARY RATIO.....	110
Table 7A-5: MAJOR FOOD GROUPINGS: REVENUES AND EXPENDITURES (Millions \$).....	113
Table 7A-6: FOOD GROUPINGS: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE & SALARY RATIO.....	114

Table 7B-1:	TOBACCO MANUFACTURING: TYPES OF PURCHASES (Millions \$).....	116
Table 7B-2:	TOBACCO MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES.....	117
Table 7B-3:	TOBACCO MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$), plus PURCHASE MANUFACTURING RANK.....	118
Table 7B-4:	TOBACCO MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE & SALARY RATIO.....	119
Table 7C-1:	TEXTILE MANUFACTURING: TYPES OF PURCHASES (Millions \$).....	121
Table 7C-2:	TEXTILE MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES.....	123
Table 7C-3:	TEXTILE MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$), plus PURCHASE MANUFACTURING RANK.....	125
Table 7C-4:	TEXTILE MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE & SALARY RATIO.....	127
Table 7D-1:	APPAREL MANUFACTURING: TYPES OF PURCHASES (Millions \$).....	130
Table 7D-2:	APPAREL MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES.....	132
Table 7D-3:	APPAREL MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$), plus PURCHASE MANUFACTURING RANK.....	134
Table 7D-4:	APPAREL MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE & SALARY RATIO.....	136
Table 7E-1:	LUMBER MANUFACTURING: TYPES OF PURCHASES (Millions \$).....	140
Table 7E-2:	LUMBER MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES.....	141
Table 7E-3:	LUMBER MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$), plus PURCHASE MANUFACTURING RANK.....	142
Table 7E-4:	LUMBER MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE & SALARY RATIO.....	143
Table 7F-1:	FURNITURE MANUFACTURING: TYPES OF PURCHASES (Millions \$).....	145
Table 7F-2:	FURNITURE MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES.....	146
Table 7F-3:	FURNITURE MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$), plus PURCHASE MANUFACTURING RANK.....	147
Table 7F-4:	FURNITURE MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE & SALARY RATIO.....	148
Table 7G-1:	PAPER MANUFACTURING: TYPES OF PURCHASES (Millions \$).....	150

Table 7G-2:	PAPER MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES.....	151
Table 7G-3:	PAPER MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$), plus PURCHASE MANUFACTURING RANK.....	152
Table 7G-4:	PAPER MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE & SALARY RATIO.....	153
Table 7H-1:	PRINTING AND PUBLISHING: TYPES OF PURCHASES (Millions \$).....	155
Table 7H-2:	PRINTING AND PUBLISHING: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES.....	156
Table 7H-3:	PRINTING AND PUBLISHING: REVENUES AND EXPENDITURES (Millions \$), plus PURCHASE MANUFACTURING RANK.....	157
Table 7H-4:	PRINTING AND PUBLISHING: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE & SALARY RATIO.....	158
Table 7I-1:	CHEMICAL MANUFACTURING: TYPES OF PURCHASES (Millions \$).....	160
Table 7I-2:	CHEMICAL MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES.....	162
Table 7I-3:	CHEMICAL MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$), plus PURCHASE MANUFACTURING RANK.....	164
Table 7I-4:	CHEMICAL MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE & SALARY RATIO.....	166
Table 7J-1:	PETROLEUM MANUFACTURING: TYPES OF PURCHASES (Millions \$).....	169
Table 7J-2:	PETROLEUM MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES.....	170
Table 7J-3:	PETROLEUM MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$), plus PURCHASE MANUFACTURING RANK.....	171
Table 7J-4:	PETROLEUM MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE & SALARY RATIO.....	172
Table 7K-1:	PLASTIC MANUFACTURING: TYPES OF PURCHASES (Millions \$).....	174
Table 7K-2:	PLASTIC MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES.....	175
Table 7K-3:	PLASTIC MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$), plus PURCHASE MANUFACTURING RANK.....	176
Table 7K-4:	PLASTIC MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE & SALARY RATIO.....	177
Table 7L-1:	LEATHER MANUFACTURING: TYPES OF PURCHASES (Millions \$).....	179
Table 7L-2:	LEATHER MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES.....	180

Table 7L-3:	LEATHER MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$), plus PURCHASE MANUFACTURING RANK.....	181
Table 7L-4:	LEATHER MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE & SALARY RATIO.....	182
Table 7M-1:	GLASS AND STONE MANUFACTURING: TYPES OF PURCHASES (Millions \$).....	184
Table 7M-2:	GLASS AND STONE MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES.....	186
Table 7M-3:	GLASS AND STONE MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$), plus PURCHASE MANUFACTURING RANK.....	188
Table 7M-4:	GLASS & STONE MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE & SALARY RATIO.....	190
Table 7N-1:	PRIMARY METAL MANUFACTURING: TYPES OF PURCHASES (Millions \$).....	194
Table 7N-2:	PRIMARY METAL MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES.....	196
Table 7N-3:	PRIMARY METAL MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$), plus PURCHASE MANUFACTURING RANK.....	198
Table 7N-4:	PRIMARY METAL MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE & SALARY RATIO.....	200
Table 7N-5:	PRIMARY METALS: TYPES OF PURCHASES (Millions \$) AND BY PERCENT OF TOTAL PURCHASES.....	202
Table 7N-6:	PRIMARY METALS: REVENUES AND EXPENDITURES (Millions \$) AND AS A PERCENT OF REVENUES, plus PURCHASE/WAGE AND SALARY RATIO.....	203
Table 7O-1:	FABRICATED METAL MANUFACTURING: TYPES OF PURCHASES (Millions \$).....	205
Table 7O-2:	FABRICATED METAL MFG: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES.....	207
Table 7O-3:	FABRICATED METAL MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$), plus PURCHASE MANUFACTURING RANK.....	209
Table 7O-4:	FABRICATED METAL MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE & SALARY RATIO.....	211
Table 7P-1:	MACHINERY MANUFACTURING: TYPES OF PURCHASES (Millions \$).....	214
Table 7P-2:	MACHINERY MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES.....	217
Table 7P-3:	MACHINERY MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$), plus PURCHASE MANUFACTURING RANK.....	220
Table 7P-4:	MACHINERY MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE & SALARY RATIO.....	223

Table 7Q-1:	ELECTRIC EQUIPMENT MANUFACTURING: TYPES OF PURCHASES (Millions \$).....	227
Table 7Q-2:	ELECTRIC EQUIPMENT MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES.....	229
Table 7Q-3:	ELECTRIC EQUIPMENT MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$), plus PURCHASE MANUFACTURING RANK.....	231
Table 7Q-4:	ELECTRIC EQUIPMENT MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE & SALARY RATIO.....	233
Table 7R-1:	TRANSPORTATION MANUFACTURING: TYPES OF PURCHASES (Millions \$).....	237
Table 7R-2:	TRANSPORTATION MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES.....	238
Table 7R-3:	TRANSPORTATION MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$), plus PURCHASE MANUFACTURING RANK.....	239
Table 7R-4:	TRANSPORTATION MFG: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE & SALARY RATIO.....	240
Table 7S-1:	INSTRUMENT MANUFACTURING: TYPES OF PURCHASES (Millions \$).....	242
Table 7S-2:	INSTRUMENT MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES.....	243
Table 7S-3:	INSTRUMENT MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$), plus PURCHASE MANUFACTURING RANK.....	244
Table 7S-4:	INSTRUMENT MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE & SALARY RATIO.....	245
Table 7T-1:	MISCELLANEOUS MFG: TYPES OF PURCHASES (Millions \$).....	247
Table 7T-2:	MISCELLANEOUS MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES.....	249
Table 7T-3:	MISCELLANEOUS MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$), plus PURCHASE MANUFACTURING RANK.....	251
Table 7T-4:	MISCELLANEOUS MFG: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE & SALARY RATIO.....	253
Table 7U-1:	MANUFACTURING: TYPES OF PURCHASES (Millions \$).....	256
Table 7U-2:	MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES.....	257
Table 7U-3:	MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$).....	258
Table 7U-4:	MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE AND SALARY RATIO.....	259
Table 7U-5:	ALL MANUFACTURING PURCHASES (Millions); Rank; and Percent of Total Manufacturing Purchases.....	260

Table 7U-6:	TOP MANUFACTURING PURCHASES (Millions \$); Rank; Percent of Total Manufacturing Purchases; And Cumulative Percent Total.....	261
Table 8-1:	TRANSPORTATION CARRIERS: TYPES OF PURCHASES (Millions \$).....	265
Table 8-2:	TRANSPORTATION CARRIERS: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES.....	266
Table 8-3:	TRANSPORTATION CARRIERS: REVENUES AND EXPENDITURES (Millions \$).....	267
Table 8-4:	TRANSPORTATION CARRIERS: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE AND SALARY RATIO.....	268
Table 9-1:	COMMUNICATION: TYPES OF PURCHASES (Millions \$) AND BY PERCENT OF TOTAL PURCHASES.....	280
Table 9-2:	COMMUNICATION: REVENUES AND EXPENDITURES (Millions \$) AND AS A PERCENT OF REVENUES, plus PURCHASE/WAGE AND SALARY RATIO.....	281
Table 10-1:	UTILITIES: TYPES OF PURCHASES (Millions \$) AND BY PERCENT OF TOTAL PURCHASES.....	286
Table 10-2:	UTILITIES: REVENUES AND EXPENDITURES (Millions \$) AND AS A PERCENT OF REVENUES, plus PURCHASE/WAGE AND SALARY RATIO.....	287
Table 11-1:	WHOLESALE (Durable Goods): TYPES OF PURCHASES (Millions \$).....	293
Table 11-2:	WHOLESALE (Durable Goods): TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES.....	294
Table 11-3:	WHOLESALE (Nondurable Goods): TYPES OF PURCHASES (Millions \$).....	295
Table 11-4:	WHOLESALE (Nondurable Goods): TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES.....	296
Table 11-5:	WHOLESALE (Durable Goods): REVENUES AND EXPENDITURES (Millions \$).....	297
Table 11-6:	WHOLESALE (Durable Goods): EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE AND SALARY RATIO.....	298
Table 11-7:	WHOLESALE (Nondurable Goods): REVENUES AND EXPENDITURES (Millions \$).....	299
Table 11-8:	WHOLESALE (Nondurable Goods): EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE AND SALARY RATIO.....	300
Table 11-9:	WHOLESALE: TYPES OF PURCHASES (Millions \$) AND BY PERCENT OF TOTAL PURCHASES.....	301
Table 11-10:	WHOLESALE: REVENUES AND EXPENDITURES (Millions \$) AND AS A PERCENT OF REVENUES, plus PURCHASE/WAGE AND SALARY RATIO.....	302
Table 12-1:	RETAIL: TYPES OF PURCHASES (Millions \$).....	308
Table 12-2:	RETAIL: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES.....	309
Table 12-3:	RETAIL: REVENUES AND EXPENDITURES (Millions \$).....	310
Table 12-4:	RETAIL: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE AND SALARY RATIO.....	311

Table 12-5:	RETAIL: TYPES OF PURCHASES (Millions \$) AND BY PERCENT OF TOTAL PURCHASES.....	312
Table 12-6:	RETAIL: REVENUES AND EXPENDITURES (Millions \$) AND AS A PERCENT OF REVENUES, plus PURCHASE/WAGE AND SALARY RATIO.....	313
Table 13-1:	SERVICE: TYPES OF PURCHASES (Millions \$).....	321
Table 13-2:	SERVICE: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES.....	322
Table 13-3:	SERVICE: REVENUES AND EXPENDITURES (Millions \$).....	323
Table 13-4:	SERVICE: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE AND SALARY RATIO.....	324
Table 14-1:	GOVERNMENT: TYPES OF PURCHASES (Millions \$).....	333
Table 14-2:	GOVERNMENT: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES.....	334
Table 14-3:	GOVERNMENT: REVENUES AND EXPENDITURES (Millions \$).....	335
Table 14-4:	GOVERNMENT: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE AND SALARY RATIO.....	336
Table 15-1:	BUSINESSES AND GOVERNMENTS: TYPES OF PURCHASES (Millions \$).....	344
Table 15-2:	RANK ORDER OF INDUSTRIES BY DOLLAR MAGNITUDE OF PURCHASES.....	347
Table 16-1:	CONCENTRATION OF PURCHASES BY TYPE OF PURCHASE (For All Industries).....	349
Table 16-2:	BUSINESSES AND GOVERNMENTS: PERCENT OF ALL TOTAL PURCHASES BY INDUSTRY AND BY PURCHASE TYPES.....	350
Table 16-3:	FOUR-DIGIT SIC MANUFACTURING INDUSTRIES WITH LARGE ENERGY PURCHASES AS A PERCENT OF TOTAL PURCHASES.....	359
Table 16-4:	CONCENTRATION OF PURCHASES BY MAJOR INDUSTRY.....	360
Table 16-5:	ALL MANUFACTURING PURCHASES (Millions \$); Rank; and Percent of Total Manufacturing Purchases.....	361
Table 16-6:	TOP MANUFACTURING PURCHASES (Millions \$); Rank; Percent of Total Manufacturing Purchases; And Cumulative Percent Total.....	362
Table 16-7:	CONCENTRATION OF PURCHASES BY TYPE OF PURCHASE AND TYPE OF INDUSTRY.....	370
Table 17-1:	BUSINESSES AND GOVERNMENTS: REVENUES & EXPENDITURES (Millions \$).....	379
Table 17-2:	BUSINESSES AND GOVERNMENTS: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE AND SALARY RATIO.....	380
Table 17-3:	BUSINESSES AND GOVERNMENTS: PERCENT OF ALL REVENUES BY INDUSTRY AND EXPENDITURE TYPES...	381
Table 17-4:	INDUSTRY PURCHASE/WAGE AND SALARY DOLLAR RATIOS.....	383

Table 17-5:	HIGHEST PURCHASE/WAGE AND SALARY DOLLAR RATIOS IN MANUFACTURING.....	384
Table 17-6:	LOWEST PURCHASE/WAGE AND SALARY DOLLAR RATIOS IN MANUFACTURING.....	385
Table 18-1:	TOTAL BUSINESS/ECONOMIC ACTIVITY: 1982, (Billions \$) and Percent of Total Revenues...	404

LIST OF FIGURES

Figure 1-1: Theoretical Framework For Business/Economic Activity.....	3
Figure 2-1: Framework For Purchases By American Business, Government, And Personal Consumers.....	37
Figure 15-1: PURCHASES BY INDUSTRY TYPE.....	345
Figure 16-1: TOTAL PURCHASES BY TYPE.....	352
Figure 16-2: CONCENTRATION OF PURCHASES.....	353
Figure 16-3: FLOW OF FOOD PURCHASES.....	372
Figure 16-4: FLOW OF AUTOMOTIVE PURCHASES.....	373
Figure 16-5: FLOW OF PETROLEUM PURCHASES.....	374
Figure 16-6: FLOW OF FOOD, AUTOMOTIVE, AND PETROLEUM PURCHASES.....	375
Figure 18-1: Purchases By American Business, Government, and Personal Consumers: 1982, (Billions \$) and Percent of Total.....	396
Figure 18-2: Business Purchases and GNP In 1982 (Billions \$).....	400
Figure 18-3: Total Operational Purchases By Businesses In 1982 (Billions \$).....	402

LIST OF EXHIBITS

Exhibit 2-1: Percentages of Total Value of Manufactured Goods.....	16
--	----

CHAPTER 1: INTRODUCTION

IMPORTANCE OF RESEARCH ON THE DOLLAR MAGNITUDE OF BUSINESS AND GOVERNMENT PURCHASES

Purchases are known to represent a major commitment of resources for many individual companies and for some types of industries [1]. To date, however, there has been no research that calculates the total magnitude of dollars spent for purchases by American businesses and governments. Furthermore, there has been no definitive research that allows inter-industry comparisons of purchases (materials and supplies, energy, resales, capital equipment, and other items) or the relationship of purchases to revenues and other cost elements, such as wages and salaries. When purchase figures have been presented they significantly understate total purchases by: (1) only addressing the manufacturing industry [2] [3], or (2) only providing figures for one company, and not for a total industry [4].

There has been a failure among America's management to recognize the importance of purchases as a major investment element in business operations. Eiler, Goletz, and Keegan [5] have stated: "Knowledge of cost proportions should direct control efforts. In many companies, although direct labor represents less than 10% of the product cost, labor receives a great deal of attention by industrial engineers, factory supervisors, and labor negotiators. Purchased materials may represent 50% or more of product costs, but many companies consider purchasing activity

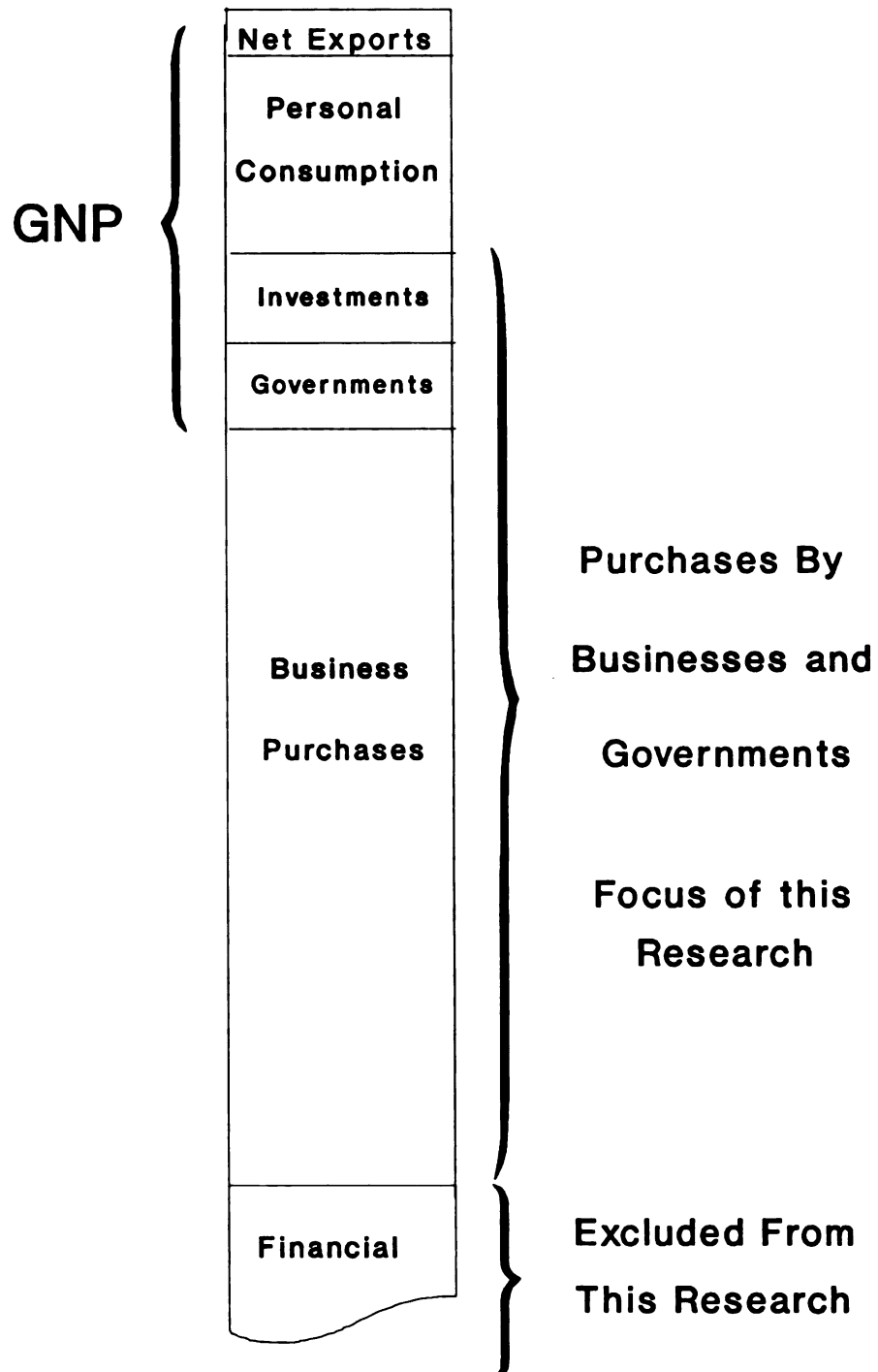
routine." They further stated that "...a shift of attention will benefit the company."

Sandretto [6] comes to a similar conclusion. He stated that "the proportion each cost bears to total production cost is an important factor in deciding which costs to control. For a product whose labor cost is 5% of production cost and material cost is 80%, control of material costs is obviously important. Yet many companies have elaborate systems to control minor elements of total costs, but ignore more important cost elements."

The role of purchasing is frequently misunderstood even by highly respected economists. Consider the following statement by Dr. Edward Yardeni [7]: "Most business managers set their prices by marking up costs. The bulk of costs is attributable to labor, not to raw materials." In many manufacturing industries the opposite is known to be true. That is, the bulk of costs is attributable to the purchase of materials and not to labor.

No one, however, is known to have researched the proportion of costs attributable to major types of purchases and to labor by types of manufacturing and by all major industry categories. This dissertation will attempt to establish these relationships and show that purchases are a major cost element, not just for manufacturing, but for the majority of American industries.

**Figure 1-1: Theoretical Framework
For Business/Economic Activity**



THEORETICAL FRAMEWORK

Figure 1-1 presents the theoretical framework upon which this research will be based. While gross national product (GNP) includes government purchases and capital expenditures, it excludes the majority of the business purchases. This research will focus on the total dollar magnitudes of business and government purchases shown in the middle portion of the framework. The completed research will establish the relationship of purchases to the components of GNP such as personal consumption expenditures. It will also establish the relationships of total purchases by businesses and governments to both revenues and to wages and salaries.

This framework was, and the ensuing research will be, based on Dr. Hoagland's theory about the dominance of industrial purchases which is discussed at length in chapter two. This "Dominance of Industrial Purchases" theory is based is on two assumptions: (1) the dollar magnitude of purchases, and (2) the dynamics of those purchases. Hoagland has done extensive research on the dynamics of purchases. There has not, however, been any definitive research on the dollar magnitude of purchases.

CLASSIFICATION OF INDUSTRIES

This dissertation will calculate the total magnitude of dollars spent for purchases by most American businesses and all governments. Total purchases for each industry will be determined by collecting data on the following types of

purchases: 1. Materials and Supplies, 2. Energy, 3. Resales, 4. Buildings and Equipment, and 5. Other Items.

In addition to data on purchases, data on revenues plus wages and salaries will also be collected. By consistently collecting these three pieces of information, the relationship of purchases to other expenditures can be established. A dollar ratio of purchases to wages and salaries will be calculated for each business and government classification. This ratio will establish the importance of purchases vis-a-vis labor expenditures.

This research will examine purchases by all industrial classifications (with the exception of financial institutions). The major industrial classifications that will be researched include: agriculture, mineral, construction, manufacturing, transportation carriers, communication, utilities, wholesale trade, retail trade, services, and governments. All these industries will be analyzed at the two-digit level of the Standard Industrial Classification (SIC) system [8]. Manufacturing, however, will be analyzed at both the two-digit and at the four-digit industry classification level. A more detailed analysis of purchases in manufacturing is warranted for two reasons: (1) manufacturing industry is expected to be the most important in terms of the dollar magnitude of purchases, and (2) much has already been written on manufacturing purchases at the two-digit industry classification level (See the Chapter 2: Literature Review). Financial institutions, such as banking,

real estate, and insurance companies, will be excluded from the research because the method for calculating revenues might provide statistical distortions when compared with other industries. In addition, due to the nature of these financial industries, purchasing information is not routinely collected nor is it readily available.

COMPARATIVE ANALYSIS OF MANUFACTURING

The analysis of the manufacturing industry will include the same purchase, labor, and other expenditure relationships, but at the four-digit SIC level as well as at the two-digit level. In addition, there will be a rank ordering of the 448 four-digit manufacturing industries based on their total purchases. This information will be used to determine those industries that constitute the majority of the total manufacturing purchasing dollars.

SOURCE OF PURCHASING INFORMATION

The majority of the information required to calculate the dollar magnitudes of purchases will come from government publications. Private sources, such as trade associations, will supplement missing government data.

Within the government, the Commerce Department publications will serve as the primary source of information. Every five years, a complete economic census is done on several major industries. The last complete available census was for the year 1982. Therefore, this

dissertation will be based on the year 1982. The 1982 census covered the following industries: manufacturing, mining, construction, retail, wholesale, and services. The census will provide the data for these industries.

In 1982, there was, however, no economic census for the following major industries: agriculture, communication, utilities, transportation, and governments. For these industries, information will be constructed from diverse sources. These sources will include other government departments and trade associations.

POTENTIAL USE OF RESEARCH

This research when completed will have a number of potential uses. It may: (1) result in a better understanding of the entire purchasing function in terms of dollar magnitudes and its impact on business operations, (2) expand current economic analysis emphasis from final consumers to include the impacts of business purchases on the nation's economy, (3) expand the current educational focus of purchasing to other industries besides manufacturing, (4) cause management to view purchases as a major investment area deserving greater attention, (5) establish purchase trends when this research is coupled with other studies on subsequent or prior years, and (6) result in better data collecting in future government censuses.

While the above represent valuable follow-on applications, they are beyond the scope of this

dissertation. With regards to the proposed research, Dr. Harold Fearon, the director of the Center for Advance Purchasing Studies (CAPS), has stated: "To our knowledge the data on total purchases for all business sectors and governments never have been available and analyzed. Such information has significant potential for researchers and others wishing to analyze this important aspect of the U.S. economy and commercial activities" [9].

CHAPTERS

The following is a brief description of the subsequent dissertation chapters:

2. LITERATURE REVIEW

This chapter will provide a review of previous, or related, research on the dollar magnitude of purchases by American businesses and governments. Numerous disciplines, in addition to purchasing, will be reviewed. These will include logistics, economics, and accounting literature.

3. RESEARCH METHODOLOGY

This chapter will present the hypotheses that will serve to direct this research. In addition, there will be a section on the sources of the purchase information and definitions for the terminology that will be used throughout the dissertation. Finally, this chapter will discuss the methods for analysis and the limitations of the research.

Chapters 4 through 14 will determine the dollar magnitudes of purchases by major industrial classification. The purchase information will be presented by (1) type of purchases, and (2) in relationship to revenues and other expenditures. All data will be presented in both dollar and percent formats.

4. AGRICULTURE INDUSTRY

The agriculture industry is composed of farms, ranches, nurseries, and greenhouses. The Standard Industrial Classification (SIC) divides the agriculture industry into crops (SIC 01) and livestock (SIC 02).

5. MINERAL INDUSTRY

Mineral industries (SIC 10-14) include all establishments primarily engaged in mining. These include the extraction of minerals existing naturally: solids, such as coal and ores; liquids, such as crude petroleum; and gases, such as natural gas.

6. CONSTRUCTION INDUSTRY

The construction industry (SIC 15-17) covers firms that are involved in general building, heavy construction and special trades.

7. MANUFACTURING INDUSTRY

This chapter will be the most extensive because manufacturing is expected to have the largest dollar magnitude of purchases. It will cover the manufacturing industry (SIC 20-39) at the two-digit and four-digit industry levels.

8. TRANSPORTATION CARRIERS

This chapter will cover three transportation carriers: railroads (SIC 40), trucking (SIC 42), and airlines (SIC 45). Water transportation and pipelines will not be included due to limited information on purchases.

9. COMMUNICATION INDUSTRY

The chapter on the communication industry (SIC 48) will focus on the telephone industry which made up 82 percent of this industry's total revenues.

10. UTILITY INDUSTRY

This chapter on utilities (SIC 49) will cover the electric and natural gas industries.

11. WHOLESALE INDUSTRY

This chapter will cover the wholesale trade for both durable (SIC 50) and nondurable (SIC 51) goods. Durable goods include the following: motor vehicles, furniture, lumber, recreational goods, metals and minerals, electrical goods, hardware, and machinery. Nondurable goods include: paper, drugs, apparel, groceries, chemicals, petroleum, and alcoholic beverages.

12. RETAIL INDUSTRY

This chapter will cover the retail trade industry (SIC 52-59). As in wholesale trade, information for both durable and nondurable goods will be presented.

13. SERVICES INDUSTRY

The service sector (SIC 70-81) chapter will cover those industries that had intangible outputs such as hotels,

business services, motion pictures, health services, and legal services.

14. GOVERNMENTS

This chapter will determine the purchases by all governments. This will include purchases at the federal plus the state and local government levels. Due to the expected magnitude of purchases in the Department of Defense, the federal government purchases will be divided into defense and non-defense purchases.

15. TOTAL MAGNITUDE OF BUSINESS AND GOVERNMENT PURCHASES

This chapter will present the total dollar magnitude of purchases for American businesses and governments. The totals will be based on the findings for each of the eleven industries presented in Chapters 4 through 14.

16. COMPARATIVE MAGNITUDES - INDUSTRIAL CONCENTRATION OF PURCHASES

This chapter will analyze the magnitudes of purchases for the eleven major industries and the 448 manufacturing four-digit industries. The concentration of purchases by both type of purchase and by type of industry will be determined.

17. COMPARATIVE MEASURES - PURCHASES VERSUS REVENUES AND WAGES AND SALARIES

This chapter will determine the importance of purchases by presenting them within the context of revenues, and other expenditures (such as wages and salaries).

18. PURCHASES IN THE CONTEXT OF TOTAL BUSINESS/ECONOMIC ACTIVITY

This chapter will establish the relationship between purchases of businesses and governments, and Gross National Product (GNP). There will be a discussion of business operational purchases and specific components of GNP: capital expenditure purchases; government purchases; and consumer purchases. The chapter will conclude by addressing the relationship of purchases to total business/economic activity.

19. CONCLUSIONS AND RECOMMENDATIONS

This final chapter will summarize the significant findings of chapters 4 through 18. Also, the hypotheses (to be presented in chapter 3) that will direct this research will be addressed to determine whether they should be accepted or rejected. In addition, this chapter will present other significant findings that may result from this research as well as implications and recommendations. Finally, areas that warrant future research will be pointed out.

ENDNOTES

- [1] Borneman, Alfred H. Essentials of Purchasing. (Columbus, OH: Grid Inc., 1974). pp. 1-2.
- [2] Carpenter, Myron A. and Beckman, Neal W. Purchasing For Profit. (St Louis , MO: Warren H. Gree, 1977). p. 2.
- [3] Pooler, Victor H. The Purchasing Man and His Job. (New York: American Management Association, 1964). p. 19.
- [4] Chew W. Bruce, "No-Nonsense Guide to Measuring Productivity." Harvard Business Review. January-February, 1988. p. 111.



- [5] Eiler, Robert G., Goletz, Walter K. and Keegan, Daniel P. "Is Your Cost Accounting Up To Date?" Harvard Business Review. July-August, 1982. p. 139.
- [6] Sandretto, Michael J. "What Kind of Cost System Do You Have?" Harvard Business Review. January-February, 1985. pp. 110-118.
- [7] Yardeni, Edward. "Money and Business Alert." Economics. Prudential-Bache Securities. January 1, 1988. p. 2.
- [8] Standard Industrial Classification Manual: 1972.
(Washington, DC: U.S. Government Printing Office, 1972).
- [9] Fearon, Harold. This was based on a personal written statement dated October 19, 1989.

CHAPTER 2: LITERATURE REVIEW

INTRODUCTION

A systematic approach was made to find sources relating to the dollar magnitude of purchases by American businesses and governments. The first step was to review journals that dealt predominately with purchases. The next step was to search books and textbooks in the purchasing field. References cited in those sources were also investigated.

The review of the literature was then expanded to the disciplines of economics and accounting. Finally, the abstracts of previous doctoral dissertations were consulted for any previous research on total purchases.

PROFESSIONAL ASSOCIATIONS, JOURNALS, AND DISSERTATIONS

A potentially important source of purchase information was the National Association of Purchasing Management (NAPM). A review of their publication, Journal of Purchasing and Materials Management, from 1975 to the present, failed to provide any information relating to the total dollar magnitude of purchases by American businesses and governments. In addition, the NAPM's information research service was unable to provide any information on the total dollar magnitude of purchases.

The National Contract Management Association, which is composed of individuals from public and commercial contracting, publishes the National Contract Management Journal semiannually. A review of all issues, dating back to

1966, had similar negative results.

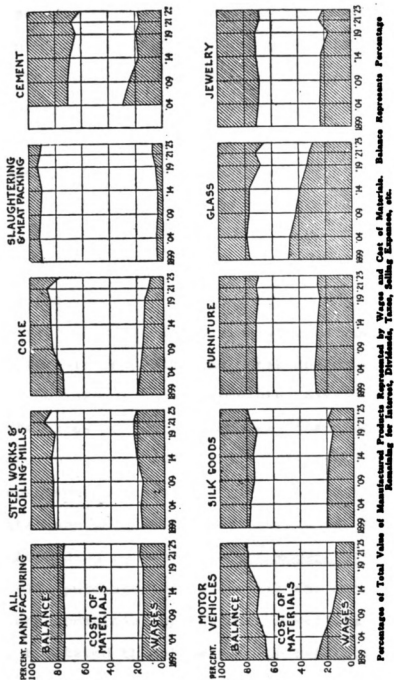
A review of the International Journal of Physical Distribution and Materials Management from 1979 to the present, and the Journal of Business Logistics from 1978 to the present, also did not reveal any research on the dollar magnitude of total purchases.

Finally, a review was conducted of the Comprehensive Dissertation Index from the year 1861 through 1988. There was no dissertation found that resembled this proposed research on the dollar magnitude of purchases in the United States by businesses and governments.

EARLY PURCHASING STUDIES

As early as 1925, there was a study on the cost of material in a few types of manufacturing. J. W. Osborne stated that "... the cost of material is the largest factor in the cost of manufacturing products, and in many cases larger than all other costs combined." He further stated "...that losses or profits are greatly influenced by the ability to buy right. A savings of one percent in the cost of materials means more than the same percentage of savings on other items of cost." Osborne found that, in 1923, the cost of materials in all manufacturing represented approximately 58% of the costs. Wages made up 18% and the balance (interest, dividends, taxes, selling expenses, etc.) made up 24%. A copy of Osborne's charts are presented in Exhibit 2-1 [1]. There is, however, no known follow-up of

Exhibit 2-1: Percentages of Total Value
of Manufactured Goods



(1925)

this report.

In 1964, the First National City Bank of New York made a study of the 100 largest manufacturing companies in the United States. The results were published in their August 1964 edition of the Monthly Economic Letter [2]. The study found that the cost of goods and services purchased from others represented 51.1% of receipts. Wages, salaries, and employee benefits made up 27.2% of the receipts. In subsequent years, this study of manufacturing purchases became a highly cited reference in the purchasing literature.

PURCHASING BOOKS

A number of books on purchasing were reviewed for studies on, or references to, the total dollar magnitude of purchases by businesses and governments. Although there were numerous references to total purchases, they dealt only with the manufacturing sector and all were all based on the Commerce Department's census and surveys of manufactures.

The citations which follow illustrate the treatment of purchases. According to Hodges in The Modern Science of Purchasing [3], purchases often control the success of industrial and commercial operations as well as government activities. He stated that "the average ratio of purchases to total costs suggests the outstanding importance of procurement as a managerial function." Hodges, however, did not provide any data to substantiate his statements.

Borneman in Essentials of Purchasing [4] stated that from the point of the economy as a whole, aggregate business spending on purchases has a significant impact on business and economic conditions. The purchasing of inventory has generally been more significant in contributing to business fluctuations than has the purchasing of capital goods. This is very similar to what Hoagland [5] had stated ten years earlier: "The importance of purchasing is due, in part, to the magnitude of its activities and to the fact that it forms an important link in the allocation of our resources. How and when purchasing is done determines the success of the firm, the success of the suppliers, and the success of our business system." Neither Borneman nor Hoagland, however, provided any data to support their assertions.

Pooler in The Purchasing Man and His Job [6] stated that 53 percent of the sales dollar in manufacturing goes to purchasing materials. This was based on the Census Bureau's 1960 Annual Survey of Manufacturers. Pooler only addressed purchases in manufacturing.

Heinritz and Farrell in Purchasing Principles and Applications [7] stated that "in the manufacturing industry, more than half of the total dollar income from the sale of products is expended in the purchase of materials, supplies, and equipment needed to produce the goods." As a reference, they cited the 1940 Census of Manufactures which showed that purchased materials and fuels represented 54.7% of the aggregate value of finished product cost. They also cited

the First National City Bank study. Heinritz and Farrell concluded that in the majority of manufacturing companies, material costs were found to be from 40% to 60% of the total product cost.

In his book Modern Procurement Management, England [8] cited the 1964 Census of manufactures which reported the cost of purchased materials and services from others averaged 57% of the value of shipments. The great majority of manufacturing industries spend between 40% and 60% of their sales income for materials and services from outside sources.

England also stated that the magnitude of purchasing expenditures in manufacturing emphasized their importance to the U.S. economy. He concluded that a specific measure of the importance of the procurement function can be found in figures showing the relationship between the cost of purchased materials and services and the total value of shipments. England, however, only provided data for the manufacturing industry.

In Purchasing for Profit, Carpenter and Beckmann [9] stated that the portion of sales dollars expended for purchased goods averages around 57% for U.S. manufacturing firms. There was, however, no documentation given for this figure, nor was there a year specified.

Aljian, in the Purchasing Handbook [10], stated that in manufacturing and associated industries, purchased materials and services totaled \$322 billion in 1968. The source was

the 1968 annual survey of manufacturers conducted by the Bureau of the Census.

Aljian also presented a figure that showed how the sales dollar was distributed in the 100 largest manufacturing concerns in 1968. It is worth noting that the figures presented by Aljian are identical to the ones in the 1964 study done by the First National City Bank of New York. However, Aljian gave no reference for the source of his information.

Aljian did cite the 1964 U.S. Census of Manufactures which reported that the cost of materials and services purchased from others averaged 57% of the total value of shipments for manufacturing.

In Purchasing and Materials Management, Cavinato [11] concluded that purchases for manufacturing ranged between 40% and 60% of sales revenues. Purchases were generally the largest single component of expenditures in manufacturing. Purchases averaged 56.2% of costs. For purchases, Cavinato includes materials, parts, containers, and energy. According to Cavinato, production wages represented 11.6% of the total shipments. It should be noted, however, that his labor figure is understated. It did not include fringe benefit costs nor did it include the labor costs for supervisory and support function personnel. Cavinato used 1977 Census of Manufacturer's data.

In their book, Purchasing and Materials Management [12], Dobler, Lee, and Burt stated that in manufacturing

"More dollars are spent for purchases of materials and services than for all other expense items combined, including expenses for wages, taxes, dividends, and depreciation." The costs of purchased goods and services averaged 57.6% of the sales based on the 1978 Annual Survey of Manufacturers.

Leenders, Fearon, and England [13] presented the most extensive break out of purchases for manufacturing in their book Purchasing and Materials Management. They provided the cost of materials and capital expenditures, and a total purchase/sales ratio for the 20 major two-digit manufacturing SICs. Using the 1985 Annual Survey of Manufactures, they concluded that purchases for materials and capital expenditures accounted for 60% of the sales dollar for manufacturing industries.

The above discussion has been dominated by references to manufacturing purchases. There was no reference to other types of industries, such as construction, agriculture, mining, or retail.

ECONOMIC LITERATURE

Business purchases are for the most part excluded from economic measurements and analyses. A review of the economic literature on consumption did not reveal any treatment of business purchases other than for capital equipment. The focus was instead on personal consumption (Morgan [14], Friedman [15], Green [16], and Nystrom [17]).

In economic literature, the discussions on business purchases were very limited. The concern was that the inclusion of business purchases (sometimes called intermediate products) for goods and services would result in double counting (Peterson [18] and Ruggles and Ruggles [19]). Consequently, the business purchases of materials, supplies, and services are excluded from the National Income and Product Accounts. According to Kendrick [20], the intermediate purchases of raw materials and semi-finished goods are already included in the value of the final products.

Shapiro [21], in Macroeconomic Analysis, stated that "It was the new interest in macroeconomic theory sparked by the publication of Keynes' General Theory in 1936 that was largely responsible for the development of national income accounting." He also stated that "the advent of the Keynesian theory not only hastened the development of national accounting: it also influenced the form of the development. The conceptual framework in which the accounts are presented was deliberately designed to facilitate the study of macroeconomic problem with Keynesian tools." This approach, however, results only in a summary of the country's final consumption and not of the total business/economic activity. It excludes the majority of business purchases.

Keynes [22] down played the importance of purchases. He wrote: "Recent American experience has afforded good

examples of the part played by fluctuations in the stocks of finished and unfinished goods -- 'inventories' -- as it is becoming usual to call them -- in causing the minor oscillations within the main movement of the Trade Cycle. Manufacturers, setting industry in motion to provide for a scale of consumption which is expected to prevail some months later, are apt to make minor miscalculations, generally in the direction of running a little ahead of the facts. When they discover their mistake they have to contract for a short time to allow for the absorption of the excess inventories; and the different pace between running a little ahead and dropping back again has proved sufficient in its effect on the current rate of investment to display itself quite clearly against the background of the excellently complete statistics now available in the United States." Keynes, however, did not provide any data on the total dollar magnitude of purchases.

Later writers such as Hoagland [23] criticized Keynes and pointed out the error in Keynes' reasoning. He noted that "John Maynard Keynes thought that an inventory fluctuation resulted from a forecasting error." Hoagland further pointed out, "There is much evidence to show, however, that businesses use inventory hedging as a means of trying to protect against threats to supplies and sometimes to beat price increases. Many inventory changes are intentional. Involuntary inventory accumulations usually develop only after there has been purposeful inventory

hedging. Furthermore, many purchasers do not try to maintain a constant inventory-to-sales ratio when there is a threat to supply." In addition, Hoagland wrote that Keynes did not recognize the possible importance of changes in business purchases that might result from supply problems.

It should be noted that Hoagland (who will be discussed at length in the subsequent section on the Dominance of Industrial Purchases) only dealt with the fluctuations in purchases and inventories. He did not provide any research on the total magnitude of purchases which is the focus of this dissertation.

The Department of Commerce's calculation of gross national product (GNP) incorporates primarily final consumption products. According to Dr. Carol Carson [24], the chief economist at the Bureau of Economic Analysis, "purchases by one producing unit from another of intermediate products are not included in the calculation of GNP."

Samuelson [25] stated that to avoid double counting of intermediate products, value-added is calculated at each stage of production. This is accomplished by subtracting all the costs of materials and intermediate products not produced at that stage. This process also results in the exclusion of the vast majority of business purchases from GNP calculations.

The Commerce Department periodically develops input-output accounts to provide estimates of intermediate

inputs associated with total value-added that corresponds to GNP. For 1982, this figure was \$2.7 trillion [26]. This figure, however, did not include all purchases. For example, it excluded all resale purchases in order to be consistent with the assumptions of national income and product accounting. This exclusion of the purchase resale category was especially significant in wholesale and retail trade.

Based on the above discussion, it appears that economists' preoccupation with the theory of double counting and the assumptions of national income accounting have served as a deterrent to research on the total dollar magnitude of business purchases. The exclusion of business purchases results in a disproportionate attention being placed on the final consumers, who only represent a portion of the total business/economic activity.

The purpose of this dissertation, however, is not to challenge the methodology for determining gross national product. Rather, the purpose of this dissertation is to estimate the dollar magnitude of purchases by businesses and governments. In addition, this research will estimate the dollar magnitude of business purchases that is left out of GNP figures.

One of the few economic studies on purchases was done by Ruth Mack in her book Consumption and Business Fluctuations. Her research was limited to the shoe, leather, and hide sequence. She found that "As fluctuation in the buying of retailers moves toward earlier stages it can be

augmented or dampened by the operations of the shoe manufacturers. Manufacturer's purchasing of leather from tanners can undergo greater or lesser, earlier or later fluctuation than that of selling -- which is, of course, the buying of shoe distributors." She also stated that "The central phenomenon is simply that expectations about the direction of change in prices, about delivery conditions, and about the adequacy of selections often cause ordering by retailers and shoe manufacturers to rise or fall before consumer buying itself does" [27].

ACCOUNTING LITERATURE

There were no studies of purchases found in the accounting literature. Numerous sources, however, stated that there was a need to de-emphasize the attention given to labor and devote more to the areas where the majority of the actual costs occur. Various authors felt that managers do not realize that purchases dominate the cost of operations. They stated that this was due to archaic accounting systems based on direct labor.

Eiler, Goletz, and Keegan [28] stated that "each year the direct labor base seems to shrink as a part of total product costs." They found that "in many companies, although direct labor represents less than 10% of product cost, labor received a great deal of attention by industrial engineers, factory supervisors, and labor negotiators." In contrast, "purchased materials may represent 50% or more of product

costs, but many companies consider purchasing activity routine." They then stated that a "knowledge of product cost proportions ... can help management avoid costly mistakes."

Sandretto [29] came to conclusions very similar to Eiler et al. To Sandretto, "the proportion that each cost bears to total production cost was an important factor in deciding which costs to control. For a product whose labor cost is 5% of production cost and material cost is 80%, control of material costs is obviously important. And yet many companies have elaborate systems to control minor elements of total costs while ignoring more important cost elements."

Kaplan [30] stated that "today's accounting systems evolved from the scientific management movement in the early part of the twentieth century. Reliance on these systems in today's competitive environment, which is characterized by products with much lower direct labor content, will provide an inadequate picture of manufacturing efficiency and effectiveness."

Cooper and Kaplan [31] wrote that many of the current cost allocating methods were outdated. The use of direct labor hours in cost allocations "may have been adequate many decades ago when labor was the principle value adding activity in the material conversion process. Labor... no longer represents a reasonable surrogate for resource demands by product. Shifting from labor hours to machine hours or material dollars provides some relief from the

problem of using unrealistic bases for attributing costs to products."

Schmenner [32] agreed that the labor portion of product cost is over emphasized. "Historically, direct labor reduction has been a significant source of productivity improvement. However, in today's factory, direct labor costs are less important. It often runs only between 5 and 10 percent of the cost of goods sold. Materials and overhead costs are often much more significant."

Many of the current accounting practices have contributed to the overemphasis by management on smaller cost elements. Income statements for companies typically mask purchasing expenditures within such catch-all categories as: (1) "cost of goods sold" or (2) "other operating expenses." Besides purchasing, these catch-all categories could include: depreciation [33], taxes, bad debt expenses, wages and salaries, social security contributions, and interest paid [34]. Those accounting practices have the potential to distort management's perspective of the true importance of purchases by businesses and governments.

The above accounting literature highlights the importance of purchases and the need for management to re-focus their attention. There were, however, no figures in accounting literature to substantiate the total dollar magnitude of purchases.

THE DOMINANCE OF INDUSTRIAL PURCHASES

Dr. John Hoagland was one of the first to do extensive research into the role of purchases in determining business trends. He has written that the analysis of business trends requires an understanding of both the fluctuations and the magnitude of business purchases [35]. While there has been extensive work on the fluctuations of business purchases, there has been limited research on the magnitude of business purchases. Dr. Hoagland's theory on the dominance of industrial purchases has evolved over the last thirty years. As early as 1959, Hoagland [36] stated "...that many people in both business and education do not adequately understand or properly evaluate the purchasing function and its impact on our economy." Though he provided no substantiating data at that time, he estimated industrial purchases to be in the range of \$100 to \$180 billion annually.

In 1960 [37] he stated: "A primary reason for the important influence of industrial purchasers is the magnitude of their activities..." In 1964 [38] [39] he again stressed the importance of the magnitude of purchases. He also stated that "Industrial purchasing has a staggering impact upon our business system because in the aggregate these purchases amount to approximately 15 to 20 billions of dollars per month." The magnitude of purchases plays a role in business cycles. This became apparent when steel strikes caused many industries to alter their purchasing practices through hedging of steel purchases. Later in 1964 [39],

Hoagland stated that "Inventory hedging prior to a steel strike takes many months and is of such magnitude that it results in a period of business expansion prior to the settlement."

Also in 1964 [39], Hoagland stated that "Whereas many forecasters focus upon final consumers, in reality it is intermediate consumers who are more important in determining the timing and magnitude of business fluctuations. Hoagland also noted that economists have placed too much emphasis on GNP which focuses on the final consumer [40] [41]. "Most economists think that it is the behavior of the final consumers that determines business trends. I have found it's the behavior of all those purchasers back along the line that determines what happens to inflation and business cycles."

In 1978 [41], Hoagland wrote "The compounded influence of purchasing is so great that the industrial purchases alone in this country, and I'm giving you a rough estimate, is about two trillion dollars annually." (Note: Hoagland stated that he was only providing a rough estimate.) Hoagland also pointed out that inventory and purchasing shifts are often of such magnitude that they overpower government monetary and fiscal policy. "The accumulation and liquidation of inventories has a significant impact on the money supply." Note that in that statement, Hoagland only dealt with shifts and not in the total dollar magnitude of purchases.

In 1980 [42], Hoagland stated that there is a pronounced lack of purchasing knowledge. "The actions of business purchasers are usually more influential than those of final consumers and they are often of such magnitude that they overpower government actions. But most business analysts, economists, and others, however, overlook the importance and impact of purchasing."

Hoagland further stated that "One reason purchasing is so important is because of its great magnitude. The magnitude of fluctuations in business purchases is staggering and dominates changes in GNP. Much has been studied and written about GNP, but there is very little research on purchasing magnitude." As in 1978, he estimated purchases to be approximately two trillion dollars annually.

In 1982 [43], Hoagland emphasized the importance and magnitude of purchasing in manufacturing as well as in other business sectors such as wholesaling and retailing, when he wrote, "In almost every [manufacturing] industry, purchases cost twice as much as wages and salaries combined. At the wholesale and retail levels of business, purchases represent an even greater proportion of costs." He further stated that "...for almost all products the total amount of prior purchases is larger than the price paid by the final consumer. Costs of prior purchases pass through the business system to be paid for eventually by the ultimate consumer..."

In 1982 Hoagland [44] stated: "Total prior purchases

are so large they exceed gross national product (GNP). ... Purchases of just the manufacturing sector are estimated to be approximately equal to GNP, that is, in excess of \$2 trillion annually."

It should be noted in the above citations, Hoagland was inconsistent in his use of terminology. The terms business, industrial, and manufacturing purchases appear to be used interchangeably.

Hoagland and Taylor [45] in 1987 stated that "...many economic theories continue to ignore all purchasing activities except final consumption and foreign trade. Too many writers and economists erroneously believe that final consumers dominate business trends because they believe final consumption is two-thirds of all economic activity. Final consumer buying is two-thirds of GNP, but certainly not two thirds of all economic activity.

"GNP calculations ignore many business transactions. Total dollars involved in business purchases transactions that are excluded from Gross National Product are far larger than the amount of dollars included. Most people do not seem to realize that purchase and sales transactions for companies such as General Motors, Ford, Chrysler, Inland Steel, Motorola, etc. are excluded from GNP calculations. Such companies usually do not sell directly to final consumers, but sell primarily to other businesses; i.e., Ford, Chrysler, and General Motors sell to automobile dealerships. Most economic theories include automobile sales

to final consumers by dealerships in Gross National Product, but exclude the calculation of prior purchases of the supplying companies. Few have studied the magnitude of prior purchases, and almost no one has measured the total size of industrial and business purchases.

"Some publications indicate that counting all purchasing transactions leads to multiple counting. This is not true for those interested in the total business system. On any given day, billions of dollars are spent for purchases of iron ore, steel, tires, glass, fabrics, chemicals, aluminum, electric motors, etc. On the same day, final consumers are buying such things as automobiles, radios, clothes, etc. It is unfortunate that most economic theories count only final sales and ignore prior purchases. Purchases are required at all levels of business -- retailing, wholesaling, and manufacturing. In manufacturing, an average fifty to sixty percent of the sales dollar has been spent for purchased products that went into the item sold. Furthermore, as an illustration of the magnitude of purchases, note that an average manufacturer spent twice as much for purchases as for wages and salaries combined. Purchasing also represents a high proportion of wholesaling and retailing costs.

"Most final sales are the culmination of many complex, interrelated levels of business transactions with each level doing considerable purchasing from others. The total amount of business purchases is unknown, but it is staggering in

amount. (Note: Underlined by this author for emphasis.)

"Strange as it seems, the aggregate price of total purchases is usually much greater than the price of the final product. This is because many different purchase transactions are necessary between raw material processing and final product distribution. As an example, consider the cascading influence of purchases when a final consumer buys an item, such as a typical washing machine. The selling retailer purchased the machine from the wholesaler, who purchased it from the manufacturer. The washing machine manufacturer purchased many materials and products, such as an electric motor. The motor manufacturer purchased bearings which were produced from purchased tubular steel, using purchased iron ore, etc. Theoretically, each purchase pays for the costs of material, labor, overhead, and profit of each supplier. Costs of prior purchases do pass through the business system to be paid eventually by the final consumer. But, the actual flow of purchased products through the system is often uneven. This is especially true in times of threatened shortages or surpluses. When troubles develop in normal channels of supply, the compounding accumulation of problems can be very great and sometimes dominate business trends. Thus, changes in industrial purchases can be more dynamic and more influential than changes in consumer buying."

Hoagland and Taylor also stated that "...purchases are important business decision points. How and when purchases

are made provide for the allocation of our resources and strongly influence the degree of inflation or deflation. Contrary to common beliefs, major dynamic shifts in business purchases are caused more by actual of potential threats to supply than by final demand shifts. Purchase dynamics are largely the result of supply dynamics."

They succinctly summarized the importance of business purchases by stating that the "Industrial purchasers are usually more influential than final consumers in determining changes in business trends." Hoagland and Taylor, however, did not provide any data on the magnitude of business and government purchases. They concentrated on the fluctuations.

Hoagland's theory on the dominance of industrial purchases is based on two assumptions: (1) the dollar magnitude of purchases, and (2) the dynamics of those purchases. His extensive research on change indexes has substantiated the dynamics of purchases. In contrast, there has been no definitive research on the dollar magnitudes of purchases. The purchasing figures he presented were only gross estimates.

This research will attempt to establish the total dollar magnitude of purchases by American businesses and governments. The results of this research when combined with Hoagland's work on the dynamics of purchases may be used to help verify the theory on the dominance of industrial purchases.

PURCHASES BY BUSINESSES, GOVERNMENTS, AND PERSONAL CONSUMERS

The economic literature primarily focused on personal consumption and on business buildings and equipment (capital expenditures). This dissertation will concentrate on business capital expenditures as well as business operational purchases. The concept of business operational purchases addresses the vast majority of the business purchases. Figure 2-1 shows the relationship of business operational purchases to: 1. Business building and equipment purchases (capital expenditures), 2. Purchases by governments (operational and capital expenditures), and 3. Purchases by personal consumers (nondurables, services, durables and residential).

Economic literature does provide a framework that can be modified and used in analyzing business purchases. As an illustration of this analytical framework, note that Peterson's text Income, Employment, and Economic Growth [46] stated, "In most societies the largest proportion of current output will consist of consumer goods and services. The usual method for measurement of the economy's output of consumer goods and services is through adding up the expenditures made by all households and private non-profit institutions. Beyond this, it is customary in national income accounting to break down this category down into three subcategories: expenditures for consumer durables (automobiles, household appliances, household furnishings, etc.), nondurables (mostly food and clothing) and services."

**Figure 2-1: Framework For Purchases By American Business,
Government, And Personal Consumers**

TIME / TYPE	Business	Government	Personal
Consumption Time Frame: One Year Or Less	Operational Purchases: 1. Materials and Supplies 2. Energy 3. Resales 4. Other	Operational Purchases: 1. Materials and Supplies 2. Energy 3. Resales 4. Other	Nondurables and Services: 1. Food 2. Clothes 3. Energy 4. Other
Greater Than One Year	Capital Expenditures: 1. Buildings 2. Equipment	Capital Expenditures: 1. Buildings, Highways, and Dams 2. Equipment	Durables and Residential: 1. Automobiles 2. Appliances & Furniture 3. Housing

In this research, nondurables and services are combined. This was done because nondurables and services are primarily bought and consumed in the same time period, i.e., less than one year.

Peterson went on to write: "The durable goods component of consumption expenditures presents us with a problem of measurement. A durable good (like an automobile) is essentially a consumer capital good (emphasis added). Typically such goods have a life span of a number of years, and their real value lies in the fact that they render a service to the consumer during this life span. Since the basic purpose of national income accounting is to measure the amount of productive activity taking place in the economy during a specific period, the logical procedure would be to count the services rendered to the consumer during each income period by a durable good, as part of the income (or output) of that income period. This logical procedure has not been followed, however, because of the near impossibility of measuring statistically the rate at which the economy's enormous stock of consumer durable goods delivers services to consumers. As a result, national income accountants and statisticians resort to the convenient fiction (emphasis added) that all consumer goods, including consumer durables, are consumed during the income period in which they are purchased. The only important exception to this procedure is consumer housing. Purchases of new houses are treated as investment rather than as consumption

expenditures."

Peterson also wrote: "It is less clear, though, why purchases of new houses should be considered investment goods. Actually the decision to include residential construction in the investment goods category is arbitrary, because one could argue with justifiable logic that the purchase of a durable item like a house which renders a service to its owner over its lifetime, is basically no different from the purchase of other durable consumer goods such as automobiles, stoves, and refrigerators. The basic reason for this procedure is that the much longer life of houses as compared to other consumer durables would make the fiction of the consumption of durables in the income period in which they are produced and sold quite absurd if applied to housing."

Based on the above discussion by Peterson, the important criteria is the time frame in which a product or service is consumed. Consequently, Peterson stated that a durable good is essentially a consumer capital good. Barro [47] presented a very similar analogy: "The second major category of GNP is the purchase of goods and services by business firms. These purchases are the private gross investment that firms make in new capital goods, such as factories, machinery, and so on. Note that business capital goods are durables. Thus investment goods are similar to the consumer durables" (Emphasis added).

Based on the above citations by Peterson and Barro, it

appears that the important criteria in consumption (For both business and personal consumption) is the time frame in which consumption occurs. Personal consumption nondurables and services are "consumed" in one period (year) or less and the durables (automobiles, appliances, and houses) are "consumed" in greater than one period.

On the business side, the literature focuses on the capital expenditures which are "consumed" in greater than one period. Those business purchases that are consumed in one period or less are not specifically addressed in the economic literature. This research defines those business purchases that are "consumed" in one period, or less, as "Business Operational Purchases." The business operational purchases include materials and supplies, energy, resales and other items, such as purchased services.

CONCLUSION

The review of the literature has resulted in a number of findings. The first is that the majority of the literature on the dollar magnitude of purchases has dealt almost exclusively with the manufacturing sector. The total dollar magnitude of purchases for most industries has not been investigated. Research on the total dollar magnitude of purchases has not been done, probably due in part to the double-counting assumptions of many economists.

There is no known study on the total dollar magnitude of purchases by American businesses and governments. Nor has

there been any study on the relationship of purchases to revenues and to other cost elements for all industries. In addition, there was no previous work on the breakdown of total purchases by types of purchases such as materials and supplies, energy, resales, buildings and equipment, and other items.

Therefore, this dissertation will represent original research that can make a significant contribution to purchasing knowledge.

ENDNOTES

- [1] Osborne, J.W., "The Importance of Ability in Purchasing." Purchasor. May 15, 1925. p. 133.
- [2] Monthly Economic News Letter. First National City Bank of New York. August 1964. p. 91.
- [3] Hodges, Henry G. The Modern Science of Purchasing. (New York: Harper and Brothers, 1961). p. 2.
- [4] Borneman, Alfred H. Essentials of Purchasing. (Columbus, OH: Grid Inc., 1974). p. 1.
- [5] Hoagland, John, H. "Strikes, Politics and Business Cycles." Paper presented at the annual meeting of the American Statistical Association, Illinois, December 27-30, 1964, under the sponsorship of the Business and Economic Statistics Section.
- [6] Pooler, Victor H. The Purchasing Man and His Job. (New York: American Management Association, 1964). p. 19.
- [7] Heinritz, S.F. and Farrell, P.V. Purchasing Principles and Applications. (Englewood Cliffs, NJ: Prentice Hall, Inc., 1965). pp. 1-3. Note: Later editions did not include this information.
- [8] England, Wilbur B. Modern Procurement Management. (Homewood, IL: Richard D. Irwin, Inc., 1970). pp. 1 and 2.
- [9] Carpenter, Myron A. and Beckmann, Neal W. Purchasing For Profit. (St Louis, MO: Warren H. Green, Inc. 1977). p. 2.

- [10] Aljian, George W. Purchasing Handbook. (New York: McGraw-Hill, 1973). pp. 1-8 and 1-9.
- [11] Cavinato, Joseph L. Purchasing and Materials Management. (St. Paul, MN: West Publishing Co., 1984). pp. 7-8.
- [12] Dobler, Donald W., Lee, Lamar, and Burt, David N. Purchasing and Materials Management. (New York: McGraw-Hill Book Company, 1984) pp. 10-12.
- [13] Leenders, Michiel R., Fearon, Harold E., and England Wilbur B. Purchasing and Materials Management. (Homewood, IL: Irwin, 1989). pp. 5-8.
- [14] Morgan, James N. Consumer Economics. (Englewood Cliffs, NJ: Prentice-Hall, Inc., 1955).
- [15] Friedman, Milton. A Theory of the Consumption Function. (Princeton, NJ: Princeton University Press, 1957).
- [16] Green, H.A. John. Consumer Theory. (New York: Academic Press, 1978).
- [17] Nystrom, Paul H. Economic Principles of Consumption. (New York: The Ronald Press Company, 1931).
- [18] Peterson, Wallace C. Income, Employment, and Economic Growth. (New York: W.W. Norton and Co., 1984). pp. 64-65.
- [19] Ruggles, Nancy, and Ruggles, Richard. The Design of Economic Accounts. (New York: Columbia University Press, 1970). pp. 46-47.
- [20] Kendrick, John W. Economic Accounts and Their Uses. (New York: McGraw-Hill, 1972). pp. 22-23.
- [21] Shapiro, Edward. Macroeconomic Analysis. (New York: Harcourt Brace Jovanovich, Inc. 1982). p. 19.
- [22] Keynes, John M. The General Theory of Employment Interest and Money. (New York: Harcourt, Brace and Company, 1936). p. 332.
- [23] Hoagland, John H. "Business/Purchasing Environment-- Today and Tomorrow." Proceedings of the 65th Annual International Purchasing Conference. (Atlanta, GA: National Association of Purchasing Management, May 19, 1980).

- [24] Carson, Carol S. "Gross National Product and Related Measures." Editors: Frank J. Fabozzi and Harry I. Greenfield. The Handbook of Economic and Financial Measures. (Homewood, IL: Dow Jones-Irwin, 1984). p. 3.
- [25] Samuelson, Paul A. Economics. (New York: McGraw-Hill, 1980). pp. 173-175.
- [26] U.S. Department of Commerce. "Input-Output Accounts of the U.S. Economy, 1982." Survey of Current Business. (Washington, DC: U.S. Government Printing Office, April, 1988). p. 31.
- [27] Mack, Ruth P. Consumption and Business Fluctuations: A Case Study of the Shoe, Leather, Hide Sequence. (New York: National Bureau of Economic Research, 1956). pp. 135 and 7.
- [28] Eiler, Robert G., Goletz, Walter K. and Keegan, Daniel P. "Is Your Cost Accounting Up To Date?" Harvard Business Review. July-August, 1982. pp. 133-139.
- [29] Sandretto, Michael J. "What Kind of Cost System Do You Have?" Harvard Business Review. January-February, 1985. pp. 110-118.
- [30] Kaplan, Robert S. "Yesterday's Accounting Undermines Production." Harvard Business Review. July-August, 1984. pp. 95-101.
- [31] Cooper, Robin and Kaplan, Robert S. "How Cost Accounting Distorts Costs." Management Accounting. April 1988. pp. 20-27.
- [32] Schmenner, Roger W. "Escaping the Black Holes of Cost Accounting." Business Horizons. January-February, 1988. pp. 66-72.
- [33] Helfert, Erich A. Techniques of Financial Analysis. (Homewood, IL: Richard D. Irwin, Inc., 1972). p. 50.
- [34] Kendrick, p. 43.
- [35] Hoagland, John H. "Purchasing, Forward Buying, and Hedging." Editor, Purchasing Handbook. Farrell, Paul V., Coordinating Editor. (New York: McGraw-Hill, Inc., 1982). p. 13-2.
- [36] Hoagland, John H. "Monthly Change Indices and Other Measures of Business Fluctuations." Paper presented at the Business and Economic Statistical Section of the American Statistical Association. (Washington DC, December 29, 1959).

- [37] Hoagland, John H. "Purchasing and Inventory Forecasting." Unpublished paper presented at the Business and Economic Statistical Section of the American Statistical Association. December, 1960).
- [38] Hoagland, John H. "Strikes, Politics and Business Cycles." Paper presented at the Business and Economic Statistical Section of the American Statistical Association. (Illinois, December 27-30, 1964).
- [39] Hoagland, John H. "Forecasting Purchasing and Business Trends." Paper presented at the Forty-Ninth Annual International Convention of the National Association of Purchasing Agents. (Dallas, Texas, May 3-6, 1964).
- [40] Hoagland, John H. "Forecast For 1975." Address at Kellogg Center, Michigan State University. (East Lansing MI, March 11, 1975).
- [41] Hoagland, John H. "Strikes and Other Supply Problems." Papers and Proceedings of the Symposium on Inflation. University of Tennessee, March 20-21, 1978.
- [42] Hoagland, John H. "Business/Purchasing Environment--Today and Tomorrow." Proceedings of the 65th Annual International Purchasing Conference. (Atlanta, GA: National Association of Purchasing Management, May 19, 1980).
- [43] Hoagland, John H. "Purchasing, Forward Buying, and Hedging." Editor, Purchasing Handbook. Farrell, Paul V., Coordinating Editor. (New York: McGraw-Hill, Inc., 1982).
- [44] Hoagland, John H. "Forecasting, Forward Buying, and Hedging." Alijan's Purchasing Handbook. Farrell, Paul V., Coordinating Editor. (New York: McGraw-Hill, Inc., 1982). p. 13-8.
- [45] Hoagland, John H. and Taylor, Barbara E., "Purchasing Business Surveys: Uses and Improvements." Proceedings of the 72nd annual International Purchasing Conference. (New York: National Association of Purchasing Management, May 3-6, 1987).
- [46] Peterson, Wallace C. Income, Employment, and Economic Growth. (New York: W. W. Norton and Co., 1984). pp. 50-51.
- [47] Barro, Robert J. Macroeconomics. (New York: John Wiley and Sons, 1984) p. 19.

CHAPTER 3: RESEARCH METHODOLOGY

INTRODUCTION

This dissertation will address the following hypotheses:

Hypothesis 1:

Purchases for materials and supplies, and resale purchases constitute the largest portion of total purchases by American businesses and governments.

Hypothesis 2:

The dollar magnitudes of purchases for materials and supplies is considerably greater than purchases for buildings and equipment.

Hypothesis 3:

The dollars spent for purchases exceed the dollars spent for wages and salaries for most American businesses and governments.

Hypothesis 4:

Purchases are the largest dollar component of expenditures by American businesses and governments.

Hypothesis 5:

The total dollar magnitudes of purchases by American businesses exceeds gross national product (GNP).

The above hypotheses will serve to direct this research which will focus on eleven major industries: agriculture, mineral, construction, manufacturing, transportation

carriers, communication, utilities, wholesale trade, retail trade, services, and governments. The total dollar magnitudes of purchases in these industries will be established by collecting data on various types of purchases. All of the industries will be analyzed at the two-digit or major group level of the Standard Industrial Classification (SIC) Manual [1]. Manufacturing purchases will be analyzed in more detail than the other industries, due to its size and expected magnitude of the purchases. Manufacturing will be analyzed at the four-digit SIC level.

SOURCE OF PURCHASE INFORMATION

The majority of the information required to calculate the magnitudes of purchases will come from government sources. Private sources, such as trade association publications, will be used to supplement missing government data.

Within the government, the Commerce Department's economic census publications will serve as the primary source of information. Every five years, a complete economic census is done on several major industries. (A representative selection of the reporting forms used in the 1982 Economic Censuses can be found in Appendix D of the Census of Manufactures - Subject Series.) The economic census provides the most complete and extensive information on industry purchases. Consequently, the census will serve as the foundation for the majority of the purchase information.

Although there was an economic census conducted in 1987, the results will not be available until late 1990 or early 1991. This estimate is based on the processing time required in other census years. The last complete and available census was for the year 1982. Therefore, this dissertation will be based on the year 1982. That census covered the following industries: manufacturing, mining, construction, retail, wholesale, and services. The 1982 census did not collect uniform purchase information in each industry. While the Census of Manufactures provided information on purchases, the Census of Service Industries did not collect information on many types of purchases, such as resale purchases. As an example, the hotel and motel industries were not required to provide figures on the cost of purchased food and beverages. When there is incomplete purchase information, other sources (both government and private) will be used in an attempt to fill the gaps in the census data.

For those industries that were not part of the census (agriculture, communications, utilities, transportation, and governments), the purchase information will be constructed from diverse sources. These sources will include other government departments and trade associations. Other government sources will include publications of the Agriculture, Energy, and Transportation Departments and the Interstate Commerce Commission (ICC). Potential private sources will include: American Trucking Association, Air Transport Association, Edison Electric Institute, American

Gas Association, the Association of American Railroads, and the National Restaurant Association. In summary, the priority for purchase information will be as follows:

1. The Census Bureau's 1982 Economic Censuses,
2. Other Government Agencies, and
3. Trade associations.

Additional background information will be sought when non-government sources serve as the basis for the purchase information (i.e., the size of the samples and the response rates when surveys are used).

DEFINITIONS

The dollar purchase figures for each of the business and government classifications will be determined by collecting individual types of purchases. For the purpose of this research, purchases will represent the acquiring of materials, supplies, equipment, or services from sources outside one's own establishment. Purchases will not be limited to those activities within a formally established purchasing department. An attempt will be made to include all known purchases, regardless of the department performing the purchasing function. For example, the purchasing department's participation in the purchase of capital equipment or energy may be limited. Many services would also fall into this category. For example, medical and insurance programs are purchased, but rarely by the formal purchasing department. In this dissertation an attempt will be made to

include all purchases (both purchase and "non-purchase" department purchases). However, the purchases for employee benefits such as hospitalization and insurance packages will not be included.

This research will categorize purchases into five broad types: 1. Materials and Supplies, 2. Energy, 3. Resales, 4. Buildings and Equipment, and 5. Other Items.

These five purchase types were selected because they were applicable across multiple industries (i.e., materials and supplies in manufacturing, and resales in wholesale and retail trade). In addition, these five types of purchases are expected to account for the vast majority of the dollar expenditures for purchases. Also, the government data can be classified under these categories.

The definitions that follow are consistent with those used by the Bureau of the Census in the 1982 Census of Manufactures. Purchases include not only the acquiring of materials and supplies from other companies, but also those purchases from other establishments of the parent company (interdivisional transfers). Those "...plants that received transferred goods were instructed to include it in the cost of materials at the same value as at the shipping point, plus the cost of freight and other handling charges" [2]. The census required that companies with operations at more than one location (such as subsidiaries) file separate reports for each location [3].

Materials and Supplies will include all raw materials,

semi-finished goods, parts, containers, packaging, and other supplies needed to carry out business and government operations. Purchases in this category will include those materials and supplies that were: "(1) put into production, (2) used as operating supplies, and (3) used in repair and maintenance" [4], such as MRO supplies.

The Energy category is composed of expenses for electricity and fuels. Energy purchases will include expenditures for: "heat, power, transportation, or the generation of electricity." This will include such purchases as: coal, natural gas, fuel oil, and electricity [5].

Resales are those purchases that are not altered or modified while in the possession of a firm. According to the Census of Manufactures, these products are then sold in the same condition as when originally purchased. There is no further manufacturing, processing or assembly of the purchased goods [6]. Resales are an important type of purchase in wholesale and retail trade.

The Buildings and Equipment category is composed of a number of different types of purchases. This category will include those purchases associated with capital expenditures such as plant (buildings and structures), equipment, and machinery. It will also include those purchases that are related to capital expenditures such as the rental and repair of capital goods.

The 1982 Census of Manufactures defines capital expenditures as "all costs that are chargeable to a fixed

asset account for which depreciation or amortization reserves are maintained." This would include vehicles, machinery, equipment, and construction.

The census defines Rentals as payments made to other enterprises for the use of such fixed assets as buildings, structures, machinery, and equipment.

Purchased Repair Services are defined as payments made to other establishments for noncapitalized repairs to buildings, structures, machinery, and equipment. Examples would include repairs to motor vehicles, painting, and roof repair [7]. Although the census places these three purchase types (capital expenditures, rentals, and repairs) in separate categories, for this research they will all be included under the purchase type "Buildings and Equipment." This is done for two reasons: 1. they all deal with capital goods, and 2. this assures that capital expenditures are not understated.

The term Other Items represents purchases that do not fall within any of the previously listed purchase categories. This catch-all type of purchase will include such items as: subcontract work, services, advertising, and communication expenditures. When "other items" represents twenty percent or more of the total dollar purchases, an explanation will be provided on the major component of this purchase type. For example, in some industries subcontract work may be significant. If this occurs then the component, subcontract work, will then be highlighted.

According to the 1982 Census of Wholesale Trade, "subcontract" represents work contracted to other organizations. "Advertising" includes "payments to other companies for printing, media coverage, and other services and materials used for advertising." Unfortunately, the Census Bureau only collected information on purchased advertising services for the wholesale, retail, and service industries. One additional type of purchase that will fall under Other Items is communication services. This will include payments for telephone, telegraph, data transmission, telex, and phototransmission [8].

The five purchase types discussed above (Materials and Supplies, Energy, Resales, Buildings and Equipment, and Other Items) will collectively make up Total Purchases. This figure will be determined for two-digit SIC business and government industries. In manufacturing, total purchases will be presented at the four-digit SIC industry level and in wholesale this will be at the three-digit SIC level.

RELATIONSHIP WITH OTHER EXPENDITURES

In addition to purchase information, revenues and labor expenditures will also be collected. An effort will be made to collect purchase, revenue, and labor information in each industry from the same source and for the same 1982 time frame. By consistently collecting these three pieces of information, the relationship of purchases to other expenditures can be established both within and between each

industry.

The category Revenues will represent the income in each industry. In businesses, this will represent the income from the sale of products or services. In governments, revenues will represent receipts from taxes (corporate, income, property, and sales), court fines, licenses, and deposits of earnings by the Federal Reserve System [9].

The labor category will be called Wages and Salaries. An effort will be made to include all expenditures associated with labor. This will represent all employees. Besides the production or hourly workers, it will include management, clerical, and functional personnel. In addition to the wages and salaries that are paid directly to the employees, this category will include supplemental labor costs and benefits. This will include two types of benefits: (1) those required by state or federal regulations (employer social security and unemployment taxes), and (2) those benefits which are not legally required. The last type of benefit will include such things as: medical and pension plans, and insurance programs [10]. It is interesting to note that these benefit packages are "purchases." Unfortunately, there was insufficient detail in the benefit figures to break out these purchases for labor benefit packages.

A final category, Other Payments will be derived by subtracting total purchases plus wages and salaries from revenues. This final category will represent all expenses

not covered by purchases or wages and salaries. The "other payments" category will include such items as taxes, depreciation, interest paid, dividends, and retained earnings. In governments, this will represent transfer payments, grants, and interest on the debt. In some cases this may result in a negative number, which indicates that payments exceeded revenues. When this occurs a footnote will state that losses were incurred.

METHOD OF ANALYSIS

The dollar magnitudes of purchases and the relationship of purchases to other expenditures will be determined by using the formats presented in Tables 3-1 and 3-2 for each of the following eleven major industries at the two-digit SIC level: agriculture, mineral, construction, manufacturing, transportation carriers, communication, utilities, wholesale trade, retail trade, services, and governments.

The format in Table 3-1 will be used to analyze each industry by types of purchases (materials and supplies, energy, resales, buildings and equipment, and other items). The five types of purchases will be aggregated to determine Total Purchases for each industry. There will be cases, however, when certain types of purchase information are not available or applicable to a particular industry. When this occurs, "n/a" will be placed in the table. The five purchase types plus total purchases will be presented in two formats.

Table 3-1: TYPES OF PURCHASES (Millions \$) AND BY PERCENT OF TOTAL PURCHASES

INDUSTRY SIC Codes:	TYPE OF PURCHASE				TOTAL PURCHASES
	Materials and Supplies	Energy	Buildings and Resale Equipment	Other Items	
TOTALS: (\$)					
(%)					100%

**Table 3-2: REVENUES AND EXPENDITURES (Millions \$) AND AS A PERCENT
OF REVENUES, plus PURCHASE/WAGE AND SALARY RATIO**

INDUSTRY SIC Code:	REVENUES	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
TOTALS: (\$)					
(%)	100%				

The first will be by dollars and the second will be by percent of total purchases. These tables will show how the dollar magnitude of purchases varies by type of purchase both within and between industries. There will be some specific analyses between the 448 four-digit SIC manufacturing industries. All data for these industries, however, will be provided to allow future comparisons by others in follow-on research.

The format in Table 3-2 will be used to establish the relationship of Revenues to expenditures: Purchases, Wages and Salaries, and Other Payments. The data in these tables will also be presented in two formats. The first format will show the relationship of expenditures to revenues by dollars and the second will show the relationship as a percent of revenues. The second format will also include a ratio between purchase dollars, and wage and salary dollars. This ratio will be calculated by dividing total purchase dollars by the total dollars spent for wages and salaries. This ratio will establish the importance of purchases vis-a-vis labor expenditures in each industry.

Manufacturing Purchases

Purchases in the manufacturing industries (SIC 20-39) will be given a more detailed analysis than the other industries for two reasons. First, manufacturing is expected to have the largest dollar magnitude of purchases. Secondly, based on findings presented in the literature review in chapter 2, some data is already available for manufacturing

purchases at the two-digit SIC level. Consequently, the purchase information for the manufacturing industries will be presented both at the four-digit SIC classification level and at the two-digit level.

The presentation of the 448 four-digit manufacturing industries will follow the same formats that will be used for the two-digit SIC industries. However, in the table that shows the summary of the revenues and expenditures by dollars, there will be an additional column showing the ranking of the 448 manufacturing industries based on their total purchases. The data for the 448 four-digit manufacturing industries will come from the 1982 Census of Manufactures computer tapes prepared by the Department of Commerce.

All of the purchase calculations and analyses will be accomplished using QUATTRO PRO, a 1989 Copyrighted product of Borland International, Inc. The specific data points needed to calculate the dollar magnitudes of purchases and the relationships of purchases to other expenditures for the eleven industries are estimated to be in excess of 10,000.

LIMITATIONS AND EXCLUSIONS

This research will attempt to calculate the dollar magnitudes of purchases in eleven major industries. The methodology to determine the magnitude of purchases will be very analogous the government's calculation of gross national product. According to Carson [11]: The GNP figures

are based on "data pulled together from diverse sources that undergo considerable processing. Gaps in information may have to be filled by referring to sources that are themselves incomplete. Conflicting evidence may be received from different sources or from slightly differing periods."

George Jaszi [12] felt that the GNP statistics "provided a logical framework for the order-of-magnitude analysis of the major forces that determine the working of the economy." In a like manner, this research will result in an order-of-magnitude estimate of the business and government purchases.

Census Limitations

The best information on purchases that is available comes from the Department of Commerce's economic census program. This census is conducted at five year intervals on a select number of industries.

This dissertation will be based on the year 1982 because that was the year of the most current and available census information. Unfortunately, the year 1982 has two drawbacks: (1) the data is eight years old as of this writing, and (2) 1982 was a recession year [13].

The 1982 economic census did not cover all industries. The following principle industry groups were excluded: agriculture, utilities, communications, transportation carriers, and finance, insurance, and real estate.

In those industries which were part of the census, there was inconsistency in purchase information between

industries. For example, resale purchase information was provided for manufacturing, wholesale, and retail, but not for services. Also, purchases for advertising services were available for wholesale, retail, and services, but not for manufacturing.

Other Limitations

Some purchase information was very limited in both government and private sources. For example, there was little information on purchased services (legal services, accounting services, non-employee insurance, security, and janitorial services) and real estate purchases for land.

Some expenditures that are charged to wages and salaries are actually purchases. The following employee fringe benefits are representative of this type of expenditure: life, hospital, dental, and other health insurance programs. This fringe benefit purchase information was not available in sufficient detail to allow a break out for inclusion in the total purchase figures.

The above purchase limitations will result in an understatement of the total dollar magnitude of purchases for each of the eleven industries included in this research.

This research will not determine the origin of the purchases (i.e., domestic and foreign sources). In addition while many businesses have foreign operations, the economic censuses were limited to domestic operations [14].

In some cases, such as the cost of materials and supplies, some items regarded as 1982 purchases, might have

come from previously purchased inventories. The overall inventory change in 1982, however, was found to be less than 1% of total purchasing costs. Therefore, the amount of purchased cost that might have been related to inventory changes was regarded as negligible for the purpose of this research.

Exclusions

This dissertation will not include the major industry classification of Finance, Insurance, and Real Estate (SIC 60-67). Due to the nature of these industries, purchase information is not routinely collected nor is it readily available.

SUMMARY OF RESULTS

Chapters 4 through 14 will establish the dollar magnitudes of purchases and the relationship of purchases to other expenditures for individual industries. Chapters 15 through 18 will determine the dollar magnitudes of purchases and the relationship of purchases to other expenditures for the eleven major industries. These last four chapters will also present a more detailed analysis of the purchase relationships than those found in the earlier chapters.

Total Magnitudes of Business and Government Purchases

Chapter 15 will establish the importance of purchases by industry and by type of purchase. The aggregate industry information based on the findings in Chapters 4-14 will be used to quantify the total dollar magnitudes of purchases by

businesses and governments.

Comparative Magnitudes - Industrial Concentration of Purchases

Chapter 16 will analyze the magnitudes of purchases for the eleven major industries and the 448 manufacturing four-digit industries. The objective will be to determine the concentration of purchases by both type of purchase and by type of industry.

Comparative Measures - Purchases Versus Revenues, and Wages and Salaries

Chapter 17 will determine the importance of purchases by presenting them within the context of revenues, and other expenditures (such as wages and salaries). This chapter will determine which industries are the most "purchase intensive" relative to labor. This will be accomplished using the purchase/wage and salary dollar ratios from Chapters 4 through 14.

Purchases in the Context of Total Business/Economic Activity

This chapter will establish the relationship between purchases of businesses and governments, and Gross National Product (GNP). There will be a discussion of business operational purchases and specific components of GNP: capital expenditure purchases; government purchases; and consumer purchases. A completed Theoretical Framework for Business/Economic Activity will be presented using the findings from Chapters 4 through 17. The chapter will conclude by addressing the relationship of purchases to

total business/economic activity.

Conclusions and Recommendations

Chapter 19 will summarize the significant findings of chapters 4 through 18. These findings will be used to either accept or reject the five hypotheses that were presented at the beginning of this chapter.

In this final chapter there will also be a section presenting any other significant findings that result from this research. Next, the findings in this dissertation will be used to establish management implications and recommendations. Finally, areas that warrant future research will be pointed out.

ENDNOTES

- [1] Standard Industrial Classification Manual 1972.
(Washington, D.C.: U.S. Government Printing Office, 1972).
- [2] U.S. Bureau of the Census, 1982 Census of Manufactures. Subject Series. General Summary. Part 1. (Washington, D.C.: U.S. Government Printing Office, 1986). p. XXI.
- [3] 1982 Census of Manufactures. Subject Series.
(Washington, D.C.: U.S. Government Printing Office, 1986). p. X.
- [4] 1982 Census of Manufactures. Subject Series.
(Washington, D.C.: U.S. Government Printing Office, 1986). Appendix D. p. D-16.
- [5] 1982 Census of Manufactures. Subject Series.
(Washington, D.C.: U.S. Government Printing Office, 1986). Appendix D. p. D-16.
- [6] 1982 Census of Manufactures. Subject Series.
(Washington, D.C.: U.S. Government Printing Office, 1986). Appendix D. p. D-26.
- [7] 1982 Census of Manufactures. Subject Series.
(Washington, D.C.: U.S. Government Printing Office, 1986). Appendix D. pp. D-11 and D-12.

- [8] U.S. Bureau of the Census, 1982 Census of Wholesale Trade. Industry Series. (Washington, D.C.: U.S. Government Printing Office, 1985). Appendix B-2.
- [9] U.S. Department of the Treasury. Treasury Bulletin, 50th Anniversary. (Washington, D.C.: U.S. Government Printing Office, 1989). p. 9.
- [10] 1982 Census of Wholesale Trade. Industry Series. (Washington, D.C.: U.S. Government Printing Office, 1985). Appendix B-2.
- [11] Carson, Carol S. "Gross National Product and Related Measures." Editors: Frank J. Fabozzi and Harry I. Greenfield. The Handbook of Economic and Financial Measures. (Homewood, IL: Dow Jones-Irwin, 1984). pp. 19-20.
- [12] Duncan, Joseph W. "Statistics Corner." Business Economics. October, 1987. p. 48.
- [13] Peterson, Wallace C. Income, Employment, and Economic Growth. (New York: W.W. Norton and Co., 1984). p. 541.
- [14] 1982 Census of Manufactures. Subject Series. (Washington, D.C.: U.S. Government Printing Office, 1986). p. XXI.

CHAPTER 4: AGRICULTURE (SIC 01-02)

INTRODUCTION

This chapter will present the dollar magnitude of purchases in agriculture which includes crops (SIC 01) and livestock (SIC 02). In addition, the relationship of agricultural purchases to revenues and other expenditures will be presented and analyzed. A summary of agriculture is found in tables 4-1 and 4-2.

THE AGRICULTURE INDUSTRY

The agriculture industry is composed of farms, ranches, nurseries, and greenhouses. Government data includes establishments with at least \$1,000 in agricultural products sold. The Standard Industrial Classification system divides agriculture into crops (SIC 01) and livestock (SIC 02). Crops include: cash grains (wheat, rice, corn and soybeans), field crops (cotton, tobacco, sugar, and potatoes), vegetables and melons, fruits and nuts, and horticultural specialties (ornamental and nursery crops). Livestock includes: livestock, dairy, poultry and eggs, and animal specialties (horses, rabbits, fish, and honey).

Agricultural establishments were classified according to the crop or livestock product that made up 50 percent or more of the value of agricultural products sold [1].

Table 4-1 AGRICULTURE: TYPES OF PURCHASES (Millions \$) AND BY PERCENT OF TOTAL PURCHASES

AGRICULTURE SIC Codes: 01-02	TYPE OF PURCHASE				TOTAL PURCHASES
	Materials and Supplies	Energy	Buildings and Equipment	Other Items	
TOTALS: (\$)	\$42,958	\$10,422	n/a	\$27,094	\$91,659
(%)	46.9%	11.4%	n/a	29.6%	100%

Table 4-2: AGRICULTURE: REVENUES AND EXPENDITURES (Millions \$) AND AS A PERCENT OF REVENUES, plus PURCHASE/WAGE AND SALARY RATIO

AGRICULTURE SIC Code: 01-02	REVENUES	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
TOTALS: (\$)	\$148,254	\$91,659	\$10,835	\$45,760	8.5
(%)	100%	61.8%	7.3%	30.9%	

DATA SOURCES AND LIMITATIONS

The information presented in tables 4-1 and 4-2 came from two sources: (1) The U.S. Department of Agriculture's Economic Indicators of the Farm Sector [2], and (2) the U.S. Department of Commerce's 1982 Census of Agriculture.

Since many of the agricultural establishments have multiple products, a break out of purchases between livestock and crop products was not possible. Consequently, purchases were presented in an aggregate form. Tables 4-1 and 4-2 do not include all purchases. For example, real estate transactions were not included.

PURCHASES

Purchases made up the largest expenditure for agriculture. The amount spent on purchases was \$92 billion, which accounted for 62 percent of the total expenditures.

The summary Table 4-1 shows that purchases for Materials and Supplies were \$43 billion. This was the major type of purchase in agriculture (47%). This category included the cost for feed (\$16.9 billion); seed (\$4 billion) which included bulbs, plants, and trees; livestock and poultry (\$9.7 billion); fertilizer and lime (\$8.8 billion); and pesticides (\$3.6 billion) [3].

Energy, at \$10 billion, accounted for 11 percent of total purchases. The energy figures in Table 4-1 represent payments for purchased fuels and oil (\$8.3 billion) and electricity (\$2.1 billion) [4].

Data for Resale purchases in agriculture were not available (n/a).

Purchases for Buildings and Equipment were \$27 billion and made up 30 percent of total purchases. This type of purchase included the following: (1) capital expenditures, (2) rentals, and (3) repairs.

(1) Capital expenditures were \$13.6 billion. This included: a. New construction, additions and major improvements (\$3.8 billion). The capital expenditures were performed on service buildings, other structures, fences, windmills, wells, dams and ponds, and drainage ditches. These capital expenditures did not include: a. farm households, b. tractors (\$2.9 billion), c. trucks (\$1.5 billion), d. automobiles that were for farm business use (\$364 million), and e. other machinery and equipment (\$5.1 billion) [5].

(2) Rental payments for buildings and equipment were \$5.6 billion [6].

(3) The repair and maintenance of buildings, motor vehicles, and machinery, was \$7.9 billion. This did not include farm households [7].

The purchasing of Other Items was \$11.2 billion and accounted for 12 percent of the total purchases. Other items consisted of: (1) contract labor (as opposed to hired farm labor) \$1.2 billion [8]. (2) Machine hire and custom work: \$2.8 billion [9]. This was contract work performed by others for such activities as plowing, planting, spraying, and

harvesting [10]. (3) Other operating expenses which were: \$7.1 billion. This last grouping included: insurance, veterinarian fees, telephones, irrigation, marketing services, grazing fees, and other miscellaneous items [11].

REVENUES AND EXPENDITURES

Table 4-2 presents purchases in relation to revenues, wages and salaries, and other payments. The \$92 billion spent on purchases made up the largest expenditure for agriculture, sixty two percent of revenues.

Agriculture Revenues were \$148 billion. This was divided between crops: \$75 billion (50.3%), livestock: \$70 billion (47.3%), and Government payments: \$3.5 billion (2.3%) [12].

Wages and Salaries for hired farm labor was \$10.8 billion. This was composed of \$9.3 billion for cash payments and \$1.5 billion for fringe benefits and social security payments [13]. Hired farm labor included all persons doing farm or ranch work for cash payments [14].

The expenditures for Other Payments represent all expenses not covered under purchases plus wages and salaries. The following items would be representative of this category: taxes, depreciation, interest, and retained earnings. The other payment figures were derived by subtracting the sum of purchases plus wages and salaries from revenues. Total other payments came to \$46 billion which was 31 percent of the expenditures.

SUMMARY

Tables 4-2 shows that purchasing in agriculture was significant both in terms of its dollar magnitude (\$92 billion) and as a percent of expenditures (62%). Table 4-2 also shows that purchases exceeded wages and salaries by a ratio of greater than eight-to-one.

ENDNOTES

- [1] U.S. Department of Commerce, 1982 Census of Agriculture. Volume 2, Subject Series. Part 1. (Washington, D.C. U.S. Government Printing Office, 1985). p. XIII-XV.
- [2] U.S. Department of Agriculture. Economic Indicators of the Farm Sector: Income and Balance Sheet Statistics, 1983. National Economics Division, Economic Research Service, (Washington, D.C. U.S. Government Printing Office, 1985).
- [3] Economic Indicators of the Farm Sector: Income and Balance Sheet Statistics, 1983. p. 64.
- [4] Economic Indicators of the Farm Sector: Income and Balance Sheet Statistics, 1983. p. 64.
- [5] Economic Indicators of the Farm Sector: Income and Balance Sheet Statistics, 1983. p. 71.
- [6] Economic Indicators of the Farm Sector: Income and Balance Sheet Statistics, 1983. p. 64.
- [7] Economic Indicators of the Farm Sector: Income and Balance Sheet Statistics, 1983. p. 70.
- [8] Economic Indicators of the Farm Sector: Income and Balance Sheet Statistics, 1983. p. 67.
- [9] Economic Indicators of the Farm Sector: Income and Balance Sheet Statistics, 1983. p. 64.
- [10] 1982 Census of Agriculture. Volume 2, Subject Series. Part 1. p. XVI.
- [11] Economic Indicators of the Farm Sector: Income and Balance Sheet Statistics, 1983. p. 68 and 69.

- [12] Economic Indicators of the Farm Sector: Income and Balance Sheet Statistics, 1983. p. 60.
- [13] Economic Indicators of the Farm Sector: Income and Balance Sheet Statistics, 1983. p. 67 and 69.
- [14] 1982 Census of Agriculture. Volume 2, Subject Series. Part 1. p. XVI.

CHAPTER 5: MINERAL INDUSTRIES (SIC 10-14)

INTRODUCTION

This chapter will present the dollar magnitude of purchases in the mineral industries. In addition, the relationship of mineral industry purchases to revenues and other expenditures will be presented and analyzed. A summary of the information is provided in Tables 5-1 through 5-4.

THE MINERAL INDUSTRY

Mineral industries include all establishments primarily engaged in mining. These include the extraction of minerals existing naturally: solids, such as coal and ores; liquids, such as crude petroleum; and gases, such as natural gas. Mining also includes quarrying, well operations, milling, and other activities needed to make a mineral marketable [1].

Mineral industries were classified based on the principle mineral produced. The Standard Industrial Classification (SIC) system groups the mineral industries into five broad categories: metal mining, anthracite coal mining, bituminous and lignite coal mining, oil and gas extraction, and nonmetallic minerals [2].

Metal Mining (SIC 10) included such metals as iron, copper, lead, zinc, gold, silver, bauxite, mercury, and other miscellaneous metal ores. This category also includes metal mining services. Metal mining accounted for 2% of

Table 5-1: MINERAL INDUSTRIES: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF MINERAL INDUSTRY	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Resale	Buildings and Equipment	Other Items	
10	Metal Mining	\$2,110	\$889	n/a	\$1,216	\$8	\$4,223
11	Anthracite Coal	109	21	n/a	28	n/a	158
12	Bituminous Coal	9,555	1,231	282	3,512	1,960	16,540
13	Oil & Gas	63,735	4,017	285	43,735	21,486	133,258
14	Nonmetallic	2,313	1,283	52	1,217	315	5,180
TOTALS: (\$)		\$77,822	\$7,441	\$658	\$49,707	\$23,974	\$159,602
(\$)		48.8%	4.7%	0.4%	31.1%	15.0%	100%

Table 5-2: MINERAL: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES

SIC Code	TYPE OF MINERAL INDUSTRY	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Resale	Buildings and Equipment	Other Items
10	Metal Mining	50.0%	21.1%	n/a	28.8%	0.1%
11	Anthracite Coal	69.0%	13.3%	n/a	17.7%	n/a
12	Bituminous Coal	57.8%	7.4%	1.7%	21.2%	11.9%
13	Oil & Gas	47.8%	3.0%	0.3%	32.8%	16.1%
14	Nonmetallic	44.7%	24.8%	1.0%	23.5%	6.1%
MINERAL AVERAGE		48.8%	4.7%	0.4%	31.1%	15.0%

Table 5-3: MINERAL INDUSTRIES: REVENUES AND EXPENDITURES (Millions \$)

SIC Code	TYPE OF MINERAL	REVENUES	EXPENDITURES		
			Purchases	Wages & Salaries	Other Payments
10	Metal Mining	\$5,287	\$4,223	\$2,367	*(\$1,303)
11	Anthracite Coal	293	158	93	42
12	Bituminous Coal	28,261	16,540	9,480	2,241
13	Oil & Gas	207,091	133,258	20,528	53,305
14	Nonmetallic	9,068	5,180	2,767	1,121
TOTALS: (\$)		\$249,999	\$159,602	\$35,235	\$55,162
(%)		100%	63.8%	14.1%	22.1%

* Losses incurred, payments exceeded revenues.

**Table 5-4: MINERAL INDUSTRIES: EXPENDITURES AS A PERCENT OF REVENUE
plus PURCHASE/WAGE AND SALARY RATIO**

SIC Code	TYPE OF MINERAL	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
10	Metal Mining	79.9%	44.8%	*(24.7)%	1.8
11	Anthracite Coal	53.9%	31.7%	14.3%	1.7
12	Bituminous Coal	58.5%	33.5%	7.9%	1.7
13	Oil & Gas	64.3%	9.9%	25.7%	6.5
14	Nonmetallic	57.1%	30.5%	12.4%	1.9
MINERAL AVERAGE		63.8%	14.1%	22.1%	4.5

* Losses incurred, payments exceeded revenues.

the total mineral industry revenues [3].

Coal mining is divided between Anthracite (SIC 11) and Bituminous Coal (SIC 12) mining. Anthracite mining is a negligible part of coal mining industry. There are only 173 anthracite firms versus 5,000 for bituminous coal. Anthracite coal accounts for only 1% of the total coal revenues. The Bituminous coal category also includes lignite coal mining. All coal accounts for 11 percent of the total mineral industry revenues [4].

Oil and Gas extraction (SIC 13) includes crude petroleum and natural gas. Oil and gas field services also fall in this category. Field services include drilling wells and field exploration. Oil and gas exploration, however, dominated the entire mineral industry. Its \$207 billion in revenues accounted for 83 percent of the mineral industry total revenues [5].

Nonmetallic minerals (SIC 14) included stone, sand, gravel, and clay. In addition, it also included chemical and fertilizer minerals such as potash, phosphates, salt, and sulphur. Nonmetallic minerals made up four percent of the mineral industry total revenues [6].

DATA SOURCES AND LIMITATIONS

All of the information presented in Tables 5-1 through 5-4 came from the 1982 Census of Mineral Industries. The census provided a comprehensive measure of the mining sector. Information was collected on mining establishments

with one or more employees [7].

The census, however, did not contain data on all mineral production. Mining operations which were secondary activities at manufacturing establishments were not included. Also, the production of minerals (particularly stone, sand and gravel) by federal, state, and local governments and by highway and construction contractors were not included [8].

In many cases, mineral firms were involved in activities that fell into more than one major mineral category. When this occurred, the Bureau of the Census requested that firms provide separate reports that split out the different mineral activities. There were cases, however, where two mineral products could not be sufficiently distinguished from company records [9].

Tables 5-1 and 5-2 do not include all purchases. For example, the expenditures for advertising, consultants, and insurance [10] were not collected in the census. Also, excluded were the expenses for land and mineral rights [11].

PURCHASES

Purchases made up the largest expenditure in the mineral industry. The amount spent on purchases was \$160 billion, which accounts for 64% of the total expenditures.

The amount spent on purchases was four and a half times as great as the \$35 billion spent on wages and salaries.

Tables 5-1 and 5-2 show that purchases for Materials

and Supplies made up almost \$78 billion [12]. This was the largest type of purchase in the mineral industry (49%). This category includes supplies, machinery and equipment used in mine development and plant expansion and capitalized repair expenses. The figures include freight and other direct charges (after discounts) incurred in acquiring the materials and supplies [13].

Energy, at \$7 billion, accounted for almost five percent of the total purchases [14]. The energy figures in Tables 5-1 and 5-2 represent payments for purchased coal, distillate and residual fuel oil, gas, gasoline, and electricity [15].

Resales were a minor type of purchase. The \$658 million for resales was less than 1 percent of the total purchases for all mineral industries [16].

Purchases for Buildings and Equipment were \$49.7 billion and made up 31 percent of total purchases. This type of purchase included: (1) capital expenditures (\$47.8 billion) for new and used structures, machinery and equipment (chargeable to fixed asset accounts), and mineral exploration and development [17] (such as core sampling and land clearing), and (2) rental payments for structures, machinery and equipment (\$1.9 billion) [18].

The purchase of Other Items accounted for 15 percent of the total purchases. Other items consisted mainly of work subcontracted to others (99%). The remaining one percent was for communication services purchased from other

companies [19].

REVENUES AND EXPENDITURES

Tables 5-3 and 5-4 present purchases in relation to revenues, wages and salaries, and other payments. The \$160 billion spent on purchases made up the largest expenditure by the mineral industries (64%).

Revenues were \$250 billion in 1982 [20] and represent the receipts for mineral products at the net selling values, f.o.b. mine or plant after discounts and allowances. These figures exclude freight charges [21].

Wages and Salaries covered full-time and part-time employees. It included production, development, and exploration workers, as well as supervisory and office personnel [22]. The costs for fringe benefits and mandatory requirements such as Social Security were also included. Total wages and salaries were \$35 billion [23] which was 14 percent of the total expenditures.

The expenditures for Other Payments represented all expenses not covered under purchases and wages and salaries. The following items would be representative of this category: taxes, depreciation, interest paid, dividends, advertising, and retained earnings. The other payment figures were derived by subtracting the sum of purchases plus wages and salaries from revenues. Total other payments came to \$55 billion which was 22 percent of expenditures.

The metal mining industry (SIC 10) did not make a

profit in 1982 [24]. Table 5-3 shows that payments exceeded revenues.

SUMMARY

Tables 5-3 and 5-4 show that purchases in the mineral industries was significant both in terms of dollar magnitude (\$160 billion) and as a percent of expenditures (64%). Purchases exceeded wages and salaries by a ratio of four and a half-to-one in mineral industries.

ENDNOTES

- [1] U.S Bureau of the Census, 1982 Census of Mineral Industries. Subject Series (Washington, D.C.: U.S. Government Printing Office, 1984), p. VII.
- [2] 1982 Census of Mineral Industries. Subject Series. General Summary. p. 1-2.
- [3] 1982 Census of Mineral Industries. Subject Series. General Summary. p. 1-22.
- [4] 1982 Census of Mineral Industries. Subject Series. General Summary. p. 1-2.
- [5] 1982 Census of Mineral Industries. Subject Series. General Summary. p. 1-2.
- [6] 1982 Census of Mineral Industries. Subject Series. General Summary. p. 1-3.
- [7] 1982 Census of Mineral Industries. Subject Series. p. V.
- [8] 1982 Census of Mineral Industries. Subject Series. p. VII.
- [9] 1982 Census of Mineral Industries. Subject Series. p. VII.
- [10] 1982 Census of Mineral Industries. Subject Series. Appendix A p. A-2.

- [11] 1982 Census of Mineral Industries. Subject Series. Appendix A p. A-3.
- [12] 1982 Census of Mineral Industries. Subject Series. General Summary. p. 1-22.
- [13] 1982 Census of Mineral Industries. Subject Series. Appendix A p. A-2.
- [14] 1982 Census of Mineral Industries. Subject Series. General Summary. p. 1-22.
- [15] 1982 Census of Mineral Industries. Subject Series. Appendix A p. A-4.
- [16] 1982 Census of Mineral Industries. Subject Series. General Summary. p. 1-22.
- [17] 1982 Census of Mineral Industries. Subject Series. Appendix A p. A-3.
- [18] 1982 Census of Mineral Industries. Subject Series. General Summary. p. 1-22.
- [19] 1982 Census of Mineral Industries. Subject Series. General Summary. p. 1-22.
- [20] 1982 Census of Mineral Industries. Subject Series. General Summary. p. 1-22.
- [21] 1982 Census of Mineral Industries. Subject Series. Appendix A p. A-2.
- [22] 1982 Census of Mineral Industries. Subject Series. Appendix A p. A-1.
- [23] 1982 Census of Mineral Industries. Subject Series. General Summary. p. 1-22.
- [24] U.S Department of Commerce, Survey of Current Business. (Washington, D.C.: U.S. Government Printing Office, July 1986), p. 72.

CHAPTER 6: CONSTRUCTION INDUSTRIES (SIC 15-17)

INTRODUCTION

This chapter will present the dollar magnitude of purchases in the construction industry. In addition, the relationship of construction purchases to revenues and other expenditures will be presented and analyzed. A summary of the information is provided in Tables 6-1 through 6-4.

THE CONSTRUCTION INDUSTRY

Construction firms are involved in new construction, as well as in the additions, alterations, maintenance and repair to existing buildings, structures, or facilities [1]. The Standard Industrial Classification (SIC) system groups the construction activities into three broad categories: general building, heavy construction, and special trade [2].

General building contractors (SIC 15) are primarily engaged in the construction of family housing, office buildings, stores, farm buildings, industrial buildings, and warehouses. General building contractors accounted for 36% of total construction revenues.

Heavy construction (SIC 16) contractors are involved in the construction of highways, streets, bridges, tunnels, air fields, and water, sewage, and utility lines. In terms of total construction revenues, this was the smallest construction category (22%).

Special trade contractors (SIC 17) include such

Table 6-1: CONSTRUCTION: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF CONSTRUCTION	TYPE OF PURCHASE				TOTAL PURCHASES
		Materials and Supplies	Energy	Buildings and Equipment	Other Items*	
15	General Building	\$24,533	\$1,057	n/a	\$2,614	\$56,224
16	Heavy Construction	20,260	2,080	n/a	4,998	12,847
17	Special Trade	45,098	2,893	n/a	5,665	10,402
TOTALS: (\$)		\$89,891	\$6,030	n/a	\$13,277	\$79,473
(\$)		47.7%	3.2%	n/a	7.0%	42.1%

* Predominately Subcontract Work

Table 6-2: CONSTRUCTION: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES

SIC Code	TYPE OF CONSTRUCTION	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Resale Equipment	Buildings and Other Items*	
15	General Building	29.1%	1.3%	n/a	3.1%	66.5%
16	Heavy Construction	50.4%	5.2%	n/a	12.4%	32.0%
17	Special Trade	70.4%	4.5%	n/a	8.8%	16.3%
CONSTRUCTION AVERAGE		47.7%	3.2%	n/a	7.0%	42.1%

* Predominately Subcontract Work

Table 6-3: CONSTRUCTION: REVENUES AND EXPENDITURES (Millions \$)

SIC Code	TYPE OF CONSTRUCTION	REVENUES	EXPENDITURES			
			Purchases	Salaries	Other	Payments
15	General Building	\$113,239	\$84,428	\$20,179	\$8,632	
16	Heavy Construction	67,271	40,185	22,905	4,181	
17	Special Trade	129,657	64,058	49,347	16,252	
TOTALS: (\$)		\$310,167	\$188,671	\$92,431	\$29,065	
(%)		10	60.8%	29.8%	9.4%	

**Table 6-4: CONSTRUCTION: EXPENDITURES AS A PERCENT OF REVENUES,
plus PURCHASE/WAGE AND SALARY RATIO**

SIC Code	TYPE OF CONSTRUCTION	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
15	General Building	74.6%	17.8%	7.6%	4.2
16	Heavy Construction	59.7%	34.0%	6.3%	1.8
17	Special Trade	49.4%	38.1%	12.5%	1.3
CONSTRUCTION AVERAGE		60.8%	29.8%	9.4%	2.0

construction activities as plumbing, heating, air conditioning, painting, electrical work, carpentry, and masonry [3]. Special trade contractors accounted for the largest share of the construction revenue (42%).

Total construction revenues in 1982 were \$310 billion. Eighty percent of the construction work was for private projects and the remaining 20 percent was on government work at the local, state, and federal level [4].

DATA SOURCES AND LIMITATIONS

All of the information presented in Tables 6-1 through 6-4 came from the 1982 Census of Construction. The census was based on a survey of all medium and large construction firms (20 or more employees) and a sample of the smaller firms (less than 20 employees) [5].

The information presented in tables 6-1 through 6-4 understates the magnitude of the construction industry (and the expenditures for purchases). This occurred because the census covered only those construction firms that had payrolls (paid employees) and were primarily engaged in contract construction. There were 457,000 construction firms (33% of the total) that fell under this criteria. These firms did account for 89 percent of the estimated total construction revenues [6]. Eleven percent of the construction revenues came from 993,000 construction firms that had "no employees." Many of these firms were small "one-man," part-time operations. Non-employee firms were

usually special trade contractors (SIC 17) in such fields as plumbing, heating, and electrical work. These firms made up 70% of all special trade firms, but accounted for only 12% of construction revenues [7].

The census information did not contain data on all purchases in the construction industries. For example, the expenditures for advertising, consultants, insurance and real estate transactions were not collected. Also, those materials and supplies that were supplied at no cost to the construction firms were not included in the census figures [8].

Individual Resale purchase figures were not available (n/a). The items that were bought and resold to others were included within material and supply purchases [9].

PURCHASES

Purchases made up the largest expenditure in the construction industry. The amount spent on purchases was \$189 billion, which accounts for 61% of the total expenditures. The amount spent on purchases was twice as great as the \$93 billion spent on wages and salaries.

Tables 6-1 and 6-2 show that purchases for Materials and Supplies made up almost \$90 billion [10]. This was the largest type of purchase for the construction industry (48%).

All materials and supplies as well as expendable tools used in construction fell under this category. The figures

include freight and other direct charges incurred in acquiring the materials and supplies [11].

Energy, at \$6 billion, accounted for just over three percent of the total purchases. The energy figures in Tables 6-1 and 6-2 represent payments for natural and manufactured gas, fuel oil, coal, coke, gasoline, kerosene and electricity [12].

Purchases for Buildings and Equipment were \$13.3 billion and made up seven percent of total purchases. This type of purchase included: (1) capital expenditures (\$5.1 billion) for new and used structures, machinery and equipment [13], (2) rental payments for structures, machinery and equipment (\$4.5 billion), and (3) the repair of structures, machinery and equipment (\$3.7 billion) [14].

The purchasing of Other Items accounted for over 42 percent of the total purchases. Other items consisted mainly of construction work subcontracted to others (98%). Since subcontracting is so significant in the construction industry, it will be addressed separately.

The remaining two percent was for communication services purchased from other companies. Communication services totaled \$1.3 billion for all construction [15].

Subcontract Work

The purchasing expenditures for subcontract construction work were \$78 billion. This constituted 41% of the total purchases in the construction industry. Subcontracting to others by general contractors (SIC 15)

accounted for the majority (70.8%) of all the purchased subcontract work. Heavy construction contractors (SIC 16) accounted for 16%, and special trade contractors (SIC 17) for 12.3% of the purchased subcontract work [16].

Subcontract work is frequently a significant expenditure for construction firms because of the high costs for some machinery and equipment. Due to the specialized nature, and in some cases the requirements for highly skilled operators, contractors who require the use of this type of equipment, often subcontract rather than purchase the equipment [17].

REVENUES AND EXPENDITURES

Tables 6-3 and 6-4 present purchases in relation to revenues, wages and salaries, and other payments. The \$188 billion spent on purchases made up the largest expenditure in the construction industry (61%).

The construction Revenues were \$310 billion in 1982 [17]. Most of the revenues came from new construction (82%). Maintenance and repair work made up the remaining 18 percent. Government projects (federal, state and local) accounted for 20 percent of the revenues and private projects came to 80 percent [19].

Revenues represent "total construction" revenues as opposed to "total business" revenues. Non-construction revenues from such activities as retail and wholesale trade, the renting of equipment, and real estate transactions were

excluded [20].

Wages and Salaries covered full-time and part-time employees. This included construction workers as well as supervisory and office personnel. The costs of fringe benefits and mandatory requirements such as Social Security were also included. Total wages and salaries were \$92 billion [21] which was 30 percent of the total expenditures.

The expenditures for Other Payments represent all expenses not covered under purchases plus wages and salaries. The following items would be representative of this category: taxes, depreciation, interest paid, dividends, advertising, and retained earnings. The other payment figures were derived by subtracting the sum of purchases plus wages and salaries from revenues. Total "other payments" came to \$29 billion which was nine percent of the expenditures.

SUMMARY

Tables 6-3 and 6-4 show that purchases in the construction industries was significant both in terms of dollar magnitude (\$189 billion) and as a percent of expenditures (61%). Purchases exceeded wages and salaries by a ratio of two-to-one in the construction industries.

ENDNOTES

- [1] U.S Bureau of the Census, 1982 Census of Construction. Geographic Area Series Series (Washington, D.C.: U.S. Government Printing Office, 1984), Appendix A, p. A-1.

- [2] Mathieu, Renee and Rubinstein, Nathan. "The 1982 Census of Construction: A Wealth of Economic Data." Construction Review. (Washington, D.C.: U.S. Government Printing Office, September/October 1985), p. 14.
- [3] Mathieu and Rubinstein, p.15.
- [4] U.S Bureau of the Census, 1982 Census of Construction. Industry Series (Washington, D.C.: U.S. Government Printing Office, 1984), p. 8.
- [5] 1982 Census of Construction. Industry Series. p. V.
- [6] 1982 Census of Construction. Industry Series. p. IV.
- [7] Mathieu and Rubinstein, p. 5.
- [8] 1982 Census of Construction. Geographic Area Series. Appendix A, p. A-3.
- [9] 1982 Census of Construction. Geographic Area Series. Appendix A, p. A-2.
- [10] 1982 Census of Construction. Industry Series. p. 8.
- [11] 1982 Census of Construction. Geographic Area Series. Appendix A, p. A-2.
- [12] 1982 Census of Construction. Geographic Area Series. Appendix A, p. A-3.
- [13] 1982 Census of Construction. Industry Series. p. 10.
- [14] 1982 Census of Construction. Industry Series. p. 8.
- [15] 1982 Census of Construction. Industry Series. p. 8.
- [16] Mathieu and Rubinstein, p. 8.
- [17] Mathieu and Rubinstein, p. 9.
- [18] 1982 Census of Construction. Industry Series. p. 8.
- [19] Mathieu and Rubinstein, p. 2.
- [20] 1982 Census of Construction. Geographic Area Series. Appendix A, p. A-2.
- [21] 1982 Census of Construction. Industry Series. p. 8.

CHAPTER 7: MANUFACTURING (SIC 20-39)

INTRODUCTION

This chapter will present the dollar magnitude of purchases in manufacturing, which covers twenty major two-digit Standard Industrial Classification (SIC) groups that can be further broken down into 448 four-digit SIC industries that make up manufacturing. In addition, the relationship of revenues and other expenditures within each manufacturing group will be presented. Finally, all of the 448 industries will be ranked based upon their total dollar magnitude of purchases. The largest will be ranked number one and the smallest number 448.

The information for each of the twenty major manufacturing groups will be totaled to show the relationship of purchases for all manufacturing. This information will be used to determine:

1. The magnitude ranking for the two digit manufacturing groups in relation to total manufacturing purchases,
2. The top 50 percent four digit manufacturing industries and their cumulative percentage of the total manufacturing purchases, and
3. The frequency in which labor costs exceed purchases and the frequency in which purchase costs exceed labor costs.

THE MANUFACTURING INDUSTRY

According to the Standard Industrial Classification System, manufacturing includes all establishments that are primarily engaged in the mechanical or chemical transformation of inorganic or organic substances into new products. It also includes the assembly of component parts of products. Production is usually for the wholesale market, other plants of the same company, or for separate industrial users [1].

Manufacturing industries are classified according to the principle products produced.

DATA SOURCES AND LIMITATIONS

All of the information presented in the subsequent Tables of this chapter come from the 1982 Census of Manufactures. The census is conducted only at five year intervals and provides the most comprehensive measures of the industrial sector [2].

In many cases a manufacturing plant was involved in the production of products in separate SIC categories. When this occurred the company was required to submit a separate report for each activity if it was of substantial size. The census found that for the most part, companies cooperated and "split out" the different manufacturing activities. There were cases, however, where two or more products were made on the same production line that could not be sufficiently distinguished in the company records [3].

The tables in this chapter do not include all purchases because not all of the purchase data was collected. For example, the expenditures for advertising, consultants, and insurance were not requested in the census. Also, excluded were the expenses for real estate transactions.

All of the information on the 448 four digit SIC manufacturing industries came from the Bureau of the Census public-use computer tapes. The summation of the individual four-digit industry figures may not add up to the two digit totals because the Census Bureau frequently withheld information. This was done to avoid disclosing data on individual companies. This sometimes occurred when one company dominated an industry. As an example, in the Sewing Machine Industry (SIC 3636), the figures for materials, resales, and contract work were withheld. The withheld data, however, was included in the two-digit SIC figures.

The industry descriptions that are found within each manufacturing subchapter came from Appendix C of the Manufactures-Subject Series [4].

PURCHASES

For this research, purchase figures for each major manufacturing groups were divided into five types: 1. Materials and Supplies, 2. Energy, 3. Resales, 4. Buildings and Equipment and 5. Other Items. As was discussed in Chapter 3, these five groups were selected because they were applicable across multiple industries and they account for

the vast majority of the dollar expenditures for purchases.

Purchases for Materials and Supplies included: all raw materials, semifinished goods, parts, components, containers, scrap, supplies, etc., that were (1) put into production, (2) used as operating supplies, or (3) used in repair and maintenance.

Energy purchases were composed of fuels and electric energy. The fuels consumed were for heat, power, or the generation of electricity. Fuels included such items as coal, coke, natural and manufactured gas, fuel oil, liquefied petroleum gas, and gasoline.

Resales were products that were bought and then sold without further manufacturing, processing, or assembly.

Building and Equipment purchases included three areas: capital expenditures, repairs, and rentals. Capital expenditures were for new and used: (1) buildings and other structures, and (2) machinery and equipment. The purchased repair services were the amounts paid to other establishments for repair services such as outside contractors and garages. This also included all noncapitalized repairs to buildings, structures, machinery and equipment.

The last type of purchase that falls under buildings and equipment category were rental purchases. This represented the payments made to other establishments for the use of all items for which depreciation reserves would have been maintained if they had been owned by the company.

This included rentals for buildings and other structures, and machinery and equipment.

Other item purchases were for contract work and communication services. Contract work represented work (on materials or parts) that was subcontracted to another company. Purchased communication included telephone, telegraph, data transmission, and all other related services.

REVENUES AND EXPENDITURES

Each major manufacturing group will have tables showing purchases in relation to Revenues, Wages and Salaries, and Other Payments.

Revenues included the net selling values of products, f.o.b. plant, after discounts and allowances. This excluded the freight charges and excise taxes. Other forms of income were not included [5].

Wages and Salaries covered full-time and part-time employees. It included production as well as nonproduction workers such as supervisory and office personnel. It also included functional support areas such as legal, marketing, and finance. The costs for fringe benefits and mandatory requirements such as Social Security were also included in "wages and salaries" to allow full representation of the actual labor expenditures. It is interesting to note that many of the fringe benefits such as medical, dental, and insurance "packages" are really purchased services.

The expenditures for Other Payments represent all expenses not covered under purchases plus wages and salaries. The following items would be representative of this category: taxes, depreciation, interest paid, dividends, advertising, and retained earnings. The "other payments" figures were derived by subtracting the sum of purchases plus wages and salaries from revenues.

A. FOOD AND KINDRED PRODUCTS (SIC 20)

Industry Description

This food industry included firms that manufactured or processed foods and beverages for human consumption. This group also included related products such as manufactured ice, chewing gum, and vegetable and animal fats and oils. Prepared feeds for animals and fowls were also included.

Purchases

The food industry had more purchases than any other manufacturing industry. The \$203 billion for purchases represented 16 percent of all manufacturing purchases. The food manufacturing industry also had the most resale purchases in manufacturing (\$15 billion). Within this industry, the companies that spent the most for purchases were meat packing plants (\$39 billion), fluid milk companies (\$15 billion) and soft drink companies (\$11 billion). The food industry is second only to the petroleum industry in the dollar ratio of purchases to wages and salaries (6.3 to 1). Purchases accounted for 72 percent of the expenditures

Table 7A-1: FOOD MANUFACTURING: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Buildings and Equipment	Resale	Other Items	
20	FOOD MANUFACTURING	\$171,482	\$5,029	\$15,234	\$10,196	\$815	\$202,756
2011	Meat Packing Plants	35,660	322	3,023	439	66	39,509
2013	Sausages & Prepared Meats	7,903	151	1,307	281	30	9,672
2016	Poultry Dressing Plants	6,732	217	152	288	45	7,433
2017	Poultry & Egg Processing	937	23	75	46	3	1,085
2021	Creamery Butter	1,491	17	46	16	2	1,573
2022	Cheese	8,275	139	589	231	16	9,249
2023	Milk, Condensed	2,985	101	191	136	22	3,436
2024	Ice Cream, Frozen Dessert	1,626	62	257	142	9	2,097
2026	Fluid Milk	12,957	256	1,636	553	38	15,440
2032	Canned Specialties	2,195	82	94	192	4	2,566
2033	Canned Fruits, Vegetables	5,384	229	143	409	23	6,188
2034	Dehydrated Fruit	901	69	0	69	17	1,056
2035	Pickles & Salad Dressings	2,265	42	225	115	4	2,650
2037	Frozen Fruits, Vegetables	2,625	188	150	314	13	3,289
2038	Frozen Specialties	2,360	93	510	235	9	3,207

Table 7A-1 Continued: FOOD MANUFACTURING: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Resale	Buildings and Equipment	Other Items	
20	FOOD MANUFACTURING	\$171,482	\$5,029	\$15,234	\$10,196	\$815	\$202,756
2041	Flour, Grain Mill Products	3,586	88	150	148	6	3,976
2043	Cereal Breakfast Foods	1,251	62	161	198	3	1,675
2044	Rice Milling	1,354	36	105	63	4	1,562
2045	Blended & Prepared Flour	737	11	76	45	7	876
2046	Wet Corn Milling	1,733	305	53	369	14	2,473
2047	Dog, Cat, Pet Food	1,962	74	97	134	9	2,276
2048	Prepared Feeds	8,416	140	538	216	22	9,332
2051	Bread and Cake	3,730	242	1,286	603	47	5,908
2052	Cookies and Crackers	1,581	75	200	147	29	2,031
2061	Raw Cane Sugar	710	36	0	108	13	866
2062	Cane Sugar Refining	2,275	117	17	95	18	2,521
2063	Beet Sugar	909	183	6	49	6	1,152
2065	Confectionery Products	3,189	97	275	275	18	3,853
2066	Chocolate, Cocoa Products	1,160	32	12	67	15	1,286
2067	Chewing Gum	288	10	0	24	15	337

Table 7A-1 Continued: FOOD MANUFACTURING: TYPES OF PURCHASES (Millions \$)

TYPE OF		TYPE OF PURCHASE					TOTAL
SIC Code	MANUFACTURING	Materials and Supplies	Energy	Resale Equipment	Buildings and Other Items	PURCHASES	
2074	Cottenseed Oil Mills	583	53	79	77	1	792
2075	Soybean Oil Mills	6,968	211	713	246	7	8,146
2076	Vegetable Oil Mills	358	16	93	77	2	546
2077	Animal, Marine Fats & Oil	959	139	84	95	11	1,287
2079	Shortening & Cooking Oils	3,431	108	94	139	15	3,786
2082	Malt Beverages	6,349	267	40	1,026	23	7,705
2083	Malt	425	53	0	40	2	520
2084	Wines, Brandy	1,690	34	36	166	7	1,932
2085	Liquor, (except Brandy)	1,404	54	230	109	14	1,811
2086	Soft Drinks	8,412	165	1,368	1,393	139	11,478
2087	Flavoring Extracts, Syrup	1,490	32	42	94	10	1,667
2091	Canned & Cured Seafood	851	26	0	38	361	1,275
2092	Fresh, Frozen Fish	2,706	67	249	98	21	3,141
2095	Roasted Coffee	3,354	67	317	99	16	3,853
2097	Manufactured Ice	45	31	3	25	0	104
2098	Macaroni and Spaghetti	459	20	36	67	2	583
2099	Food Preparations	4,903	187	234	409	35	5,768
20	FOOD MFG TOTALS: (\$)	\$171,482	\$5,029	\$15,234	\$10,196	\$815	\$202,756
	(%)	84.6%	2.5%	7.5%	5.0%	0.4%	100%

Table 7A-2: FOOD MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Buildings and Resale Equipment	Other Items	
20	FOOD MANUFACTURING	84.6%	2.5%	7.5%	5.0%	0.4%
2011	Meat Packing Plants	90.3%	0.8%	7.7%	1.1%	0.1%
2013	Sausages & Prepared Meats	81.7%	1.6%	13.5%	2.9%	0.3%
2016	Poultry Dressing Plants	90.6%	2.9%	2.0%	3.9%	0.6%
2017	Poultry & Egg Processing	86.4%	2.2%	6.9%	4.3%	0.2%
2021	Creamery Butter	94.8%	1.1%	2.9%	1.0%	0.2%
2022	Cheese	89.5%	1.5%	6.4%	2.5%	0.1%
2023	Milk, Condensed	86.9%	2.9%	5.6%	4.0%	0.6%
2024	Ice Cream, Frozen Dessert	77.5%	3.0%	12.3%	6.8%	0.4%
2026	Fluid Milk	83.9%	1.7%	10.6%	3.6%	0.2%
2032	Canned Specialties	85.5%	3.2%	3.6%	7.5%	0.2%
2033	Canned Fruits, Vegetables	87.0%	3.7%	2.3%	6.6%	0.4%
2034	Dehydrated Fruit	85.3%	6.5%	0.0%	6.6%	1.6%
2035	Pickles & Salad Dressing	85.5%	1.6%	8.5%	4.3%	0.1%
2037	Frozen Fruits, Vegetables	79.8%	5.7%	4.6%	9.5%	0.4%
2038	Frozen Specialties	73.6%	2.9%	15.9%	7.3%	0.3%

Table 7A-2 Continued: FOOD MFG: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Buildings and Equipment	Resale	Other Items
20	FOOD MANUFACTURING	84.6%	2.5%	7.5%	5.0%	0.4%
2041	Flour, Grain Mill Products	90.2%	2.2%	3.8%	3.7%	0.1%
2043	Cereal Breakfast Foods	74.7%	3.7%	9.6%	11.8%	0.2%
2044	Rice Milling	86.7%	2.3%	6.7%	4.0%	0.3%
2045	Blended & Prepared Flour	84.1%	1.2%	8.7%	5.1%	0.8%
2046	Wet Corn Milling	70.1%	12.3%	2.1%	14.9%	0.6%
2047	Dog, Cat, Pet Food	86.2%	3.2%	4.3%	5.9%	0.4%
2048	Prepared Feeds	90.2%	1.5%	5.8%	2.3%	0.2%
2051	Bread and Cake	63.1%	4.1%	21.8%	10.2%	0.8%
2052	Cookies and Crackers	77.8%	3.7%	9.8%	7.2%	1.4%
2061	Raw Cane Sugar	81.9%	4.1%	0.0%	12.4%	1.5%
2062	Cane Sugar Refining	90.2%	4.6%	0.7%	3.8%	0.7%
2063	Beet Sugar	78.9%	15.8%	0.6%	4.3%	0.4%
2065	Confectionery Products	82.8%	2.5%	7.1%	7.1%	0.5%
2066	Chocolate, Cocoa Products	90.2%	2.5%	0.9%	5.2%	1.2%
2067	Chewing Gum	85.4%	3.0%	0.0%	7.1%	4.5%

Table 7A-2 Continued: FOOD MANUFACTURING: TYPES OF PURCHASES BY PERCENT
OF TOTAL PURCHASES

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Resale Equipment	Buildings and	Other Items
2074	Cottenseed Oil Mills	73.7%	6.7%	9.9%	9.7%	0.0%
2075	Soybean Oil Mills	85.5%	2.6%	8.8%	3.0%	0.1%
2076	Vegetable Oil Mills	65.5%	3.0%	17.0%	14.2%	0.3%
2077	Animal, Marine Fats & Oil	74.5%	10.8%	6.5%	7.4%	0.9%
2079	Shortening & Cooking Oils	90.6%	2.9%	2.5%	3.7%	0.3%
2082	Malt Beverages	82.4%	3.5%	0.5%	13.3%	0.3%
2083	Malt	81.6%	10.2%	0.0%	7.7%	0.5%
2084	Wines, Brandy	87.5%	1.8%	1.8%	8.6%	0.3%
2085	Liquor, (except Brandy)	77.5%	3.0%	12.7%	6.0%	0.8%
2086	Soft Drinks	73.3%	1.4%	11.9%	12.1%	1.2%
2087	Flavoring Extracts, Syrup	89.3%	1.9%	2.5%	5.7%	0.6%
2091	Canned & Cured Seafood	66.7%	2.0%	0.0%	3.0%	*28.3%
2092	Fresh, Frozen Fish	86.1%	2.1%	7.9%	3.1%	0.7%
2095	Roasted Coffee	87.0%	1.7%	8.2%	2.6%	0.5%
2097	Manufactured Ice	42.7%	29.9%	2.9%	24.2%	0.4%
2098	Macaroni and Spaghetti	78.6%	3.4%	6.1%	11.5%	0.4%
2099	Food Preparations	85.0%	3.2%	4.1%	7.1%	0.6%
20	FOOD MFG AVERAGE	84.6%	2.5%	7.5%	5.0%	0.4%

* Predominately Subcontract Work

**Table 7A-3: FOOD MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$),
plus PURCHASE MANUFACTURING RANK**

SIC Code	TYPE OF MANUFACTURING	REVENUES	EXPENDITURES			PURCHASE MFG RANK
			Purchases	Wages & Salaries	Other Payments	
20	FOOD MANUFACTURING	\$280,529	\$202,756	\$32,040	\$45,733	
2011	Meat Packing Plants	44,854	39,509	3,136	2,209	3
2013	Sausages & Prepared Meats	12,278	9,672	1,473	1,133	16
2016	Poultry Dressing Plants	9,047	7,433	1,269	345	25
2017	Poultry & Egg Processing	1,424	1,085	183	156	229
2021	Creamery Butter	1,687	1,573	51	63	172
2022	Cheese	10,763	9,249	577	937	18
2023	Milk, Condensed	4,731	3,436	322	973	76
2024	Ice Cream, Frozen Dessert	2,855	2,097	381	378	131
2026	Fluid Milk	19,028	15,440	1,869	1,719	10
2032	Canned Specialties	4,141	2,566	488	1,086	105
2033	Canned Fruits, Vegetables	9,283	6,188	1,294	1,801	37
2034	Dehydrated Fruit,Vegetabl	1,745	1,056	278	412	234
2035	Pickles & Salad Dressing	4,269	2,650	456	1,164	101
2037	Frozen Fruits, Vegetables	5,375	3,289	813	1,272	81
2038	Frozen Specialties	5,034	3,207	788	1,039	82

Table 7A-3 Continued: FOOD MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$),
plus PURCHASE MANUFACTURING RANK

SIC Code	TYPE OF MANUFACTURING	REVENUES	EXPENDITURES			PURCHASE MFG RANK
			Purchases	Wages & Salaries	Other Payments	
20	FOOD MANUFACTURING	\$280,529	\$202,756	\$32,040	\$45,733	
2041	Flour, Grain Mill Products	4,933	3,976	397	560	69
2043	Cereal Breakfast Foods	4,132	1,675	541	1,916	165
2044	Rice Milling	1,934	1,562	116	256	174
2045	Blended & Prepared Flour	1,419	876	159	384	260
2046	Wet Corn Milling	3,268	2,473	325	471	114
2047	Dog, Cat, Pet Food	4,402	2,276	416	1,709	123
2048	Prepared Feeds	11,298	9,332	734	1,233	17
2051	Bread, Cake, Related Prod	13,143	5,908	4,045	3,191	41
2052	Cookies and Crackers	4,665	2,031	1,004	1,630	135
2061	Raw Cane Sugar	1,114	866	163	85	263
2062	Cane Sugar Refining	3,040	2,521	248	271	107
2063	Beet Sugar	1,516	1,152	205	159	217
2065	Confectionery Products	6,773	3,853	1,066	1,854	70
2066	Chocolate, Cocoa Products	2,217	1,286	252	679	201
2067	Chewing Gum	915	337	123	455	369

Table 7A-3 Continued: FOOD MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$),
plus PURCHASE MANUFACTURING RANK

SIC Code	TYPE OF MANUFACTURING	REVENUES	EXPENDITURES			PURCHASE MFG RANK
			Purchases	Wages & Salaries	Other Payments	
2074	Cottenseed Oil Mills	933	792	94	48	270
2075	Soybean Oil Mills	8,604	8,146	229	229	20
2076	Vegetable Oil Mills	557	546	27	* (16)	316
2077	Animal, Marine Fats & Oil	1,753	1,287	260	205	200
2079	Shortening & Cooking Oils	4,906	3,786	337	783	74
2082	Malt Beverages	11,183	7,705	1,624	1,854	21
2083	Malt	661	520	55	86	322
2084	Wines, Brandy	2,786	1,932	308	546	140
2085	Liquor, (except Brandy)	3,126	1,811	331	983	153
2086	Soft Drinks	16,808	11,478	2,574	2,755	14
2087	Flavoring Extracts, Syrup	4,237	1,667	288	2,282	167
2091	Canned & Cured Seafood	1,849	1,275	231	343	203
2092	Fresh, Frozen Fish	4,009	3,141	478	390	84
2095	Roasted Coffee	5,827	3,853	326	1,649	71
2097	Manufactured Ice	229	104	74	51	436
2098	Macaroni and Spaghetti	1,065	583	173	309	309
2099	Food Preparations	10,979	5,768	1,509	3,702	42
20	FOOD MFG TOTALS: (\$)	\$280,529	\$202,756	\$32,040	\$45,733	
	(%)	100%	72.3%	11.4%	16.3%	

* Losses incurred, payments exceeded revenues.

**Table 7A-4: FOOD MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES,
plus PURCHASE/WAGE & SALARY RATIO**

SIC Code	TYPE OF MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
20	FOOD MANUFACTURING	72.3%	11.4%	16.3%	6.3
2011	Meat Packing Plants	88.1%	7.0%	4.9%	12.6
2013	Sausages & Prepared Meats	78.8%	12.0%	9.2%	6.6
2016	Poultry Dressing Plants	82.2%	14.0%	3.8%	5.9
2017	Poultry & Egg Processing	76.2%	12.9%	11.0%	5.9
2021	Creamery Butter	93.2%	3.0%	3.8%	31.0
2022	Cheese	85.9%	5.4%	8.7%	16.0
2023	Milk, Condensed	72.6%	6.8%	20.6%	10.7
2024	Ice Cream, Frozen Dessert	73.4%	13.3%	13.2%	5.5
2026	Fluid Milk	81.1%	9.8%	9.0%	8.3
2032	Canned Specialties	62.0%	11.8%	26.2%	5.3
2033	Canned Fruits, Vegetables	66.7%	13.9%	19.4%	4.8
2034	Dehydrated Fruit	60.5%	15.9%	23.6%	3.8
2035	Pickles & Salad Dressing	62.1%	10.7%	27.3%	5.8
2037	Frozen Fruits, Vegetables	61.2%	15.1%	23.7%	4.0
2038	Frozen Specialties	63.7%	15.7%	20.6%	4.1

Table 7A-4 Continued: FOOD MANUFACTURING: EXPENDITURES AS A PERCENT
OF REVENUES, plus PURCHASE/WAGE & SALARY RATIO

SIC Code	TYPE OF MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
20	FOOD MANUFACTURING	72.3%	11.4%	16.3%	6.3
2041	Flour, Grain Mill Products	80.6%	8.0%	11.3%	10.0
2043	Cereal Breakfast Foods	40.5%	13.1%	46.4%	3.1
2044	Rice Milling	80.8%	6.0%	13.2%	13.5
2045	Blended & Prepared Flour	61.7%	11.2%	27.1%	5.5
2046	Wet Corn Milling	75.7%	9.9%	14.4%	7.6
2047	Dog, Cat, Pet Food	51.7%	9.5%	38.8%	5.5
2048	Prepared Feeds	82.6%	6.5%	10.9%	12.7
2051	Bread & Cakes	44.9%	30.8%	24.3%	1.5
2052	Cookies and Crackers	43.5%	21.5%	34.9%	2.0
2061	Raw Cane Sugar	77.8%	14.6%	7.6%	5.3
2062	Cane Sugar Refining	82.9%	8.2%	8.9%	10.2
2063	Beet Sugar	76.0%	13.5%	10.5%	5.6
2065	Confectionery Products	56.9%	15.7%	27.4%	3.6
2066	Chocolate, Cocoa Products	58.0%	11.4%	30.6%	5.1
2067	Chewing Gum	36.8%	13.4%	49.8%	2.7

Table 7A-4 Continued: FOOD MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE & SALARY RATIO

SIC Code	TYPE OF MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
2074	Cottenseed Oil Mills	84.9%	10.0%	5.1%	8.5
2075	Soybean Oil Mills	94.7%	2.7%	2.7%	35.6
2076	Vegetable Oil Mills	98.1%	4.8%	* -2.9%	20.4
2077	Animal, Marine Fats & Oil	73.4%	14.9%	11.7%	4.9
2079	Shortening & Cooking Oils	77.2%	6.9%	16.0%	11.2
2082	Malt Beverages	68.9%	14.5%	16.6%	4.7
2083	Malt	78.7%	8.3%	13.0%	9.4
2084	Wines, Brandy	69.4%	11.1%	19.6%	6.3
2085	Liquor, (except Brandy)	57.9%	10.6%	31.5%	5.5
2086	Soft Drinks	68.3%	15.3%	16.4%	4.5
2087	Flavoring Extracts, Syrup	39.4%	6.8%	53.8%	5.8
2091	Canned & Cured Seafood	69.0%	12.5%	18.5%	5.5
2092	Fresh, Frozen Fish	78.3%	11.9%	9.7%	6.6
2095	Roasted Coffee	66.1%	5.6%	28.3%	11.8
2097	Manufactured Ice	45.4%	32.2%	22.4%	1.4
2098	Macaroni and Spaghetti	54.8%	16.3%	29.0%	3.4
2099	Food Preparations	52.5%	13.7%	33.7%	3.8
20	FOOD MFG AVERAGE	72.3%	11.4%	16.3%	6.3

* Losses incurred, payments exceeded revenues.

Table 7A-5: MAJOR FOOD GROUPINGS: REVENUES AND EXPENDITURES (Millions \$)

TYPE OF FOOD MANUFACTURING	REVENUES	EXPENDITURES			
		Purchases	Wages & Salaries	Other Payments	
Meat, Poultry, and Fish	\$73,461	\$62,115	\$6,770		\$4,576
Dairy Products	39,064	31,795	3,199		4,070
Fruits and Vegetables	20,672	13,183	2,840		4,649
Grain & Bakery Products	34,559	19,084	6,759		8,716
Sugar & Confectionery	15,575	10,015	2,057		3,503
Food Oils	16,753	14,557	947		1,249
Beverages	43,967	28,446	5,451		10,069
FOOD GROUPING TOTALS: (\$)	\$244,051	\$179,195	\$28,023		\$36,832
(%)	100%	73.4%	11.5%		15.1%

**Table 7A-6: FOOD GROUPINGS: EXPENDITURES AS A PERCENT OF REVENUES,
plus PURCHASE/WAGE & SALARY RATIO**

TYPE OF FOOD MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
	Purchases	Wages & Salaries	Other Payments	
Meat, Poultry, and Fish	84.6%	9.2%	6.2%	9.2
Dairy Products	81.4%	8.2%	10.4%	9.9
Fruits and Vegetables	63.8%	13.7%	22.5%	4.6
Grain and Bakery Products	55.2%	19.6%	25.2%	2.8
Sugar & Confectionery	64.3%	13.2%	22.5%	4.9
Food Oils	86.9%	5.7%	7.4%	15.4
Beverages	64.7%	12.4%	22.9%	5.2
FOOD GROUP AVERAGE	73.4%	11.5%	15.1%	6.4

in the food industry compared to 11 percent for wages and salaries.

Tables 7A-1 through 7A-4 summarize the purchases in the food industry by type of purchase and in relation to other expenditures. Table 7A-3 shows the purchases dollar rank of each four-digit industry in relation to the purchases of the other 448 manufacturing industries.

Due to the size of the food industry, Tables 7A-5 and 7A-6 group similar food manufacturers together. The following seven groupings represent the majority of the food manufacturers: 1. meat, poultry and fish, 2. dairy products, 3. fruits and vegetables, 4. grain and bakery products, 5. sugar and confectionery products, 6. food oils, and 7. beverages.

B. TOBACCO MANUFACTURES (SIC 21)

Industry Description

This major group included firms engaged in the manufacturing of cigarettes, cigars, smoking and chewing tobacco, snuff, and in the stemming and redrying of tobacco.

Purchases

The tobacco industry had purchases of \$8 billion. This was a very small portion (1%) of the total manufacturing purchases. The only industry with fewer purchases was the leather industry. Within the tobacco industry, the companies that spent the most for purchases were cigarette companies (\$4.7 billion) and tobacco stemming and redrying companies (\$2.8 billion). The tobacco industry is third only to the

Table 7B-1: TOBACCO MANUFACTURING: TYPES OF PURCHASES (Millions \$)

TYPE OF		TYPE OF PURCHASE					TOTAL
SIC Code	MANUFACTURING	Materials and Supplies	Energy	Buildings and Resale Equipment	Other Items	PURCHASES	
2111	Cigarettes	\$3,674	\$72	n/a	\$648	\$316	\$4,709
2121	Cigars	108	4	9	11	1	132
2131	Chewing, Smoking Tobacco	211	6	n/a	12	30	260
2141	Tobacco Stemming, Redrying	2,453	32	192	124	4	2,805
21	TOBACCO MFG TOTALS: (\$)	\$6,446	\$114	\$201	\$796	\$350	\$7,906
	(%)	81.5%	1.4%	2.5%	10.1%	4.4%	100%

**Table 7B-2: TOBACCO MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF
TOTAL PURCHASES**

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Resale Equipment	Buildings and Other Items	
2111	Cigarettes	78.0%	1.5%	0.0%	13.8%	6.7%
2121	Cigars	81.5%	2.9%	6.6%	8.6%	0.5%
2131	Chewing, Smoking Tobacco	81.3%	2.5%	0.0%	4.7%	11.5%
2141	Tobacco Stemming, Redrying	87.4%	1.1%	6.8%	4.4%	0.1%
21	TOBACCO MFG AVERAGE	81.5%	1.4%	2.5%	10.1%	4.4%

Table 7B-3: TOBACCO MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$),
plus PURCHASE MANUFACTURING RANK

SIC Code	TYPE OF MANUFACTURING	REVENUES	EXPENDITURES			PURCHASE MFG RANK
			Purchases	Wages & Other Salaries Payments		
2111	Cigarettes	\$12,127	\$4,709	\$1,458	\$5,960	58
2121	Cigars	254	132	72	50	427
2131	Chewing, Smoking Tobacco	665	260	66	339	389
2141	Tobacco Stemming, Redrying	3,015	2,805	152	58	91
21	TOBACCO MFG TOTALS: (\$)	\$16,061	\$7,906	\$1,749	\$6,406	
	(%)	100%	49.2%	10.9%	39.9%	

Table 7B-4: TOBACCO MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES,
plus PURCHASE/WAGE & SALARY RATIO

SIC Code	TYPE OF MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
2111	Cigarettes	38.8%	12.0%	49.1%	3.2
2121	Cigars	52.1%	28.3%	19.6%	1.8
2131	Chewing, Smoking Tobacco	39.0%	10.0%	51.0%	3.9
2141	Tobacco Stemming, Redrying	93.0%	5.1%	1.9%	18.4
21	TOBACCO MFG AVERAGE	49.2%	10.9%	39.9%	4.5

petroleum and food industries in the dollar ratio of purchases to wages and salaries (4.5 to 1). Purchases accounted for 49 percent of the expenditures in this industry compared to 11 percent for wages and salaries.

Tables 7B-1 through 7B-4 summarize the purchase activities in this industry by type of purchase and in relation to other expenditures. Table 7B-3 shows the purchase dollar rank of each four-digit tobacco industry in relation to the purchases of the other 448 manufacturing industries.

C. TEXTILE MILL PRODUCTS (SIC 22)

Industry Description

This group included firms that performed the following operations: (1) the preparation of fiber and subsequent manufacturing of yarn, thread, braids, twine, and cordage; (2) manufacturing broad woven fabric, knit fabric, and carpets and rugs from yarn; (3) dyeing and finishing fiber, yarn, fabric, and knit apparel; (4) coating, waterproofing, and treating fabric; (5) the integrated manufacture of knit apparel and other finished articles from yarn; and (6) the manufacture of felt goods, lace goods, nonwoven fabrics, and miscellaneous textiles.

There was no distinction made between the two types of organizations which operate in the textile industry. These two types were: (1) the "integrated" mill which purchases materials, produces textiles and related articles within the establishment and sells the finished products; and (2) the

Table 7C-1: TEXTILE MANUFACTURING: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Resale	Buildings and Equipment	Other Items	
22	TEXTILE MANUFACTURING	\$25,543	\$1,714	\$412	\$2,365	\$1,106	\$31,140
2211	Weaving Mills, Cotton	1,967	188	0	369	142	2,666
2221	Weaving Mill Manmade,Silk	4,137	329	17	527	171	5,180
2231	Weaving Mills, Wool	313	30	0	40	52	435
2241	Narrow Fabric Mills	359	24	3	37	5	427
2251	Women's Hosiery, Less Sock	551	29	22	49	36	688
2252	Hosiery	734	29	40	58	30	892
2253	Knit Outerwear Mills	1,048	54	25	93	356	1,575
2254	Knit Underwear Mills	330	19	5	19	16	389
2257	Circular Knit Fabric Mill	1,474	98	5	116	95	1,788
2258	Warp Knit Fabric Mills	806	56	3	77	41	983
2259	Knitting Mills	49	3	2	4	4	61
2261	Finishing Mills, Cotton	431	54	5	39	3	533
2262	Finishing Mills, Manmade	1,942	175	36	134	24	2,311
2269	Finishing Plants	633	47	0	27	6	713
2271	Woven Carpets and Rugs	120	5	0	7	2	134

Table 7C-1 Continued: TEXTILE MANUFACTURING: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Resale	Buildings and Equipment	Other Items	
2272	Tufted Carpets and Rugs	\$3,658	\$121	\$21	\$146	\$123	\$4,069
2279	Carpets and Rugs	91	4	0	6	11	111
2281	Yarn Mills, except Wool	2,565	202	22	236	11	3,036
2282	Throwing & Winding Mills	1,309	64	0	93	28	1,494
2283	Wool Yarn Mills	107	6	2	7	3	125
2284	Thread Mills	332	25	0	24	5	385
2291	Felt Goods, Less Woven, Hat	91	8	0	32	1	133
2292	Lace Goods	21	3	0	2	1	28
2293	Padding & Upholstery Fill	138	10	3	11	1	163
2294	Processed Textile Waste	137	7	55	10	2	211
2295	Coated Fabrics	613	30	25	47	11	726
2296	Tire Cord and Fabric	657	29	0	17	3	705
2297	Nonwoven Fabrics	679	46	9	104	12	850
2298	Cordage and Twine	149	9	19	24	3	204
2299	Textile Goods	151	13	0	14	1	179
22	TEXTILE MFG TOTALS: (\$)	\$25,592	\$1,714	\$412	\$2,365	\$1,106	\$31,140
	(%)	82.0%	5.5%	1.3%	7.6%	3.6%	100%

Table 7C-2: TEXTILE MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Resale Equipment	Buildings and	Other Items
22	TEXTILE MANUFACTURING	82.0%	5.5%	1.3%	7.6%	3.6%
2211	Weaving Mills, Cotton	73.8%	7.1%	0.0%	13.8%	5.3%
2221	Weaving Mill Manmade, Silk	79.9%	6.4%	0.3%	10.2%	3.3%
2231	Weaving Mills, Wool	71.8%	6.9%	0.0%	9.2%	12.0%
2241	Narrow Fabric Mills	84.0%	5.6%	0.7%	8.6%	1.1%
2251	Women's Hosiery, Less Sock	80.1%	4.3%	3.3%	7.2%	5.2%
2252	Hosiery	82.3%	3.2%	4.5%	6.5%	3.4%
2253	Knit Outerwear Mills	66.5%	3.4%	1.6%	5.9%	*22.6%
2254	Knit Underwear Mills	84.8%	5.0%	1.3%	4.8%	4.1%
2257	Circular Knit Fabric Mill	82.5%	5.5%	0.3%	6.5%	5.3%
2258	Warp Knit Fabric Mills	82.1%	5.7%	0.3%	7.8%	4.2%
2259	Knitting Mills	79.8%	4.7%	2.9%	6.0%	6.5%
2261	Finishing Mills, Cotton	80.9%	10.1%	1.0%	7.4%	0.6%
2262	Finishing Mills, Manmade	84.0%	7.6%	1.6%	5.8%	1.0%
2269	Finishing Plants	88.8%	6.6%	0.0%	3.7%	0.9%
2271	Woven Carpets and Rugs	89.9%	3.7%	0.0%	4.9%	1.5%

* Predominately Subcontract Work

Table 7C-2 Continued: TEXTILE MANUFACTURING: TYPES OF PURCHASES BY PERCENT
OF TOTAL PURCHASES

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Resale Equipment	Buildings and Other Items	
2272	Tufted Carpets and Rugs	89.9%	3.0%	0.5%	3.6%	3.0%
2279	Carpets and Rugs	81.3%	3.2%	0.0%	5.6%	10.0%
2281	Yarn Mills, except Wool	84.5%	6.7%	0.7%	7.8%	0.3%
2282	Throwing & Winding Mills	87.6%	4.3%	0.0%	6.2%	1.9%
2283	Wool Yarn Mills	85.7%	4.6%	1.8%	5.4%	2.5%
2284	Thread Mills	86.3%	6.4%	0.0%	6.1%	1.2%
2291	Felt Goods, Less Woven, Hat	68.8%	5.8%	0.3%	24.2%	0.9%
2292	Lace Goods	75.8%	12.3%	0.0%	7.6%	4.3%
2293	Padding & Upholstery Fill	84.8%	5.8%	2.1%	6.8%	0.4%
2294	Processed Textile Waste	65.0%	3.1%	26.3%	4.6%	1.1%
2295	Coated Fabrics	84.4%	4.2%	3.5%	6.5%	1.5%
2296	Tire Cord and Fabric	93.1%	4.1%	0.0%	2.4%	0.5%
2297	Nonwoven Fabrics	79.9%	5.4%	1.0%	12.2%	1.4%
2298	Cordage and Twine	72.9%	4.6%	9.1%	11.9%	1.5%
2299	Textile Goods	84.3%	7.5%	0.2%	7.5%	0.6%
22	TEXTILE MFG AVERAGE	82.0%	5.5%	1.3%	7.6%	3.6%

Table 7C-3: TEXTILE MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$),
plus PURCHASE MANUFACTURING RANK

SIC Code	TYPE OF MANUFACTURING	REVENUES	EXPENDITURES			PURCHASE MFG RANK
			Purchases	Wages & Salaries	Other Payments	
22	TEXTILE MANUFACTURING	\$47,515	\$31,140	\$10,677	\$5,698	
2211	Weaving Mills, Cotton	3,972	2,666	1,129	177	100
2221	Weaving Mill Manmade,Silk	8,187	5,180	2,141	866	52
2231	Weaving Mills, Wool	763	435	213	115	345
2241	Narrow Fabric Mills	852	427	248	177	346
2251	Women's Hosiery, Less Sock	1,411	688	366	357	289
2252	Hosiery	1,443	892	372	180	256
2253	Knit Outerwear Mills	3,182	1,575	863	744	171
2254	Knit Underwear Mills	830	389	274	167	353
2257	Circular Knit Fabric Mill	2,539	1,788	496	255	154
2258	Warp Knit Fabric Mills	1,466	983	305	178	243
2259	Knitting Mills	114	61	39	15	440
2261	Finishing Mills, Cotton	754	533	196	25	319
2262	Finishing Mills, Manmade	3,186	2,311	617	258	120
2269	Finishing Plants	1,032	713	185	134	281
2271	Woven Carpets and Rugs	218	134	45	39	424

Table 7C-3 Continued: TEXTILE MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$),
plus PURCHASE MANUFACTURING RANK

SIC Code	TYPE OF MANUFACTURING	REVENUES	EXPENDITURES			PURCHASE MFG RANK
			Purchases	Wages & Salaries	Other Payments	
2272	Tufted Carpets and Rugs	\$5,515	\$4,069	\$621	\$825	68
2279	Carpets and Rugs	150	111	47	* (9)	433
2281	Yarn Mills, except Wool	4,328	3,036	1,001	291	86
2282	Throwing & Winding Mills	1,945	1,494	327	124	182
2283	Wool Yarn Mills	185	125	47	14	431
2284	Thread Mills	579	385	136	58	355
2291	Felt Goods, Less Woven, Hat	250	133	79	38	426
2292	Lace Goods	72	28	30	15	447
2293	Padding & Upholstery Fill	284	163	71	50	417
2294	Processed Textile Waste	297	211	47	39	402
2295	Coated Fabrics	1,115	726	251	138	276
2296	Tire Cord and Fabric	982	705	116	160	284
2297	Nonwoven Fabrics	1,279	850	244	185	264
2298	Cordage and Twine	359	204	94	61	405
2299	Textile Goods	298	179	87	32	412
22	TEXTILE MFG TOTALS: (\$)	\$47,515	\$31,140	\$10,677	\$5,698	
	(%)	100%	65.5%	22.5%	12.0%	

* Losses incurred, payments exceeded revenues.

Table 7C-4: TEXTILE MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES,
plus PURCHASE/WAGE & SALARY RATIO

SIC Code	TYPE OF MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
20	TEXTILE MANUFACTURING	65.5%	22.5%	12.0%	2.9
2211	Weaving Mills, Cotton	67.1%	28.4%	4.5%	2.4
2221	Weaving Mill Manmade, Silk	63.3%	26.1%	10.6%	2.4
2231	Weaving Mills, Wool	57.0%	27.9%	15.1%	2.0
2241	Narrow Fabric Mills	50.1%	29.1%	20.8%	1.7
2251	Women's Hosiery, Less Sock	48.7%	26.0%	25.3%	1.9
2252	Hosiery	61.8%	25.7%	12.4%	2.4
2253	Knit Outerwear Mills	49.5%	27.1%	23.4%	1.8
2254	Knit Underwear Mills	46.9%	33.1%	20.1%	1.4
2257	Circular Knit Fabric Mill	70.4%	19.5%	10.1%	3.6
2258	Warp Knit Fabric Mills	67.0%	20.8%	12.2%	3.2
2259	Knitting Mills	53.6%	33.6%	12.8%	1.6
2261	Finishing Mills, Cotton	70.7%	25.9%	3.3%	2.7
2262	Finishing Mills, Manmade	72.5%	19.4%	8.1%	3.7
2269	Finishing Plants	69.1%	17.9%	13.0%	3.9
2271	Woven Carpets and Rugs	61.4%	20.7%	17.9%	3.0

Table 7C-4 Continued: TEXTILE MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE & SALARY RATIO

SIC Code	TYPE OF MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
2272	Tufted Carpets and Rugs	73.8%	11.3%	15.0%	6.6
2279	Carpets and Rugs	74.5%	31.3%	*(5.8)%	2.4
2281	Yarn Mills, except Wool	70.1%	23.1%	6.7%	3.0
2282	Throwing & Winding Mills	76.8%	16.8%	6.4%	4.6
2283	Wool Yarn Mills	67.4%	25.3%	7.3%	2.7
2284	Thread Mills	66.5%	23.5%	10.0%	2.8
2291	Felt Goods, Less Woven, Hat	53.2%	31.7%	15.1%	1.7
2292	Lace Goods	38.4%	40.9%	20.8%	0.9
2293	Padding & Upholstery Fill	57.3%	25.1%	17.6%	2.3
2294	Processed Textile Waste	71.0%	16.0%	13.1%	4.4
2295	Coated Fabrics	65.1%	22.5%	12.4%	2.9
2296	Tire Cord and Fabric	71.9%	11.8%	16.3%	6.1
2297	Nonwoven Fabrics	66.5%	19.1%	14.5%	3.5
2298	Cordage and Twine	56.9%	26.1%	17.0%	2.2
2299	Textile Goods	60.2%	29.1%	10.7%	2.1
22	TEXTILE MFG AVERAGE	65.5%	22.5%	12.0%	2.9

* Losses incurred, payments exceeded revenues.

"contract" or "commission" mill which processes materials owned by others.

Purchases

The textile industry had purchases of \$31 billion. This represented three percent of the total manufacturing purchases. Within this industry, the companies that spent the most for purchases were broad woven fabric mills (\$5 billion), tufted carpet and rug companies (\$4 billion) and cotton weaving mills (\$2 billion). The textile industry was the same as the average for all manufacturing in the dollar ratio of purchases to wages and salaries (2.9 to 1). Lace goods companies (SIC 2292, however, had wage and salary expenditures (\$30 million) that exceeded purchase expenditures (\$28 million).

Purchases accounted for 65 percent of the expenditures in textile industry. This compared to 11 percent for wages and salaries.

Tables 7C-1 through 7C-4 summarize the purchasing activities in this industry by type of purchase and in relation to other expenditures. Table 7C-3 shows the purchasing dollar rank of each four-digit textile manufacturing industry in relation to the purchases of the other 448 manufacturing industries.

D. APPAREL (SIC 23)

Industry Description

This industry is known as the "cutting-up and needle"

Table 7D-1: APPAREL MANUFACTURING: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Buildings and Resale Equipment	Other Items		
23	APPAREL MANUFACTURING	\$20,015	\$513	\$983	\$1,406	\$5,957	\$28,874
2311	Men's, Boy's Suits & Coat	898	37	77	60	390	1,463
2321	Men's, Boy's Shirts	1,183	28	143	68	327	1,748
2322	Men's, Boy's Underwear	177	6	0	6	24	213
2323	Men's, Boy's Neckwear	128	3	5	10	14	159
2327	Men's, Boy's Trousers	695	21	5	54	333	1,109
2328	Men's, Boy's Work Clothes	1,761	36	120	140	256	2,312
2329	Men's, Boy's Clothing	602	15	34	35	99	784
2331	Women's Blouses	1,237	36	59	120	710	2,163
2335	Women's Dresses	1,372	74	17	210	818	2,490
2337	Women's Suits and Coats	1,643	32	94	68	1,007	2,844
2339	Women's Outerwear	1,638	38	85	134	803	2,698
2341	Women's Underwear	897	24	53	75	332	1,380
2342	Brassieres & Allied	251	5	42	14	38	350
2351	Millinery	48	1	0	1	1	50
2352	Hats and Caps	166	7	8	15	6	202
2361	Children Dresses, Blouse	438	11	5	28	215	697
2363	Children Coats and Suits	68	2	0	2	18	89
2369	Children Outerwear	391	10	11	26	91	530

Table 7D-1 Continued: APPAREL MANUFACTURING: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Resale Equipment	Buildings and Equipment	Other Items*	
2371	Fur Goods	\$269	\$2	\$0	\$4	\$17	\$291
2381	Dress & Work Gloves	90	3	6	5	1	104
2384	Robes and Dressing Gowns	156	3	0	7	47	213
2385	Waterproof Outer garments	157	4	7	8	38	214
2386	Leather, Sheep Clothing	110	1	3	4	9	127
2387	Apparel Belts	213	4	24	16	11	268
2389	Apparel & Accessories	99	5	17	8	6	134
2391	Curtains and Draperies	569	8	12	19	27	636
2392	House Furnishings	1,850	40	51	73	65	2,078
2393	Textile Bags	225	4	22	13	3	266
2394	Canvas, Related Products	338	6	37	28	5	414
2395	Pleating and Stitching	398	10	4	31	11	455
2396	Automotive, Apparel Trim	1,081	18	8	64	17	1,188
2397	Schiffli Machine Embroid	77	5	1	13	34	130
2399	Fabricated Textile Prod	790	17	15	39	23	884
23	APPAREL MFG TOTALS: (\$)	\$20,015	\$513	\$983	\$1,406	\$5,957	\$28,874
	(%)	69.3%	1.8%	3.4%	4.9%	*20.6%	100%

* Predominately Subcontract Work

Table 7D-2: APPAREL MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Resale Equipment	Buildings and	Other Items*
23	APPAREL MANUFACTURING	69.3%	1.8%	3.4%	4.9%	20.6%
2311	Men's, Boy's Suits & Coat	61.4%	2.6%	5.3%	4.1%	26.7%
2321	Men's, Boy's Shirts	67.7%	1.6%	8.2%	3.9%	18.7%
2322	Men's, Boy's Underwear	83.4%	2.6%	0.0%	2.7%	11.3%
2323	Men's, Boy's Neckwear	80.2%	1.6%	3.4%	6.3%	8.5%
2327	Men's, Boy's Trousers	62.7%	1.9%	0.5%	4.9%	30.0%
2328	Men's, Boy's Work Clothes	76.2%	1.6%	5.2%	6.1%	11.1%
2329	Men's, Boy's Clothing	76.7%	1.9%	4.3%	4.5%	12.6%
2331	Women's Blouses	57.2%	1.7%	2.7%	5.6%	32.8%
2335	Women's Dresses	55.1%	3.0%	0.7%	8.4%	32.8%
2337	Women's Suits and Coats	57.8%	1.1%	3.3%	2.4%	35.4%
2339	Women's Outerwear	60.7%	1.4%	3.1%	5.0%	29.8%
2341	Women's Underwear	65.0%	1.7%	3.8%	5.4%	24.0%
2342	Brassieres & Allied	71.8%	1.4%	11.9%	4.0%	10.9%
2351	Millinery	95.6%	1.6%	0.0%	1.0%	1.8%
2352	Hats and Caps	82.3%	3.5%	3.9%	7.5%	2.8%
2361	Children Dresses, Blouse	62.9%	1.5%	0.7%	4.0%	30.8%
2363	Children Coats and Suits	75.6%	2.1%	0.0%	2.0%	20.2%
2369	Children Outerwear	73.8%	1.8%	2.1%	5.0%	17.3%

* Predominately Subcontract Work

Table 7D-2 Continued: APPAREL MANUFACTURING: TYPES OF PURCHASES BY PERCENT
TOTAL PURCHASES

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Resale Equipment	Buildings and Equipment	Other Items*
2371	Fur Goods	92.5%	0.6%	0.0%	1.3%	5.7%
2381	Dress & Work Gloves	86.5%	3.0%	5.4%	4.5%	0.6%
2384	Robes and Dressing Gowns	73.3%	1.4%	0.0%	3.3%	22.0%
2385	Waterproof Outergarments	73.4%	2.0%	3.5%	3.6%	17.5%
2386	Leather, Sheep Clothing	86.8%	0.9%	2.2%	2.8%	7.3%
2387	Apparel Belts	79.5%	1.5%	9.0%	5.8%	4.1%
2389	Apparel & Accessories	74.1%	3.4%	12.4%	5.8%	4.3%
2391	Curtains and Draperies	89.4%	1.3%	1.9%	3.0%	4.3%
2392	House Furnishings	89.0%	1.9%	2.4%	3.5%	3.1%
2393	Textile Bags	84.4%	1.4%	8.2%	4.9%	1.1%
2394	Canvas, Related Products	81.7%	1.4%	9.0%	6.8%	1.1%
2395	Pleating and Stitching	87.6%	2.3%	1.0%	6.8%	2.4%
2396	Automotive, Apparel Trim	91.0%	1.5%	0.7%	5.4%	1.5%
2397	Schiffli Machine Embroid	59.4%	3.5%	1.1%	9.9%	26.2%
2399	Fabricated Textile Prod	89.3%	1.9%	1.7%	4.4%	2.6%
23	APPAREL MFG AVERAGE	69.3%	1.8%	3.4%	4.9%	20.6%

* Predominately Subcontract Work

Table 7D-3: APPAREL MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$),
plus PURCHASE MANUFACTURING RANK

SIC Code	TYPE OF MANUFACTURING	REVENUES	EXPENDITURES			PURCHASE MFG RANK
			Purchases	Wages & Other Salarye Payment	Other Payment	
23	APPAREL MANUFACTURING	\$53,388	\$28,874	\$14,116	\$10,398	
2311	Men's, Boy's Suits & Coat	3,060	1,463	1,048	548	185
2321	Men's, Boy's Shirts	3,478	1,748	970	760	156
2322	Men's, Boy's Underwear	429	213	118	99	401
2323	Men's, Boy's Neckwear	335	159	91	85	418
2327	Men's, Boy's Trousers	2,165	1,109	671	386	224
2328	Men's, Boy's Work Clothes	4,661	2,312	986	1,364	119
2329	Men's, Boy's Clothing	1,658	784	495	379	271
2331	Women's Blouses	3,896	2,163	989	745	128
2335	Women's Dresses	4,623	2,490	1,423	710	112
2337	Women's Suits and Coats	4,887	2,844	993	1,050	89
2339	Women's Outerwear	4,834	2,698	1,255	880	98
2341	Women's Underwear	2,602	1,380	737	486	193
2342	Brassieres & Allied	720	350	167	203	365
2351	Millinery	90	50	25	15	444
2352	Hats and Caps	432	202	155	75	407
2361	Children Dresses, Blouse	1,418	697	405	316	287
2363	Children Coats and Suits	193	89	53	51	439
2369	Children Outerwear	1,102	530	304	268	320

Table 7D-3 Continued: APPAREL MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$),
plus PURCHASE MANUFACTURING RANK

SIC Code	TYPE OF MANUFACTURING	REVENUES	EXPENDITURES			PURCHASE MFG RANK
			Purchases	Wages & Other Salarie Payment		
2371	Fur Goods	\$419	\$291	\$70	\$58	380
2381	Dress & Work Gloves	208	104	60	44	437
2384	Robes and Dressing Gowns	404	213	99	91	400
2385	Waterproof Outergarments	449	214	115	120	399
2386	Leather, Sheep Clothing	221	127	58	37	430
2387	Apparel Belts	556	268	158	131	387
2389	Apparel & Accessories	279	134	99	47	425
2391	Curtains and Draperies	1,062	636	279	147	303
2392	House Furnishings	3,262	2,078	612	573	133
2393	Textile Bags	422	266	102	54	388
2394	Canvas, Related Products	752	414	209	129	349
2395	Pleating and Stitching	873	455	235	183	342
2396	Automotive, Apparel Trim	2,130	1,188	674	268	215
2397	Schiffli Machine Embroid	303	130	110	63	429
2399	Fabricated Textile Prod	1,476	884	346	246	259
23	APPAREL MFG TOTALS: (\$)	\$53,388	\$28,874	\$14,116	\$10,398	
	(%)	100%	54.1%	26.4%	19.5%	

**Table 7D-4: APPAREL MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES,
plus PURCHASE/WAGE & SALARY RATIO**

SIC Code	TYPE OF MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
23	APPAREL MANUFACTURING	54.1%	26.4%	19.5%	2.0
2311	Men's, Boy's Suits & Coat	47.8%	34.3%	17.9%	1.4
2321	Men's, Boy's Shirts	50.3%	27.9%	21.9%	1.8
2322	Men's, Boy's Underwear	49.6%	27.4%	23.1%	1.8
2323	Men's, Boy's Neckwear	47.5%	27.2%	25.3%	1.7
2327	Men's, Boy's Trousers	51.2%	31.0%	17.8%	1.7
2328	Men's, Boy's Work Clothes	49.6%	21.1%	29.3%	2.3
2329	Men's, Boy's Clothing	47.3%	29.8%	22.9%	1.6
2331	Women's Blouses	55.5%	25.4%	19.1%	2.2
2335	Women's Dresses	53.9%	30.8%	15.4%	1.8
2337	Women's Suits and Coats	58.2%	20.3%	21.5%	2.9
2339	Women's Outerwear	55.8%	26.0%	18.2%	2.1
2341	Women's Underwear	53.0%	28.3%	18.7%	1.9
2342	Brassieres & Allied	48.6%	23.2%	28.2%	2.1
2351	Millinery	55.7%	27.3%	17.0%	2.0
2352	Hats and Caps	46.8%	35.8%	17.4%	1.3
2361	Children Dresses, Blouse	49.1%	28.6%	22.3%	1.7
2363	Children Coats and Suits	46.3%	27.2%	26.4%	1.7
2369	Children Outerwear	48.1%	27.6%	24.3%	1.7

Table 7D-4 Continued: APPAREL MANUFACTURING: EXPENDITURES AS A PERCENT
OF REVENUES, plus PURCHASE/WAGE & SALARY RATIO

SIC Code	TYPE OF MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
2371	Fur Goods	69.5%	16.6%	13.9%	4.2
2381	Dress & Work Gloves	49.9%	28.8%	21.3%	1.7
2384	Robes and Dressing Gowns	52.8%	24.6%	22.6%	2.2
2385	Waterproof Outergarments	47.6%	25.6%	26.7%	1.9
2386	Leather, Sheep Clothing	57.3%	26.1%	16.7%	2.2
2387	Apparel Belts	48.1%	28.4%	23.5%	1.7
2389	Apparel & Accessories	47.9%	35.3%	16.8%	1.4
2391	Curtains and Draperies	59.9%	26.2%	13.9%	2.3
2392	House Furnishings	63.7%	18.7%	17.6%	3.4
2393	Textile Bags	63.1%	24.2%	12.7%	2.6
2394	Canvas, Related Products	55.0%	27.8%	17.1%	2.0
2395	Pleating and Stitching	52.1%	27.0%	20.9%	1.9
2396	Automotive, Apparel Trim	55.8%	31.6%	12.6%	1.8
2397	Schiffli Machine Embroid	42.9%	36.4%	20.8%	1.2
2399	Fabricated Textile Prod	59.9%	23.5%	16.6%	2.6
23	APPAREL MFG AVERAGE	54.1%	26.4%	19.5%	2.0

trade. It included firms that produced clothing and fabricating products by cutting and sewing purchased woven or knit textile fabrics and related materials such as leather, rubberized fabrics, plastics, and furs.

There were three primary types of apparel industries. The first was the "regular" or inside factories that performed the usual manufacturing functions within their own plant and did not use subcontractors. The second type were the contract factories which manufactured apparel from materials owned by others. The third type was the apparel jobbers, which performed the entrepreneurial functions of a manufacturing company, such as buying raw materials, designing and preparing samples, arranging for the manufacture of their materials, and selling of the finished apparels.

Purchases

The apparel industry had purchases of \$28 billion. This represented two percent of the total manufacturing purchases. The top three four-digit apparel manufacturing industries that spent the most on purchases all made women's clothing. They were women's suits and coats companies (\$2.8 billion), women's outer wear companies (\$2.7 billion), and those companies that made women's dresses (\$2.5 billion). The apparel industry had the highest percentage of subcontract purchases within all manufacturing. Subcontract purchases were \$5.5 billion, which accounted for 19 percent of all apparel purchases. The apparel industry dollar ratio

of purchases to wages and salaries was 2 to 1. Purchases accounted for 54 percent of the expenditures in the apparel manufacturing industry compared to 26 percent for wages and salaries.

Tables 7D-1 through 7D-4 summarize the purchase activities in the apparel industry by type of purchase and in relation to other expenditures. Table 7D-3 shows the purchase dollar rank of each four-digit apparel manufacturing industry in relation to the purchases of the other 448 manufacturing industries.

E. LUMBER AND WOOD PRODUCTS, Except Furniture (SIC 24)

Industry Description

This industry includes logging camps that were involved in the cutting of timber and pulpwood. It also included merchant sawmills, lath mills, shingle mills, cooperage stock mills, planing mills, plywood mills, and veneer mills. Finally, it included those establishments that manufactured finished articles made entirely or mainly of wood or wood substitutes.

Purchases

The lumber and wood products industry had purchases of \$29 billion. This represented two percent of the total manufacturing purchases. Within this industry, the companies that spent the most for purchases were sawmills (\$7.3 billion) and logging camps (\$6 billion). The lumber and wood products industry had a dollar ratio of purchases to wages

Table 7E-1: LUMBER MANUFACTURING: TYPES OF PURCHASES (Millions \$)

TYPE OF		TYPE OF PURCHASE					TOTAL
SIC	MANUFACTURING	Materials and Supplies	Energy	Buildings and Resale Equipment	Other Items	PURCHASES	
Code							
2411	Logging, Camps	\$3,817	\$123	\$764	\$421	\$930	
2421	Sawmills	5,845	331	186	685	324	
2426	Hardwood Flooring	418	30	14	43	6	
2429	Special Product Sawmills	78	3	10	6	2	
2431	Millwork	2,293	54	140	138	23	
2434	Wood Kitchen Cabinets	844	31	17	79	20	
2435	Hardwood Veneer & Plywood	779	32	32	39	5	
2436	Softwood Veneer & Plywood	2,180	140	12	144	37	
2439	Structural Wood Members	467	11	36	35	5	
2441	Nailed Wood Boxes, Shook	145	6	13	13	3	
2448	Wood Pallets and Skids	541	28	18	59	5	
2449	Wood Containers	159	6	3	12	1	
2451	Mobile Homes	2,369	22	10	84	30	
2452	Prefab Wood Buildings	735	12	17	36	33	
2491	Wood Preserving	891	39	41	59	9	
2492	Particleboard	293	49	0	121	3	
2499	Wood Products	1,444	176	43	205	24	
24 LUMBER MFG TOTALS: (\$)		\$23,292	\$1,091	\$1,366	\$2,104	\$1,470	
(\$)		79.4%	3.7%	4.7%	7.2%	5.0%	
				</			

Table 7E-2: LUMBER MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Buildings and Resale Equipment	Other Items	
2411	Logging, Camps	63.0%	2.0%	12.6%	7.0%	15.4%
2421	Sawmills	79.3%	4.5%	2.5%	9.3%	4.4%
2426	Hardwood Flooring	81.9%	5.8%	2.7%	8.5%	1.1%
2429	Special Product Sawmills	79.7%	2.6%	9.7%	6.2%	1.8%
2431	Millwork	86.6%	2.1%	5.3%	5.2%	0.9%
2434	Wood Kitchen Cabinets	85.1%	3.1%	1.8%	8.0%	2.0%
2435	Hardwood Veneer & Plywood	87.9%	3.6%	3.6%	4.4%	0.5%
2436	Softwood Veneer & Plywood	86.7%	5.6%	0.5%	5.7%	1.5%
2439	Structural Wood Members	84.3%	2.0%	6.5%	6.3%	0.9%
2441	Nailed Wood Boxes, Shook	80.7%	3.3%	7.2%	7.2%	1.6%
2448	Wood Pallets and Skids	83.2%	4.2%	2.7%	9.1%	0.7%
2449	Wood Containers	87.5%	3.4%	1.7%	6.7%	0.7%
2451	Mobile Homes	94.2%	0.9%	0.4%	3.3%	1.2%
2452	Prefab Wood Buildings	88.2%	1.5%	2.0%	4.3%	4.0%
2491	Wood Preserving	85.8%	3.7%	4.0%	5.6%	0.9%
2492	Particleboard	62.9%	10.5%	0.1%	25.9%	0.6%
2499	Wood Products	76.4%	9.3%	2.3%	10.8%	1.3%
24	LUMBER MFG AVERAGE	79.4%	3.7%	4.7%	7.2%	5.0%

Table 7E-3: LUMBER MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$),
plus PURCHASE MANUFACTURING RANK

TYPE OF MANUFACTURING		REVENUES	EXPENDITURES			PURCHASE MFG RANK
SIC Code			Purchases	Wages & Salaries	Other Payments	
2411	Logging, Camps	\$8,274	\$6,055	\$1,449	\$770	38
2421	Sawmills	10,065	7,371	2,488	206	27
2426	Hardwood Flooring	913	510	294	109	326
2429	Special Product Sawmills	155	98	38	19	438
2431	Millwork	4,248	2,647	1,080	521	102
2434	Wood Kitchen Cabinets	2,061	991	708	362	241
2435	Hardwood Veneer & Plywood	1,304	886	287	131	257
2436	Softwood Veneer & Plywood	3,221	2,514	848	*(141)	110
2439	Structural Wood Members	848	554	218	76	313
2441	Nailed Wood Boxes, Shook	307	180	90	37	411
2448	Wood Pallets and Skids	1,012	650	262	101	298
2449	Wood Containers	316	181	97	37	410
2451	Mobile Homes	3,606	2,515	722	369	109
2452	Prefab Wood Buildings	1,349	834	302	213	265
2491	Wood Preserving	1,360	1,039	195	126	237
2492	Particleboard	547	466	132	*(51)	339
2499	Wood Products	3,348	1,891	966	490	142
24	LUMBER MFG TOTALS: (\$)	\$42,935	\$29,323	\$10,176	\$3,436	
	(%)	100%	68.9%	23.7%	8.0%	

* Losses incurred, payments exceeded revenues.

Table 7E-4: LUMBER MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES,
plus PURCHASE/WAGE & SALARY RATIO

SIC Code	TYPE OF MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
2411	Logging, Camps	73.2%	17.5%	9.3%	4.2
2421	Sawmills	73.2%	24.7%	2.0%	3.0
2426	Hardwood Flooring	55.9%	32.2%	11.9%	1.7
2429	Special Product Sawmills	63.3%	24.3%	12.4%	2.6
2431	Millwork	62.3%	25.4%	12.3%	2.5
2434	Wood Kitchen Cabinets	48.1%	34.3%	17.6%	1.4
2435	Hardwood Veneer & Plywood	67.9%	22.0%	10.1%	3.1
2436	Softwood Veneer & Plywood	78.0%	26.3%	*(4.4)%	3.0
2439	Structural Wood Members	65.3%	25.8%	9.0%	2.5
2441	Nailed Wood Boxes, Shook	58.7%	29.3%	12.0%	2.0
2448	Wood Pallets and Skids	64.2%	25.9%	10.0%	2.5
2449	Wood Containers	57.4%	30.8%	11.7%	1.9
2451	Mobile Homes	69.7%	20.0%	10.2%	3.5
2452	Prefab Wood Buildings	61.8%	22.4%	15.8%	2.8
2491	Wood Preserving	76.4%	14.3%	9.3%	5.3
2492	Particleboard	85.1%	24.2%	*(9.3)%	3.5
2499	Wood Products	56.5%	28.9%	14.6%	2.0
24	LUMBER MFG AVERAGE	68.9%	23.7%	8.0%	2.9

* Losses incurred, payments exceeded revenues.

and salaries of 2.9 to 1 (which was the manufacturing average). Purchases accounted for 69 percent of the expenditures in the lumber and wood product industry compared to 24 percent for wages and salaries.

Tables 7E-1 through 7E-4 summarize the purchases in this industry by type of purchase and in relation to other expenditures. Table 7E-3 shows the purchase dollar rank of each four-digit for each of the lumber and wood product industries in relation to the purchases of the other 448 manufacturing industries.

F. FURNITURE AND FIXTURES (SIC 25)

Industry Description

This industry included companies that manufactured household, office, public building, and restaurant furniture. This industry also included firms that manufactured office and store fixtures such as shelves, partitions, and drapery hardware.

Purchases

The furniture industry had purchases of \$12 billion. This represented one percent of the total manufacturing purchases. The furniture industries that spent the most for purchases were wood furniture companies (\$2.5 billion), upholstered furniture companies (\$1.9 billion) and metal office furniture companies (\$1.4 billion). The furniture and fixture industry had a purchases to wages and salaries dollar ratio of 1.7 to 1. Purchases accounted for 51 percent

Table 7F-1: FURNITURE MANUFACTURING: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Buildings and Resale Equipment	Other Items		
2511	Wood Furniture	\$2,082	\$102	\$118	\$199	\$25	\$2,525
2512	Upholstered Furniture	1,693	37	26	123	12	1,890
2514	Metal Furniture	724	22	20	54	13	832
2515	Mattresses & Bedsprings	1,010	15	20	60	6	1,112
2517	Wood TV & Radio Cabinets	143	6	0	16	4	168
2519	Household Furniture	212	8	0	26	6	253
2521	Wood Office Furniture	373	14	31	56	10	483
2522	Metal Office Furniture	1,154	40	30	165	16	1,405
2531	Public Building Furniture	469	17	18	43	22	568
2541	Wood Partitions, Fixtures	635	24	36	71	57	822
2542	Metal Partitions, Fixture	761	36	37	85	48	966
2591	Drapery, Blinds, Shades	460	11	84	55	6	615
2599	Furniture and Fixtures	482	13	83	50	21	648
25	FURNITURE MFG TOTALS: (\$)	\$10,198	\$344	\$510	\$1,002	\$236	\$12,290
	(%)	83.0%	2.8%	4.1%	8.2%	1.9%	100%

Table 7F-2: FURNITURE MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Buildings and Resale Equipment	Other Items	
2511	Wood Furniture	82.4%	4.0%	4.7%	7.9%	1.0%
2512	Upholstered Furniture	89.6%	2.0%	1.4%	6.5%	0.6%
2514	Metal Furniture	87.0%	2.6%	2.4%	6.5%	1.6%
2515	Mattresses & Bedsprings	90.9%	1.4%	1.8%	5.4%	0.5%
2517	Wood TV & Radio Cabinets	85.1%	3.3%	0.0%	9.5%	2.1%
2519	Household Furniture	83.9%	3.3%	0.0%	10.3%	2.5%
2521	Wood Office Furniture	77.2%	2.9%	6.4%	11.6%	2.0%
2522	Metal Office Furniture	82.1%	2.9%	2.1%	11.7%	1.2%
2531	Public Building Furniture	82.6%	3.0%	3.1%	7.5%	3.8%
2541	Wood Partitions, Fixtures	77.2%	2.9%	4.4%	8.6%	6.9%
2542	Metal Partitions, Fixture	78.8%	3.7%	3.9%	8.7%	4.9%
2591	Draperies, Blinds, Shades	74.8%	1.7%	13.7%	8.9%	1.0%
2599	Furniture and Fixtures	74.4%	2.0%	12.7%	7.6%	3.3%
25	FURNITURE MFG AVERAGE	83.0%	2.8%	4.1%	8.2%	1.9%

**Table 7F-3: FURNITURE MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$),
plus PURCHASE MANUFACTURING RANK**

SIC Code	TYPE OF MANUFACTURING	REVENUES	EXPENDITURES			PURCHASE MFG RANK
			Purchases	Wages & Salaries	Other Payments	
2511	Wood Furniture	\$5,057	\$2,525	\$1,657	\$875	106
2512	Upholstered Furniture	3,505	1,890	975	640	143
2514	Metal Furniture	1,591	832	430	328	266
2515	Mattresses & Bedsprings	1,935	1,112	429	395	223
2517	Wood TV & Radio Cabinets	307	168	110	29	415
2519	Household Furniture	381	253	129	* (1)	390
2521	Wood Office Furniture	1,087	483	350	254	334
2522	Metal Office Furniture	3,063	1,405	923	734	191
2531	Public Building Furniture	1,103	568	352	183	310
2541	Wood Partitions, Fixtures	1,767	822	636	308	267
2542	Metal Partitions, Fixture	1,943	966	592	385	245
2591	Drapery, Blinds, Shades	1,114	615	277	223	305
2599	Furniture and Fixtures	1,276	648	374	254	299
25	FURNITURE MFG TOTALS: (\$)	\$24,129	12,290	7,233	4,606	
	(%)	100%	50.9%	30.0%	19.1%	

* Losses incurred, payments exceeded revenues.

**Table 7F-4: FURNITURE MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES,
plus PURCHASE/WAGE & SALARY RATIO**

SIC Code	TYPE OF MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
2511	Wood Furniture	49.9%	32.8%	17.3%	1.5
2512	Upholstered Furniture	53.9%	27.8%	18.3%	1.9
2514	Metal Furniture	52.3%	27.0%	20.6%	1.9
2515	Mattresses & Bedsprings	57.4%	22.2%	20.4%	2.6
2517	Wood TV & Radio Cabinets	54.9%	35.8%	9.3%	1.5
2519	Household Furniture	66.3%	33.9%	*(0.2)%	2.0
2521	Wood Office Furniture	44.4%	32.2%	23.4%	1.4
2522	Metal Office Furniture	45.9%	30.1%	24.0%	1.5
2531	Public Building Furniture	51.5%	31.9%	16.6%	1.6
2541	Wood Partitions, Fixtures	46.5%	36.0%	17.4%	1.3
2542	Metal Partitions, Fixture	49.7%	30.5%	19.8%	1.6
2591	Drapery, Blinds, Shades	55.2%	24.8%	20.0%	2.2
2599	Furniture and Fixtures	50.8%	29.3%	19.9%	1.7
25	FURNITURE MFG AVERAGE	50.9%	30.0%	19.1%	1.7

* Losses incurred, payments exceeded revenues.

of the expenditures in the furniture and fixtures industry compared to 30 percent for wages and salaries.

Tables 7F-1 through 7F-4 summarize the purchases in this industry by type of purchase and in relation to other expenditures. Table 7F-3 shows the purchases dollar rank of each four-digit furniture and fixture industry in relation to the purchases of the other 448 manufacturing industries.

G. PAPER AND ALLIED PRODUCTS (SIC 26)

Industry Description

This industry included those firms that manufactured pulp from wood, cellulose fibers, and from rags. Other firms manufactured paper and paperboard into such products as paper bags, boxes, and envelopes.

Purchases

The paper industry had purchases of \$53 billion. This represented four percent of the total manufacturing purchases. The paper industries that spent the most for purchases were paper mills (\$14 billion), paperboard mills (\$7 billion), and manufacturers of corrugated boxes (\$7 billion). The paper industry had a purchases to wages and salaries dollar ratio of 3.4 to 1. Purchases accounted for 67 percent of the expenditures in this industry compared to 20 percent for wages and salaries.

Tables 7G-1 through 7G-4 summarize the purchases in this industry by type of purchase and in relation to other

Table 7G-1: PAPER MANUFACTURING: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Resale	Buildings and Equipment	Other Items	
2611 Pulp Mills		\$1,549	\$376	\$0	\$760	\$64	\$2,749
2621 Paper Mills		9,307	2,667	53	2,298	134	14,459
2631 Paperboard Mills		4,159	1,598	27	1,604	96	7,484
2661 Building Paper Mills		123	74	7	21	2	226
2641 Paper Coating & Glazing		2,857	118	130	278	27	3,409
2642 Envelopes		824	26	46	93	30	1,019
2643 Bags, Less Textile Bags		2,797	94	74	210	18	3,193
2645 Die-cut Paper and Board		919	18	33	55	9	1,033
2646 Pressed, Molded Pulp Good		61	38	0	11	1	111
2647 Sanitary Paper Products		4,294	95	342	326	12	5,070
2648 Stationary Products		481	9	107	42	6	645
2649 Converted Paper Products		1,097	47	72	111	24	1,352
2651 Folding Paperboard Boxes		2,089	66	38	194	33	2,420
2652 Set-up Paperboard Boxes		166	9	6	23	6	209
2653 Corrugated, Boxes		6,512	225	104	532	57	7,430
2654 Sanitary Food Containers		1,424	43	128	100	11	1,705
2655 Fiber Cans, Drums Product		850	24	9	61	7	950
26 PAPER MFG TOTALS: (\$)		\$39,538	\$5,526	\$1,184	\$6,724	\$528	\$53,500
	(%)	73.9%	10.3%	2.2%	12.6%	1.0%	100%

Table 7G-2: PAPER MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Resale	Buildings and Equipment	Other Items
2611	Pulp Mills	56.4%	13.7%	0.0%	27.6%	2.3%
2621	Paper Mills	64.4%	18.4%	0.4%	15.9%	0.9%
2631	Paperboard Mills	55.6%	21.3%	0.4%	21.4%	1.3%
2661	Building Paper Mills	54.4%	32.6%	3.1%	9.3%	0.7%
2641	Paper Coating & Glazing	83.8%	3.4%	3.8%	8.1%	0.8%
2642	Envelopes	80.8%	2.6%	4.5%	9.2%	3.0%
2643	Bags, Less Textile Bags	87.6%	2.9%	2.3%	6.6%	0.6%
2645	Die-cut Paper and Board	88.9%	1.7%	3.2%	5.3%	0.8%
2646	Pressed, Molded Pulp Good	54.9%	34.7%	0.0%	9.9%	0.5%
2647	Sanitary Paper Products	84.7%	1.9%	6.7%	6.4%	0.2%
2648	Stationary Products	74.6%	1.4%	16.6%	6.4%	1.0%
2649	Converted Paper Products	81.2%	3.5%	5.3%	8.2%	1.8%
2651	Folding Paperboard Boxes	86.3%	2.7%	1.6%	8.0%	1.4%
2652	Set-up Paperboard Boxes	79.4%	4.1%	2.7%	11.0%	2.8%
2653	Corrugated, Boxes	87.6%	3.0%	1.4%	7.2%	0.8%
2654	Sanitary Food Containers	83.5%	2.5%	7.5%	5.8%	0.6%
2655	Fiber Cans, Drums Product	89.4%	2.5%	0.9%	6.4%	0.8%
26	PAPER MFG AVERAGE	73.9%	10.3%	2.2%	12.6%	1.0%

Table 7G-3: PAPER MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$),
plus PURCHASE MANUFACTURING RANK

SIC Code	TYPE OF MANUFACTURING	REVENUES	EXPENDITURES			PURCHASE MFG RANK
			Purchases	Wages & Salaries	Other Payments	
2611	Pulp Mills	\$3,110	\$2,749	\$573	* \$(211)	95
2621	Paper Mills	20,995	14,459	4,221	2,315	12
2631	Paperboard Mills	9,531	7,484	1,836	212	23
2661	Building Paper Mills	366	226	88	53	393
2641	Paper Coating & Glazing	5,454	3,409	1,058	987	77
2642	Envelopes	1,771	1,019	516	237	240
2643	Bags, Less Textile Bags	5,038	3,193	1,040	805	83
2645	Die-cut Paper and Board	1,680	1,033	297	350	238
2646	Pressed, Molded Pulp Good	236	111	75	50	434
2647	Sanitary Paper Products	9,086	5,070	1,075	2,941	53
2648	Stationary Products	1,034	645	234	156	301
2649	Converted Paper Products	2,399	1,352	527	520	195
2651	Folding Paperboard Boxes	3,886	2,420	1,012	454	117
2652	Set-up Paperboard Boxes	433	209	160	64	403
2653	Corrugated, Boxes	10,544	7,430	2,273	841	26
2654	Sanitary Food Containers	2,826	1,705	525	595	161
2655	Fiber Cans, Drums Product	1,456	950	301	205	248
26	PAPER MFG TOTALS: (\$)	\$79,895	\$53,500	\$15,827	\$10,568	
	(%)	100%	67.0%	19.8%	13.2%	

* Losses incurred, payments exceeded revenues.

**Table 7G-4: PAPER MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES,
plus PURCHASE/WAGE & SALARY RATIO**

SIC Code	TYPE OF MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
2611	Pulp Mills	88.4%	18.4%	*(6.8)%	4.8
2621	Paper Mills	68.9%	20.1%	11.0%	3.4
2631	Paperboard Mills	78.5%	19.3%	2.2%	4.1
2661	Building Paper Mills	61.7%	24.0%	14.4%	2.6
2641	Paper Coating & Glazing	62.5%	19.4%	18.1%	3.2
2642	Envelopes	57.5%	29.1%	13.4%	2.0
2643	Bags, Less Textile Bags	63.4%	20.6%	16.0%	3.1
2645	Die-cut Paper and Board	61.5%	17.7%	20.8%	3.5
2646	Pressed, Molded Pulp Good	46.9%	31.8%	21.3%	1.5
2647	Sanitary Paper Products	55.8%	11.8%	32.4%	4.7
2648	Stationary Products	62.3%	22.6%	15.1%	2.8
2649	Converted Paper Products	56.3%	22.0%	21.7%	2.6
2651	Folding Paperboard Boxes	62.3%	26.0%	11.7%	2.4
2652	Set-up Paperboard Boxes	48.3%	37.0%	14.7%	1.3
2653	Corrugated, Boxes	70.5%	21.6%	8.0%	3.3
2654	Sanitary Food Containers	60.3%	18.6%	21.1%	3.2
2655	Fiber Cans, Drums Product	65.3%	20.7%	14.1%	3.2
26	PAPER MFG AVERAGE	67.0%	19.8%	13.2%	3.4

* Losses incurred, payments exceeded revenues.

expenditures. Table 7G-3 shows the purchase dollar rank of each four-digit paper industry in relation to the purchases of the other 448 manufacturing industries.

H. PRINTING PUBLISHING AND ALLIED PRODUCTS (SIC 27)

Industry Description

This industry included establishments that engaged in printing that used one or more common processes, such as letterpress, lithography, gravure, or screen. Other firms in this industry performed services for the printing trade such as bookbinding, typesetting, engraving, photoengraving, and electrotyping. The final group in this industry published newspapers, books and periodicals. They were included here regardless of whether or not they did their own printing.

Purchases

The printing and publishing industry had purchases of \$38 billion. This represented three percent of the total manufacturing purchases. Within this industry, the companies that spent the most for purchases were lithographic commercial printers (\$9.7 billion), newspapers (\$8.1 billion), and those that publish and print periodicals (\$5 billion).

The printing and publishing industry was second only to the apparel industry in the amount of purchased subcontract work. Subcontract work totaled \$6.7 billion and represented 18 percent of all the purchases. In periodicals and book publishing more was spent on contract work than for

Table 7H-1: PRINTING AND PUBLISHING: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Buildings and Equipment	Resale	Other Items	
2711 Newspapers		\$5,193	\$198	\$21	\$1,624	\$1,150	\$8,185
2721 Periodicals		1,797	41	83	397	2,684	5,003
2731 Book Publishing		682	26	42	294	1,707	2,751
2732 Book Printing		816	39	4	169	96	1,123
2741 Miscellaneous Publishing		298	19	33	116	560	1,025
2751 Com Printing, Letterpress		2,075	76	68	389	139	2,746
2752 Com Print, Lithographic		7,113	270	172	1,333	897	9,785
2753 Engraving, Plate Printing		121	12	9	52	10	203
2754 Com Printing, Gravure		979	64	4	128	36	1,211
2761 Manifold Business Forms		2,379	49	106	211	46	2,791
2771 Greeting Card Publishing		405	13	26	61	116	620
2782 Blankbooks, Looseleaf		611	23	31	88	13	766
2789 Bookbinding		152	14	1	65	18	250
2791 Typesetting		162	17	5	103	33	320
2793 Photoengraving		31	2	0	9	2	44
2795 Lithographic Platemaking		281	15	13	102	26	436
27	PRINTING TOTALS: (\$)	\$23,097	\$877	\$618	\$5,802	\$7,658	\$38,052
	(%)	60.7%	2.3%	1.6%	15.2%	*20.2%	100%

* Predominately Subcontract Work

Table 7H-2: PRINTING AND PUBLISHING: TYPES OF PURCHASES BY PERCENT OF
TOTAL PURCHASES

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Buildings and Resale Equipment	Other Items*	
2711 Newspapers		63.4%	2.4%	0.3%	19.8%	14.0%
2721 Periodicals		35.9%	0.8%	1.7%	7.9%	53.7%
2731 Book Publishing		24.8%	0.9%	1.5%	10.7%	62.1%
2732 Book Printing		72.6%	3.4%	0.4%	15.0%	8.6%
2741 Miscellaneous Publishing		29.0%	1.8%	3.2%	11.3%	54.6%
2751 Com Printing, Letterpress		75.6%	2.8%	2.5%	14.2%	5.0%
2752 Com Print, Lithographic		72.7%	2.8%	1.8%	13.6%	9.2%
2753 Engraving, Plate Printing		59.4%	5.9%	4.2%	25.4%	5.0%
2754 Com Printing, Gravure		80.8%	5.3%	0.3%	10.6%	3.0%
2761 Manifold Business Forms		85.2%	1.8%	3.8%	7.5%	1.7%
2771 Greeting Card Publishing		65.3%	2.0%	4.2%	9.8%	18.6%
2782 Blankbooks, Looseleaf		79.8%	3.0%	4.0%	11.5%	1.6%
2789 Bookbinding		60.8%	5.6%	0.4%	25.8%	7.3%
2791 Typesetting		50.5%	5.4%	1.5%	32.2%	10.4%
2793 Photoengraving		69.8%	4.5%	0.0%	20.9%	4.8%
2795 Lithographic Platemaking		64.4%	3.4%	3.0%	23.3%	5.9%
27	PRINTING AVERAGE	60.7%	2.3%	1.6%	15.2%	20.2%

* Predominately Subcontract Work

Table 7H-3: PRINTING AND PUBLISHING: REVENUES AND EXPENDITURES (Millions \$),
plus PURCHASE MANUFACTURING RANK

SIC Code	TYPE OF MANUFACTURING	REVENUES	EXPENDITURES				PURCHASE MFG RANK
			Purchases	Salaries	Wages & Other	Payments	
2711	Newspapers	\$21,276	\$8,185	\$7,745	\$5,346	19	
2721	Periodicals	11,478	5,003	2,347	4,129	54	
2731	Book Publishing	7,740	2,751	1,570	3,419	94	
2732	Book Printing	2,392	1,123	910	359	221	
2741	Miscellaneous Publishing	2,871	1,025	819	1,027	239	
2751	Com Printing, Letterpress	5,504	2,746	1,826	932	96	
2752	Com Print, Lithographic	19,442	9,785	6,671	2,985	15	
2753	Engraving, Plate Printing	584	203	263	118	406	
2754	Com Printing, Gravure	2,170	1,211	656	303	211	
2761	Manifold Business Forms	5,059	2,791	1,102	1,166	92	
2771	Greeting Card Publishing	1,894	620	425	849	304	
2782	Blankbooks, Looseleaf	2,039	766	688	586	273	
2789	Bookbinding	764	250	390	123	391	
2791	Typesetting	1,243	320	653	269	372	
2793	Photoengraving	153	44	75	34	445	
2795	Lithographic Platemaking	1,188	436	541	210	344	
27	PRINTING TOTALS: (\$)	\$85,797	\$38,052	\$26,685	\$21,060		
	(\$)	100%	44.4%	31.1%	24.5%		

**Table 7H-4: PRINTING AND PUBLISHING: EXPENDITURES AS A PERCENT OF REVENUES,
plus PURCHASE/WAGE & SALARY RATIO**

SIC Code	TYPE OF MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
2711	Newspapers	38.5%	36.4%	25.1%	1.1
2721	Periodicals	43.6%	20.4%	36.0%	2.1
2731	Book Publishing	35.5%	20.3%	44.2%	1.8
2732	Book Printing	46.9%	38.1%	15.0%	1.2
2741	Miscellaneous Publishing	35.7%	28.5%	35.8%	1.3
2751	Com Printing, Letterpress	49.9%	33.2%	16.9%	1.5
2752	Com Print, Lithographic	50.3%	34.3%	15.4%	1.5
2753	Engraving, Plate Printing	34.8%	45.1%	20.1%	0.8
2754	Com Printing, Gravure	55.8%	30.2%	14.0%	1.8
2761	Manifold Business Forms	55.2%	21.8%	23.0%	2.5
2771	Greeting Card Publishing	32.7%	22.4%	44.8%	1.5
2782	Blankbooks, Looseleaf	37.6%	33.7%	28.7%	1.1
2789	Bookbinding	32.8%	51.1%	16.1%	0.6
2791	Typesetting	25.8%	52.6%	21.7%	0.5
2793	Photoengraving	28.7%	48.8%	22.5%	0.6
2795	Lithographic Platemaking	36.8%	45.6%	17.7%	0.8
27	PRINTING AVERAGE	44.4%	31.1%	24.5%	1.4

materials and supplies.

Printing and publishing had a purchases to wages and salaries dollar ratio of 1.7 to 1. Printing and publishing was one of the more labor intensive industries in manufacturing. Five of the sixteen (four-digit) printing and publishing industries had expenditures for wages and salaries that exceeded purchase expenditures. Those industries were engraving and plate printing, bookbinding, typesetting, photoengraving, and lithographic platemaking.

For the whole printing and publishing industry, however, purchases accounted for 44 percent of the expenditures compared to 31 percent for wages and salaries.

Tables 7H-1 through 7H-4 summarize the purchases in the printing and publishing industry by type of purchase and in relation to other expenditures. Table 7H-3 shows the purchase dollar rank of each four-digit printing and publishing industry in relation to the purchases of the other 448 manufacturing industries.

I. CHEMICALS AND ALLIED PRODUCTS (SIC 28)

Industry Description

The chemical industry included those firms that produced basic chemicals and also those firms that manufactured products by predominately chemical processes. The chemical industry can be divided into three major classes. The first class produced basic chemicals such as acids, alkalies, salts, and organic chemicals. The next

Table 7I-1: CHEMICAL MANUFACTURING: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Buildings and Equipment	Resale	Other Items	
28	CHEMICAL MANUFACTURING	\$76,048	\$10,616	\$4,445	\$12,390	\$1,712	\$105,211
2812	Alkalies and Chlorine	324	472	35	205	30	1,067
2813	Industrial Gases	215	664	68	278	23	1,247
2816	Inorganic Pigments	679	184	21	162	11	1,057
2819	Inorganic Chemicals	3,805	1,726	212	672	111	6,525
2821	Plastics and Resins	9,606	962	124	1,089	143	11,924
2822	Synthetic Rubber	1,957	210	0	282	54	2,503
2823	Cellulosic Manmade Fibers	702	101	0	116	5	924
2824	Organic Fibers	4,383	515	0	529	84	5,511
2831	Biological Products	716	35	128	155	18	1,051
2833	Medicinals & Botanicals	1,095	166	55	361	26	1,702
2834	Pharmaceuticals	4,446	270	658	1,105	196	6,675
2841	Soap & Other Detergents	3,689	116	532	362	47	4,746
2842	Polishes, Sanitation Good	1,700	35	176	125	79	2,114
2843	Surface Active Agents	1,179	90	32	131	13	1,445
2844	Toilet Preparations	2,728	58	118	295	136	3,335
2851	Paints & Allied Products	4,622	91	449	355	23	5,539

Table 7I-1 Continued: CHEMICAL MANUFACTURING: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Buildings and Equipment	Resale	Other Items	
2861	Gum & Wood Chemicals	\$351	\$44	\$10	\$52	\$5	\$462
2865	Cyclic Crudes	4,043	712	97	588	165	5,605
2869	Organic Chemicals	16,413	2,701	511	3,211	405	23,241
2873	Nitrogenous Fertilizers	1,388	672	310	217	29	2,616
2874	Phosphatic Fertilizers	2,631	237	155	1,037	37	4,096
2875	Fertilizers, Mixing Only	1,072	24	341	64	11	1,511
2879	Agricultural Chemicals	2,157	131	126	360	41	2,814
2891	Adhesives and Sealants	1,563	55	69	113	20	1,820
2892	Explosives	256	62	22	47	3	390
2893	Printing Ink	966	18	32	42	3	1,060
2895	Carbon Black	370	63	0	59	1	494
2899	Chemical Preparations	3,007	205	122	434	27	3,794
28	CHEMICAL MFG TOTALS: (\$)	\$76,048	\$10,616	\$4,445	\$12,390	\$1,712	\$105,211
	(%)	72.3%	10.1%	4.2%	11.8%	1.6%	100%

Table 7I-2: CHEMICAL MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF
TOTAL PURCHASES

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Buildings and Equipment	Other Items	
28	CHEMICAL MANUFACTURING	72.3%	10.1%	4.2%	11.8%	1.6%
2812	Alkalies and Chlorine	30.4%	44.3%	3.3%	19.2%	2.8%
2813	Industrial Gases	17.3%	53.2%	5.4%	22.3%	1.8%
2816	Inorganic Pigments	64.2%	17.4%	2.0%	15.3%	1.1%
2819	Inorganic Chemicals	58.3%	26.4%	3.2%	10.3%	1.7%
2821	Plastics and Resins	80.6%	8.1%	1.0%	9.1%	1.2%
2822	Synthetic Rubber	78.2%	8.4%	0.0%	11.3%	2.2%
2823	Cellulosic Manmade Fibers	75.9%	11.0%	0.0%	12.5%	0.5%
2824	Organic Fibers	79.5%	9.4%	0.0%	9.6%	1.5%
2831	Biological Products	68.1%	3.3%	12.2%	14.7%	1.7%
2833	Medicinals & Botanicals	64.3%	9.7%	3.2%	21.2%	1.5%
2834	Pharmaceuticals	66.6%	4.0%	9.9%	16.5%	2.9%
2841	Soap & Other Detergents	77.7%	2.4%	11.2%	7.6%	1.0%
2842	Polishes, Sanitation Good	80.4%	1.6%	8.3%	5.9%	3.7%
2843	Surface Active Agents	81.6%	6.2%	2.2%	9.1%	0.9%
2844	Toilet Preparations	81.8%	1.7%	3.5%	8.9%	4.1%
2851	Paints & Allied Products	83.4%	1.6%	8.1%	6.4%	0.4%

Table 7I-2 Continued: CHEMICAL MANUFACTURING: TYPES OF PURCHASES BY PERCENT
TOTAL PURCHASES

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Resale Equipment	Buildings and Other Items	
2861	Gum & Wood Chemicals	76.0%	9.5%	2.1%	11.3%	1.1%
2865	Cyclic Crudes	72.1%	12.7%	1.7%	10.5%	2.9%
2869	Organic Chemicals	70.6%	11.6%	2.2%	13.8%	1.7%
2873	Nitrogenous Fertilizers	53.0%	25.7%	11.9%	8.3%	1.1%
2874	Phosphatic Fertilizers	64.2%	5.8%	3.8%	25.3%	0.9%
2875	Fertilizers, Mixing Only	70.9%	1.6%	22.5%	4.2%	0.7%
2879	Agricultural Chemicals	76.6%	4.7%	4.5%	12.8%	1.5%
2891	Adhesives and Sealants	85.9%	3.0%	3.8%	6.2%	1.1%
2892	Explosives	65.6%	15.9%	5.7%	12.1%	0.8%
2893	Printing Ink	91.1%	1.7%	3.0%	3.9%	0.3%
2895	Carbon Black	75.0%	12.8%	0.0%	12.0%	0.2%
2899	Chemical Preparations	79.3%	5.4%	3.2%	11.4%	0.7%
28	CHEMICAL MFG AVERAGE	72.3%	10.1%	4.2%	11.8%	1.6%

**Table 7I-3: CHEMICAL MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$),
plus PURCHASE MANUFACTURING RANK**

SIC Code	TYPE OF MANUFACTURING	REVENUES	EXPENDITURES				PURCHASE MFG RANK
			Purchases	Wages & Other Salaries Payments			
28	CHEMICAL MANUFACTURING	\$170,737	\$105,211	\$25,855	\$39,671		
2812	Alkalies and Chlorine	1,570	1,067	270	234	230	
2813	Industrial Gases	2,019	1,247	226	546	206	
2816	Inorganic Pigments	1,630	1,057	345	228	232	
2819	Inorganic Chemicals	12,060	6,525	2,707	2,828	34	
2821	Plastics and Resins	15,814	11,924	1,783	2,106	13	
2822	Synthetic Rubber	3,139	2,503	431	204	111	
2823	Cellulosic Manmade Fibers	1,240	924	362	* (47)	249	
2824	Organic Fibers	8,288	5,511	1,759	1,018	47	
2831	Biological Products	2,300	1,051	549	699	235	
2833	Medicinals & Botanicals	3,398	1,702	556	1,140	162	
2834	Pharmaceuticals	18,998	6,675	3,742	8,581	33	
2841	Soap & Other Detergents	9,167	4,746	1,036	3,385	57	
2842	Polishes, Sanitation Good	4,626	2,114	540	1,972	130	
2843	Surface Active Agents	2,060	1,445	247	369	188	
2844	Toilet Preparations	10,183	3,335	1,356	5,492	80	
2851	Paints & Allied Products	\$9,162	\$5,539	\$1,412	\$2,212	46	
* Losses incurred, payments exceeded revenues.							

* Losses incurred, payments exceeded revenues.

Table 7I-3 Continued: CHEMICAL MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$),
plus PURCHASE MANUFACTURING RANK

SIC Code	TYPE OF MANUFACTURING	REVENUES	EXPENDITURES			PURCHASE MFG RANK
			Purchases	Wages & Salaries	Other Payments	
2861	Gum & Wood Chemicals	624	462	100	62	340
2865	Cyclic Crudes	7,138	5,605	918	615	45
2869	Organic Chemicals	30,394	23,241	3,997	3,156	5
2873	Nitrogenous Fertilizers	3,391	2,616	324	451	103
2874	Phosphatic Fertilizers	3,922	4,096	402	* (575)	67
2875	Fertilizers, Mixing Only	1,903	1,511	183	209	181
2879	Agricultural Chemicals	5,436	2,814	502	2,120	90
2891	Adhesives and Sealants	2,857	1,820	451	586	151
2892	Explosives	923	390	317	216	352
2893	Printing Ink	1,572	1,060	254	257	231
2895	Carbon Black	633	494	70	69	331
2899	Chemical Preparations	6,330	3,794	1,019	1,516	73
28	CHEMICAL MFG TOTALS: (\$)	\$170,737	\$105,211	\$25,855	\$39,671	
	(%)	100%	61.6%	15.1%	23.2%	

* Losses incurred, payments exceeded revenues.

Table 7I-4: CHEMICAL MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES,
plus PURCHASE/WAGE & SALARY RATIO

SIC Code	TYPE OF MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
28	CHEMICAL MANUFACTURING	61.6%	15.1%	23.2%	4.1
2812	Alkalies and Chlorine	67.9%	17.2%	14.9%	4.0
2813	Industrial Gases	61.8%	11.2%	27.0%	5.5
2816	Inorganic Pigments	64.9%	21.1%	14.0%	3.1
2819	Inorganic Chemicals	54.1%	22.4%	23.4%	2.4
2821	Plastics and Resins	75.4%	11.3%	13.3%	6.7
2822	Synthetic Rubber	79.8%	13.7%	6.5%	5.8
2823	Cellulosic Manmade Fibers	74.5%	29.2%	*(3.8)%	2.6
2824	Organic Fibers	66.5%	21.2%	12.3%	3.1
2831	Biological Products	45.7%	23.9%	30.4%	1.9
2833	Medicinals & Botanicals	50.1%	16.4%	33.6%	3.1
2834	Pharmaceuticals	35.1%	19.7%	45.2%	1.8
2841	Soap & Other Detergents	51.8%	11.3%	36.9%	4.6
2842	Polishes, Sanitation Good	45.7%	11.7%	42.6%	3.9
2843	Surface Active Agents	70.1%	12.0%	17.9%	5.9
2844	Toilet Preparations	32.7%	13.3%	53.9%	2.5
2851	Paints & Allied Products	60.5%	15.4%	24.1%	3.9
* Losses incurred, payments exceeded revenues.					

Table 7I-4 Continued: CHEMICAL MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE & SALARY RATIO

SIC Code	TYPE OF MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
2861	Gum & Wood Chemicals	74.1%	16.0%	9.9%	4.6
2865	Cyclic Crudes	78.5%	12.9%	8.6%	6.1
2869	Organic Chemicals	76.5%	13.2%	10.4%	5.8
2873	Nitrogenous Fertilizers	77.1%	9.5%	13.3%	8.1
2874	Phosphatic Fertilizers	104.4%	10.2%	*(14.7)%	10.2
2875	Fertilizers, Mixing Only	79.4%	9.6%	11.0%	8.3
2879	Agricultural Chemicals	51.8%	9.2%	39.0%	5.6
2891	Adhesives and Sealants	63.7%	15.8%	20.5%	4.0
2892	Explosives	42.3%	34.3%	23.4%	1.2
2893	Printing Ink	67.5%	16.2%	16.4%	4.2
2895	Carbon Black	78.0%	11.1%	10.9%	7.1
2899	Chemical Preparations	59.9%	16.1%	24.0%	3.7
28	CHEMICAL MFG AVERAGE	61.6%	15.1%	23.2%	4.1

* Losses incurred, payments exceeded revenues.

class produced chemical products that were used in additional manufacturing such as synthetic fibers, plastic materials, dry colors, and pigments. The last class produced chemical products that were used for ultimate consumption. Examples from this last group included drugs, cosmetics, and soaps. This last class produced chemical products that were used as materials or supplies in other industries such as paints, fertilizers, and explosives.

Purchases

The chemical industry had purchases of \$105 billion. This represented eight percent of the total manufacturing purchases. The companies that spent the most for purchases were those that manufactured: organic chemicals (\$23 billion), plastics and resins (\$12 billion) and pharmaceuticals (\$6.6 billion).

The chemical industry purchased the most energy (\$10 billion) and the most capital equipment (\$12 billion) within all manufacturing. The purchases to wages and salaries dollar ratio in this industry was 4.1 to 1. Purchases accounted for 62 percent of the expenditures compared to 15 percent for wages and salaries.

Tables 7I-1 through 7I-4 summarize the purchases in this industry by type of purchase and in relation to other expenditures. Table 7I-3 shows the purchase dollar rank of each four-digit chemical industry in relation to the purchases of the other 448 manufacturing industries.

Table 7J-1: PETROLEUM MANUFACTURING: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Buildings and Equipment	Other Items		
2911	Petroleum Refining	\$166,875	\$5,136	\$7,821	\$638		\$186,807
2951	Paving Mixtures & Blocks	1,834	215	140	72		2,305
2952	Asphalt Felts & Coatings	1,771	113	89	12		2,086
2992	Lubricating Oils, Greases	1,790	35	97	34		2,051
2999	Petroleum & Coal Products	452	37	84	4		646
29	PETROLEUM MFG TOTALS: (\$)	\$172,722	\$5,535	\$8,231	\$759		\$193,895
	(%)	89.1%	2.9%	4.2%	0.4%		100%

Table 7J-2: PETROLEUM MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Resale Equipment	Buildings and Other Items	
2911	Petroleum Refining	89.3%	2.7%	3.4%	4.2%	0.3%
2951	Paving Mixtures & Blocks	79.6%	9.3%	1.9%	6.1%	3.1%
2952	Asphalt Felts & Coatings	84.9%	5.4%	4.9%	4.3%	0.6%
2992	Lubricating Oils, Greases	87.3%	1.7%	4.6%	4.7%	1.7%
2999	Petroleum & Coal Products	70.0%	5.7%	10.7%	13.0%	0.6%
29	PETROLEUM MFG AVERAGE	89.1%	2.9%	3.4%	4.2%	0.4%

Table 7J-3: PETROLEUM MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$), plus PURCHASE MANUFACTURING RANK

SIC Code	TYPE OF MANUFACTURING	REVENUES	EXPENDITURES				PURCHASE MFG RANK
			Purchases	Wages & Salaries	Other Payments		
2911	Petroleum Refining	\$199,723	\$186,807	\$4,333	\$8,583		1
2951	Paving Mixtures & Blocks	3,099	2,305	405	389		121
2952	Asphalt Felts & Coatings	2,850	2,086	359	405		132
2992	Lubricating Oils, Greases	2,875	2,051	317	507		134
2999	Petroleum & Coal Products	739	646	58	36		300
29	PETROLEUM MFG TOTALS: (\$)	\$209,286	\$193,895	\$5,471	\$9,919		
	(%)	100%	92.6%	2.6%	4.8%		

Table 7J-4: PETROLEUM MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES,
plus PURCHASE/WAGE & SALARY RATIO

SIC Code	TYPE OF MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
2911	Petroleum Refining	93.5%	2.2%	4.3%	43.1
2951	Paving Mixtures & Blocks	74.4%	13.1%	12.5%	5.7
2952	Asphalt Felts & Coatings	73.2%	12.6%	14.2%	5.8
2992	Lubricating Oils, Greases	71.3%	11.0%	17.6%	6.5
2999	Petroleum & Coal Products	87.4%	7.8%	4.8%	11.2
29	PETROLEUM MFG AVERAGE	92.6%	2.6%	4.8%	35.5

J. PETROLEUM REFINING AND RELATED INDUSTRIES (SIC 29)**Industry Description**

This industry included those companies that were primarily engaged in petroleum refining, manufacturing paving and roofing materials, and compounding lubricating oils and greases from purchased materials.

Purchases

The petroleum refining industry had purchases of \$193 billion. This accounted for 16 percent of the total manufacturing purchases making it second only to the food industry. Petroleum refining (SIC 2911) accounted for 96 percent of purchases within the SIC 29 manufacturing group. The petroleum refining industry had a purchases to wages and salaries dollar ratio of 35 to 1. This was the highest ratio for all manufacturing. Purchases accounted for 92 percent of the expenditures in this industry compared to three percent for wages and salaries.

Tables 7J-1 through 7J-4 summarize the purchases in the petroleum industry by type of purchase and in relation to other expenditures. Table 7J-3 shows the purchase dollar rank of each four-digit petroleum industry in relation to the purchases of the other 448 manufacturing industries.

K. RUBBER AND MISCELLANEOUS PLASTIC PRODUCTS (SIC 30)**Industry Description**

This industry included firms that manufactured products from natural, synthetic or reclaimed rubber. These products

Table 7K-1: PLASTIC MANUFACTURING: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Buildings and Resale Equipment	Other Items		
3011 Tires & Inner Tubes		\$4,038	\$271	\$271	\$298	\$21	\$4,899
3021 Rubber & Plastic Footwear		277	15	40	28	3	363
3031 Reclaimed Rubber		25	5	0	2	1	34
3041 Rubber & Plastic Hoses		765	64	64	149	7	1,049
3069 Fabricated Rubber Product		2,744	202	150	331	53	3,479
3079 Misc Plastic Products		17,099	1,139	476	2,868	615	22,198
30 PLASTIC MFG TOTALS: (\$)		\$24,948	\$1,696	\$1,001	\$3,676	\$700	\$32,022
(%)		77.9%	5.3%	3.1%	11.5%	2.2%	100%

**Table 7K-2: PLASTIC MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF
TOTAL PURCHASES**

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Resale Equipment	Buildings and Equipment	Other Items
3011	Tires & Inner Tubes	82.4%	5.5%	5.5%	6.1%	0.4%
3021	Rubber & Plastic Footwear	76.5%	4.2%	10.9%	7.6%	0.8%
3031	Reclaimed Rubber	75.8%	15.2%	0.0%	6.6%	2.4%
3041	Rubber & Plastic Hoses	72.9%	6.1%	6.1%	14.2%	0.7%
3069	Fabricated Rubber Product	78.9%	5.8%	4.3%	9.5%	1.5%
3079	Misc Plastic Products	77.0%	5.1%	2.1%	12.9%	2.8%
30	PLASTIC MFG AVERAGE	77.9%	5.3%	3.1%	11.5%	2.2%

Table 7K-3: PLASTIC MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$),
plus PURCHASE MANUFACTURING RANK

SIC Code	TYPE OF MANUFACTURING	REVENUES	EXPENDITURES			PURCHASE MFG RANK
			Purchases	Wages & Salaries	Other Payments	
3011	Tires & Inner Tubes	\$9,340	\$4,899	\$2,271	\$2,170	55
3021	Rubber & Plastic Footwear	706	363	236	107	363
3031	Reclaimed Rubber	63	34	18	12	446
3041	Rubber & Plastic Hoses	1,964	1,049	662	253	236
3069	Fabricated Rubber Product	6,366	3,479	1,944	942	75
3079	Misc Plastic Products	37,009	22,198	9,225	5,587	6
30	PLASTIC MFG TOTALS: (\$)	\$55,448	\$32,022	\$14,356	\$9,071	
	(%)	100%	57.8%	25.9%	16.4%	

Table 7K-4: PLASTIC MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES,
plus PURCHASE/WAGE & SALARY RATIO

SIC Code	TYPE OF MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
3011	Tires & Inner Tubes	52.4%	24.3%	23.2%	2.2
3021	Rubber & Plastic Footwear	51.3%	33.5%	15.2%	1.5
3031	Reclaimed Rubber	53.2%	28.3%	18.6%	1.9
3041	Rubber & Plastic Hoses	53.4%	33.7%	12.9%	1.6
3069	Fabricated Rubber Product	54.7%	30.5%	14.8%	1.8
3079	Misc Plastic Products	60.0%	24.9%	15.1%	2.4
30	PLASTIC MFG AVERAGE	57.8%	25.9%	16.4%	2.2

included tires, rubber footwear, and flooring. The plastic portion of this industry included firms that were involved in molding primary plastics for the trade and manufacturing of miscellaneous finished plastic products.

Purchases

The rubber and plastic product industry had purchases of \$32 billion. This represented three percent of the total manufacturing purchases. The companies that spent the most for purchases were those that made: (1) miscellaneous plastic products (\$22 billion) and (2) tires and inner tubes (\$5 billion). The whole industry had a purchases to wages and salaries dollar ratio of 2.2 to 1. Purchases accounted for 58 percent of the expenditures compared to 26 percent for wages and salaries.

Tables 7K-1 through 7K-4 summarize the purchases in the rubber industry by type of purchase and in relation to other expenditures. Table 7K-3 shows the purchase dollar rank of each four-digit rubber industry in relation to the purchases of the other 448 manufacturing industries.

L. LEATHER AND LEATHER PRODUCTS (SIC 31)

Industry Description

This industry included businesses that were engaged in tanning, currying, and finishing hides and skins. It also included firms that manufactured finished leather, artificial leather products, and some similar products made of other materials. Leather converters were also included in

Table 7L-1: LEATHER MANUFACTURING: TYPES OF PURCHASES (Millions \$)

TYPE OF MANUFACTURING		TYPE OF PURCHASE					TOTAL PURCHASES
SIC Code		Materials and Supplies	Energy	Buildings and Resale Equipment	Other Items		
3111	Leather Tanning & Finish	\$1,014	\$57	\$24	\$59	\$74	\$1,227
3131	Boot & Shoe Cut Stock	197	5	10	10	1	223
3142	House Slippers	118	3	4	5	5	134
3143	Men's Footwear	991	17	127	64	9	1,208
3144	Women's Footwear	769	16	18	51	21	875
3149	Footwear, Except Rubber	292	7	53	25	2	379
3151	leather Gloves, Mittens	71	4	26	3	5	108
3161	Luggage	272	8	67	22	11	380
3171	Women's Handbags & Purses	208	4	0	13	90	315
3172	Personal Leather Goods	123	4	38	10	3	177
3199	Leather Goods	142	5	15	14	2	178
31	LEATHER MFG TOTALS: (\$)	\$4,197	\$129	\$382	\$274	\$222	\$5,204
	(%)	80.6%	2.5%	8.5%	5.3%	3.1%	100%

Table 7L-2: LEATHER MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF
TOTAL PURCHASES

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Resale	Buildings and Equipment	Other Items
3111	Leather Tanning & Finish	82.6%	4.6%	2.0%	4.8%	6.0%
3131	Boot & Shoe Cut Stock	88.4%	2.4%	4.5%	4.3%	0.4%
3142	House Slippers	87.6%	1.9%	3.3%	3.8%	3.4%
3143	Men's Footwear	82.0%	1.4%	10.5%	5.3%	0.8%
3144	Women's Footwear	87.9%	1.8%	2.0%	5.8%	2.4%
3149	Footwear, Except Rubber	77.1%	1.9%	14.0%	6.6%	0.5%
3151	leather Gloves, Mittens	65.3%	3.4%	23.8%	2.6%	4.9%
3161	Luggage	71.5%	2.2%	17.7%	5.8%	2.8%
3171	Women's Handbags & Purses	66.0%	1.4%	0.0%	4.0%	*28.6%
3172	Personal Leather Goods	69.5%	2.0%	21.2%	5.4%	1.9%
3199	Leather Goods	80.0%	2.5%	8.7%	7.8%	1.1%
31	LEATHER MFG AVERAGE	80.6%	2.5%	8.5%	5.3%	3.1%

* Predominately Subcontract Work

Table 7L-3: LEATHER MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$),
plus PURCHASE MANUFACTURING RANK

SIC Code	TYPE OF MANUFACTURING	REVENUES	EXPENDITURES			PURCHASE MFG RANK
			Purchases	Wages & Salaries	Other Payments	
3111	Leather Tanning & Finish	\$1,752	\$1,227	\$376	\$149	208
3131	Boot & Shoe Cut Stock	368	223	96	49	396
3142	House Slippers	276	134	84	57	423
3143	Men's Footwear	2,261	1,208	599	455	212
3144	Women's Footwear	1,933	875	572	486	261
3149	Footwear, Except Rubber	799	379	229	192	359
3151	leather Gloves, Mittens	178	108	42	28	435
3161	Luggage	789	380	229	181	358
3171	Women's Handbags & Purses	624	315	175	134	373
3172	Personal Leather Goods	411	177	135	100	414
3199	Leather Goods	325	178	85	62	413
31	LEATHER MFG TOTALS: (\$)	\$9,716	\$5,204	\$2,620	\$1,891	
	(%)	100%	53.6%	27.0%	19.4%	

**Table 7L-4: LEATHER MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES,
plus PURCHASE/WAGE & SALARY RATIO**

SIC Code	TYPE OF MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
3111	Leather Tanning & Finish	70.1%	21.5%	8.5%	3.3
3131	Boot & Shoe Cut Stock	60.5%	26.2%	13.3%	2.3
3142	House Slippers	48.7%	30.6%	20.7%	1.6
3143	Men's Footwear	53.4%	26.5%	20.1%	2.0
3144	Women's Footwear	45.3%	29.6%	25.2%	1.5
3149	Footwear, Except Rubber	47.4%	28.6%	24.0%	1.7
3151	Leather Gloves, Mittens	60.8%	23.4%	15.8%	2.6
3161	Luggage	48.1%	29.0%	22.9%	1.7
3171	Women's Handbags & Purses	50.6%	28.0%	21.4%	1.8
3172	Personal Leather Goods	43.1%	32.7%	24.2%	1.3
3199	Leather Goods	54.8%	26.1%	19.1%	2.1
31	LEATHER MFG AVERAGE	53.6%	27.0%	19.4%	2.0

this industry.

Purchases

Leather manufacturing, the smallest industry, had purchases of \$5 billion. This represented less than one percent of the total manufacturing purchases. Within this industry, the companies that spent the most for purchases were leather tanning and finishing companies (\$1.2 billion), men's footwear (\$1.2 billion) and women's footwear (\$875 million). The leather industry had a purchases to wages and salaries dollar ratio of 2 to 1. Purchases accounted for 54 percent of the expenditures compared to 27 percent for wages and salaries.

Tables 7L-1 through 7L-4 summarize the purchases in the leather industry by type of purchase and in relation to other expenditures. Table 7L-3 shows the purchase dollar rank of each four-digit leather industry in relation to the purchases of the other 448 manufacturing industries.

M. STONE, CLAY, GLASS, AND CONCRETE PRODUCTS (SIC 32)

Industry Description

The products in this industry were made from materials taken principally from the earth in the form of stone, clay and sand. These products included flat glass, other glass products, cement, structural clay products, pottery, concrete, gypsum products, cut stone, abrasives, and asbestos products.

Table 7M-1: GLASS AND STONE MANUFACTURING: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Resale	Buildings and Equipment	Other Items	
32	GLASS & STONE MFG	\$16,860	\$3,862	\$1,112	\$3,344	\$591	\$25,769
3211	Flat Glass	500	231	93	131	6	960
3221	Glass Containers	1,825	665	0	368	41	2,898
3229	Pressed and Blown Glass	672	267	22	332	186	1,479
3231	Glass Products, Purchase	1,321	98	41	184	29	1,672
3241	Cement, Hydraulic	729	962	25	575	46	2,337
3251	Brick, Clay Tile	134	141	17	43	5	340
3253	Ceramic Wall & Floor Tile	88	35	0	15	28	165
3255	Clay Refractories	259	61	18	29	3	370
3259	Structural Clay Products	20	25	7	4	1	57
3261	Vitreous Plumbing Fixture	117	36	9	34	1	197
3262	Vitreous China Utensils	33	14	2	10	1	60
3263	Earthenware Food Utensils	18	6	0	3	1	27
3264	Porcelain Elect Supplies	149	29	2	37	5	222
3269	Pottery Products	137	18	22	23	2	202
3271	Concrete Block & Brick	518	42	154	88	8	810

Table 7M-1 Continued: GLASS AND STONE MANUFACTURING: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Resale	Buildings and Equipment	Other Items	
3272	Concrete Products	\$1,344	\$85	\$109	\$214	\$105	\$1,857
3273	Ready Mixed Concrete	4,477	180	213	470	43	5,382
3274	Lime	115	178	2	44	6	345
3275	Gypsum Products	580	194	34	106	4	919
3281	Cut Stone Products	198	16	10	29	35	288
3291	Abrasive Products	1,034	73	159	154	36	1,456
3292	Asbestos Products	381	36	12	53	3	484
3293	Gaskets	569	39	37	89	22	756
3295	Minerals, Ground & Treat	503	97	10	85	9	704
3296	Mineral Wool	734	246	58	104	7	1,148
3297	Nonclay Refractories	278	59	5	75	4	420
3299	Nonmetallic Mineral Prod	139	33	5	46	2	225
32	GLASS & STONE TOTALS: (\$)	\$16,860	\$3,862	\$1,112	\$3,344	\$591	\$25,769
	(%)	65.4%	15.0%	4.3%	13.0%	2.3%	100%

185

Table 7M-2: GLASS AND STONE MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Resale Equipment	Buildings and Other Items	
32	GLASS & STONE MFG	65.4%	15.0%	4.3%	13.0%	2.3%
3211	Flat Glass	52.0%	24.0%	9.7%	13.7%	0.7%
3221	Glass Containers	63.0%	22.9%	0.0%	12.7%	1.4%
3229	Pressed and Blown Glass	45.5%	18.1%	1.5%	22.4%	12.6%
3231	Glass Products, Purchase	79.0%	5.8%	2.4%	11.0%	1.8%
3241	Cement, Hydraulic	31.2%	41.2%	1.1%	24.6%	2.0%
3251	Brick, Clay Tile	39.4%	41.6%	5.0%	12.5%	1.5%
3253	Ceramic Wall & Floor Tile	53.4%	20.9%	0.0%	8.9%	16.9%
3255	Clay Refractories	70.1%	16.4%	4.8%	7.9%	0.8%
3259	Structural Clay Products	35.5%	43.8%	12.3%	6.3%	2.1%
3261	Vitreous Plumbing Fixture	59.5%	18.3%	4.4%	17.4%	0.4%
3262	Vitreous China Utensils	54.8%	23.2%	3.0%	17.0%	2.0%
3263	Earthenware Food Utensils	64.6%	21.8%	0.0%	11.4%	2.2%
3264	Porcelain Elect Supplies	67.2%	13.1%	1.1%	16.4%	2.1%
3269	Pottery Products	68.0%	8.7%	11.0%	11.5%	0.8%
3271	Concrete Block & Brick	64.0%	5.2%	19.0%	10.8%	1.0%

Table 7M-2 Continued: GLASS AND STONE MANUFACTURING: TYPES OF PURCHASES BY
PERCENT OF TOTAL PURCHASES

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Resale Equipment	Buildings and Other Items	
3272	Concrete Products	72.4%	4.6%	5.8%	11.5%	5.7%
3273	Ready Mixed Concrete	83.2%	3.3%	4.0%	8.7%	0.8%
3274	Lime	33.5%	51.5%	0.5%	12.8%	1.7%
3275	Gypsum Products	63.1%	21.1%	3.7%	11.6%	0.5%
3281	Cut Stone Products	68.8%	5.4%	3.5%	10.0%	12.3%
3291	Abrasive Products	71.0%	5.0%	10.9%	10.6%	2.5%
3292	Asbestos Products	78.7%	7.4%	2.5%	10.9%	0.5%
3293	Gaskets	75.3%	5.1%	4.9%	11.8%	2.9%
3295	Minerals, Ground & Treat	71.4%	13.8%	1.4%	12.1%	1.3%
3296	Mineral Wool	63.9%	21.4%	5.0%	9.0%	0.6%
3297	Nonclay Refractories	66.1%	14.0%	1.1%	17.7%	1.0%
3299	Nonmetallic Mineral Prod	61.8%	14.5%	2.3%	20.5%	0.9%
32	GLASS & STONE MFG AVG	65.4%	15.0%	4.3%	13.0%	2.3%

Table 7M-3: GLASS AND STONE MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$),
plus PURCHASE MANUFACTURING RANK

SIC Code	TYPE OF MANUFACTURING	REVENUES	EXPENDITURES			PURCHASE MFG RANK
			Purchases	Wages & Salaries	Other Payments	
32	GLASS & STONE MFG	\$45,181	\$25,769	\$12,534	\$6,878	
3211	Flat Glass	1,666	960	569	136	246
3221	Glass Containers	5,217	2,898	1,658	661	88
3229	Pressed and Blown Glass	2,724	1,479	927	318	184
3231	Glass Products, Purchase	2,977	1,672	861	444	166
3241	Cement, Hydraulic	3,542	2,337	824	381	118
3251	Brick, Clay Tile	657	340	218	99	368
3253	Ceramic Wall & Floor Tile	407	165	136	105	416
3255	Clay Refractories	670	370	209	91	360
3259	Structural Clay Products	134	57	45	31	443
3261	Vitreous Plumbing Fixture	474	197	180	97	409
3262	Vitreous China Utensils	242	60	122	60	441
3263	Earthenware Food Utensils	88	27	45	15	448
3264	Porcelain Elect Supplies	528	222	244	62	397
3269	Pottery Products	431	202	147	82	408
3271	Concrete Block & Brick	1,302	810	305	187	269

188

Table 7M-3 Continued: GLASS AND STONE MANUFACTURING: REVENUES AND EXPENDITURES
(Millions \$), plus PURCHASE MANUFACTURING RANK

SIC Code	TYPE OF MANUFACTURING	REVENUES	EXPENDITURES			PURCHASE MFG RANK
			Purchases	Wages & Other Salaries Payments		
3272	Concrete Products	\$3,649	\$1,857	\$1,158	\$635	148
3273	Ready Mixed Concrete	8,199	5,382	1,739	1,078	49
3274	Lime	543	345	134	64	367
3275	Gypsum Products	1,289	919	226	145	251
3281	Cut Stone Products	555	288	183	84	382
3291	Abrasive Products	2,751	1,456	680	615	186
3292	Asbestos Products	843	484	222	136	333
3293	Gaskets	1,666	756	615	295	275
3295	Minerals, Ground & Treat	1,257	704	234	319	285
3296	Mineral Wool	2,281	1,148	551	583	219
3297	Nonclay Refractories	691	420	195	76	347
3299	Nonmetallic Mineral Prod	422	225	113	84	395
32	GLASS & STONE TOTALS: (\$)	\$45,181	\$25,769	\$12,534	\$6,878	
	(%)	100%	57.0%	27.7%	15.3%	

**Table 7M-4: GLASS & STONE MANUFACTURING: EXPENDITURES AS A PERCENT
OF REVENUES, plus PURCHASE/WAGE & SALARY RATIO**

SIC Code	TYPE OF MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
20	GLASS & STONE MFG	57.0%	27.7%	15.3%	2.1
3211	Flat Glass	57.7%	34.1%	8.2%	1.7
3221	Glass Containers	55.6%	31.8%	12.7%	1.7
3229	Pressed and Blown Glass	54.3%	34.0%	11.7%	1.6
3231	Glass Products, Purchase	56.2%	28.9%	14.9%	1.9
3241	Cement, Hydraulic	66.0%	23.3%	10.8%	2.8
3251	Brick, Clay Tile	51.7%	33.2%	15.1%	1.6
3253	Ceramic Wall & Floor Tile	40.6%	33.5%	25.9%	1.2
3255	Clay Refractories	55.2%	31.2%	13.6%	1.8
3259	Structural Clay Products	43.0%	33.5%	23.4%	1.3
3261	Vitreous Plumbing Fixture	41.6%	37.9%	20.5%	1.1
3262	Vitreous China Utensils	24.8%	50.5%	24.6%	0.5
3263	Earthenware Food Utensils	30.9%	51.7%	17.4%	0.6
3264	Porcelain Elect Supplies	42.0%	46.3%	11.7%	0.9
3269	Pottery Products	46.9%	34.1%	19.0%	1.4
3271	Concrete Block & Brick	62.2%	23.5%	14.4%	2.7

Table 7M-4 Continued: GLASS & STONE MFG: EXPENDITURES AS A PERCENT
OF REVENUES, plus PURCHASE/WAGE & SALARY RATIO

SIC Code	TYPE OF MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
3272	Concrete Products	50.9%	31.7%	17.4%	1.6
3273	Ready Mixed Concrete	65.6%	21.2%	13.1%	3.1
3274	Lime	63.4%	24.7%	11.9%	2.6
3275	Gypsum Products	71.3%	17.5%	11.2%	4.1
3281	Cut Stone Products	51.9%	32.9%	15.2%	1.6
3291	Abrasive Products	52.9%	24.7%	22.3%	2.1
3292	Asbestos Products	57.5%	26.4%	16.2%	2.2
3293	Gaskets	45.4%	36.9%	17.7%	1.2
3295	Minerals, Ground & Treat	56.0%	18.6%	25.4%	3.0
3296	Mineral Wool	50.3%	24.1%	25.5%	2.1
3297	Nonclay Refractories	60.8%	28.2%	11.1%	2.2
3299	Nonmetallic Mineral Prod	53.4%	26.8%	19.8%	2.0
32	GLASS & STONE MFG AVG	57.0%	27.7%	15.3%	2.1

Purchases

The stone, clay, and glass industry had purchases of \$26 billion. This represented two percent of the total manufacturing purchases. This was the most energy intensive industry. Energy purchases accounted for 15 percent of the total purchases. The companies that spent the most for purchases were ready mix concrete companies (\$5.3 billion), glass container companies (\$2.9 billion), and hydraulic cement companies (\$2.3 billion). The entire industry had a purchases to wages and salaries dollar ratio of 2.1 to 1. There were, however, three labor intensive industries within SIC 32 that had expenditures for wages and salaries that exceeded purchase expenditures. These industries were manufacturers of: (1) vitreous china table and kitchen articles, (2) fine earthenware (whiteware) table and kitchen articles, and (3) porcelain electrical supplies.

For the whole industry, however, purchases accounted for 57 percent of the expenditures compared to 28 percent for wages and salaries.

Tables 7M-1 through 7M-4 summarize the purchases in the stone, clay, and glass industry by type of purchase and in relation to other expenditures. Table 7M-3 shows the purchase dollar rank of each four-digit stone, clay, and glass industry in relation to the purchases of the other 448 manufacturing industries.

N. PRIMARY METAL INDUSTRIES (SIC 33)**Industry Description**

The primary metal industries were engaged: in the smelting and refining of ferrous and nonferrous metals from ore, pig, or scrap; in the rolling, drawing and alloying of ferrous and nonferrous metals; in the manufacture of castings and other basic products of ferrous and nonferrous metals. and in the manufacture of nails, spikes, and insulated wire.

This industry financially suffered the highest losses within all manufacturing during the 1982 recession [4]. Tables 7N-3 and 7N-4 show that seven of the 26 four-digit SIC industries had payments that exceeded their revenues. These industries were: (1) steel mills and blast furnaces (including coke ovens), (2) steel foundries, (3) lead, (4) zinc, (5) primary production of aluminum, (6) secondary smelting and refining of nonferrous metals, and (7) aluminum sheet, plate, and foil.

Purchases

The primary metal industries had purchases of \$76 billion. This represented six percent of the total manufacturing purchases. Within this industry, the companies that spent the most for purchases were steel mills and blast furnaces (\$27 billion) and aluminum sheet (\$6.2 billion). The primary metal industry had a purchases to wages and salaries dollar ratio of 2.8 to 1. Tables 7N-1 through 7N-4 summarize the purchases in the primary metal industry by

Table 7N-1: PRIMARY METAL MANUFACTURING: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Resale	Buildings and Equipment	Other Items	
33	PRIMARY METAL MFG	\$57,188	\$9,096	\$1,378	\$7,269	\$1,509	\$76,440
3312	Steel Mills, Blast Furn	18,239	4,590	321	2,992	467	26,607
3313	Electro Metal Products	335	149	7	32	4	527
3315	Steel Wire Related Prod	1,275	90	53	115	21	1,554
3316	Cold Finishing Steel	2,196	104	10	74	43	2,426
3317	Steel Pipe and Tubes	2,234	110	51	209	127	2,731
3321	Gray Iron Foundries	2,083	594	132	512	68	3,388
3322	Malleable Iron Foundries	66	44	1	18	2	131
3324	Steel Investment Foundry	282	40	4	52	39	417
3325	Steel Foundries	608	164	19	753	95	1,637
3331	Primary Copper	2,438	174	4	144	16	2,776
3332	Primary Lead	426	46	0	23	4	499
3333	Primary Zinc	180	54	29	22	0	284
3334	Primary Aluminum	2,390	1,360	127	311	43	4,232
3339	Primary Nonferrous Metals	1,604	153	12	100	4	1,873
3341	Secondary Nonferrous	3,586	195	294	219	64	4,359

Table 7N-1 Continued: PRIMARY METAL MFG: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Resale Equipment	Buildings and Equipment	Other Items	
3351	Copper Rolling & Drawing	\$2,078	\$131	\$24	\$175	\$40	\$2,448
3353	Aluminum Sheet, Plate	5,440	321	0	361	156	6,279
3354	Aluminum Extruded Product	1,606	125	13	157	40	1,942
3355	Aluminum Rolling, Drawing	513	18	0	9	5	544
3356	Nonferrous Rolling	2,160	83	9	173	63	2,489
3357	Nonferrous Wiredrawing	4,982	182	74	412	44	5,694
3361	Aluminum Foundries	1,102	158	27	193	171	1,651
3362	Brass, Bronze, Copper	263	29	7	31	15	345
3369	Nonferrous Foundries	341	36	7	48	46	478
3398	Metal Heat Treating	276	93	29	73	21	492
3399	Primary Metal Products	508	54	10	72	29	673
33	PRIMARY METAL TOTALS: (\$)	\$57,188	\$9,096	\$1,378	\$7,269	\$1,509	\$76,440
	(%)	74.8%	11.9%	1.8%	9.5%	2.0%	100%

Table 7N-2: PRIMARY METAL MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF
TOTAL PURCHASES

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Resale Equipment	Buildings and	Other Items
33	PRIMARY METAL MFG	74.8%	11.9%	1.8%	9.5%	2.0%
3312	Steel Mills, Blast Furn	68.5%	17.2%	1.2%	11.2%	1.8%
3313	Electro Metal Products	63.6%	28.3%	1.4%	6.0%	0.7%
3315	Steel Wire Related Prod	82.1%	5.8%	3.4%	7.4%	1.3%
3316	Cold Finishing Steel	90.5%	4.3%	0.4%	3.0%	1.8%
3317	Steel Pipe and Tubes	81.8%	4.0%	1.9%	7.7%	4.6%
3321	Gray Iron Foundries	61.5%	17.5%	3.9%	15.1%	2.0%
3322	Malleable Iron Foundries	50.5%	33.8%	0.4%	13.4%	1.8%
3324	Steel Investment Foundry	67.7%	9.5%	0.9%	12.4%	9.4%
3325	Steel Foundries	37.1%	10.0%	1.1%	46.0%	5.8%
3331	Primary Copper	87.8%	6.3%	0.1%	5.2%	0.6%
3332	Primary Lead	85.4%	9.3%	0.0%	4.6%	0.7%
3333	Primary Zinc	63.4%	18.9%	10.1%	7.6%	0.1%
3334	Primary Aluminum	56.5%	32.1%	3.0%	7.4%	1.0%
3339	Primary Nonferrous Metals	85.7%	8.2%	0.6%	5.3%	0.2%
3341	Secondary Nonferrous	82.3%	4.5%	6.7%	5.0%	1.5%

Table 7N-2 Continued: PRIMARY METAL MFG: TYPES OF PURCHASES BY PERCENT OF
TOTAL PURCHASES

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Resale Equipment	Buildings and Other Items	
3351	Copper Rolling & Drawing	84.9%	5.4%	1.0%	7.1%	1.6%
3353	Aluminum Sheet, Plate	86.6%	5.1%	0.0%	5.8%	2.5%
3354	Aluminum Extruded Product	82.7%	6.5%	0.7%	8.1%	2.1%
3355	Aluminum Rolling, Drawing	94.2%	3.4%	0.0%	1.6%	0.9%
3356	Nonferrous Rolling	86.8%	3.3%	0.4%	7.0%	2.5%
3357	Nonferrous Wiredrawing	87.5%	3.2%	1.3%	7.2%	0.8%
3361	Aluminum Foundries	66.8%	9.6%	1.6%	11.7%	10.3%
3362	Brass, Bronze, Copper	76.2%	8.4%	2.0%	9.1%	4.3%
3369	Nonferrous Foundries	71.4%	7.6%	1.4%	10.1%	9.6%
3398	Metal Heat Treating	56.0%	19.0%	5.9%	14.8%	4.3%
3399	Primary Metal Products	75.4%	8.0%	1.5%	10.8%	4.4%
33	PRIMARY METAL MFG AVERAGE	74.8%	11.9%	1.8%	9.5%	2.0%

Table 7N-3: PRIMARY METAL MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$),
plus PURCHASE MANUFACTURING RANK

SIC Code	TYPE OF MANUFACTURING	REVENUES	EXPENDITURES			PURCHASE MFG RANK
			Purchases	Wages & Other Salaries	Other Payments	
33	PRIMARY METAL MFG	\$104,667	\$76,440	\$27,550	\$667	
3312	Steel Mills, Blast Furn	36,824	26,607	12,067	*(1850)	4
3313	Electro Metal Products	708	527	168	12	321
3315	Steel Wire Related Prod	2,415	1,554	568	294	178
3316	Cold Finishing Steel	3,005	2,426	490	89	116
3317	Steel Pipe and Tubes	3,762	2,731	856	175	97
3321	Gray Iron Foundries	6,202	3,388	2,638	177	78
3322	Malleable Iron Foundries	323	131	182	11	428
3324	Steel Investment Foundry	1,025	417	376	231	348
3325	Steel Foundries	2,091	1,637	958	*(503)	170
3331	Primary Copper	3,077	2,776	291	11	93
3332	Primary Lead	559	499	73	*(13)	329
3333	Primary Zinc	334	284	69	*(20)	384
3334	Primary Aluminum	5,037	4,232	994	*(188)	63
3339	Primary Nonferrous Metals	2,313	1,873	306	135	145
3341	Secondary Nonferrous	4,852	4,359	505	*(12)	60

* Losses incurred, payments exceeded revenues.

Table 7N-3 Continued: PRIMARY METAL MFG: REVENUES AND EXPENDITURES (Millions \$),
plus PURCHASE MANUFACTURING RANK

SIC Code	TYPE OF MANUFACTURING	REVENUES	EXPENDITURES			PURCHASE MFG RANK
			Purchases	Wages & Other Salaries Payments		
3351	Copper Rolling & Drawing	\$3,270	\$2,448	\$611	\$211	115
3353	Aluminum Sheet, Plate	7,229	6,279	1,131	*(181)	36
3354	Aluminum Extruded Product	2,673	1,942	636	95	139
3355	Aluminum Rolling, Drawing	671	544	88	38	317
3356	Nonferrous Rolling	3,418	2,489	602	328	113
3357	Nonferrous Wiredrawing	8,224	5,694	1,613	917	44
3361	Aluminum Foundries	3,014	1,651	1,162	200	168
3362	Brass, Bronze, Copper	702	345	249	108	366
3369	Nonferrous Foundries	916	478	325	113	336
3398	Metal Heat Treating	1,128	492	387	249	332
3399	Primary Metal Products	938	673	217	48	293
33	PRIMARY METAL TOTALS: (\$)	\$104,667	\$76,440	\$27,550	\$667	
	(%)	100%	73.0%	26.3%	0.7%	

* Losses incurred, payments exceeded revenues.

**Table 7N-4: PRIMARY METAL MFG: EXPENDITURES AS A PERCENT OF REVENUES,
plus PURCHASE/WAGE & SALARY RATIO**

SIC Code	TYPE OF MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
33	PRIMARY METAL MFG	73.0%	26.3%	0.7%	2.8
3312	Steel Mills, Blast Furn	72.3%	32.8%	*(5.0)%	2.2
3313	Electro Metal Products	74.5%	23.8%	1.7%	3.1
3315	Steel Wire Related Prod	64.3%	23.5%	12.2%	2.7
3316	Cold Finishing Steel	80.7%	16.3%	3.0%	4.9
3317	Steel Pipe and Tubes	72.6%	22.8%	4.7%	3.2
3321	Gray Iron Foundries	54.6%	42.5%	2.8%	1.3
3322	Malleable Iron Foundries	40.5%	56.2%	3.3%	0.7
3324	Steel Investment Foundry	40.7%	36.7%	22.6%	1.1
3325	Steel Foundries	78.3%	45.8%	*(24.1)%	1.7
3331	Primary Copper	90.2%	9.5%	0.4%	9.5
3332	Primary Lead	89.3%	13.0%	*(2.2)%	6.9
3333	Primary Zinc	85.2%	20.8%	*(5.9)%	4.1
3334	Primary Aluminum	84.0%	19.7%	*(3.7)%	4.3
3339	Primary Nonferrous Metals	81.0%	13.2%	5.8%	6.1
3341	Secondary Nonferrous	89.8%	10.4%	*(0.2)%	8.6

* Losses incurred, payments exceeded revenues.

Table 7N-4 Continued: PRIMARY METAL: EXPENDITURES AS A PERCENT OF REVENUES,
plus PURCHASE/WAGE & SALARY RATIO

SIC Code	TYPE OF MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
3351	Copper Rolling & Drawing	74.9%	18.7%	6.5%	4.0
3353	Aluminum Sheet, Plate	86.9%	15.7%	*(2.5)%	5.5
3354	Aluminum Extruded Product	72.6%	23.8%	3.6%	3.1
3355	Aluminum Rolling, Drawing	81.2%	13.1%	5.7%	6.2
3356	Nonferrous Rolling	72.8%	17.6%	9.6%	4.1
3357	Nonferrous Wiredrawing	69.2%	19.6%	11.2%	3.5
3361	Aluminum Foundries	54.8%	38.6%	6.6%	1.4
3362	Brass, Bronze, Copper	49.2%	35.4%	15.4%	1.4
3369	Nonferrous Foundries	52.2%	35.5%	12.3%	1.5
3398	Metal Heat Treating	43.6%	34.3%	22.0%	1.3
3399	Primary Metal Products	71.8%	23.2%	5.1%	3.1
33	PRIMARY METAL AVERAGE	73.0%	26.3%	0.7%	2.8

* Losses incurred, payments exceeded revenues.

**Table 7N-5: PRIMARY METALS: TYPES OF PURCHASES (Millions \$) AND BY PERCENT OF
OF TOTAL PURCHASES**

TYPE OF MANUFACTURING	TYPE OF PURCHASE					TOTAL PURCHASES
	Materials and Supplies	Energy	Resale	Buildings and Equipment	Other Items	
Ferrous Metals (\$)	\$27,318	\$5,885	\$598	\$4,757	\$866	\$39,424
(%)	69.3%	14.9%	1.5%	12.1%	2.2%	100%
Nonferrous Metals (\$)	29,893	3,212	666	2,523	761	37,055
(%)	80.7%	8.7%	1.8%	6.8%	2.1%	100%
TOTALS: (\$)	\$57,211	\$9,097	\$1,264	\$7,280	\$1,627	\$76,479
(%)	74.8%	11.9%	1.7%	9.5%	2.1%	100%

Table 7N-6: PRIMARY METALS: REVENUES AND EXPENDITURES (Millions \$) AND AS PERCENT OF REVENUES, plus PURCHASE/WAGE AND SALARY RATIO

TYPE OF MANUFACTURING	REVENUES	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
Ferrous Metals (\$)	\$56,355	\$39,424	\$18,303	(\$1,372)	2.2
(%)	100%	70.0%	32.5%	(2.4)%	
Nonferrous Metals (\$)	48,355	37,055	9,247	2,053	4.0
(%)	100%	76.6%	19.1%	4.2%	
TOTALS: (\$)	\$104,710	\$76,479	\$27,550	\$681	2.8
(%)	100%	73.0%	26.3%	0.7%	

type of purchase and in relation to other expenditures. Table 7N-3 shows the purchases dollar rank of each four-digit primary metal industry in relation to the purchases of the other 448 manufacturing industries. Two additional tables, 7N-5 and 7N-6, compare ferrous and nonferrous metal industries.

O. FABRICATED METAL PRODUCTS (SIC 34)

Industry Description

This industry included firms that were involved in fabricating ferrous and nonferrous metal products, such as metal cans, tinware, hand tools, cutlery, general hardware, nonelectric heating apparatus, fabricated structural metal products, metal forgings, metal stampings, ordnance, and a variety of metal and wire products.

Purchases

The fabricated metal industry had purchases of \$67 billion. This accounted for five percent of the total manufacturing purchases. Within this industry, the companies that spent the most for purchases were the makers of metal cans (\$7.4 billion), fabricated structural metals manufacturers (\$5.5 billion), and automotive stampings (\$5.2 billion). The fabricated metal industry had a purchases to wages and salaries dollar ratio of 1.9 to 1. There were, however, two labor intensive industries within SIC 34 that had expenditures for wages and salaries that exceeded purchase expenditures. These industries were manufacturers

Table 70-1: FABRICATED METAL MANUFACTURING: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Resale	Buildings and Equipment	Other Items	
34	FABRICATED METAL MFG	\$51,831	\$2,464	\$2,728	\$6,756	\$3,429	\$67,208
3411	Metal Cans	6,676	189	165	396	29	7,454
3412	Metal Barrel, Drum, Pail	630	26	3	40	13	711
3421	Cutlery	201	24	25	55	10	314
3423	Hand and Edge Tools	843	57	168	141	74	1,283
3425	Hand Saws & Saw Blades	185	12	25	38	8	269
3429	Hardware	2,107	106	96	741	328	3,379
3431	Metal Sanitary Ware	233	26	21	27	3	310
3432	Plumbing Fittings	574	18	11	54	13	670
3433	Heating Equipment	861	30	111	76	27	1,105
3441	Fab Structural Metal	3,890	124	416	321	751	5,503
3442	Metal Doors, Sash & Trim	2,288	63	131	167	49	2,698
3443	Fabricated Plate Work	3,487	140	101	328	226	4,282
3444	Sheet Metal Work	3,328	83	221	266	204	4,103
3446	Architectural Metal Work	595	19	20	44	29	707
3448	Prefab Metal Buildings	1,251	24	65	78	73	1,491
3449	Miscellaneous Metal Work	1,431	41	153	74	35	1,733
3451	Screw Machine Products	671	38	14	142	113	979
3452	Bolts, Nuts, Rivets	1,262	95	110	211	134	1,812
3462	Iron & Steel Forgings	1,245	178	37	239	72	1,771
3463	Nonferrous Forgings	477	41	6	145	47	717

Table 70-1 Continued: FABRICATED METAL MFG: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Buildings and Resale Equipment	Other Items		
3465	Automotive Stampings	\$4,276	\$189	\$38	\$593	\$127	\$5,223
3466	Crowns and Closures	419	18	4	31	2	474
3469	Metal Stampings	2,573	128	95	702	337	3,835
3471	Plating and Polishing	823	144	17	338	239	1,560
3479	Metal Coating	1,045	102	19	145	34	1,345
3482	Small Arms Ammunition	243	19	0	44	6	312
3483	Ammunition, Other	533	67	0	82	36	718
3484	Small Arms	302	19	13	52	9	395
3489	Ordnance & Accessories	239	36	22	42	43	382
3493	Steel Springs	163	15	23	13	5	219
3494	Valves and Pipe Fittings	3,212	146	236	526	170	4,290
3495	Wire Springs	442	20	21	53	18	554
3496	Misc Fab Wire Products	1,035	47	70	116	26	1,294
3497	Metal Foil and Leaf	1,063	51	41	60	5	1,219
3498	Fab Pipe and Fittings	1,485	42	99	177	54	1,857
3499	Fab Metal Products nec	1,764	87	116	202	85	2,253
34 FABRICATED METAL TOTAL: (\$)		\$51,831	\$2,464	\$2,728	\$6,756	\$3,429	\$67,208

Table 70-2: FABRICATED METAL MFG: TYPES OF PURCHASES BY PERCENT OF
TOTAL PURCHASES

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Buildings and Resale Equipment	Other Items	
34	FABRICATED METAL MFG	77.1%	3.7%	4.1%	10.1%	5.1%
3411	Metal Cans	89.6%	2.5%	2.2%	5.3%	0.4%
3412	Metal Barrel, Drum, Pail	88.5%	3.7%	0.4%	5.7%	1.8%
3421	Cutlery	63.9%	7.6%	7.8%	17.6%	3.1%
3423	Hand and Edge Tools	65.7%	4.5%	13.1%	11.0%	5.8%
3425	Hand Saws & Saw Blades	69.1%	4.4%	9.4%	14.2%	2.9%
3429	Hardware	62.4%	3.1%	2.8%	21.9%	9.7%
3431	Metal Sanitary Ware	75.1%	8.3%	6.7%	8.8%	1.1%
3432	Plumbing Fittings	85.6%	2.7%	1.7%	8.0%	1.9%
3433	Heating Equipment	78.0%	2.7%	10.0%	6.9%	2.4%
3441	Fab Structural Metal	70.7%	2.3%	7.6%	5.8%	13.7%
3442	Metal Doors, Sash & Trim	84.8%	2.3%	4.9%	6.2%	1.8%
3443	Fabricated Plate Work	81.4%	3.3%	2.4%	7.7%	5.3%
3444	Sheet Metal Work	81.1%	2.0%	5.4%	6.5%	5.0%
3446	Architectural Metal Work	84.1%	2.7%	2.8%	6.3%	4.1%
3448	Prefab Metal Buildings	83.9%	1.6%	4.4%	5.2%	4.9%
3449	Miscellaneous Metal Work	82.6%	2.4%	8.8%	4.2%	2.0%
3451	Screw Machine Products	68.6%	3.8%	1.4%	14.5%	11.6%
3452	Bolts, Nuts, Rivets	69.6%	5.3%	6.1%	11.6%	7.4%
3462	Iron & Steel Forgings	70.3%	10.1%	2.1%	13.5%	4.0%
3463	Nonferrous Forgings	66.6%	5.7%	0.9%	20.3%	6.6%

Table 70-2 Continued: FABRICATED METAL: TYPES OF PURCHASES BY PERCENT OF
TOTAL PURCHASES

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Resale Equipment	Buildings and	Other Items
3465	Automotive Stampings	81.9%	3.6%	0.7%	11.3%	2.4%
3466	Crowns and Closures	88.5%	3.8%	0.8%	6.4%	0.5%
3469	Metal Stampings	67.1%	3.3%	2.5%	18.3%	8.8%
3471	Plating and Polishing	52.8%	9.2%	1.1%	21.6%	15.3%
3479	Metal Coating	77.7%	7.6%	1.4%	10.8%	2.5%
3482	Small Arms Ammunition	77.9%	6.2%	0.0%	14.1%	1.8%
3483	Ammunition, Other	74.3%	9.3%	0.0%	11.4%	4.9%
3484	Small Arms	76.4%	4.9%	3.3%	13.1%	2.3%
3489	Ordnance & Accessories	62.6%	9.5%	5.7%	11.0%	11.2%
3493	Steel Springs	74.3%	7.0%	10.3%	6.0%	2.3%
3494	Valves and Pipe Fittings	74.9%	3.4%	5.5%	12.3%	4.0%
3495	Wire Springs	79.7%	3.6%	3.8%	9.6%	3.3%
3496	Misc Fab Wire Products	80.0%	3.6%	5.4%	9.0%	2.0%
3497	Metal Foil and Leaf	87.2%	4.2%	3.3%	4.9%	0.4%
3498	Fab Pipe and Fittings	80.0%	2.3%	5.3%	9.5%	2.9%
3499	Fab Metal Products nec	78.3%	3.9%	5.1%	9.0%	3.8%
34	FABRICATED METAL AVG	77.1%	3.7%	4.1%	10.1%	5.1%

Table 70-3: FABRICATED METAL MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$),
plus PURCHASE MANUFACTURING RANK

SIC Code	TYPE OF MANUFACTURING	REVENUES	EXPENDITURES			PURCHASE MFG RANK
			Purchases	Wages & Other Salaries Payments		
34	FABRICATED METAL MFG	\$119,444	\$67,208	\$36,116	\$16,120	
3411	Metal Cans	11,133	7,454	1,724	1,955	24
3412	Metal Barrel, Drum, Pail	1,039	711	244	83	282
3421	Cutlery	938	314	280	344	374
3423	Hand and Edge Tools	2,898	1,283	872	743	202
3425	Hand Saws & Saw Blades	498	269	169	61	386
3429	Hardware	5,741	3,379	1,929	433	79
3431	Metal Sanitary Ware	584	310	169	105	376
3432	Plumbing Fittings	1,300	670	299	332	294
3433	Heating Equipment	2,083	1,105	543	434	226
3441	Fab Structural Metal	8,840	5,503	2,411	926	48
3442	Metal Doors, Sash & Trim	4,685	2,698	1,217	770	99
3443	Fabricated Plate Work	8,230	4,282	2,718	1,231	62
3444	Sheet Metal Work	6,913	4,103	1,818	992	66
3446	Architectural Metal Work	1,369	707	450	213	283
3448	Prefab Metal Buildings	2,316	1,491	523	302	183
3449	Miscellaneous Metal Work	2,595	1,733	509	352	157
3451	Screw Machine Products	2,173	979	851	344	244
3452	Bolts, Nuts, Rivets	3,661	1,812	1,270	579	152
3462	Iron & Steel Forgings	2,953	1,771	915	267	155
3463	Nonferrous Forgings	1,094	717	265	112	280

Table 70-3 Continued: FABRICATED METAL MFG: REVENUES AND EXPENDITURES (Millions \$),
plus PURCHASE MANUFACTURING RANK

SIC Code	TYPE OF MANUFACTURING	REVENUES	EXPENDITURES			PURCHASE MFG RANK
			Purchases	Wages & Other Salaries Payments		
3465	Automotive Stampings	\$8,777	\$5,223	\$3,082	\$473	51
3466	Crowns and Closures	805	474	187	144	337
3469	Metal Stampings	6,438	3,835	2,163	440	72
3471	Plating and Polishing	2,731	1,560	1,089	83	175
3479	Metal Coating	2,393	1,345	722	327	197
3482	Small Arms Ammunition	800	312	282	207	375
3483	Ammunition, Other	1,757	718	630	409	279
3484	Small Arms	1,032	395	418	220	351
3489	Ordnance & Accessories	1,402	382	886	134	356
3493	Steel Springs	413	219	133	61	398
3494	Valves and Pipe Fittings	9,040	4,290	2,869	1,882	61
3495	Wire Springs	1,104	554	359	191	312
3496	Misc Fab Wire Products	2,357	1,294	700	363	199
3497	Metal Foil and Leaf	1,831	1,219	306	306	210
3498	Fab Pipe and Fittings	3,116	1,857	795	464	147
3499	Fab Metal Products nec	4,406	2,253	1,338	815	124
34 FABRICATED METAL TOTAL: (\$)		\$119,444	\$67,208	\$36,116	\$16,120	
(\$)		100%	56.3%	30.2%	13.5%	

**Table 70-4: FABRICATED METAL MFG: EXPENDITURES AS A PERCENT OF REVENUES,
plus PURCHASE/WAGE & SALARY RATIO**

SIC Code	TYPE OF MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
34	FABRICATED METAL MFG	56.3%	30.2%	13.5%	1.9
3411	Metal Cans	67.0%	15.5%	17.6%	4.3
3412	Metal Barrel, Drum, Pail	68.5%	23.5%	8.0%	2.9
3421	Cutlery	33.5%	29.9%	36.7%	1.1
3423	Hand and Edge Tools	44.3%	30.1%	25.6%	1.5
3425	Hand Saws & Saw Blades	53.9%	33.9%	12.2%	1.6
3429	Hardware	58.9%	33.6%	7.5%	1.8
3431	Metal Sanitary Ware	53.1%	29.0%	17.9%	1.8
3432	Plumbing Fittings	51.5%	23.0%	25.5%	2.2
3433	Heating Equipment	53.1%	26.1%	20.8%	2.0
3441	Fab Structural Metal	62.2%	27.3%	10.5%	2.3
3442	Metal Doors, Sash & Trim	57.6%	26.0%	16.4%	2.2
3443	Fabricated Plate Work	52.0%	33.0%	15.0%	1.6
3444	Sheet Metal Work	59.4%	26.3%	14.3%	2.3
3446	Architectural Metal Work	51.6%	32.8%	15.5%	1.6
3448	Prefab Metal Buildings	64.4%	22.6%	13.0%	2.9
3449	Miscellaneous Metal Work	66.8%	19.6%	13.6%	3.4
3451	Screw Machine Products	45.0%	39.1%	15.8%	1.2
3452	Bolts, Nuts, Rivets	49.5%	34.7%	15.8%	1.4
3462	Iron & Steel Forgings	60.0%	31.0%	9.0%	1.9
3463	Nonferrous Forgings	65.5%	24.2%	10.3%	2.7

Table 70-4 Continued: FABRICATED METAL MFG: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE & SALARY RATIO

SIC Code	TYPE OF MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
3465	Automotive Stampings	59.5%	35.1%	5.4%	1.7
3466	Crowns and Closures	58.9%	23.2%	17.9%	2.5
3469	Metal Stampings	59.6%	33.6%	6.8%	1.8
3471	Plating and Polishing	57.1%	39.9%	3.0%	1.4
3479	Metal Coating	56.2%	30.2%	13.7%	1.9
3482	Small Arms Ammunition	39.0%	35.2%	25.8%	1.1
3483	Ammunition, Other	40.8%	35.9%	23.3%	1.1
3484	Small Arms	38.2%	40.5%	21.3%	0.9
3489	Ordinance & Accessories	27.3%	63.2%	9.6%	0.4
3493	Steel Springs	53.0%	32.2%	14.8%	1.6
3494	Valves and Pipe Fittings	47.5%	31.7%	20.8%	1.5
3495	Wire Springs	50.2%	32.5%	17.3%	1.5
3496	Misc Fab Wire Products	54.9%	29.7%	15.4%	1.8
3497	Metal Foil and Leaf	66.5%	16.7%	16.7%	4.0
3498	Fab Pipe and Fittings	59.6%	25.5%	14.9%	2.3
3499	Fab Metal Products nec	51.1%	30.4%	18.5%	1.7
34	FABRICATED METAL AVERAGE	56.3%	30.2%	13.5%	1.9

of: (1) small arms and (2) ordnance.

For the fabricated metal industry, however, purchases accounted for 56 percent of the expenditures compared to 30 percent for wages and salaries. Tables 70-1 through 70-4 summarize the purchases in the fabricated metal industry by type of purchase and in relation to other expenditures. Table 70-3 shows the purchases dollar rank of each four-digit fabricated metal industry in relation to the purchases of the other 448 manufacturing industries.

P. MACHINERY (SIC 35)

Industry Description

Firms within this industry manufactured machinery and equipment other than electrical equipment (SIC 34) and transportation equipment (SIC 37). Industries that made machines powered by built-in or detachable motors and the makers of portable tools, both electric and pneumatic powered were also included.

Purchases

The machinery industry had purchases of \$96 billion. This accounted for eight percent of the total manufacturing purchases. Within this industry, the companies that spent the most for purchases were manufacturers of electronic computing equipment (\$21 billion), construction machinery (\$6.7 billion) and refrigeration and heating equipment (\$6.6 billion). The machinery industry had a purchases to wages and salaries dollar ratio of 1.7 to 1. There were, however,

Table 7P-1: MACHINERY MANUFACTURING: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Buildings and Resale Equipment	Other Items		
35	MACHINERY MANUFACTURING	\$73,055	\$2,472	\$4,615	\$11,886	\$4,368	\$96,396
3511	Turbines & Generator Sets	1,266	61	23	202	182	1,733
3519	Int Combustion Engines	4,598	151	325	768	80	5,922
3523	Farm Machinery & Equip	4,860	148	171	481	58	5,718
3524	Lawn & Garden Equipment	1,301	23	47	73	8	1,453
3531	Construction Machinery	5,508	187	332	598	153	6,777
3532	Mining Machinery	824	27	94	105	55	1,106
3533	Oil Field Machinery	3,712	151	456	1,102	499	5,919
3534	Elevators	486	10	23	48	42	609
3535	Conveyors & Equipment	1,113	27	162	95	160	1,557
3536	Hoists, Cranes, Monorails	443	15	21	39	30	548
3537	Indus Trucks & Tractors	1,041	25	31	120	24	1,241
3541	Machine Tools, Cutting	1,380	59	68	225	101	1,833
3542	Machine Tools, Forming	513	22	17	70	29	651
3544	Special Dies, Tools, Jigs	1,132	88	50	363	278	1,910
3545	Machine Tool Accessories	779	58	84	206	74	1,200
3546	Power Driven Hand Tools	652	21	106	108	18	905
							214

Table 7P-1 Continued: MACHINERY MANUFACTURING: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Resale	Buildings and Equipment	Other Items	
3547	Rolling Mill Machinery	\$187	\$10	\$33	\$29	\$18	\$278
3549	Metalworking Machinery	495	18	38	75	57	682
3551	Food Products Machinery	848	29	57	92	32	1,057
3552	Textile Machinery	366	21	28	75	15	504
3553	Woodworking Machinery	298	9	17	33	11	369
3554	Paper Industry Machinery	479	18	59	42	71	668
3555	Printing Trade Machinery	787	28	108	113	67	1,102
3559	Special Ind. Machinery	1,919	82	125	279	164	2,569
3561	Pumps & Pumping Equipment	2,380	76	211	338	102	3,106
3562	Ball and Roller Bearings	1,056	102	38	220	28	1,443
3563	Air & Gas Compressors	1,426	39	131	164	116	1,875
3564	Blowers and Fans	855	28	42	94	82	1,101
3565	Industrial Patterns	74	7	0	26	17	124
3566	Speed Changers & Drives	462	29	24	144	43	702
3567	Industry Furnaces & Ovens	432	14	12	35	19	511
3568	Power Transmission Equip	650	40	53	124	34	900

215

Table 7P-1 Continued: MACHINERY MANUFACTURING: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Buildings and Resale Equipment	Other Items		
3569	Gen Industrial Machinery	\$1,679	\$59	\$82	\$204	\$92	\$2,116
3573	Elect Computing Equip	15,872	289	605	2,991	903	20,660
3574	Calculating Machines	655	10	0	84	20	769
3576	Scales and Balances	202	5	7	25	8	245
3579	Typewriters, Off Machines	1,258	40	247	275	50	1,870
3581	Auto Merchandise Machine	250	7	9	21	4	290
3582	Commercial Laundry Equip	132	4	9	8	3	157
3585	Refrigeration & Heating	5,556	169	443	458	52	6,678
3586	Measuring, Dispense Pumps	267	9	19	23	8	325
3589	Service Ind Machinery	1,093	22	84	118	59	1,375
3592	Carburetor, Piston, Rings	719	56	17	185	8	984
3599	Machinery, Less Electric	3,056	183	100	1,019	510	4,868
35	MACHINERY MFG TOTALS: (\$)	\$73,055	\$2,472	\$4,615	\$11,886	\$4,368	\$96,396
	(%)	75.8%	2.6%	4.8%	12.3%	4.5%	100%

Table 7P-2: MACHINERY MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Resale Equipment	Buildings and Equipment	Other Items
35	MACHINERY MANUFACTURING	75.8%	2.6%	4.8%	12.3%	4.5%
3511	Turbines & Generator Sets	73.1%	3.5%	1.3%	11.6%	10.5%
3519	Int Combustion Engines	77.6%	2.5%	5.5%	13.0%	1.4%
3523	Farm Machinery & Equip	85.0%	2.6%	3.0%	8.4%	1.0%
3524	Lawn & Garden Equipment	89.6%	1.6%	3.2%	5.0%	0.6%
3531	Construction Machinery	81.3%	2.8%	4.9%	8.8%	2.3%
3532	Mining Machinery	74.6%	2.5%	8.5%	9.5%	5.0%
3533	Oil Field Machinery	62.7%	2.5%	7.7%	18.6%	8.4%
3534	Elevators	79.8%	1.6%	3.7%	7.9%	7.0%
3535	Conveyors & Equipment	71.5%	1.8%	10.4%	6.1%	10.3%
3536	Hoists, Cranes, Monorails	80.8%	2.7%	3.8%	7.2%	5.5%
3537	Indus Trucks & Tractors	83.9%	2.0%	2.5%	9.7%	1.9%
3541	Machine Tools, Cutting	75.3%	3.2%	3.7%	12.3%	5.5%
3542	Machine Tools, Forming	78.7%	3.4%	2.6%	10.8%	4.4%
3544	Special Dies, Tools, Jigs	59.3%	4.6%	2.6%	19.0%	14.5%
3545	Machine Tool Accessories	64.9%	4.8%	7.0%	17.1%	6.2%
3546	Power Driven Hand Tools	72.1%	2.3%	11.7%	11.9%	2.0%

Table 7P-2 Continued: MACHINERY MFG: TYPES OF PURCHASES BY PERCENT OF
TOTAL PURCHASES

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Resale Equipment	Buildings and	Other Items
3547	Rolling Mill Machinery	67.4%	3.6%	11.8%	10.6%	6.6%
3549	Metalworking Machinery	72.5%	2.6%	5.5%	11.0%	8.3%
3551	Food Products Machinery	80.2%	2.7%	5.4%	8.7%	3.0%
3552	Textile Machinery	72.5%	4.1%	5.5%	14.9%	2.9%
3553	Woodworking Machinery	81.0%	2.5%	4.7%	8.8%	3.0%
3554	Paper Industry Machinery	71.7%	2.6%	8.8%	6.3%	10.6%
3555	Printing Trade Machinery	71.4%	2.6%	9.8%	10.2%	6.0%
3559	Special Ind. Machinery	74.7%	3.2%	4.9%	10.9%	6.4%
3561	Pumps & Pumping Equipment	76.6%	2.4%	6.8%	10.9%	3.3%
3562	Ball and Roller Bearings	73.2%	7.0%	2.6%	15.2%	1.9%
3563	Air & Gas Compressors	76.0%	2.1%	7.0%	8.8%	6.2%
3564	Blowers and Fans	77.6%	2.6%	3.8%	8.5%	7.5%
3565	Industrial Patterns	59.7%	5.5%	0.3%	20.8%	13.8%
3566	Speed Changers & Drives	65.8%	4.1%	3.4%	20.6%	6.1%
3567	Industry Furnaces & Ovens	84.5%	2.7%	2.4%	6.7%	3.6%
3568	Power Transmission Equip	72.2%	4.4%	5.8%	13.8%	3.8%

Table 7P-2 Continued: MACHINERY MFG: TYPES OF PURCHASES BY PERCENT OF
TOTAL PURCHASES

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Buildings and Resale Equipment	Other Items	
3569	Gen Industrial Machinery	79.4%	2.8%	3.9%	9.6%	4.3%
3573	Elect Computing Equip	76.8%	1.4%	2.9%	14.5%	4.4%
3574	Calculating Machines	85.2%	1.3%	0.0%	11.0%	2.6%
3576	Scales and Balances	82.1%	1.9%	2.9%	10.0%	3.1%
3579	Typewriters, Off Machines	67.3%	2.2%	13.2%	14.7%	2.7%
3581	Auto Merchandise Machine	86.1%	2.3%	3.0%	7.3%	1.3%
3582	Commercial Laundry Equip	84.5%	2.3%	5.9%	5.3%	2.0%
3585	Refrigeration & Heating	83.2%	2.5%	6.6%	6.9%	0.8%
3586	Measuring, Dispense Pumps	82.2%	2.7%	5.8%	7.0%	2.4%
3589	Service Ind Machinery	79.4%	1.6%	6.1%	8.6%	4.3%
3592	Carburetor, Piston, Rings	73.0%	5.6%	1.7%	18.8%	0.8%
3599	Machinery, Less Electric	62.8%	3.7%	2.0%	20.9%	10.5%
35	MACHINERY MFG AVERAGE	75.8%	2.6%	4.8%	12.3%	4.5%

Table 7P-3: MACHINERY MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$),
plus PURCHASE MANUFACTURING RANK

SIC Code	TYPE OF MANUFACTURING	REVENUES	EXPENDITURES			PURCHASE MFG RANK
			Purchases	Wages & Other Salaries Payments	Other	
35	MACHINERY MANUFACTURING	\$187,896	\$96,396	\$57,762	\$33,738	
3511	Turbines & Generator Sets	3,676	1,733	1,111	832	158
3519	Int Combustion Engines	9,356	5,922	2,564	869	39
3523	Farm Machinery & Equip	10,742	5,718	2,721	2,303	43
3524	Lawn & Garden Equipment	2,365	1,453	391	521	187
3531	Construction Machinery	11,647	6,777	3,487	1,383	31
3532	Mining Machinery	2,109	1,106	665	339	225
3533	Oil Field Machinery	11,189	5,919	2,834	2,436	40
3534	Elevators	1,121	609	335	176	306
3535	Conveyors & Equipment	2,936	1,557	907	471	177
3536	Hoists, Cranes, Monorails	1,086	548	363	174	315
3537	Indus Trucks & Tractors	1,922	1,241	632	50	207
3541	Machine Tools, Cutting	4,440	1,833	1,661	946	150
3542	Machine Tools, Forming	1,429	651	551	226	297
3544	Special Dies, Tools, Jigs	5,375	1,910	2,682	783	141
3545	Machine Tool Accessories	3,164	1,200	1,322	643	214
3546	Power Driven Hand Tools	1,795	905	489	401	254

Table 7P-3 Continued: MACHINERY MFG: REVENUES AND EXPENDITURES (Millions \$),
plus PURCHASE MANUFACTURING RANK

SIC Code	TYPE OF MANUFACTURING	REVENUES	EXPENDITURES			PURCHASE MFG RANK
			Purchases	Wages & Other Salaries Payments		
3547	Rolling Mill Machinery	\$503	\$278	\$160	\$65	385
3549	Metalworking Machinery	1,471	682	521	269	290
3551	Food Products Machinery	2,321	1,057	841	423	233
3552	Textile Machinery	1,059	504	388	167	327
3553	Woodworking Machinery	731	369	208	155	361
3554	Paper Industry Machinery	1,387	668	494	225	295
3555	Printing Trade Machinery	2,257	1,102	724	432	227
3559	Special Ind. Machinery	5,351	2,569	1,901	882	104
3561	Pumps & Pumping Equipment	6,198	3,106	1,825	1,268	85
3562	Ball and Roller Bearings	3,136	1,443	1,197	496	189
3563	Air & Gas Compressors	3,270	1,875	890	505	144
3564	Blowers and Fans	2,173	1,101	681	391	228
3565	Industrial Patterns	452	124	251	77	432
3566	Speed Changers & Drives	1,621	702	622	297	286
3567	Industry Furnaces & Ovens	1,131	511	404	215	325
3568	Power Transmission Equip	1,940	900	719	322	255

Table 7P-3 Continued: MACHINERY MFG: REVENUES AND EXPENDITURES (Millions \$),
plus PURCHASE MANUFACTURING RANK

SIC Code	TYPE OF MANUFACTURING	REVENUES	EXPENDITURES			PURCHASE MFG RANK
			Purchases	Wages & Other Salaries Payments		
3569	Gen Industrial Machinery	\$4,567	\$2,116	\$1,519	\$932	129
3573	Elect Computing Equip	36,704	20,660	9,631	6,413	8
3574	Calculating Machines	1,487	769	345	373	272
3576	Scales and Balances	498	245	152	100	392
3579	Typewriters, Off Machines	4,257	1,870	1,181	1,206	146
3581	Auto Merchandise Machine	479	290	150	39	381
3582	Commercial Laundry Equip	321	157	98	67	419
3585	Refrigeration & Heating	12,390	6,678	3,064	2,649	32
3586	Measuring, Dispense Pumps	676	325	197	154	370
3589	Service Ind Machinery	2,583	1,375	698	510	194
3592	Carburetor, Piston, Rings	2,224	984	916	324	242
3599	Machinery, Less Electric	12,271	4,868	5,235	2,169	56
35	MACHINERY MFG TOTALS: (\$)	\$187,896	\$96,396	\$57,762	\$33,738	
	(%)	100%	51.3%	30.7%	18.0%	

**Table 7P-4: MACHINERY MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES,
plus PURCHASE/WAGE & SALARY RATIO**

SIC Code	TYPE OF MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
35	MACHINERY MANUFACTURING	51.3%	30.7%	18.0%	1.7
3511	Turbines & Generator Sets	47.1%	30.2%	22.6%	1.6
3519	Int Combustion Engines	63.3%	27.4%	9.3%	2.3
3523	Farm Machinery & Equip	53.2%	25.3%	21.4%	2.1
3524	Lawn & Garden Equipment	61.4%	16.5%	22.0%	3.7
3531	Construction Machinery	58.2%	29.9%	11.9%	1.9
3532	Mining Machinery	52.4%	31.5%	16.1%	1.7
3533	Oil Field Machinery	52.9%	25.3%	21.8%	2.1
3534	Elevators	54.4%	29.9%	15.7%	1.8
3535	Conveyors & Equipment	53.0%	30.9%	16.1%	1.7
3536	Hoists, Cranes, Monorails	50.5%	33.5%	16.0%	1.5
3537	Indus Trucks & Tractors	64.6%	32.9%	2.6%	2.0
3541	Machine Tools, Cutting	41.3%	37.4%	21.3%	1.1
3542	Machine Tools, Forming	45.6%	38.6%	15.8%	1.2
3544	Special Dies, Tools, Jigs	35.5%	49.9%	14.6%	0.7
3545	Machine Tool Accessories	37.9%	41.8%	20.3%	0.9
3546	Power Driven Hand Tools	50.4%	27.2%	22.3%	1.9

Table 7P-4 Continued: MACHINERY MFG: EXPENDITURES AS A PERCENT OF REVENUES,
plus PURCHASE/WAGE & SALARY RATIO

SIC Code	TYPE OF MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
3547	Rolling Mill Machinery	55.2%	31.8%	13.0%	1.7
3549	Metalworking Machinery	46.3%	35.4%	18.3%	1.3
3551	Food Products Machinery	45.6%	36.2%	18.2%	1.3
3552	Textile Machinery	47.6%	36.7%	15.7%	1.3
3553	Woodworking Machinery	50.4%	28.4%	21.1%	1.8
3554	Paper Industry Machinery	48.2%	35.6%	16.2%	1.4
3555	Printing Trade Machinery	48.8%	32.1%	19.1%	1.5
3559	Special Ind. Machinery	48.0%	35.5%	16.5%	1.4
3561	Pumps & Pumping Equipment	50.1%	29.4%	20.5%	1.7
3562	Ball and Roller Bearings	46.0%	38.2%	15.8%	1.2
3563	Air & Gas Compressors	57.4%	27.2%	15.4%	2.1
3564	Blowers and Fans	50.7%	31.3%	18.0%	1.6
3565	Industrial Patterns	27.5%	55.5%	17.0%	0.5
3566	Speed Changers & Drives	43.3%	38.4%	18.3%	1.1
3567	Industry Furnaces & Ovens	45.2%	35.8%	19.0%	1.3
3568	Power Transmission Equip	46.4%	37.0%	16.6%	1.3

Table 7P-4 Continued: MACHINERY MFG: EXPENDITURES AS A PERCENT OF REVENUES,
plus PURCHASE/WAGE & SALARY RATIO

SIC Code	TYPE OF MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
3569	Gen Industrial Machinery	46.3%	33.3%	20.4%	1.4
3573	Elect Computing Equip	56.3%	26.2%	17.5%	2.1
3574	Calculating Machines	51.7%	23.2%	25.1%	2.2
3576	Scales and Balances	49.3%	30.6%	20.1%	1.6
3579	Typewriters, Off Machines	43.9%	27.7%	28.3%	1.6
3581	Auto Merchandise Machine	60.6%	31.3%	8.2%	1.9
3582	Commercial Laundry Equip	48.8%	30.5%	20.7%	1.6
3585	Refrigeration & Heating	53.9%	24.7%	21.4%	2.2
3586	Measuring, Dispense Pumps	48.1%	29.1%	22.8%	1.7
3589	Service Ind Machinery	53.3%	27.0%	19.7%	2.0
3592	Carburetor, Piston, Rings	44.2%	41.2%	14.6%	1.1
3599	Machinery, Less Electric	39.7%	42.7%	17.7%	0.9
35	MACHINERY MFG AVERAGE	51.3%	30.7%	18.0%	1.7

four labor intensive industries within SIC 35 that had expenditures for wages and salaries that exceeded purchase expenditures. These industries were manufacturers of: (1) special dies, tools, and jigs, (2) machine tool accessories, (3) industrial patterns, and (4) miscellaneous nonelectrical equipment. The last group included businesses that were primarily engaged in producing or repairing machine and equipment parts on a job or order basis for others. It also included amusement park equipment.

For the whole machinery industry, however, purchases accounted for 51 percent of the expenditures compared to 31 percent for wages and salaries. Tables 7P-1 through 7P-4 summarize the purchases in this industry by type of purchase and in relation to other expenditures. Table 7P-3 shows the purchases dollar rank of each four-digit machinery industry in relation to the purchases of the other 448 manufacturing industries.

Q. ELECTRICAL AND ELECTRONIC MACHINERY (SIC 36)

Industry Description

This industry manufactured machinery, apparatus, and supplies for the generation, storage, transmission, transformation, and utilization of electrical energy. The manufacture of household appliances were also included in this group.

Purchases

The electrical machinery industry had purchases of \$74

Table 7Q-1: ELECTRIC EQUIPMENT MANUFACTURING: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE					TOTAL PURCHASES	
		Materials and Supplies		Buildings and Equipment				Other Items
		Energy	Resale	Equipment				
36	ELECTRIC EQUIPMENT MFG	\$55,408	\$2,069	\$4,107	\$10,089	\$2,312	\$73,985	
3612	Transformers	1,331	52	32	117	17	1,549	
3613	Switchgear & Switchboard	1,653	56	207	246	47	2,208	
3621	Motors and Generators	2,323	102	74	391	47	2,936	
3622	Industrial Controls	1,468	45	125	282	255	2,175	
3623	Welding Apparatus, Elect	576	22	25	71	25	719	
3624	Carbon & Graphic Products	314	87	0	173	69	643	
3629	Electric Ind Apparatus	403	17	28	52	18	517	
3631	Household Cooking Equip	1,243	39	120	101	11	1,515	
3632	Refrigerators & Freezers	1,385	34	39	96	5	1,559	
3633	Household Laundry Equip	1,062	38	0	45	17	1,163	
3634	Elect Houseware, Fans	1,397	41	108	120	17	1,683	
3635	Household Vacuum Cleaners	271	10	7	26	10	324	
3636	Sewing Machines	(w)	6	(w)	16	(w)	139	
3639	Household Appliances	702	29	22	59	5	817	
3641	Electric Lamps	718	39	34	120	6	916	
3643	Current Carrying Wiring	869	39	34	141	65	1,149	
3644	NonCurrent Carrying Wire	1,006	55	57	109	24	1,251	
3645	Residential Light Fixture	586	20	18	41	13	678	
3646	Commercial Light Fixture	851	19	12	56	14	952	
3647	Vehicular Light Equip	370	17	22	55	5	468	
(w) Data withheld, total is correct								

(w) Data withheld, total is correct

Table 7Q-1 Continued: ELECTRIC EQUIPMENT MFG: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Buildings and Resale Equipment	Other Items		
3648	Lighting Equipment	\$413	\$14	\$18	\$42	\$13	\$499
3651	Radio & TV Receiving Sets	3,648	37	280	181	13	4,158
3652	Phonograph Records, Tapes	458	29	12	71	87	657
3661	Telephone Apparatus	5,639	103	515	712	159	7,128
3662	Radio & TV Comm Equip	10,743	339	289	2,419	859	14,649
3671	Electron Tubes, All Types	858	59	23	128	48	1,116
3674	Semiconductors	2,967	273	755	2,021	298	6,314
3675	Electronic Capacitors	421	28	15	92	6	563
3676	Electronic Resistors	214	16	5	55	6	296
3677	Elect Transformer, Coils	307	11	3	50	11	380
3678	Electronic Connectors	856	33	33	220	63	1,205
3679	Electronic Components	5,456	179	543	1,134	285	7,596
3691	Storage Batteries	1,099	70	27	151	5	1,351
3692	Prim Batteries, Dry & Wet	500	15	15	60	4	593
3693	X-Ray & Elect Medic Equip	1,302	31	288	290	48	1,958
3694	Engine Electrical Equip	1,309	41	228	123	13	1,713
3699	Electric Equip & Supplies	571	24	15	68	11	688
36 ELECTRIC EQUIP TOTALS: (\$)		\$55,408	\$2,069	\$4,107	\$10,089	\$2,312	\$73,985
(\$)		74.9%	2.8%	5.6%	13.6%	1.3%	100%

Table 7Q-2: ELECTRIC EQUIPMENT MANUFACTURING: TYPES OF PURCHASES BY
PERCENT OF TOTAL PURCHASES

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Buildings and Resale Equipment	Other Items	
36	ELECTRIC EQUIPMENT MFG	74.9%	2.8%	5.6%	13.6%	1.3%
3612	Transformers	85.9%	3.4%	2.0%	7.6%	1.1%
3613	Switchgear & Switchboard	74.9%	2.5%	9.4%	11.1%	2.1%
3621	Motors and Generators	79.1%	3.5%	2.5%	13.3%	1.6%
3622	Industrial Controls	67.5%	2.1%	5.8%	13.0%	11.7%
3623	Welding Apparatus, Elect	80.1%	3.1%	3.4%	9.9%	3.4%
3624	Carbon & Graphic Products	48.9%	13.4%	0.0%	26.9%	10.7%
3629	Electric Ind Apparatus	78.0%	3.3%	5.3%	10.0%	3.4%
3631	Household Cooking Equip	82.1%	2.6%	7.9%	6.7%	0.7%
3632	Refrigerators & Freezers	88.8%	2.2%	2.5%	6.1%	0.3%
3633	Household Laundry Equip	91.3%	3.3%	0.0%	3.9%	1.5%
3634	Elect Houseware, Fans	83.0%	2.4%	6.4%	7.1%	1.0%
3635	Household Vacuum Cleaners	83.7%	3.1%	2.1%	8.1%	3.0%
3636	Sewing Machines	(w)	4.2%	(w)	11.4%	(w)
3639	Household Appliances	86.0%	3.5%	2.7%	7.2%	0.6%
3641	Electric Lamps	78.4%	4.2%	3.7%	13.1%	0.6%
3643	Current Carrying Wiring	75.7%	3.4%	3.0%	12.3%	5.7%
3644	NonCurrent Carrying Wire	80.4%	4.4%	4.5%	8.7%	1.9%
3645	Residential Light Fixture	86.5%	2.9%	2.7%	6.0%	1.9%
3646	Commercial Light Fixture	89.4%	2.0%	1.2%	5.9%	1.5%
3647	Vehicular Light Equip	79.1%	3.6%	4.7%	11.7%	1.0%

(w) Data withheld

Table 7Q-2 Continued: ELECTRIC EQUIPMENT MFG: TYPES OF PURCHASES BY
PERCENT OF TOTAL PURCHASES

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Resale Equipment	Buildings and Equipment	Other Items
3648	Lighting Equipment	82.8%	2.7%	3.6%	8.3%	2.5%
3651	Radio & TV Receiving Sets	87.7%	0.9%	6.7%	4.3%	0.3%
3652	Phonograph Records, Tapes	69.7%	4.5%	1.9%	10.8%	13.2%
3661	Telephone Apparatus	79.1%	1.4%	7.2%	10.0%	2.2%
3662	Radio & TV Comm Equip	73.3%	2.3%	2.0%	16.5%	5.9%
3671	Electron Tubes, All Types	76.9%	5.3%	2.1%	11.5%	4.3%
3674	Semiconductors	47.0%	4.3%	12.0%	32.0%	4.7%
3675	Electronic Capacitors	74.7%	5.0%	2.7%	16.4%	1.1%
3676	Electronic Resistors	72.4%	5.4%	1.7%	18.5%	2.0%
3677	Elect Transformer, Coils	80.7%	2.8%	0.7%	13.1%	2.8%
3678	Electronic Connectors	71.0%	2.7%	2.8%	18.3%	5.2%
3679	Electronic Components	71.8%	2.4%	7.1%	14.9%	3.8%
3691	Storage Batteries	81.3%	5.2%	2.0%	11.2%	0.4%
3692	Prim Batteries, Dry & Wet	84.2%	2.6%	2.4%	10.2%	0.6%
3693	X-Ray & Elect Medic Equip	66.5%	1.6%	14.7%	14.8%	2.4%
3694	Engine Electrical Equip	76.4%	2.4%	13.3%	7.2%	0.7%
3699	Electric Equip & Supplies	83.0%	3.4%	2.1%	9.8%	1.6%
36	ELECTRIC EQUIP MFG AVG	74.9%	2.8%	5.6%	13.6%	1.3%

Table 7Q-3: ELECTRIC EQUIPMENT MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$)
plus PURCHASE MANUFACTURING RANK

SIC Code	TYPE OF MANUFACTURING	REVENUES	EXPENDITURES			PURCHASE MFG RANK
			Purchases	Salaries	Wages & Other Payments	
36	ELECTRIC EQUIPMENT MFG	\$147,944	\$73,985	\$47,255	\$26,704	
3612	Transformers	2,916	1,549	918	449	179
3613	Switchgear & Switchboard	5,173	2,208	1,546	1,418	126
3621	Motors and Generators	6,058	2,936	1,943	1,179	87
3622	Industrial Controls	4,331	2,175	1,555	601	127
3623	Welding Apparatus, Elect	1,353	719	415	219	278
3624	Carbon & Graphic Products	980	643	333	5	302
3629	Electric Ind Apparatus	1,111	517	346	248	324
3631	Household Cooking Equip	2,415	1,515	503	397	180
3632	Refrigerators & Freezers	2,471	1,559	571	341	176
3633	Household Laundry Equip	2,122	1,163	426	533	216
3634	Elect Houseware, Fans	3,156	1,683	661	812	164
3635	Household Vacuum Cleaners	776	324	192	259	371
3636	Sewing Machines	300	139	134	27	421
3639	Household Appliances	1,432	817	327	289	268
3641	Electric Lamps	2,073	916	515	641	252
3643	Current Carrying Wiring	2,510	1,149	861	501	218
3644	NonCurrent Carrying Wire	2,400	1,251	635	514	205
3645	Residential Light Fixture	1,352	678	364	310	292
3646	Commercial Light Fixture	1,672	952	374	346	247
3647	Vehicular Light Equip	1,014	468	362	183	338

**Table 7Q-3 Continued: ELECTRIC EQUIPMENT MFG: REVENUES AND EXPENDITURES (Millions \$)
plus PURCHASE MANUFACTURING RANK**

TYPE OF MANUFACTURING		REVENUES	EXPENDITURES				PURCHASE MFG RANK
SIC Code			Purchases	Salaries	Wages & Other		
3648	Lighting Equipment	\$1,028	\$499	\$255	\$274	330	
3651	Radio & TV Receiving Sets	6,064	4,158	1,080	826	64	
3652	Phonograph Records, Tapes	1,769	657	350	762	296	
3661	Telephone Apparatus	13,394	7,128	3,819	2,448	29	
3662	Radio & TV Comm Equip	33,028	14,649	13,341	5,038	11	
3671	Electron Tubes, All Types	2,302	1,116	969	217	222	
3674	Semiconductors	12,430	6,314	4,601	1,516	35	
3675	Electronic Capacitors	1,189	563	473	153	311	
3676	Electronic Resistors	766	296	317	153	379	
3677	Elect Transformer, Coils	863	380	344	139	357	
3678	Electronic Connectors	2,565	1,205	835	525	213	
3679	Electronic Components	14,402	7,596	4,297	2,508	22	
3691	Storage Batteries	2,431	1,351	599	481	196	
3692	Prim Batteries, Dry & Wet	1,102	593	239	269	308	
3693	X-Ray & Elect Medic Equip	4,261	1,958	1,271	1,032	138	
3694	Engine Electrical Equip	3,464	1,713	1,098	653	160	
3699	Electric Equip & Supplies	1,272	688	380	204	288	
36 ELECTRIC EQUIP TOTALS: (\$)		\$147,944	\$73,985	\$47,255	\$26,704		

Table 7Q-4: ELECTRIC EQUIPMENT MFG: EXPENDITURES AS A PERCENT OF REVENUES,
plus PURCHASE/WAGE & SALARY RATIO

SIC Code	TYPE OF MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
36	ELECTRIC EQUIP MFG	50.0%	31.9%	18.1%	1.6
3612	Transformers	53.1%	31.5%	15.4%	1.7
3613	Switchgear & Switchboard	42.7%	29.9%	27.4%	1.4
3621	Motors and Generators	48.5%	32.1%	19.5%	1.5
3622	Industrial Controls	50.2%	35.9%	13.9%	1.4
3623	Welding Apparatus, Elect	53.1%	30.7%	16.2%	1.7
3624	Carbon & Graphic Products	65.6%	33.9%	0.5%	1.9
3629	Electric Ind Apparatus	46.5%	31.1%	22.3%	1.5
3631	Household Cooking Equip	62.7%	20.8%	16.5%	3.0
3632	Refrigerators & Freezers	63.1%	23.1%	13.8%	2.7
3633	Household Laundry Equip	54.8%	20.1%	25.1%	2.7
3634	Elect Houseware, Fans	53.3%	20.9%	25.7%	2.5
3635	Household Vacuum Cleaners	41.8%	24.8%	33.4%	1.7
3636	Sewing Machines	46.2%	44.7%	9.1%	1.0
3639	Household Appliances	57.0%	22.8%	20.1%	2.5
3641	Electric Lamps	44.2%	24.9%	30.9%	1.8
3643	Current Carrying Wiring	45.8%	34.3%	19.9%	1.3
3644	NonCurrent Carrying Wire	52.1%	26.4%	21.4%	2.0
3645	Residential Light Fixture	50.1%	26.9%	23.0%	1.9
3646	Commercial Light Fixture	57.0%	22.4%	20.7%	2.5
3647	Vehicular Light Equip	46.2%	35.7%	18.1%	1.3

Table 7Q-4 Continued: ELECTRIC EQUIPMENT: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE & SALARY RATIO

SIC Code	TYPE OF MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
3648	Lighting Equipment	48.5%	24.8%	26.7%	2.0
3651	Radio & TV Receiving Sets	68.6%	17.8%	13.6%	3.8
3652	Phonograph Records, Tapes	37.1%	19.8%	43.1%	1.9
3661	Telephone Apparatus	53.2%	28.5%	18.3%	1.9
3662	Radio & TV Comm Equip	44.4%	40.4%	15.3%	1.1
3671	Electron Tubes, All Types	48.5%	42.1%	9.4%	1.2
3674	Semiconductors	50.8%	37.0%	12.2%	1.4
3675	Electronic Capacitors	47.3%	39.8%	12.9%	1.2
3676	Electronic Resistors	38.6%	41.3%	20.0%	0.9
3677	Elect Transformer, Coils	44.1%	39.9%	16.1%	1.1
3678	Electronic Connectors	47.0%	32.5%	20.5%	1.4
3679	Electronic Components	52.7%	29.8%	17.4%	1.8
3691	Storage Batteries	55.6%	24.6%	19.8%	2.3
3692	Prim Batteries, Dry & Wet	53.9%	21.7%	24.4%	2.5
3693	X-Ray & Elect Medic Equip	46.0%	29.8%	24.2%	1.5
3694	Engine Electrical Equip	49.4%	31.7%	18.9%	1.6
3699	Electric Equip & Supplies	54.1%	29.9%	16.0%	1.8
36	ELECTRIC EQUIPMENT AVG	50.0%	31.9%	18.1%	1.6

billion. This accounted for six percent of the total manufacturing purchases. Within this industry, the companies that spent the most for purchases were manufacturers of radio and television equipment (\$15 billion), electronic components (\$7.6 billion), and telephone apparatus (\$7.1 billion). The electrical machinery industry had a purchases to wages and salaries dollar ratio of 1.6 to 1. There was, however, one labor intensive industry, manufacturers of electronic resistors, within SIC 36 that had expenditures for wages and salaries that exceeded purchase expenditures.

For the whole electrical machinery industry, however, purchases accounted for 50 percent of the expenditures compared to 32 percent for wages and salaries.

Tables 7Q-1 through 7Q-4 summarize the purchases in the electrical machinery industry by type of purchase and in relation to other expenditures. Table 7Q-3 shows the purchases dollar rank of each four-digit electrical machinery industry in relation to the purchases of the other 448 manufacturing industries.

In the Sewing Machine Industry (SIC 3636), the figures for materials, resales, and contract work in Tables 7Q-1 and 7Q-2 were withheld by the Census Department. This was done to avoid disclosing data on individual companies. The total purchasing figures, however, are correct.

R. TRANSPORTATION EQUIPMENT (SIC 37)**Industry Description**

This industry manufactured equipment for the transportation of passengers and cargo by land, air, and water. The primary products were motor vehicles, aircraft, guided missiles, space vehicles, ships, boats, railroad equipment, and miscellaneous transportation equipment, such as motorcycles, bicycles, and snowmobiles.

Purchases

The transportation manufacturing industry had purchases of \$131 billion. This accounted for 11 percent of the total manufacturing purchases (putting it third behind food and petroleum purchases). The companies that spent the most for purchases were the manufacturers of motor vehicles and car bodies (\$58 billion), motor vehicle parts (\$22 billion), and aircraft (\$17 billion). The transportation manufacturing industry had a purchases to wages and salaries dollar ratio of 2.5 to 1. Purchases accounted for 65 percent of the expenditures compared to 26 percent for wages and salaries.

Tables 7R-1 through 7R-4 summarize the purchases in this industry by type of purchase and in relation to other expenditures. Table 7R-3 shows the purchases dollar rank of each four-digit transportation manufacturing industry in relation to the purchases of the other 448 manufacturing industries.

Table 7R-1: TRANSPORTATION MANUFACTURING: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Resale	Buildings and Equipment	Other Items	
3711	Motor Vehicles & Car Body	\$54,583	\$547	\$366	\$2,902	\$69	\$58,467
3713	Truck and Bus Bodies	1,227	32	62	80	17	1,418
3714	Motor Vehicle Parts	17,772	687	322	2,824	277	21,883
3715	Truck Trailers	1,092	23	45	54	11	1,224
3716	Motor Homes	646	5	1	24	5	681
3721	Aircraft	14,315	254	547	1,133	684	16,933
3724	Aircraft Engines & Parts	5,060	194	363	872	683	7,172
3728	Aircraft Equipment	3,400	144	50	597	443	4,633
3761	Missiles & Space Vehicles	2,533	83	0	421	1,078	4,115
3764	Space Propulsion Units	645	38	0	136	65	884
3769	Space Vehicle Equipment	567	18	0	101	73	759
3731	Ship Building & Repairing	3,958	153	45	647	457	5,260
3732	Boat Building & Repairing	1,163	25	26	89	19	1,322
3743	Railroad Equipment	1,646	59	54	190	20	1,969
3751	Motorcycles & Bicycles	836	17	0	33	38	924
3792	Travel Trailers & Campers	779	10	48	31	5	872
3795	Tanks and Tank Components	1,370	17	0	132	118	1,638
3799	Transportation Equipment	469	9	19	27	15	540
37	TRANSPORTATION TOTAL: (\$)	\$112,056	\$2,315	\$2,294	\$10,288	\$3,730	\$130,685
	(%)	85.7%	1.8%	1.8%	7.9%	2.9%	100%

Table 7R-2: TRANSPORTATION MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Buildings and Resale Equipment	Other Items	
3711	Motor Vehicles & Car Body	93.4%	0.9%	0.6%	5.0%	0.1%
3713	Truck and Bus Bodies	86.5%	2.3%	4.4%	5.7%	1.2%
3714	Motor Vehicle Parts	81.2%	3.1%	1.5%	12.9%	1.3%
3715	Truck Trailers	89.2%	1.9%	3.6%	4.4%	0.9%
3716	Motor Homes	94.9%	0.8%	0.1%	3.5%	0.8%
3721	Aircraft	84.5%	1.5%	3.2%	6.7%	4.0%
3724	Aircraft Engines & Parts	70.6%	2.7%	5.1%	12.2%	9.5%
3728	Aircraft Equipment	73.4%	3.1%	1.1%	12.9%	9.6%
3761	Missiles & Space Vehicles	61.6%	2.0%	0.0%	10.2%	26.2%
3764	Space Propulsion Units	73.0%	4.3%	0.0%	15.3%	7.3%
3769	Space Vehicle Equipment	74.7%	2.3%	0.0%	13.3%	9.6%
3731	Ship Building & Repairing	75.2%	2.9%	0.9%	12.3%	8.7%
3732	Boat Building & Repairing	88.0%	1.9%	2.0%	6.7%	1.5%
3743	Railroad Equipment	83.6%	3.0%	2.7%	9.6%	1.0%
3751	Motorcycles & Bicycles	90.5%	1.9%	0.0%	3.6%	4.1%
3792	Travel Trailers & Campers	89.4%	1.1%	5.4%	3.5%	0.6%
3795	Tanks and Tank Components	83.7%	1.0%	0.0%	8.1%	7.2%
3799	Transportation Equipment	86.9%	1.7%	3.6%	5.1%	2.8%
37	TRANSPORTATION MFG AVG	85.7%	1.8%	1.8%	7.9%	2.9%

Table 7R-3: TRANSPORTATION MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$),
plus PURCHASE MANUFACTURING RANK

SIC Code	TYPE OF MANUFACTURING	REVENUES	EXPENDITURES			PURCHASE MFG RANK
			Purchases	Wages & Other Salaries Payments		
3711	Motor Vehicles & Car Body	\$70,740	\$58,467	\$9,627	\$2,645	2
3713	Truck and Bus Bodies	2,511	1,418	613	480	190
3714	Motor Vehicle Parts	36,293	21,883	10,210	4,200	7
3715	Truck Trailers	1,773	1,224	407	142	209
3716	Motor Homes	953	681	142	130	291
3721	Aircraft	28,047	16,933	9,772	1,342	9
3724	Aircraft Engines & Parts	13,799	7,172	4,546	2,082	28
3728	Aircraft Equipment	10,222	4,633	4,302	1,287	59
3761	Missiles & Space Vehicles	10,219	4,115	4,070	2,034	65
3764	Space Propulsion Units	2,221	884	909	428	258
3769	Space Vehicle Equipment	1,958	759	761	438	274
3731	Ship Building & Repairing	10,979	5,260	4,686	1,033	50
3732	Boat Building & Repairing	2,347	1,322	686	339	198
3743	Railroad Equipment	3,457	1,969	1,104	384	137
3751	Motorcycles & Bicycles	1,341	924	271	146	250
3792	Travel Trailers & Campers	1,281	872	256	153	262
3795	Tanks and Tank Components	2,344	1,638	578	128	169
3799	Transportation Equipment	886	540	206	140	318
37	TRANSPORTATION TOTALS (\$)	\$201,346	130,683	53,130	17,533	
	(%)	100%	64.9%	26.4%	8.7%	

Table 7R-4: TRANSPORTATION MFG: EXPENDITURES AS A PERCENT OF REVENUES,
plus PURCHASE/WAGE & SALARY RATIO

SIC Code	TYPE OF MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
3711	Motor Vehicles & Car Body	82.7%	13.6%	3.7%	6.1
3713	Truck and Bus Bodies	56.5%	24.4%	19.1%	2.3
3714	Motor Vehicle Parts	60.3%	28.1%	11.6%	2.1
3715	Truck Trailers	69.0%	23.0%	8.0%	3.0
3716	Motor Homes	71.4%	14.9%	13.7%	4.8
3721	Aircraft	60.4%	34.8%	4.8%	1.7
3724	Aircraft Engines & Parts	52.0%	32.9%	15.1%	1.6
3728	Aircraft Equipment	45.3%	42.1%	12.6%	1.1
3761	Missiles & Space Vehicles	40.3%	39.8%	19.9%	1.0
3764	Space Propulsion Units	39.8%	40.9%	19.2%	1.0
3769	Space Vehicle Equipment	38.7%	38.9%	22.4%	1.0
3731	Ship Building & Repairing	47.9%	42.7%	9.4%	1.1
3732	Boat Building & Repairing	56.3%	29.2%	14.4%	1.9
3743	Railroad Equipment	57.0%	31.9%	11.1%	1.8
3751	Motorcycles & Bicycles	68.9%	20.2%	10.9%	3.4
3792	Travel Trailers & Campers	68.1%	20.0%	11.9%	3.4
3795	Tanks and Tank Components	69.9%	24.7%	5.5%	2.8
3799	Transportation Equipment	61.0%	23.3%	15.8%	2.6
37	TRANSPORTATION MFG AVG	64.9%	26.4%	8.7%	2.5

8. MEASURING, ANALYZING AND CONTROLLING INSTRUMENTS (SIC 38)**Industry Description**

This industry manufactured instruments (including professional and scientific) for measuring, testing, analyzing, controlling, and their associated sensors and accessories; optical instruments and lenses; surveying and drafting instruments; surgical, medical, and dental instruments, equipment, and supplies; ophthalmic goods; photographic equipment and supplies; and watches and clocks.

Purchases

The instruments industry had purchases of \$21 billion. This accounted for two percent of the total manufacturing purchases. Within this industry, the companies that spent the most for purchases were manufacturers of photographic equipment (\$6.8 billion), surgical appliances (\$2.5 billion), and instruments for measuring and testing electricity (\$2.3 billion). The instrument manufacturing industry had the lowest purchases to wages and salaries dollar ratio (1.3 to 1) of all the 20 major manufacturing groups. There was, however, only one industry, the manufacturers of industrial instruments for measurements, within SIC 38, that had expenditures for wages and salaries that exceeded purchase expenditures.

For the whole industry, however, purchases accounted for 40.5 percent (again the lowest) of the expenditures compared to 30 percent for wages and salaries.

Tables 7S-1 through 7S-4 summarize the purchases in

Table 7S-1: INSTRUMENT MANUFACTURING: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Resale	Buildings and Equipment	Other Items	
3811	Engineer, Science Instr.	\$847	\$30	\$59	\$140	\$56	\$1,131
3822	Environmental Controls	464	21	23	83	11	602
3823	Proc Control Instruments	1,026	39	63	206	67	1,400
3824	Fluid Meter, Count Device	247	10	5	38	8	307
3825	Elect Measure Instruments	1,576	59	143	420	104	2,302
3829	Measure & Control Device	697	25	41	111	34	908
3832	Optical Instrument, Lens	1,250	40	81	224	89	1,684
3841	Surgical & Medical Instr	1,086	45	100	301	36	1,568
3842	Surgical Appliances	1,880	63	199	266	108	2,516
3843	Dental Equipment	392	10	65	39	12	517
3851	Ophthalmic Goods	306	24	51	79	19	478
3861	Photographic Equipment	4,997	184	580	949	135	6,846
3873	Watches & Clocks	633	13	40	29	7	720
38	INSTRUMENT MFG TOTALS (\$)	\$15,390	\$561	\$1,450	\$2,883	\$684	\$20,968
	(%)	73.4%	2.7%	6.9%	13.7%	3.3%	100%

Table 7S-2: INSTRUMENT MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF
TOTAL PURCHASES

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Resale Equipment	Buildings and Equipment	Other Items
3811 Engineer, Science Instr.		74.8%	2.6%	5.2%	12.4%	4.9%
3822 Environmental Controls		77.1%	3.5%	3.9%	13.8%	1.8%
3823 Proc Control Instruments		73.3%	2.8%	4.5%	14.7%	4.8%
3824 Fluid Meter, Count Device		80.4%	3.2%	1.7%	12.2%	2.5%
3825 Elect Measure Instruments		68.5%	2.6%	6.2%	18.2%	4.5%
3829 Measure & Control Device		76.8%	2.7%	4.5%	12.3%	3.8%
3832 Optical Instrument, Lens		74.2%	2.4%	4.8%	13.3%	5.3%
3841 Surgical & Medical Instr		69.2%	2.9%	6.4%	19.2%	2.3%
3842 Surgical Appliances		74.7%	2.5%	7.9%	10.6%	4.3%
3843 Dental Equipment		75.8%	1.9%	12.5%	7.5%	2.3%
3851 Ophthalmic Goods		63.9%	5.1%	10.6%	16.6%	3.9%
3861 Photographic Equipment		73.0%	2.7%	8.5%	13.9%	2.0%
3873 Watches & Clocks		87.8%	1.8%	5.5%	4.0%	0.9%
38	INSTRUMENT MFG AVERAGE	73.4%	2.7%	6.9%	13.7%	3.3%

Table 7S-3: INSTRUMENT MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$),
plus PURCHASE MANUFACTURING RANK

SIC Code	TYPE OF MANUFACTURING	REVENUES	EXPENDITURES			PURCHASE MFG RANK
			Purchases	Wages & Other Salaries Payments		
3811	Engineer, Science Instr.	\$3,046	\$1,131	\$1,051	\$864	220
3822	Environmental Controls	1,549	602	628	320	307
3823	Proc Control Instruments	4,006	1,400	1,513	1,092	192
3824	Fluid Meter, Count Device	727	307	243	176	378
3825	Elect Measure Instruments	6,120	2,302	2,250	1,568	122
3829	Measure & Control Device	2,195	908	951	335	253
3832	Optical Instrument, Lens	3,813	1,684	1,262	867	163
3841	Surgical & Medical Instr	4,084	1,568	1,220	1,297	173
3842	Surgical Appliances	5,667	2,516	1,462	1,690	108
3843	Dental Equipment	1,112	517	333	261	323
3851	Ophthalmic Goods	1,287	478	503	306	335
3861	Photographic Equipment	17,038	6,846	3,833	6,359	30
3873	Watches & Clocks	1,188	720	303	164	277
38	INSTRUMENTS TOTALS: (\$)	\$51,798	20,968	15,538	15,292	
	(%)	100%	40.5%	30.0%	29.5%	

Table 7S-4: INSTRUMENT MFG: EXPENDITURES AS A PERCENT OF REVENUES,
plus PURCHASE/WAGE & SALARY RATIO

SIC Code	TYPE OF MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
3811	Engineer, Science Instr.	37.1%	34.5%	28.4%	1.1
3822	Environmental Controls	38.8%	40.5%	20.7%	1.0
3823	Proc Control Instruments	35.0%	37.8%	27.3%	0.9
3824	Fluid Meter, Count Device	42.3%	33.5%	24.2%	1.3
3825	Elect Measure Instruments	37.6%	36.8%	25.6%	1.0
3829	Measure & Control Device	41.4%	43.3%	15.3%	1.0
3832	Optical Instrument, Lens	44.2%	33.1%	22.7%	1.3
3841	Surgical & Medical Instr	38.4%	29.9%	31.8%	1.3
3842	Surgical Appliances	44.4%	25.8%	29.8%	1.7
3843	Dental Equipment	46.6%	29.9%	23.5%	1.6
3851	Ophthalmic Goods	37.2%	39.1%	23.8%	1.0
3861	Photographic Equipment	40.2%	22.5%	37.3%	1.8
3873	Watches & Clocks	60.6%	25.5%	13.8%	2.4
38	INSTRUMENT MFG AVERAGE	40.5%	30.0%	29.5%	1.3

this industry by type of purchase and in relation to other expenditures. Table 7S-3 shows the purchases dollar rank of each four-digit instrument manufacturing industry in relation to the purchases of the other 448 manufacturing industries.

T. MISCELLANEOUS MANUFACTURING INDUSTRIES (SIC 39)

Industry Description

This last industry group was a "catch-all" category that included firms that manufactured products that were not classified in any other manufacturing group. Industries in this group fell into the following categories: jewelry, silverware and plated ware, musical instruments, toys, sporting and athletic goods; pens, pencils, and other office and artists' materials; buttons, costume novelties, brooms and brushes; caskets; and other miscellaneous manufacturing industries.

Purchases

The miscellaneous manufacturing industries had purchases of \$13 billion. This represented one percent of the total manufacturing purchases. Within the miscellaneous industries, the companies that spent the most for purchases were manufacturers of toys and games (\$2 billion), jewelry and precious metals (\$1.8 billion), and sporting and athletic goods (\$1.7 billion). The miscellaneous industries had a purchases to wages and salaries dollar ratio of 2.1 to 1. Purchases accounted for 51 percent of the expenditures in this industry compared to 22 percent for wages and salaries.

Table 7T-1: MISCELLANEOUS MANUFACTURING: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Resale Equipment	Buildings and Equipment	Other Items	
39	MISCELLANEOUS MFG	\$11,167	\$328	\$981	\$1,006	\$380	\$13,862
3911	Jewelry, Precious Metals	1,684	14	48	55	38	1,839
3914	Silverware & Plated Ware	205	9	45	21	5	285
3915	Jeweler Material,Lapidary	518	3	8	11	8	549
3931	Musical Instruments	368	15	24	37	11	455
3942	Dolls	167	3	7	14	13	205
3944	Toys and Games	1,559	46	220	167	39	2,030
3949	Sporting & Athletic Goods	1,344	48	175	121	32	1,722
3951	Pens & Mechanical Pencils	281	10	47	36	12	385
3952	Lead Pencils & Art Goods	167	7	22	25	5	226
3953	Marking Devices	95	4	16	15	6	134
3955	Carbon Paper & Ink Ribbon	372	9	74	37	11	502
3961	Costume Jewelry	313	13	42	33	50	451
							247

Table 7T-1 Continued: MISCELLANEOUS MFG: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Resale Equipment	Buildings and Other Items		
3962	Artificial Flowers	\$119	\$4	\$13	\$13	\$1	\$150
3963	Buttons	50	3	2	3	1	60
3964	Needles Pins & Fasteners	269	17	21	48	9	364
3991	Brooms and Brushes	316	11	47	28	4	407
3993	Signs, Advertise Displays	969	38	45	115	101	1,267
3995	Burial Caskets	290	10	9	46	1	357
3996	Hard Surf Floor Coverings	234	17	0	38	20	309
3999	Manufacturing Industries	1,917	49	95	145	36	2,241
39	MISC MFG TOTALS: (\$)	\$11,167	\$328	\$981	\$1,006	\$380	\$13,862
	(%)	80.6%	2.4%	7.1%	7.3%	2.7%	100%

Table 7T-2: MISCELLANEOUS MFG: TYPES OF PURCHASES BY PERCENT OF
TOTAL PURCHASES

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Buildings and Resale Equipment	Other Items	
39	MISCELLANEOUS MFG	80.6%	2.4%	7.1%	7.3%	2.7%
3911	Jewelry, Precious Metals	91.5%	0.8%	2.6%	3.0%	2.1%
3914	Silverware & Plated Ware	72.0%	3.2%	15.7%	7.4%	1.8%
3915	Jeweler Material, Lapidary	94.3%	0.6%	1.5%	2.1%	1.5%
3931	Musical Instruments	80.8%	3.3%	5.2%	8.1%	2.5%
3942	Dolls	81.7%	1.5%	3.6%	7.0%	6.2%
3944	Toys and Games	76.8%	2.3%	10.8%	8.2%	1.9%
3949	Sporting & Athletic Goods	78.1%	2.8%	10.2%	7.0%	1.9%
3951	Pens & Mechanical Pencils	72.9%	2.5%	12.1%	9.3%	3.1%
3952	Lead Pencils & Art Goods	74.0%	2.9%	9.8%	10.9%	2.3%
3953	Marking Devices	70.3%	2.9%	11.6%	10.8%	4.4%
3955	Carbon Paper & Ink Ribbon	74.1%	1.8%	14.7%	7.3%	2.1%
3961	Costume Jewelry	69.4%	2.9%	9.4%	7.2%	11.0%
3962	Artificial Flowers	79.3%	2.7%	8.9%	8.4%	0.7%
3963	Buttons	84.9%	5.2%	3.2%	4.7%	2.0%
3964	Needles Pins & Fasteners	73.7%	4.8%	5.8%	13.3%	2.4%

Table 7T-2 Continued: MISC MFG: TYPES OF PURCHASES BY PERCENT OF
TOTAL PURCHASES

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Buildings and Resale Equipment	Other Items	
3962	Artificial Flowers	79.3%	2.7%	8.9%	8.4%	0.7%
3963	Buttons	84.9%	5.2%	3.2%	4.7%	2.0%
3964	Needles Pins & Fasteners	73.7%	4.8%	5.8%	13.3%	2.4%
3991	Brooms and Brushes	77.8%	2.8%	11.6%	6.9%	0.9%
3993	Signs, Advertise Displays	76.5%	3.0%	3.5%	9.1%	8.0%
3995	Burial Caskets	81.4%	2.8%	2.5%	12.9%	0.4%
3996	Hard Surf Floor Coverings	75.7%	5.4%	0.0%	12.4%	6.4%
3999	Manufacturing Industries	85.6%	2.2%	4.2%	6.5%	1.6%
39	MISC MFG AVERAGE	80.6%	2.4%	7.1%	7.3%	2.7%

**Table 7T-3: MISCELLANEOUS MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$),
plus PURCHASE MANUFACTURING RANK**

SIC Code	TYPE OF MANUFACTURING	REVENUES	EXPENDITURES			PURCHASE MFG RANK
			Purchases	Salaries	Wages & Other Payments	
39	MISCELLANEOUS MFG	\$26,891	\$13,862	\$6,737	\$6,292	
3911	Jewelry, Precious Metals	3,039	1,839	615	585	149
3914	Silverware & Plated Ware	584	285	182	117	383
3915	Jeweler Material, Lapidary	756	549	100	107	314
3931	Musical Instruments	916	455	314	146	341
3942	Dolls	396	205	100	92	404
3944	Toys and Games	4,476	2,030	773	1,673	136
3949	Sporting & Athletic Goods	3,377	1,722	819	836	159
3951	Pens & Mechanical Pencils	809	385	211	213	354
3952	Lead Pencils & Art Goods	446	226	108	113	394
3953	Marking Devices	338	134	129	75	422
3955	Carbon Paper & Ink Ribbon	779	502	138	139	328
3961	Costume Jewelry	1,027	451	312	264	343

Table 7T-3 Continued: MISCELLANEOUS MFG: REVENUES AND EXPENDITURES (Millions \$),
plus PURCHASE MANUFACTURING RANK

SIC Code	TYPE OF MANUFACTURING	REVENUES	EXPENDITURES			PURCHASE MFG RANK
			Purchases	Wages & Other Salaries Payments	Other Payments	
3962	Artificial Flowers	\$260	\$150	\$60	\$50	420
3963	Buttons	124	60	42	23	442
3964	Needles Pins & Fasteners	699	364	214	120	362
3991	Brooms and Brushes	818	407	243	169	350
3993	Signs, Advertise Displays	2,739	1,267	1,021	451	204
3995	Burial Caskets	682	357	175	150	364
3996	Hard Surf Floor Coverings	604	309	135	160	377
3999	Manufacturing NEC	4,131	2,241	1,084	806	125
39	MISC MFG TOTALS: (\$)	\$26,891	\$13,862	\$6,737	\$6,292	
	(%)	100%	51.5%	21.6%	14.9%	

Table 7T-4: MISCELLANEOUS MFG: EXPENDITURES AS A PERCENT OF REVENUES,
plus PURCHASE/WAGE & SALARY RATIO

SIC Code	TYPE OF MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
39	MISCELLANEOUS MFG	51.5%	21.6%	14.9%	2.1
3911	Jewelry, Precious Metals	60.5%	20.2%	19.3%	3.0
3914	Silverware & Plated Ware	48.9%	31.1%	20.0%	1.6
3915	Jeweler Material, Lapidary	72.6%	13.2%	14.1%	5.5
3931	Musical Instruments	49.7%	34.3%	16.0%	1.4
3942	Dolls	51.7%	25.2%	23.1%	2.1
3944	Toys and Games	45.3%	17.3%	37.4%	2.6
3949	Sporting & Athletic Goods	51.0%	24.2%	24.8%	2.1
3951	Pens & Mechanical Pencils	47.6%	26.0%	26.4%	1.8
3952	Lead Pencils & Art Goods	50.6%	24.1%	25.3%	2.1
3953	Marking Devices	39.8%	38.1%	22.1%	1.0
3955	Carbon Paper & Ink Ribbon	64.5%	17.8%	17.8%	3.6
3961	Costume Jewelry	43.9%	30.4%	25.7%	1.4

Table 7T-4 Continued: MISC MFG: EXPENDITURES AS A PERCENT OF REVENUES,
plus PURCHASE/WAGE & SALARY RATIO

SIC Code	TYPE OF MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
3962	Artificial Flowers	57.6%	23.0%	19.4%	2.5
3963	Buttons	47.9%	33.6%	18.5%	1.4
3964	Needles Pins & Fasteners	52.1%	30.7%	17.2%	1.7
3991	Brooms and Brushes	49.7%	29.6%	20.6%	1.7
3993	Signs, Advertise Displays	46.3%	37.3%	16.5%	1.2
3995	Burial Caskets	52.3%	25.7%	22.0%	2.0
3996	Hard Surf Floor Coverings	51.2%	22.4%	26.4%	2.3
3999	Manufacturing NEC	54.2%	26.2%	19.5%	2.1
39	MISC MFG AVERAGE	51.5%	21.6%	14.9%	2.1

Tables 7T-1 through 7T-4 summarize the purchases in this industry by type of purchase and in relation to other expenditures. Table 7T-3 shows the purchases dollar rank of each four-digit miscellaneous manufacturing industry in relation to the purchases of the other 448 manufacturing industries.

U. ALL MANUFACTURING INDUSTRIES (SIC 20-39)

This section summarizes the information for all of the 20 major manufacturing industries. Tables 7U-1 through 7U-4 summarize the purchases for all manufacturing industries by type of purchase and in relation to other expenditures.

Table 7U-5 shows the relationship of purchases by dollar magnitude for all twenty major manufacturing industries. The table shows that four industries accounted for 50 percent of all the purchases. These were Food, Petroleum, Transportation, and Chemicals. Table 7U-6 lists the top 32 four-digit manufacturing industries by total purchases. The table shows that only 32 of the total 448 manufacturing industries account for 50% of all the manufacturing purchases.

The importance of purchases in relation to labor is illustrated in Tables 7U-3 and 7U-4. Purchases exceed wages and salaries in all manufacturing by a ratio of 3-to-1. A review of the 448 four-digit manufacturing purchases to wages and salaries dollar ratios shows that only 18 industries (4%) had expenditures for wages and salaries that exceeded the expenditures for purchases. These 18 labor

Table 7U-1: MANUFACTURING: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Resale	Buildings and Equipment	Other Items	
20	Food	\$171,482	\$5,029	\$15,234	\$10,196	\$815	\$202,756
21	Tobacco	6,446	114	533	781	18	7,892
22	Textiles	25,543	1,714	412	2,365	1,106	31,140
23	Apparel	20,015	513	983	1,406	5,957	28,874
24	Lumber	23,292	1,091	1,366	2,104	1,470	29,323
25	Furniture	10,198	344	510	1,002	236	12,290
26	Paper	39,538	5,526	1,184	6,724	528	53,500
27	Printing	23,097	877	618	5,802	7,658	38,052
28	Chemicals	76,048	10,616	4,445	12,390	1,712	105,211
29	Petroleum	172,336	5,518	6,628	8,142	759	193,383
30	Plastics	24,936	1,695	1,001	3,675	699	32,006
31	Leather	4,198	130	441	275	164	5,208
32	Glass	16,860	3,862	1,112	3,344	591	25,769
33	Primary Metals	57,188	9,096	1,378	7,269	1,509	76,440
34	Fabricated Metals	51,831	2,464	2,728	6,756	3,429	67,208
35	Machinery	73,055	2,472	4,615	11,886	4,368	96,396
36	Electric Equipment	55,408	2,069	4,107	10,089	2,312	73,985
37	Transportation	112,056	2,315	2,294	10,288	3,730	130,683
38	Instruments	15,390	561	1,450	2,883	684	20,968
39	Miscellaneous	11,167	328	981	1,006	380	13,862
TOTALS: (\$)		\$990,084	\$56,334	\$52,020	\$108,383	\$38,125	\$1,244,946
(\$)		79.5%	4.5%	4.2%	8.7%	3.1%	100%

Table 7U-2: MANUFACTURING: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES

SIC Code	TYPE OF MANUFACTURING	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Resale	Buildings and Equipment	Other Items
20	Food	84.6%	2.5%	7.5%	5.0%	0.4%
21	Tobacco	81.7%	1.4%	6.8%	9.9%	0.2%
22	Textiles	82.0%	5.5%	1.3%	7.6%	3.6%
23	Apparel	69.3%	1.8%	3.4%	4.9%	*20.6%
24	Lumber	79.4%	3.7%	4.7%	7.2%	5.0%
25	Furniture	83.0%	2.8%	4.1%	8.2%	1.9%
26	Paper	73.9%	10.3%	2.2%	12.6%	1.0%
27	Printing	60.7%	2.3%	1.6%	15.2%	*20.2%
28	Chemicals	72.3%	10.1%	4.2%	11.8%	1.6%
29	Petroleum	89.1%	2.9%	3.4%	4.2%	0.4%
30	Plastics	77.9%	5.3%	3.1%	11.5%	2.2%
31	Leather	80.6%	2.5%	8.5%	5.3%	3.1%
32	Glass	65.4%	15.0%	4.3%	13.0%	2.3%
33	Primary Metals	74.8%	11.9%	1.8%	9.5%	2.0%
34	Fabricated Metals	77.1%	3.7%	4.1%	10.1%	5.1%
35	Machinery	75.8%	2.6%	4.8%	12.3%	4.5%
36	Electric Equipment	74.9%	2.8%	5.6%	13.6%	3.1%
37	Transportation	85.7%	1.8%	1.8%	7.9%	2.9%
38	Instruments	73.4%	2.7%	6.9%	13.7%	3.3%
39	Miscellaneous	80.6%	2.4%	7.1%	7.3%	2.7%
MANUFACTURING AVERAGE		79.5%	4.5%	4.2%	8.7%	3.1%

* Predominately Subcontract Work

Table 7U-3: MANUFACTURING: REVENUES AND EXPENDITURES (Millions \$)

SIC Code	TYPE OF MANUFACTURING	REVENUES	EXPENDITURES		
			Purchases	Wages & Other Salaries Payments	Other
20	Food	\$280,529	\$202,756	\$32,040	\$45,733
21	Tobacco	16,061	7,892	1,749	6,420
22	Textiles	47,515	31,140	10,677	5,698
23	Apparel	53,388	28,874	14,116	10,398
24	Lumber	42,935	29,323	10,176	3,436
25	Furniture	24,129	12,290	7,233	4,606
26	Paper	79,895	53,500	15,827	10,568
27	Printing	85,797	38,052	26,685	21,060
28	Chemicals	170,737	105,211	25,855	39,671
29	Petroleum	208,919	193,383	5,455	10,081
30	Plastics	55,416	32,006	14,346	9,064
31	Leather	9,719	5,208	2,622	1,889
32	Glass	45,181	25,769	12,534	6,878
33	Primary Metals	104,667	76,440	27,550	677
34	Fabricated Metals	119,444	67,208	36,116	16,120
35	Machinery	187,896	96,396	57,762	33,738
36	Electric Equipment	147,944	73,985	47,255	26,704
37	Transportation	201,346	130,683	53,130	17,533
38	Instruments	51,798	20,968	15,538	15,292
39	Miscellaneous	26,891	13,862	6,737	6,292
TOTALS: (\$)		\$1,960,207	\$1,244,946	\$423,403	\$291,858
(%)		100%	63.5%	21.6%	14.9%

Table 7U-4: MANUFACTURING: EXPENDITURES AS A PERCENT OF REVENUES,
plus PURCHASE/WAGE AND SALARY RATIO

SIC Code	TYPE OF MANUFACTURING	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
20	Food	72.3%	11.4%	16.3%	6.3
21	Tobacco	49.1%	10.9%	40.0%	4.5
22	Textiles	65.5%	22.5%	12.0%	2.9
23	Apparel	54.1%	26.4%	19.5%	2.0
24	Lumber	68.3%	23.7%	8.0%	2.9
25	Furniture	50.9%	30.0%	19.1%	1.7
26	Paper	67.0%	19.8%	13.2%	3.4
27	Printing	44.4%	31.1%	24.5%	1.4
28	Chemicals	61.6%	15.1%	23.2%	4.1
29	Petroleum	92.6%	2.6%	4.8%	35.5
30	Plastics	57.8%	25.9%	16.4%	2.2
31	Leather	53.6%	27.0%	19.4%	2.0
32	Glass	57.0%	27.7%	15.2%	2.1
33	Primary Metals	73.0%	26.3%	0.6%	2.8
34	Fabricated Metals	56.3%	30.2%	13.5%	1.9
35	Machinery	51.3%	30.7%	18.0%	1.7
36	Electric Equipment	50.0%	31.9%	18.1%	1.6
37	Transportation	64.9%	26.4%	8.7%	2.5
38	Instruments	40.5%	30.0%	29.5%	1.3
39	Miscellaneous	51.5%	25.1%	23.4%	2.1
MANUFACTURING AVERAGE		63.5%	21.6%	14.9%	2.9

Table 7U-5: ALL MANUFACTURING PURCHASES (Millions \$);
Rank; and Percent of Total Manufacturing Purchases

SIC Code	TYPE OF MANUFACTURING	PURCHASES	RANK	% TOT MFG PURCHASES
20	Food	\$202,756	1	16.3%
21	Tobacco	7,892	19	0.6%
22	Textiles	31,140	12	2.5%
23	Apparel	28,874	14	2.3%
24	Lumber	29,323	13	2.4%
25	Furniture	12,290	17	1.0%
26	Paper	53,500	9	4.3%
27	Printing	38,052	10	3.1%
28	Chemicals	105,211	4	8.5%
29	Petroleum	193,383	2	15.5%
30	Plastics	32,006	11	2.6%
31	Leather	5,208	20	0.4%
32	Glass	25,769	15	2.1%
33	Primary Metals	76,440	6	6.1%
34	Fabricated Metals	67,208	8	5.4%
35	Machinery	96,396	5	7.7%
36	Electric Equipment	73,985	7	5.9%
37	Transportation	130,683	3	10.5%
38	Instruments	20,968	16	1.7%
39	Miscellaneous	13,862	18	1.1%
TOTALS:		\$1,244,946		100%

Table 7U-6: TOP MANUFACTURING PURCHASES (Millions \$); Rank; Percent of Total Manufacturing Purchases; And Cumulative Percent Total

SIC Code	TYPE OF MANUFACTURING	PURCHASES	RANK	% TOT MFG PURCHASES	CUMULATIVE % TOTAL
2911	Petroleum Refining	\$186,807	1	15.0%	15.0%
3711	Motor Vehicles	58,467	2	4.7%	19.7%
2011	Meat Packing Plants	39,509	3	3.2%	22.9%
3312	Steel Mills	26,607	4	2.1%	25.0%
2869	Organic Chemicals	23,241	5	1.9%	26.9%
3079	Plastic Products	22,198	6	1.8%	28.7%
3714	Motor Vehicle Parts	21,883	7	1.8%	30.4%
3573	Electronic Computing	20,660	8	1.7%	32.1%
3721	Aircraft	16,933	9	1.4%	33.4%
2026	Fluid Milk	15,440	10	1.2%	34.7%
3662	Radio & TV Equipment	14,649	11	1.2%	35.9%
2621	Paper Mills	14,459	12	1.2%	37.0%
2821	Plastics and Resins	11,924	13	1.0%	38.0%
2086	Soft Drinks	11,478	14	0.9%	38.9%
2752	Commercial Printing	9,785	15	0.8%	39.7%

Table 7U-6 Continued: TOP MANUFACTURING PURCHASES (Millions \$);
Rank; Percent of Total Mfg Purchases; And Cumulative Percent Total

SIC Code	TYPE OF MANUFACTURING	PURCHASES	RANK	% TOT MFG PURCHASES	CUMULATIVE % TOTAL
2013	Sausages & Prepared Meats	\$9,672	16	0.8%	40.5%
2048	Prepared Feeds (Animals)	9,332	17	0.7%	41.2%
2022	Cheese	9,249	18	0.7%	42.0%
2711	Newspapers	8,185	19	0.7%	42.6%
2075	Soybean Oil Mills	8,146	20	0.7%	43.3%
2082	Malt Beverages	7,705	21	0.6%	43.9%
3679	Electronic Components	7,596	22	0.6%	44.5%
2631	Paperboard Mills	7,484	23	0.6%	45.1%
3411	Metal Cans	7,454	24	0.6%	45.7%
2016	Poultry Dressing Plants	7,433	25	0.6%	46.3%
2653	Corrugated Boxes	7,430	26	0.6%	46.9%
2421	Sawmills	7,371	27	0.6%	47.5%
3724	Aircraft Engines & Parts	7,172	28	0.6%	48.1%
3661	Telephone Apparatus	7,128	29	0.6%	48.7%
3861	Photographic Equipment	6,846	30	0.5%	49.1%
3531	Construction Machinery	6,777	31	0.5%	49.6%
3585	Refrigeration & Heating	6,678	32	0.5%	50.2%
All Other Manufacturing		619,248		49.8%	100%
Mfg Purchase Totals:		\$1,244,946		100%	

intensive industries are discussed in chapter 17.

ENDNOTES

- [1] U.S Bureau of the Census, 1982 Census of Manufactures. Subject Series. General Summary. Part 1. (Washington, D.C.: U.S. Government Printing Office, 1986), p. X.
- [2] 1982 Census of Manufactures. Subject Series. General Summary. p. IV.
- [3] 1982 Census of Manufactures. Subject Series. General Summary. p. XI.
- [4] 1982 Census of Manufactures. Subject Series. Appendix C. pp. C-1 through C-45.
- [5] 1982 Census of Manufactures. Industry Series. Appendix A. p. A-2.
- [6] U.S. Department of Commerce. Survey of Current Business. (Washington, D.C.: U.S. Government Printing Office, July, 1986), p. 72.

MICHIGAN STATE UNIV. LIBRARIES



31293009041173

**PLACE IN RETURN BOX to remove this checkout from your record.
TO AVOID FINES return on or before date due.**

DATE DUE	DATE DUE	DATE DUE
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

MSU Is An Affirmative Action/Equal Opportunity Institution

c:\circ\datedue.pm3-p.1

**PURCHASES BY AMERICAN BUSINESSES AND GOVERNMENTS:
TYPES AND DOLLAR MAGNITUDES BY INDUSTRIES**

Volume II

By

Michael E. Heberling

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Management

1991

CHAPTER 8: TRANSPORTATION CARRIERS (SIC 40-45)

INTRODUCTION

This chapter will present the magnitude of purchasing for three major transportation carriers: railroads (SIC 40), trucking (SIC 42), and airlines (SIC 45). In addition, the relationship of these transportation carrier purchases to revenues and other expenditures will be presented and analyzed. Tables 8-1 through 8-4 summarize the purchasing activities by type of purchase and in relation to other expenditures.

THE TRANSPORTATION CARRIER INDUSTRY

The five major transportation carriers had revenues of \$253 billion in 1982. The trucking industry accounted for the majority of the revenues (66%), followed by the airlines (14%), railroads (11%), water (6%), and pipelines (3%) [1]. Only the first three, however, had sufficient purchasing data to be included in this research. There was no government census on any of these industries. Also, in the case of the water and pipeline carriers, there were no trade associations to provide purchasing information.

Railroads (SIC 401)

The railroad industry included 31 Class I (revenues greater than \$50 million) railroads and numerous smaller companies. The smaller railroads (Class II and III) were not required to report extensive financial or traffic data to

Table 8-1: TRANSPORTATION CARRIERS: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF TRANSPORTATION CARRIER	TYPE OF PURCHASE				TOTAL PURCHASES
		Materials and Supplies	Energy	Buildings and Resale Equipment	Other Items	
40	Railroads	\$1,643	\$3,012	n/a	\$5,836	\$3,884
42	Trucking	3,717	3,854	n/a	2,480	10,797
45	Air	1,015	9,674	n/a	11,013	731
TOTALS: (\$)		\$6,375	\$16,540	n/a	\$19,329	\$15,412
						\$57,656

Table 8-2: TRANSPORTATION TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES

SIC Code	TYPE OF TRANSPORTATION CARRIER	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Buildings and Equipment	Resale	Other Items
40	Railroads	11.4%	21.0%	n/a	40.6%	27.0%
42	Trucking	17.8%	18.5%	n/a	11.9%	51.8%
45	Air	4.5%	43.1%	n/a	49.1%	3.3%
TRANSPORTATION AVG		11.1%	28.7%	n/a	33.5%	26.7%

Table 8-3: TRANSPORTATION: REVENUES AND EXPENDITURES (Millions \$)

SIC Code	TYPE OF TRANSPORTATION	REVENUES	EXPENDITURES		
			Purchases	Wages & Salaries	Other Payments
40	Railroads	\$27,504	\$14,375	\$11,021	\$2,108
42	Trucking	47,176	20,848	22,976	3,352
45	Air	36,407	22,433	12,511	1,463
TOTALS: (\$)		\$111,087	\$57,656	\$46,508	\$6,923
(\$)		100%	51.9%	41.9%	6.2%

**Table 8-4: TRANSPORTATION CARRIERS: EXPENDITURES AS A PERCENT
OF REVENUES, plus PURCHASE/WAGE AND SALARY RATIO**

SIC Code	TYPE OF TRANSPORTATION	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Salaries	Other Payments	
40	Railroads	52.3%	40.1%	7.7%	1.3
42	Trucking	44.2%	48.7%	7.1%	0.9
45	Air	61.6%	34.4%	4.0%	1.8
TRANSPORTATION AVG		51.9%	41.9%	6.2%	1.2

the Interstate Commerce Commission (ICC). The Association of American Railroads reported that in 1981, Class I railroads accounted for 98% of the rail freight miles and 92 % of railroad employment [2]. Due to the lack of information on Class II and III railroads, this research was restricted to the Class I railroads.

Trucking (SIC 421)

The Interstate Commerce Commission (ICC) divided the trucking industry into three classes. A Class I carrier was one having gross operating revenues of \$5 million or more, Class II were those having revenues of \$1 million or more (but less than \$5 million) and Class III carriers were those with revenues of less than \$1 million. The ICC required Class I common and contract carriers to file quarterly and annual reports. Class II carriers were required to just file annual reports [3]. The total trucking industry has estimated revenues of \$173 billion. Intercity trucking accounted for \$100 billion (\$48 billion ICC regulated and \$52 billion for Non-ICC regulated) and local trucking was \$73 billion [4].

Airlines (SIC 451)

The airlines were divided into three categories: major, national, and regional carriers. A major carrier was defined by the industry as one having revenues of at least \$1 billion per year. These airlines accounted for 82 percent of the revenue. The national carriers had revenues of less than \$1 billion but more than \$75 million. In 1982, they had

15 percent of the revenues. The last group, regionals (revenues of less than \$75 million), formerly termed "commuters" have grown significantly since deregulation. Regional service and revenues expanded as the larger airlines abandoned the less profitable routes [5]. The regionals made up the remaining three percent of the airline revenues [6].

DATA SOURCES AND LIMITATIONS

In 1982 there was a Census of Transportation conducted by the Commerce Department. Unfortunately, this census was of limited scope and was not comparable to the census of manufactures or the census of wholesale trade. There was no information provided on the operating expenses of transportation industry [7].

Consequently, all of the information presented in tables 8-1 through 8-4 came from a number of diverse government and private sources. For the railroad industry data came from the Association of American Railroads, and the Interstate Commerce Commission (ICC). The primary source for airlines was the Air Transport Association of America, and for the trucking industry it was the American Trucking Association, the ICC, and Trinc Transportation Consultants.

The trucking industry was the most difficult industry to determine purchases because many truck operations were either small businesses (Class III carriers) or they were independent owner-operators. In either case, they were not

required to file reports with the ICC.

Since the ICC did not require the Class III carriers nor the independent owner-operator carriers to file financial reports, their cost structure (and their purchases) can only be approximated. Moody's states that it is impossible to get fully accurate and authentic figure on the various types of carriers [8].

As a result of deregulation (1980 Motor Carrier Act), there was an influx of 3,500 new (mostly Class III and nonunion) carriers [9]. This resulted in a 25 percent labor cost differential between union and nonunion carriers [10]. Among 3558 Class I and II carriers that filed reports, labor (wages, salaries and benefits) made up 48.7 percent of the revenues [11].

For the first time in 1985, the Census Department conducted a survey of both the regulated and nonregulated trucking firms. It did not, however, include the independent owner-operators. This survey showed that in 1984, labor (wages, salaries and benefits) accounted for 38.9 percent of the revenues [12]. Unfortunately, figures were not available for 1982. The 1984 figure of 38.9 percent is probably more representative of the whole trucking industry than is the 1982 figure of 48.7 percent, which only included the larger Class I and II carriers.

Since there was limited information on Class III and independents, this research was limited to Class I and II carriers. This restriction probably resulted in a higher

wages and salary percentage than exists in the industry as a whole. This also means that purchases as a percent of revenues were probably understated. Class I and II carriers accounted for \$47 billion of the total (27%) [13].

The U.S. water transportation industry (SIC 44) which includes deep sea, coastal, great lakes, river, and canal transportation was not included in this research because there was insufficient purchasing information. Local and interurban passenger transit (SIC 41), petroleum pipelines (SIC 46) and transportation services (SIC 47) were excluded for the same reason.

PURCHASES

Of the three carriers presented, purchases made up the majority of the expenditures (51.9%). The amount spent on purchases was \$58 billion. The amount spent on purchases was greater than the \$47 billion spent on wages and salaries.

Table 8-1 shows that purchases for Materials and Supplies were \$6.3 billion. This was the smallest type of purchase (11% of the total). For railroads, the material and supply purchases were \$1.6 billion [14]. The trucking figure, of \$3.7 billion, was composed of operating supplies, such as tires and vehicle maintenance parts (\$2.1 billion), and general supplies (\$1.6 billion [15]). The \$1 billion figure for the airlines was entirely for purchased food. The materials and supplies that were used in maintenance are included under building and equipment purchases [16].

Energy, at over \$16 billion, accounted for 29 percent of the total purchases. The energy figures in Tables 8-1 and 8-2 only represented purchased fuels. For the railroads, the \$3 billion was for locomotive fuel [17]. In the trucking industry, \$3.8 billion was spent on fuel and oil (this includes taxes) [18]. In 1982, the airlines purchased 10.2 billion gallons of fuel [19] which totaled \$9.7 billion [20].

Resales figures for the transportation carriers were not available (n/a).

Purchases for Buildings and Equipment were \$19 billion and made up 33 percent of the total purchases. This type of purchase included: (1) capital expenditures for new and used: structures, machinery and equipment, (2) rental payments for structures, machinery and equipment and (3) purchased repair services. In railroads, the total was \$5.8 billion. Expenditures for new structures (\$1.4 billion) and equipment (\$2.8 billion) totaled \$4.2 billion [21]. The amount spent on repair and maintenance parts was \$1 billion [22] and \$626 million was spent for the lease and rental of locomotives, freight cars, and other equipment [23].

The trucking figure of \$2.5 billion is made up of transportation equipment rentals (that is, without drivers) and \$5 billion for building and office equipment rentals [24]. The expenditures for capital equipment were not available.

The airline total was \$11 billion. This was composed of

maintenance and maintenance materials, \$7 billion [25] and expenditures for new plant and equipment, \$4 billion [26].

The purchasing of Other Items was \$15 billion and accounted for 27 percent of the purchases. In the railroads this category is made up entirely of purchased services \$3.884 [27]. In the trucking industry, other items totaled \$11 billion. The majority of this was for subcontracted transportation, \$9 billion. The rest was for insurance, communication, and other utilities, (\$2 billion) [28]. For the airlines, the \$731 million represents expenditures for advertising [29].

REVENUES AND EXPENDITURES

Table 8-3 presents purchases in relation to revenues, wages and salaries, and other payments. The \$57 billion spent on purchases made up the largest expenditure in the transportation carrier industry (52%).

The Revenues for the three transportation carriers were \$111 billion. In the railroads revenues were \$27.5. Two percent of the revenue (\$573 million) came from passenger transportation (Amtrak) [30]. For Class I and II trucking, the revenues were \$47 billion [31]. The airline figure of \$36 billion included freight, passenger, charter and U.S. mail revenue [32].

Total Wages and Salaries were \$46 billion and represented 42 percent of the total expenditures. In the railroads, wages and salaries were \$11 billion. This was

divided between: executives (6%), professional and clerical (19%), maintenance personnel for the railway and equipment (35%), and the train crews (40%) [33].

Wages and salaries in the Class I and II trucking industry were \$23 billion, which represented 49 percent of the total expenditures. These labor figures include officers and supervisors, as well as fringe benefits [34]. As was stated previously, when both the regulated and nonregulated trucking firms were combined in a 1984 Census Bureau survey, the wages and salaries percentage dropped 10 percent, to 38% of the expenditures. In the airlines wages and salaries were \$12.5 billion [35]. This represent 34 percent of the revenues.

The expenditures for Other Payments represent all expenses not covered under purchases and wages and salaries. The following items would be representative of this category: taxes, depreciation, interest paid, dividends, insurance, and retained earnings. The other payment figures were derived by subtracting the sum of purchases and wages and salaries from revenues. Total other payments came to \$7 billion, which was 6 percent of the expenditures.

SUMMARY

Tables 8-3 shows that purchasing in the transportation carrier industry (\$58 billion) was the most significant expenditure (52%). Wages and salaries were \$47 billion and made up 42 percent of the expenditures. The trucking figures

presented are probably not very representative of the whole trucking industry. The smaller trucking firms and the independent owner-operators were not included in this research. Their labor costs are probably 10 to 25 percent lower than than the regulated Class I and II firms. The lowering of the labor costs will result in a greater share of the expenditures going to purchases in the smaller trucking operations which account for 71% of the trucking revenues.

ENDNOTES

- [1] U.S. Department of Commerce. Statistical Abstract of the United States, 1986. (Washington, D.C.: U.S. Government Printing Office, 1986). p. 589. Note: The airline figures came from the Air Transport Association of America, see [6].
- [2] U.S. Department of Commerce. 1985 U.S. Industrial Outlook. (Washington, D.C.: U.S. Government Printing Office, 1985). p. 52-7.
- [3] Hanson, Robert P. Moody's Transportation Manual. (New York: Moody's Investor Service, Inc., 1988). p. A46.
- [4] U.S. Department of Commerce. Statistical Abstract of the United States, 1986. p. 589.
- [5] U.S. Department of Commerce. 1984 U.S. Industrial Outlook. (Washington, D.C.: U.S. Government Printing Office, 1984). pp. 45-7 and 45-8.
- [6] Air Transport, 1983. (Washington D.C.: Air Transport Association of America, June 1983). p. 15. Note: David Donithen of ATAA stated on November 8, 1989 that all of the data used in the ATAA figures came from the U.S. Department of Transportation.
- [7] U.S. Bureau of the Census, 1982 Census of Transportation. (Washington, D.C.: U.S. Government Printing Office, 1985).
- [8] Moody's Transportation Manual. p. A26.

- [9] U.S. Department of Commerce. 1983 U.S. Industrial Outlook. p. 44-4.
- [10] U.S. Department of Commerce. 1984 U.S. Industrial Outlook. p. 45-5.
- [11] Trinc's Blue Book of the Trucking Industry. (McLean VA: Trinc Transportation Consultants, 1983). pp. s5, s7, and s8.
- [12] U.S. Bureau of the Census, Current Business Reports, 1985 Motor Freight Transportation and Warehousing Survey. (Washington, D.C.: U.S. Government Printing Office, 1986). p. 5.
- [13] Trinc's Blue Book of the Trucking Industry. pp. s5, s7, and s8.
- [14] U.S. Interstate Commerce Commission. Transport Statistics in the United States, Part 1: Railroads. (Washington, D.C.: U.S. Government Printing Office, 1983). p. 19. Note: The figure of \$1.643 was derived by subtracting out fuel (\$3.012 billion) and maintenance and repair parts (\$1.040 billion) from the total figure of \$5.694 billion for material, tools, supplies, fuel, and lubricants.
- [15] Trinc's Blue Book of the Trucking Industry. pp. s5, s7, and s8.
- [16] Air Transport, 1983. p. 11.
- [17] U.S. Interstate Commerce Commission. Transport Statistics in the United States, Part 1: Railroads. p. 18.
- [18] Trinc's Blue Book of the Trucking Industry. pp. s5, s7, and s8.
- [19] U.S. Department of Commerce. 1984 U.S. Industrial Outlook. p. 45-8.
- [20] Air Transport, 1983. p. 11.
- [21] U.S. Department of Commerce, Survey of Current Business. (Washington, D.C.: U.S. Government Printing Office, July, 1984). Tables 5.4 and 5.6.
- [22] U.S. Interstate Commerce Commission. Transport Statistics in the United States, Part 1: Railroads. p. 17.

- [23] U.S. Interstate Commerce Commission. Transport Statistics in the United States, Part 1: Railroads. pp. 8 and 9.
- [24] Trinc's Blue Book of the Trucking Industry. pp. s5, s7, and s8.
- [25] Air Transport, 1983. p. 11.
- [26] U.S. Department of Commerce, Survey of Current Business. (Washington, D.C.: U.S. Government Printing Office, June, 1983). p. 23.
- [27] U.S. Interstate Commerce Commission. Transport Statistics in the United States, Part 1: Railroads. p. 19.
- [28] Trinc's Blue Book of the Trucking Industry. pp. s5, s7, and s8.
- [29] Air Transport, 1983. p. 11.
- [30] U.S. Department of Commerce. Statistical Abstract of the United States. (Washington, D.C.: U.S. Government Printing Office, June, 1986), p. 611.
- [31] Trinc's Blue Book of the Trucking Industry. pp. s5, s7, and s8.
- [32] Air Transport, 1983. p. 15.
- [33] Moody's Transportation Manual. p. A25.
- [34] Trinc's Blue Book of the Trucking Industry. pp. s5, s7, and s8.
- [35] Air Transport, 1983. p. 11.

CHAPTER 9: COMMUNICATIONS (SIC 48)

INTRODUCTION

This chapter will present the magnitude of purchases in the communication industry (SIC 48). In addition, the relationship of communication purchases to revenues and other expenditures will be presented and analyzed. Tables 9-1 and 9-2 summarize the communication industry purchase activities by type of purchase and by relation to other expenditures.

THE COMMUNICATIONS INDUSTRY

Communications is made up of the following industries: telephone and telegraph, radio, and television (both broadcast and cable). The telephone industry dominated, accounting for 82 percent of the communications' \$94 billion in revenues. Broadcast television, with 1045 stations was next with 12 percent. Radio broadcasting, with 7978 AM and FM stations, had four percent of the revenues and cable television had two percent [1].

DATA SOURCES AND LIMITATIONS

In 1982 there was no government census of the communication industry. Therefore, other sources besides the Commerce Department data were used to construct the purchasing figures. These sources included: The Federal Communications Commission, The National Association of

Table 9-1: COMMUNICATION: TYPES OF PURCHASES (Millions \$) AND BY
PERCENT OF TOTAL PURCHASES

COMMUNICATION SIC Code: 48	TYPE OF PURCHASE				TOTAL PURCHASES
	Materials and Supplies	Energy	Resale Equipment	Buildings and Other Items	
TOTALS: (\$)	\$1,542	\$1,170	n/a	\$22,525	\$25,237
(%)	6.1%	4.6%	n/a	89.3%	100%

**Table 9-2: COMMUNICATION: REVENUES AND EXPENDITURES (Millions \$) AND AS
A PERCENT OF REVENUES, plus PURCHASE/WAGE AND SALARY RATIO**

COMMUNICATION SIC Code: 48	REVENUES	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
TOTALS: (\$)	\$77,100	\$25,237	\$24,776	\$27,087	1.0
(%)	100%	32.7%	32.1%	35.1%	

Regulatory Utility Commissioners, and The U.S. Independent Telephone Association.

There was negligible purchasing information for the radio and television industries. Purchasing information was not routinely collected in these industries. Consequently, this research was restricted to the telephone industry (which accounted for 82% of the communication revenues). The tables do not include all purchases. For example, the expenditures for, consultants, insurance, various services, and real estate transactions were not available.

PURCHASES

The amount spent on purchases was \$25 billion, which accounted for 33 percent of the total expenditures. The amount spent on purchases was larger than wages and salaries (\$24.7 billion), but smaller than the remaining other expenditures (\$27 billion).

Table 9-1 shows that purchases for Materials and Supplies were \$1.5 billion. This was a minor type of purchase making up six percent of total purchases [2]. Energy expenditures were estimated to be \$1.1 billion and made up five percent of the total purchases [3]. Resales figures were not available for the telephone industry were not available (n/a).

Purchases for Buildings and Equipment were \$22.5 billion and made up 89 percent of total purchases. This type of purchase included expenditures for the growth in new

customers and to increase the capacity of the existing network (\$12.8 billion). Expenditures for modernization projects, such as the conversion to electronic switches and the installation of improved digital carrier systems were \$5 billion. The remaining capital expenditures were for the replacement of old equipment and construction [4]. Figures for purchased services and Other Items were not available (n/a).

REVENUES AND EXPENDITURES

Table 9-2 presents purchases in relation to revenues, wages and salaries, and other payments. The \$25 billion spent on purchases made up 33 percent of the expenditures in the telephone and telegraph industry.

The Revenues from the sale of telephone service were \$77 billion in 1982 [5]. The total compensation for Wages and Salaries was 24.7 billion [6].

The expenditures for Other Payments represent all expenses not covered under purchases and wages and salaries. The following items would be representative of this category: taxes, depreciation, interest paid, dividends, insurance, and retained earnings. The other payment figures were derived by subtracting the sum of purchases and wages and salaries from revenues. Total other payments came to \$27 billion, which was 35 percent of the expenditures.

SUMMARY

Tables 9-2 shows that purchasing in the communication industry was minor, both in terms of its dollar magnitude (\$25 billion) and as a percent of expenditures (33%). Table 9-2 also shows that purchases slightly exceeded wages and salaries. The overall ratio, however, was one-to-one.

ENDNOTES

- [1] U.S. Department of Commerce. 1983 U.S. Industrial Outlook. (Washington, D.C.: U.S. Government Printing Office, 1983), pp. 45-2 and 46-3.
- [2] Beierlein, Geneva. 1982 Annual Report On Utility and Carrier Regulation of the National Association of Regulatory Utility Commissioners. (Washington DC: The National Association of Regulatory Utility Commissioners. 1983). p. 643. Note: Materials and supplies represent two percent of revenues.
- [3] U.S. Department of Commerce. Survey of Current Business. (Washington, D.C.: U.S. Government Printing Office, April, 1988), p. 37.
- [4] U.S. Department of Commerce. 1983 U.S. Industrial Outlook. p. 46-1.
- [5] U.S. Department of Commerce. 1983 U.S. Industrial Outlook. p. 46-3.
- [6] Hanson, Robert P. Moody's Public Utility Manual (New York: Moody's Investor Service, Inc., 1984). p. A61.

CHAPTER 10: UTILITIES (SIC 49)

INTRODUCTION

This chapter will present the magnitude of purchases in the electric (SIC 491) and natural gas (SIC 492) utility industries. In addition, the relationship of utility purchases to revenues and other expenditures will be presented and analyzed. Tables 10-1 and 10-2 summarize the utility industry purchases by type of purchase and by relation to other expenditures.

DATA SOURCES AND LIMITATIONS

In 1982 there was no government census of the utility industry. Therefore, other sources besides the Commerce Department data were used to construct the purchase figures. These sources included: The U.S. Department of Energy, the Internal Revenue Service, the National Association of Regulatory Utility Commissioners, the Edison Electric Institute, and the American Gas Association.

Data collection was complicated because utilities are both publicly and privately owned. In electric utilities, private companies made up 93 percent of the total revenues [1]. Also, many utility companies are both a natural gas company and an electric company. An effort was made to collect data separately. The utility industry (SIC 49) also includes water supply, sewage, and sanitation companies. There was, however, insufficient purchasing information on

Table 10-1: UTILITIES: TYPES OF PURCHASES (Millions \$) AND BY
PERCENT OF TOTAL PURCHASES

SIC Code	TYPE OF UTILITY	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Resale	Buildings and Equipment	Other Items	
491	Electric (\$)	\$9,684	\$41,311	n/a	\$48,005	n/a	\$99,000
	(%)	9.8%	41.7%	n/a	48.5%	n/a	100%
492	Natural Gas (\$)	1,390	n/a	89,624	13,868	n/a	104,882
	(%)	1.3%	n/a	85.5%	13.2%	n/a	100%
TOTALS:		\$11,074	\$41,311	\$89,624	\$61,873	n/a	\$203,882
	(%)	5.4%	20.3%	44.0%	30.3%	n/a	100%

Table 10-2: UTILITIES: REVENUES AND EXPENDITURES (Millions \$) AND AS
A PERCENT OF REVENUES, plus PURCHASE/WAGE AND SALARY RATIO

SIC Code	TYPE OF UTILITY	REVENUES	EXPENDITURES			P/W&S \$ RATIO
			Purchases	Wages & Salaries	Other Payments	
491	Electric (\$)	\$121,062	\$99,000	\$10,987	\$11,075	7.3
	(%)	100%	81.8%	9.1%	9.1%	
492	Natural Gas (\$)	115,875	104,882	5,963	5,030	16.9
	(%)	100%	90.5%	5.1%	4.3%	
TOTALS: (\$)		\$236,937	\$203,882	\$16,950	\$16,105	11.2
		100%	86.0%	7.2%	6.8%	

these companies to include them in this research.

The tables do not include all purchases. For example, the expenditures for, consultants, inventory storage, and insurance were not available.

PURCHASES

Purchases made up the largest expenditure in the utility industry. The amount spent on purchases was \$203 billion, which accounts for 86 percent of the total expenditures. The amount spent on purchases was over eleven times greater than the \$17 billion spent on wages and salaries.

Table 10-1 shows that purchases for Materials and Supplies were \$11 billion. This was a minor type of purchase making up about five percent of total purchases. Electric companies accounted for the majority (\$9.6 billion). Gas utilities had \$1.4 billion in material and supply purchases. [2].

Energy expenditures were \$41 billion and made up 20 percent of the total purchases. This figure only represents electric utilities. The types of energy were divided between: Coal (\$20.6 billion), Natural Gas (\$11.2 billion), Petroleum Products (\$7.7 billion), Nuclear (\$1.7 billion), and Wood and Waste (\$4 million) [3].

Energy purchases in the gas industry could have been placed in this category. Natural gas, however, is sold to customers in basically the same state that it is purchased

by the utility companies. Therefore, energy purchases in the natural gas utilities are discussed in the next section on resale purchases.

Resales among gas utilities were \$89.6 billion and represented 44 percent of the total purchases [4].

Purchases for Buildings and Equipment were \$62 billion and made up 30 percent of total purchases. This type of purchase included: (1) capital expenditures for structures and equipment, \$52 billion (\$40.2 billion for electric [5] and \$11.9 billion for gas [6]), (2) rental payments for structures, machinery and equipment, \$683 million (\$233 million for electric and \$450 million for gas) [7] and (3) purchased repair services for structures, machinery and equipment, \$9 billion (\$7.5 billion for electric [8] and \$1.5 billion for gas [9]). The purchasing figures for Other Items were not available (n/a). Other items consisted entirely of advertising for \$135 million (\$44 million for electric and \$ 91 million for gas) [10].

REVENUES AND EXPENDITURES

Table 10-2 presents purchases in relation to revenues, wages and salaries, and other payments. The \$202 billion spent on purchases made up the largest expenditure in the utility industry (86%).

Revenues from the sale of electric and gas service were \$237 billion in 1982. For electric companies, the total revenues were \$121 billion [10] and for natural gas

companies the total was \$116 billion [11].

Wages and Salaries in the utility industry totaled \$16 billion which represented seven percent of the expenditures. This total was composed of \$10.9 billion for electric companies [12] and \$5.9 billion for gas companies [13].

The expenditures for Other Payments represent all expenses not covered under purchases and wages and salaries. The following items would be representative of this category: taxes, depreciation, interest paid, dividends, insurance, and retained earnings. The other payment figures were derived by subtracting the sum of purchases and wages and salaries from revenues. Total other payments came to \$16.7 billion, which was seven percent of the expenditures.

SUMMARY

Tables 10-2 shows that purchasing in the utility industry was substantial, both in terms of its dollar magnitude (\$202 billion) and as a percent of expenditures (86%). Table 10-2 also shows that purchases exceeded wages and salaries by a ratio of eleven-to-one.

ENDNOTES

- [1] Hanson, Robert P. Moody's Public Utility Manual. (New York: Moody's Investor Service, Inc., 1984). p. A23-A24.
- [2] Beierlein, Geneva. 1982 Annual Report On Utility And Carrier Regulation of The National Association of Regulatory Utility Commissioners. (Washington DC: The National Association of Regulatory Utility

Commissioners. 1983). pp. 727 and 743. Note: In electric companies, materials and supplies represented eight percent of the revenues and in gas companies the figure was 1.2 percent.

- [3] U.S. Department of Energy. State Energy Price and Expenditure Report 1986. Energy Information Administration, Office of Energy Markets and End Use. (Washington, D.C.: U.S. Government Printing Office, 1986), p. 17.
- [4] Gas Facts, A Statistical Record for 1982 of the Gas Utility Industry. (American Gas Association, 1983), p. 151. Note: According to Carol Hopkins of the AGA, the total figures are based primarily on actual data which accounts for 92% of the gas utility sales in 1982. The remaining 8% was estimated to come up with the total figures.
- [5] Moody's Public Utility Manual. p. A26.
- [6] Gas Facts, A Statistical Record for 1982 of the Gas Utility Industry. p. 183.
- [7] U.S. Internal Revenue Service. 1982 Corporation Source Book of Statistics of Income. (Washington, D.C.: U.S. Government Printing Office, 1985), p. 373 and 374.
- [8] Statistical Yearbook of the Electric Utility Industry, 1982. (Edison Electric Institute, 1983), p. 80. Note: According to Barbara Brough, EEI surveyed 205 companies. There were 169 responses (an 82% response rate).
- [9] Gas Facts, A Statistical Record for 1982 of the Gas Utility Industry. p. 146.
- [10] U.S. Internal Revenue Service. 1982 Corporation Source Book of Statistics of Income. p. 373 and 374.
- [11] Statistical Yearbook of the Electric Utility Industry, 1982. p. 80.
- [12] Gas Facts, A Statistical Record for 1982 of the Gas Utility Industry. p. 146.
- [13] U.S. Department of Labor. Employment and Wages, Annual Averages 1982. (Washington, D.C.: U.S. Government Printing Office, 1984), p. 16.
- [14] Moody's Public Utility Manual. p. A58.

1

i

(

t

P

t

p

o

a

TI

er

wh

fa

DA

11-

ent

50:

bet

inf

This

CHAPTER 11: WHOLESALE TRADE (SIC 50-51)

INTRODUCTION

This chapter will present the magnitude of purchasing in wholesale trade for both durable (SIC 50) and nondurable (SIC 51) goods. In addition, the relationship of wholesale trade purchases to revenues and other expenditures will be presented and analyzed. Due to the size of wholesale trade, the durable and nondurable portions were broken out and presented separately in Tables 11-1 through 11-8. A summary of the entire wholesale trade is presented in Tables 11-9 and 11-10.

THE WHOLESALE TRADE INDUSTRY

Wholesale trade includes establishments primarily engaged in selling merchandise to: retailers, other wholesalers, and to industrial, commercial, institutional, farm, and professional businesses [1].

DATA SOURCES AND LIMITATIONS

All of the information presented in tables 11-1 through 11-10 came from the 1982 Census of Wholesale Trade. The entire wholesale trade industry is represented by only SIC 50: Durable Goods and SIC 51: Nondurable Goods. To provide a better picture of the purchases in wholesale trade, the information will be presented at the three digit SIC level. This is a departure from the format presented in the other

Table 11-1: WHOLESALE (Durable Goods): TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF WHOLESALE	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Resale	Buildings and Equipment	Other Items*	
DURABLE GOODS							
501	Motor Vehicles	\$358	\$321	\$71,739	\$1,788	\$1,325	\$75,531
502	Furniture	137	69	12,313	523	221	13,263
503	Building Material	130	156	25,164	789	243	26,482
504	Recreational	134	52	9,180	266	307	9,939
505	Metals & Minerals	179	226	41,661	1,280	621	43,967
506	Electrical	302	165	43,075	1,168	871	45,581
507	Hardware	198	124	21,282	882	342	22,828
508	Machinery	915	597	97,307	4,788	1,884	105,491
509	Miscellaneous	200	259	40,082	1,237	305	42,083
TOTALS: (\$)		\$2,735	\$2,012	\$361,803	\$12,720	\$7,456	\$386,726
(%)		0.7%	0.5%	93.6%	3.3%	1.9%	100%

* Contract work figures withheld for all industries except 505, total is correct

Table 11-2: WHOLESALE (Durable Goods): TYPE OF PURCHASES BY PERCENT OF TOTAL PURCHASES

TYPE OF		TYPE OF PURCHASE				
SIC Code	WHOLESALE	Materials and Supplies	Energy	Resale	Buildings and Equipme	Other Items
DURABLE GOODS						
501	Motor Vehicles	0.5%	0.4%	95.0%	2.4%	1.8%
502	Furniture	1.0%	0.5%	92.8%	3.9%	1.7%
503	Building Material	0.5%	0.6%	95.0%	3.0%	0.9%
504	Recreational	1.3%	0.5%	92.4%	2.7%	3.1%
505	Metals & Minerals	0.4%	0.5%	94.8%	2.9%	1.4%
506	Electrical	0.7%	0.4%	94.5%	2.6%	1.9%
507	Hardware	0.9%	0.5%	93.2%	3.9%	1.5%
508	Machinery	0.9%	0.6%	92.9%	4.6%	1.1%
509	Miscellaneous	0.5%	0.6%	95.2%	2.9%	0.7%
AVERAGE		0.7%	0.5%	93.6%	3.3%	1.9%

Table 11-3: WHOLESALE (Nondurable Goods): TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF WHOLESALE	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Resale	Buildings and Equipment	Other Items*	
NONDURABLE GOODS							
511	Paper Products	64	86	20,366	596	344	21,456
512	Drugs	89	36	15,060	380	171	15,736
513	Apparel	150	82	20,786	565	498	22,081
514	Groceries	1400	743	151,642	3,246	1,028	158,059
515	Farm Products	187	360	115,954	1,528	281	118,310
516	Chemicals	58	148	13,861	749	226	15,042
517	Petroleum	145	190	156,464	2,199	342	159,340
518	Alcoholic Beverages	107	100	27,478	1,052	511	29,248
519	Miscellaneous	189	306	69,556	1,764	726	72,541
TOTALS: (\$)		\$2,799	\$2,051	\$591,167	\$12,079	\$4,159	\$612,255
(\$)		0.5%	0.3%	96.6%	2.0%	0.7%	100%

* Contract work figures for individual industries withheld, total is correct.

Table 11-4: WHOLESALE (Nondurable Goods): TYPE OF PURCHASES BY PERCENT
OF TOTAL PURCHASES

SIC Code	TYPE OF WHOLESALE	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Resale Equipment	Buildings and	Other Items
NONDURABLE GOODS						
511	Paper Products	0.3%	0.4%	94.9%	2.8%	1.6%
512	Drugs	0.6%	0.2%	95.7%	2.4%	1.1%
513	Apparel	0.7%	0.4%	94.1%	2.6%	2.3%
514	Groceries	0.9%	0.5%	95.9%	2.1%	0.7%
515	Farm Products	0.2%	0.3%	98.0%	1.3%	0.2%
516	Chemicals	0.4%	1.0%	92.1%	5.0%	1.5%
517	Petroleum	0.1%	0.1%	98.2%	1.4%	0.2%
518	Alcoholic Beverages	0.4%	0.3%	93.9%	3.6%	1.7%
519	Miscellaneous	0.3%	0.4%	95.9%	2.4%	1.0%
AVERAGE		0.5%	0.3%	96.6%	2.0%	0.7%

Table 11-5: WHOLESALE (Durable Goods): REVENUES
AND EXPENDITURES (Millions \$)

SIC Code	TYPE OF WHOLESALE	REVENUES	EXPENDITURES			
			Purchases	Salaries	Wages &	Other
						Payments
DURABLE GOODS						
501	Motor Vehicles	\$91,394	\$75,531	\$7,954		\$7,909
502	Furniture	17,663	13,263	2,231		2,169
503	Building Material	33,118	26,482	3,579		3,057
504	Recreational	13,653	9,939	1,414		2,300
505	Metals & Minerals	52,489	43,967	3,940		4,582
506	Electrical	55,837	45,581	5,584		4,672
507	Hardware	29,255	22,828	4,255		2,172
508	Machinery	140,896	105,491	20,427		14,978
509	Miscellaneous	45,994	42,083	3,305		606
TOTALS: (\$)			\$386,366	\$52,700		\$41,233
(\$)			80.4%	11.0%		8.6%

**Table 11-6: WHOLESALE (Durable Goods): EXPENDITURES AS A PERCENT
OF REVENUES, plus PURCHASE/WAGE AND SALARY RATIO**

SIC Code	TYPE OF WHOLESALE	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
DURABLE GOODS					
501	Motor Vehicles	82.6%	8.7%	8.7%	9.5
502	Furniture	75.1%	12.6%	12.3%	5.9
503	Building Material	80.0%	10.8%	9.2%	7.4
504	Recreational	72.8%	10.4%	16.8%	7.0
505	Metals & Minerals	83.8%	7.5%	8.7%	11.2
506	Electrical	81.6%	10.0%	8.4%	8.2
507	Hardware	78.0%	14.5%	7.4%	5.4
508	Machinery	74.9%	14.5%	10.6%	5.2
509	Miscellaneous	91.5%	7.2%	1.3%	12.7
AVERAGE		80.4%	11.0%	8.6%	7.3

Table 11-7: WHOLESALE (Nondurable Goods): REVENUES AND EXPENDITURES (Millions \$)

SIC Code	TYPE OF WHOLESALE	REVENUES	EXPENDITURES			
			Purchases	Salaries	Wages & Other	Payments
NONDURABLE GOODS						
511	Paper Products	\$25,937	\$21,456	\$3,371	\$1,110	
512	Drugs	18,636	15,736	1,574	1,326	
513	Apparel	29,845	22,081	3,014	4,750	
514	Groceries	174,687	158,059	11,101	5,527	
515	Farm Products	121,932	118,310	2,463	1,159	
516	Chemicals	19,462	15,042	2,149	2,271	
517	Petroleum	167,069	159,340	3,087	4,642	
518	Alcoholic Beverages	36,456	29,248	3,584	3,624	
519	Miscellaneous	88,492	72,541	5,841	10,110	
TOTALS: (\$)		\$682,515	\$612,255	\$36,173	\$34,087	
(\$)		100%	89.7%	5.3%	5.0%	

**Table 11-8: WHOLESALE (Nondurable Goods): EXPENDITURES AS A PERCENT
OF REVENUES, plus PURCHASE/WAGE AND SALARY RATIO**

SIC Code	TYPE OF WHOLESALE	EXPENDITURES				P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments		
NONDURABLE GOODS						
511	Paper Products	82.7%	13.0%	4.3%	6.4	
512	Drugs	84.4%	8.4%	7.1%	10.0	
513	Apparel	74.0%	10.1%	15.9%	7.3	
514	Groceries	90.5%	6.4%	3.2%	14.2	
515	Farm Products	97.0%	2.0%	1.0%	48.0	
516	Chemicals	77.3%	11.0%	11.7%	7.0	
517	Petroleum	95.4%	1.8%	2.8%	51.6	
518	Alcoholic Beverages	80.2%	9.8%	9.9%	8.2	
519	Miscellaneous	82.0%	6.6%	11.4%	12.4	
AVERAGE		89.7%	5.3%	5.0%	16.9	

Table 11-9: WHOLESALE: TYPES OF PURCHASES (Millions \$) AND BY
PERCENT OF TOTAL PURCHASES

SIC Code	TYPE OF WHOLESALE	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Resale	Buildings and Equipment	Other Items	
50	Durable Goods (\$)	2,735	2,012	361,803	12,720	7,456	386,726
	(%)	0.7%	0.5%	93.6%	3.3%	1.9%	100%
51	Nondurable Goods (\$)	2,799	2,051	591,167	12,079	4,159	612,255
	(%)	0.5%	0.3%	96.6%	2.0%	0.7%	100%
TOTALS:		\$5,534	\$4,063	\$952,970	\$24,799	\$11,615	\$998,981
	(%)	0.6%	0.4%	95.4%	2.5%	1.2%	100%

Table 11-10: WHOLESALE: REVENUES AND EXPENDITURES (Millions \$) AND AS A PERCENT OF REVENUES, plus PURCHASE/WAGE AND SALARY RATIO

SIC Code	TYPE OF WHOLESALE	REVENUES	EXPENDITURES			P/W&S \$ RATIO
			Purchases	Wages & Salaries	Other Payments	
50	Durable Goods (\$)	\$480,299	\$386,726	\$52,700	\$40,873	7.3
	(%)	100%	80.5%	11.0%	8.5%	
51	Nondurable Goods (\$)	682,515	612,255	36,173	34,087	16.9
	(%)	100%	89.7%	5.3%	5.0%	
WHOLESALE TOTALS (\$)		\$1,162,814	\$998,981	\$88,873	\$74,960	11.2
	(%)	100%	85.9%	7.6%	6.4%	

industries.

The tables do not include all purchases. For example, the expenditures for, consultants, inventory storage, and insurance were not broken out from the other operating expenses. Finally, real estate transactions for land were not collected in the census [2].

PURCHASES

Purchases made up the largest expenditure in the wholesale trade. The amount spent on purchases was nearly one trillion dollars, which accounted for 86% of the total expenditures. The amount spent on purchases was over eleven times greater than the \$89 billion spent on wages and salaries.

The summary Table 11-9 shows that purchases for Materials and Supplies were \$5.5 billion. This was a minor type of purchase in the wholesale trade industry (less than 1%). This category included the cost of materials and office supplies. Materials included, containers, wrapping, packing, and selling supplies used in packaging, processing, shipping, and selling of goods. Many firms in the survey were unable to provide this figure. In some of the firms, however, the cost of materials were included under resale purchases [3]. Material costs were \$3.1 billion and office supplies were \$2.4 billion.

Energy, at \$4.1 billion, also accounted for less than 1 percent total purchases. The energy figures in Tables 11-9

and 11-10 represent payments for purchased fuels (\$1.7 billion) and electricity (\$2.4 billion) [4].

Resales were the most significant type of purchase. The \$953 billion for resales represented 95 percent of the total purchases in wholesale trade [5]. Resale purchases represent the total cost to a firm for goods after deductions for returns, allowances, and discounts. The resale figures included the cost of freight, delivery, and other transportation costs and import duties [6].

Purchases for Buildings and Equipment were \$25 billion and made up 25 percent of total purchases. This type of purchase included: (1) capital expenditures (\$13.7 billion) for new and used: structures, machinery and equipment (chargeable to depreciable asset accounts) [7], (2) rental payments for structures, machinery and equipment (\$7.6 billion) and (3) purchased repair services for structures, machinery and equipment (\$3.5 billion). The purchasing of Other Items accounted for just over one percent of the total purchases. Other items consists of: (1) work subcontracted to others (\$3.2 billion), (2) communication services: telephones, telex, data transmission, and photo transmission (\$3.6 billion), and (3) purchased advertising services (\$4.8 billion) [8].

In many cases the subcontract work figures were withheld by the census. When this occurred, the wholesale industry average was used to estimate the missing data. For wholesalers of durable goods, subcontract work represented

1.7% of the total operating expenses, and for nondurable goods the figure was two percent.

REVENUES AND EXPENDITURES

Table 11-10 presents purchases in relation to revenues, wages and salaries, and other payments. The \$999 billion spent on purchases made up the largest expenditure in the wholesale trade industry (86%).

The Revenues were \$1,163 billion in 1982 [9] and represented receipts from the sale of merchandise. This figure was net after deductions and refunds [10].

Wages and Salaries included all wages, salaries, commissions, bonuses and allowances for hourly, supervisory and executive personnel (\$75.7 billion). The costs for fringe benefits and mandatory requirements (\$13.2 billion) such as Social Security were also included. Total wages and salaries were \$89 billion [11]. This represented eight percent of the total expenditures.

The expenditures for Other Payments represented all expenses not covered under purchases and wages and salaries. The following items would be representative of this category: taxes, depreciation, interest paid, dividends, insurance, and retained earnings. The other payment figures were derived by subtracting the sum of purchases and wages and salaries from revenues. Total other payments came to \$75 billion which was 6.4 percent of the expenditures.

SUMMARY

Table 11-10 shows that purchasing in the wholesale trade industry was significant both in terms of its dollar magnitude (nearly one trillion dollars and as a percent of expenditures (86%). Table 11-10 also shows that purchases exceeded wages and salaries by a ratio of eleven-to-one.

ENDNOTES

- [1] U.S Bureau of the Census, 1982 Census of Wholesale Trade. Industry Series (WC82-I-2): Measures of Value Produced Capital Expenditures, Depreciable Assets, and Operating Expenses (Washington, D.C.: U.S. Government Printing Office, 1985), Appendix A, p. A-5.
- [2] 1982 Census of Wholesale Trade. Industry Series. Appendix A, p. A-4 & 5.
- [3] 1982 Census of Wholesale Trade. Industry Series. Appendix A, p. A-4..
- [4] 1982 Census of Wholesale Trade. Industry Series. p. 2-6.
- [5] 1982 Census of Wholesale Trade. Industry Series. p. 2-4.
- [6] 1982 Census of Wholesale Trade. Industry Series. Appendix A, p. A-3.
- [7] 1982 Census of Wholesale Trade. Industry Series. p. 2-4.
- [8] 1982 Census of Wholesale Trade. Industry Series. p. 2-6.
- [9] 1982 Census of Wholesale Trade. Industry Series. p. 2-4.
- [10] 1982 Census of Wholesale Trade. Industry Series. Appendix A, p. A-3.
- [11] 1982 Census of Wholesale Trade. Industry Series. p. 2-5.

CHAPTER 12: RETAIL TRADE (SIC 52-59)

INTRODUCTION

This chapter will present the magnitude of purchasing in retail trade for both durable and nondurable goods. In addition, the relationship of retail trade purchases to revenues and other expenditures will be presented and analyzed. The entire retail trade is presented in Tables 12-1 through 12-4. The durable and nondurable totals are summarized in Tables 12-5 and 12-6.

THE RETAIL TRADE INDUSTRY

Retail trade includes establishments primarily selling merchandise for personal or household consumption. This is in contrast to wholesale trade where establishments sell to business, institutional, industrial, or contractors.

Retail trade is broadly divided into durable and nondurable goods. The durable good retailers include:

1. Building, hardware, and garden supplies (SIC 52),
2. Auto, boat, trailer, and motorcycle dealers (SIC 55),
3. Furniture and home furnishing stores (SIC 57), and
4. Some miscellaneous retail categories (SIC 59).

The nondurable good retailers include:

1. General merchandise stores (SIC 53),
2. Food stores (SIC 54),
3. Automotive gasoline service stations (SIC 554),
4. Apparel and accessory stores (SIC 56),

Table 12-1: RETAIL: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF RETAIL	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Resale	Buildings and Equipment	Other Items	
52	Building Materials	\$289	\$444	\$36,455	\$1,933	\$1,101	\$40,222
53	Merchandise Stores	1,187	1,416	79,225	6,362	4,132	92,322
54	Food Stores	1,983	3,503	182,592	9,142	2,617	199,837
55	Automotive	885	1,346	232,364	4,802	2,780	242,177
56	Apparel Stores	627	692	34,230	4,561	1,628	41,738
57	Furniture Stores	336	494	28,357	2,459	2,015	33,661
58	Eating & Drinking	1,701	3,481	41,173	11,312	2,562	60,229
59	Misc. Retail	304	557	38,301	2,148	774	42,084
TOTALS: (\$)		\$8,585	\$12,773	\$720,356	\$48,950	\$20,427	\$811,091
(\$)		1.1%	1.6%	88.8%	6.0%	2.5%	100.0%

Table 12-2: RETAIL: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES

SIC Code	TYPE OF RETAIL	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Resale Equipment	Buildings and Other Items	
52	Building Materials	0.7%	1.1%	90.6%	4.8%	2.7%
53	Merchandise Stores	1.3%	1.5%	85.8%	6.9%	4.5%
54	Food Stores	1.0%	1.8%	91.4%	4.6%	1.3%
55	Automotive	0.4%	0.6%	95.9%	2.0%	1.1%
56	Apparel Stores	1.5%	1.7%	82.0%	10.9%	3.9%
57	Furniture Stores	1.0%	1.5%	84.2%	7.3%	6.0%
58	Eating & Drinking	2.8%	5.8%	68.4%	18.8%	4.3%
59	Misc. Retail	0.7%	1.3%	91.0%	5.1%	1.8%
RETAIL AVERAGE		1.1%	1.6%	88.8%	6.0%	2.5%

Table 12-3: RETAIL: REVENUES AND EXPENDITURES (Millions \$)

SIC Code	TYPE OF RETAIL	REVENUES	EXPENDITURES			
			Purchases	Wages & Salaries	Other Payments	
52	Building Materials	\$49,939	\$40,222	\$7,903	\$1,814	
53	Merchandise Stores	119,947	92,322	22,743	4,882	
54	Food Stores	240,520	199,837	32,433	8,250	
55	Automotive	285,471	242,177	24,545	18,749	
56	Apparel Stores	56,869	41,738	10,425	4,706	
57	Furniture Stores	45,314	33,661	7,649	4,004	
58	Eating & Drinking	101,723	60,229	29,748	11,746	
59	Misc. Retail	53,582	42,084	7,363	4,135	
TOTALS: (\$)		\$1,039,029	\$811,091	\$157,250	\$70,688	
(\$)		100%	78.1%	15.1%	6.8%	

Table 12-4: RETAIL: EXPENDITURES AS A PERCENT OF REVENUES,
plus PURCHASE/WAGE AND SALARY RATIO

SIC Code	TYPE OF RETAIL	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
52	Building Materials	80.5%	15.8%	3.6%	5.1
53	Merchandise Stores	77.0%	19.0%	4.1%	4.1
54	Food Stores	83.1%	13.5%	3.4%	6.2
55	Automotive	84.8%	8.6%	6.6%	9.9
56	Apparel Stores	73.4%	18.3%	8.3%	4.0
57	Furniture Stores	74.3%	16.9%	8.8%	4.4
58	Eating & Drinking	59.2%	29.2%	11.5%	2.0
59	Misc. Retail	78.5%	13.7%	7.7%	5.7
RETAIL AVERAGE		78.1%	15.1%	6.8%	5.2

Table 12-5: RETAIL: TYPES OF PURCHASES (Millions \$) AND BY PERCENT OF
OF TOTAL PURCHASES

TYPE OF RETAIL TRADE	TYPE OF PURCHASE					TOTAL PURCHASES
	Materials and Supplies	Energy	Resale	Buildings and Equipment	Other Items	
Durable Goods (\$)	\$1,660	\$2,245	\$238,268	\$10,956	\$6,977	\$260,106
(%)	0.6%	0.9%	91.6%	4.2%	2.7%	100%
Nondurable Goods (\$)	6,925	10,528	482,088	37,994	13,450	550,985
(%)	1.3%	1.9%	87.5%	6.9%	2.4%	100%
TOTALS: (\$)	\$8,585	\$12,773	\$720,356	\$48,950	\$20,427	\$811,091
(%)	1.1%	1.6%	88.8%	6.0%	2.5%	100%

Table 12-6: RETAIL: REVENUES AND EXPENDITURES (Millions \$) AND AS A PERCENT OF REVENUES, plus PURCHASE/WAGE AND SALARY RATIO

TYPE OF RETAIL TRADE	REVENUES	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
Durable Goods (\$)	\$326,214	\$260,106	\$42,153	\$23,955	6.2
(%)	100%	79.7%	12.9%	7.3%	
Nondurable Goods (\$)	712,815	550,985	115,097	46,733	4.8
(%)	100%	77.3%	16.1%	6.6%	
RETAIL TOTALS: (\$)	\$1,039,029	\$811,091	\$157,250	\$70,688	5.2
(%)	100%	78.1%	15.1%	6.8%	

5. Eating and drinking establishments (SIC 58),
6. Some miscellaneous retail categories (SIC 59) [1].

DATA SOURCES AND LIMITATIONS

All of the information presented in tables 12-1 through 12-6 came from the 1982 Census of Retail Trade. Many firms sold merchandise that fell in two or more SIC classifications. When this occurred, the census classified a firm based on the individual or commodity group that was the primary source of the firm's revenue. For example, all products sold at a food store would be classified under SIC 54, even though some of the products are non-food items.

The tables do not include all purchases. For example, the expenditures for: consultants, inventory storage, and insurance were not broken out from the other operating expenses. Also, real estate transactions for land were not collected in the census [2].

The total figures in tables 12-1 through 12-4 are larger than the summation on the individual industries. This occurs because the only information under miscellaneous retail industries (SIC 59) is drug stores (SIC 5912) and liquor stores (SIC 5921). The total figures, however, include all of SIC 59.

In two other cases, information was withheld by the census. When this occurred, the retail industry average was used to estimate the missing data. In Building Materials (SIC 52), there was no resale figure. This was estimated to

be \$36.5 billion based on the durable goods average as a percent of sales (73%). The same procedure was used to estimate the capital expenditures in service stations (SIC 554). On average, capital expenditures were 2.5% of sales. Using this figure for service stations, capital expenditures were estimated to be \$2.3 billion.

The tables also do not include the retail purchases of military exchanges and commissaries. Although these retail activities occur on federal property, federal funds were not used for the purchase of goods for resale. The total retail sales for all services was \$9.1 billion [3]. This equates to \$6.4 billion in resale purchases based on the retail industry average.

PURCHASES

Purchases made up the largest expenditure in retail trade. The amount spent on purchases was \$811 billion, which accounted for 78 percent of the total expenditures.

The amount spent on purchases was over five times greater than the \$157 billion spent on wages and salaries.

Table 12-1 shows that purchases for Materials and Supplies were \$8.6 billion. This was a minor type of purchase in retail trade (1%). This category included the cost of materials (\$4.9 billion) and office supplies (\$3.7 billion) [4]. Materials included, containers, wrapping, packing, and selling supplies used in processing, shipping and selling goods. This figure is understated. Due to record

keeping policies, many firms included material and supply purchases within resale purchases [5].

Energy, at \$12.7 billion, accounted for just over one percent of the total purchases. The energy figures in tables 12-1 and 12-2 represent payments for purchased fuels (\$2.4 billion) and electricity (\$10.3 billion) [6].

Resales made up the majority of purchases. The \$720 billion for resales represented 89 percent of the total purchases in retail trade [7]. Resale purchases represent the total cost to a firm for goods after deductions for returns, allowances, and discounts. The resale figures include the cost of freight, delivery, other transportation costs and import duties [8].

Purchases for Buildings and Equipment were \$49 billion and made up six percent of the total purchases. This type of purchase included: (1) capital expenditures (\$22 billion) for new and used: structures, machinery and equipment [9], (2) rental payments for structures, machinery and equipment (\$21 billion) and (3) purchased repair services for structures, machinery and equipment (\$6 billion). The purchasing of Other Items was \$20 billion and accounted for over two percent of the purchases. Other items consisted of: (1) communication services: telephones, telex, data transmission, and photo transmission (\$3 billion), and (2) purchased advertising services (\$17 billion) [10].

REVENUES AND EXPENDITURES

Table 12-3 presents purchases in relation to revenues, wages and salaries, and other payments. The \$811 billion spent on purchases made up the largest expenditure in the retail trade industry (78%).

The Revenues were \$1,039 billion in 1982 and represent receipts for the sale of merchandise [11]. This figure is net after deductions and refunds. Revenues also include receipts from: (1) the rental or leasing of vehicles, equipment and tools, (2) delivery, installation, maintenance, repair and other services, and (3) taxes that were passed on from manufacturers and wholesalers. It does not, however, include sales and excise taxes collected from customers and paid directly to local, state, and federal governments [12].

Total Wages and Salaries were \$157 billion and represents 15 percent of the total expenditures. This includes all wages, salaries, commissions, bonuses and allowances for hourly, supervisory and executive personnel (\$136 billion) and the costs for fringe benefits and mandatory requirements (\$21 billion), such as Social Security [13].

The expenditures for Other Payments represent all expenses not covered under purchases and wages and salaries. The following items would be representative of this category: taxes, depreciation, interest paid, dividends, insurance, and retained earnings. The other payment figures

were derived by subtracting the sum of purchases and wages and salaries from revenues. Total other payments came to \$71 billion, which was 6.8 percent of the expenditures.

SUMMARY

Tables 12-3 shows that purchasing in the retail trade industry (\$811 billion) was the most significant expenditure (78%). Purchases exceeded wages and salaries by a ratio of greater than five-to-one.

ENDNOTES

- [1] U.S Bureau of the Census, 1982 Census of Retail Trade. Industry Series (RC82-I-2): Measures of Value Produced Capital Expenditures, Depreciable Assets, and Operating Expenses. (Washington, D.C.: U.S. Government Printing Office, 1985). Appendix A, p. A-5 through A-11.
- [2] 1982 Census of Retail Trade. Industry Series. Appendix A, p. A-5.
- [3] 1983-84 Worldwide Directory. (Washington, D.C.: American Logistics Association, 1984). pp. 141-213.
- [4] 1982 Census of Retail Trade. Industry Series. p. 2-4.
- [5] 1982 Census of Retail Trade. Industry Series. Appendix A, p. A-4.
- [6] 1982 Census of Retail Trade. Industry Series. p. 2-6.
- [7] 1982 Census of Retail Trade. Industry Series. p. 2-4.
- [8] 1982 Census of Retail Trade. Industry Series. Appendix A, p. A-3.
- [9] 1982 Census of Retail Trade. Industry Series. p. 2-4.
- [10] 1982 Census of Retail Trade. Industry Series. p. 2-6.
- [11] 1982 Census of Retail Trade. Industry Series. p. 2-4.

- [12] 1982 Census of Retail Trade. Industry Series. Appendix A, p. A-3.
- [13] 1982 Census of Retail Trade. Industry Series. p. 2-5.

CHAPTER 13: SERVICE INDUSTRIES (SIC 70-81)

INTRODUCTION

This chapter will present the magnitude of purchasing in selected service industries. In addition, the relationship of service purchases to revenues and other expenditures will be presented and analyzed. A summary of service industry is presented in Tables 13-1 through 13-4.

THE SERVICE INDUSTRY

The service sector consisted primarily of those industries that had intangible outputs [1]. Although retail and wholesale functions may have taken place, the majority of the receipts fell within the definition of services in the Standard Industrial Classification (SIC) Manual [2].

The major services were: 1. Hotels and Other Lodging (SIC 70), 2. Personal Services (SIC 72), such as laundries, photographic studios, beauty and barber shops, shoe repair, and funeral services, 3. Business Services (SIC 73), such as advertising, building maintenance, temporary help services, and computer and data processing, 4. Auto Services (SIC 75) which includes: vehicle rentals and repair, 5. Miscellaneous Repair (SIC 76), 6. Motion Pictures (SIC 78) 7. Recreation (SIC 79) which includes amusement parks, bowling, commercial sports, and golf courses, 8. Health Services (SIC 80), and 9. Legal Services (SIC 81).

Table 13-1: SERVICE: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF SERVICE	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Resale Equipment	Buildings and Other Items		
70	Hotels, Motels	\$1,482	\$1,788	\$2,829	\$7,531	\$1,330	\$14,960
72	Personal Services	224	884	n/a	2,904	775	4,787
73	Business Services	1,682	964	n/a	14,480	3,757	20,883
75	Auto Services	165	512	n/a	6,985	604	8,266
76	Misc Repair	102	203	n/a	1,122	302	1,729
78	Motion Pictures	90	138	245	1,096	1,077	2,646
79	Recreation	1,364	739	1,135	4,087	821	8,146
80	Hospitals	13,632	2,525	2,884	8,644	9,956	37,641
81	Legal Services	780	130	n/a	3,598	677	5,185
TOTALS: (\$)		\$19,521	\$7,883	\$7,093	\$50,447	\$19,299	\$104,243
(\$)		18.7%	7.6%	6.8%	48.4%	18.5%	100%

Table 13-2: SERVICE: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES

SIC Code	TYPE OF SERVICE	TYPE OF PURCHASE				
		Materials and Supplies	Energy	Resale	Buildings and Equipment	Other Items
70	Hotels, Motels	9.9%	12.0%	18.9%	50.3%	8.9%
72	Personal Services	4.7%	18.5%	n/a	60.7%	16.2%
73	Business Services	8.1%	4.6%	n/a	69.3%	18.0%
75	Auto Services	2.0%	6.2%	n/a	84.5%	7.3%
76	Misc Repair	5.9%	11.7%	n/a	64.9%	17.5%
78	Motion Pictures	3.4%	5.2%	9.3%	41.4%	40.7%
79	Recreation	16.7%	9.1%	13.9%	50.2%	10.1%
80	Hospitals	36.2%	6.7%	7.7%	23.0%	26.4%
81	Legal Services	15.0%	2.5%	n/a	69.4%	13.1%
SERVICE AVERAGE		18.7%	7.6%	6.8%	48.4%	18.5%

Table 13-3: SERVICE: REVENUES AND EXPENDITURES (Millions \$)

SIC Code	TYPE OF SERVICE	REVENUES	EXPENDITURES		
			Purchases	Wages & Salaries	Other Payments
70	Hotels, Motels	\$33,221	\$14,960	\$11,280	\$6,981
72	Personal Services	22,980	4,787	8,817	9,376
73	Business Services	109,470	20,883	54,805	33,782
75	Auto Services	30,695	8,266	7,892	14,537
76	Misc Repair	14,133	1,729	5,077	7,327
78	Motion Pictures	13,693	2,646	3,093	7,954
79	Recreation	23,719	8,146	8,607	6,966
80	Hospitals	134,900	37,641	52,448	44,811
81	Legal Services	34,768	5,185	14,488	15,095
TOTALS: (\$)		\$417,579	\$104,243	\$166,507	\$146,829
(%)		100%	25.0%	39.9%	35.2%

Table 13-4: SERVICE: EXPENDITURES AS A PERCENT OF REVENUES,
plus PURCHASE/WAGE AND SALARY RATIO

SIC Code	TYPE OF SERVICE	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
70	Hotels, Motels	45.0%	34.0%	21.0%	1.3
72	Personal Services	20.8%	38.4%	40.8%	0.5
73	Business Services	19.1%	50.1%	30.9%	0.4
75	Auto Services	26.9%	25.7%	47.4%	1.0
76	Misc Repair	12.2%	35.9%	51.8%	0.3
78	Motion Pictures	19.3%	22.6%	58.1%	0.9
79	Recreation	34.3%	36.3%	29.4%	0.9
80	Hospitals	27.9%	38.9%	33.2%	0.7
81	Legal Services	14.9%	41.7%	43.4%	0.4
SERVICE AVERAGE		25.0%	39.9%	35.2%	0.6

DATA SOURCES AND LIMITATIONS

The majority of the information in tables 13-1 through 13-4 came from the 1982 Census of Service Industries. When compared to the census of wholesale and retail, the census of services had several major drawbacks from a purchasing perspective. Two important questions were not asked in the census: 1. How much was spent for materials and supplies used in the operation of your business?, and 2. How much was spent on resale purchases?

This omission of these two types of purchasing information was significant in the lodging, recreation, auto repair, and health care industries. Consequently, other sources were sought to supplement the missing data. In the lodging industry, Trends in the Hotel Industry was consulted [3] and for health care, publications of the U.S. Department of Health and Human Services were used.

There were other purchasing expenses that were not broken out in the census. These included expenditures for consultants, inventory storage, and insurance. Finally, real estate transactions for land were not collected in the census [4].

The census did not include all services. Information was not collected for the following: educational services (SIC 82), social services (SIC 83), museums, zoos, and botanical gardens (SIC 84), and membership organizations (SIC 86).

Hospital purchasing information came from the

Department of Health and Human Services. The census did not collect information on hospitals, which made up approximately 50 percent of the health care industry (SIC 80) [5]. The census did collect information on the remaining industries that fell under health care. Due to the unavailability of information on materials and supplies, the health service portion of the census was not used. Therefore, the tables only contain hospital purchase information. This was obtained from the Department of Health and Human Services. In 1982 there were 6,988 hospitals which employed more than four million people [6].

PURCHASES

The amount spent on purchases was \$104 billion, which accounted for 25 percent of the total expenditures. This was smaller than wages and salaries and other payments.

Tables 13-1 and 13-2 shows that purchases for Materials and Supplies were \$19 billion. This was second largest type of purchase in the service trade industry (19%). For all service groups, except hotels and hospitals, this category included only the cost of office supplies, stationery, and postage. The total for these services was \$4.4 billion [7].

In hotels and other lodging, this category included operating supplies, tableware and linen, and maintenance supplies. This totaled \$1.5 billion [8]. In hospitals, materials and supplies consisted of pharmaceuticals, chemicals, cleaning products, surgical and medical

instruments, photographic supplies, rubber and plastics, paper products, apparel, and miscellaneous products.

Hospital purchases for materials and supplies was estimated to be \$13.6 billion [9]. Energy, at \$7.8 billion, accounted for over seven percent of the total purchases. The energy figures in tables 13-1 and 13-2 represent payments for purchased fuels (\$3.3 billion) and electricity (\$4.5 billion) [10].

Resales figures were not collected in the census. This was also a major oversight. The purchase of food, beverages, and merchandise for resale is a major expense in several service industries. Consequently, some of this information was obtained from alternative sources. The food and beverage resale purchases were estimated for the following services: hotel and motel restaurants, \$2.8 billion, recreation, \$1.1 billion, and hospitals \$3.4 billion [11]. In the motion picture industry, resales were \$245 million [12].

Merchandise resale figures were not available for any of the service industries (examples: hotel gift shops, amusement parks, golf "pro" shops, and hospital pharmacies).

Purchases for Buildings and Equipment were \$51 billion and made up almost half (48%) of the total purchases. This type of purchase included: (1) capital expenditures (\$33.9 billion) for new and used: structures, machinery and equipment [13], (2) rental payments for structures, machinery and equipment (\$12.6 billion) and (3) purchased repair services for structures, machinery and equipment

(\$4.5 Billion) [14]. The purchasing of Other Items accounted for over 18 percent of the total purchases. Other items (for all services except hospitals) consisted of: (1) purchased advertising services (\$4.8 billion), and (2) communication services: telephones, telex, data transmission, and photo transmission (\$4.5 billion) [15].

In hospitals, other items included: professional fees (\$607 million), water and sewage (\$24 million), malpractice insurance (\$527 million), contract food (\$1.8 billion), and other services (\$6.9 billion) [9].

REVENUES AND EXPENDITURES

Table 13-3 presents purchases in relation to revenues, wages and salaries, and other payments. The \$104 billion spent on purchases made up 25 percent of the expenditures in the service industry.

The service industry Revenues were \$418 billion. It represents receipts for services rendered and for the sale of merchandise. This figure is net after deductions and allowances [16]. In hospitals the revenues were \$135 billion [17].

Wages and Salaries includes all wages, salaries, commissions, bonuses and allowances for hourly, supervisory and executive personnel (\$167 billion). This figure includes the employer costs for fringe benefits and mandatory requirements (\$24 billion) [18]. For hospitals the figure was \$52 billion [9]. Wages and salaries for all services

represented 40 percent of the expenditures.

The expenditures for Other Payments represent all expenses not covered under purchases and wages and salaries. Unfortunately, this category also includes an undetermined amount of purchases (materials and resale). The following items would normally be representative of this category: taxes, depreciation, interest paid, dividends, insurance, and retained earnings. The other payment figures were derived by subtracting the sum of purchases and wages and salaries from revenues. Total other payments came to \$147 billion which was 35 percent of the expenditures.

SUMMARY

Tables 13-3 and 13-4 show that purchasing in the service industries was the smallest of the three expenditure categories. Since two major purchasing categories were not collected in the census, the purchasing figures were understated. For the same reason, the other payments category is overstated. The wages and salaries category, however, is correct. It is important to note that in the service sector, which is one of the more labor intensive industries, wages and salaries do not account for the majority of the expenses (40%).

ENDNOTES

- [1] U.S. Department of Commerce. 1983 U.S. Industrial Outlook. (Washington, D.C.: U.S. Government Printing Office, 1983), p. 52-1.

- [2] U.S. Bureau of the Census, 1982 Census of Service Industries. Industry Series: Capital Expenditures. (Washington, D.C.: U.S. Government Printing Office, 1985), Appendix A, p. A-4.
- [3] Trends in the Hotel Industry. (Houston, TX: Pannell Kerr Forster, 1983).
- [4] 1982 Census of Service Industries. Industry Series. Appendix A, p. A-4.
- [5] U.S. Department of Commerce. Current Business Reports, 1986 Service Annual Survey. (Washington, D.C.: U.S. Government Printing Office, 1987), p. 8.
- [6] U.S. Department of Commerce. 1983 U.S. Industrial Outlook. p. 52-6.
- [7] 1982 Census of Service Industries. Industry Series. p. 2-5.
- [8] This figure was derived using information from two sources: (1) Mahon, James, J. Mahon's Industry Guides for Accountants and Auditors: Guide 8 Hotels and Motels. (Boston MA: Warren, Gorham and Lamont, 1980), p. 8-5. (2) 1982 Census of Service Industries. Industry Series. pp. 2-4 and 2-5. Mahon's provides a cost breakdown of the lodging industry expenses (exclusive of labor and capital expenditures). Of these expenses, materials and supplies made up nine percent of the expenses: five percent for operating supplies, three percent for tableware and one percent for maintenance supplies. To obtain the operating expenses, the census figures of \$11.3 billion for labor and \$5.5 billion for capital expenditures were subtracted from revenues of \$33 billion.
- [9] This figure was derived using two sources: (1) U.S. Department of Health and Human Services. Health Care Financing Review. (Washington, D.C.: U.S. Government Printing Office, Spring 1988, Vol. 9, Number 3), p. 90. and (2) U.S. Department of Labor. Employment and Wages: Annual Averages 1982. (Washington, D.C.: U.S. Government Printing Office, June, 1984), p. 23. The Health Care Financing Administration provided an expense structure model by percentages for hospitals. The known wages and salaries figure, from the Department of Labor was put into the cost structure to derive estimated values for the other expenses.
- [10] 1982 Census of Service Industries. Industry Series. p. 2-5. For hospitals see [9].

- [11] U.S. Department of Commerce. Statistical Abstract of the United States. (Washington, D.C.: U.S. Government Printing Office, 1986), p. 777. For recreation, the \$1,135 million figure came from: U.S. Department of Agriculture. Statistics, 1985. (Washington, D.C.: U.S. Government Printing Office, 1986), p. 504.
- [12] 1982 Census of Service Industries. Industry Series. p. 4-11. Note: the census only provides the revenue from movie refreshment stands. The purchased expenses were derived using a cost per dollar of sales figure of 36.7%. This represents the costs per dollar of sales for a limited menu - no tableservice restaurant. Source: Restaurant Industry Operations Report '83. (National Restaurant Association and Leventhol & Horwath, 1983), p. 15.
- [13] 1982 Census of Service Industries. Industry Series. p. 2-4. For hospitals, this represents expenditures of \$8.3 billion for construction (U.S. Department of Commerce. 1983 U.S. Industrial Outlook. p. 52-7.) and \$344 million for minor machinery and equipment (see [9]).
- [14] 1982 Census of Service Industries. Industry Series. p. 2-5.
- [15] 1982 Census of Service Industries. Industry Series. p. 2-5.
- [16] 1982 Census of Service Industries. Industry Series. p. 2-4.
- [17] 1983 U.S. Industrial Outlook. p. 52-6.
- [18] 1982 Census of Service Industries. Industry Series. p. 2-5.

CHAPTER 14: GOVERNMENTS (SIC 91-97)

INTRODUCTION

This chapter will present the magnitude of purchases in government at both the Federal and the State and Local levels. In addition, the relationship of government purchases to revenues and other expenditures will be presented and analyzed. Federal purchases are divided into defense and nondefense purchases. A summary of all purchases by governments is presented in tables 14-1 through 14-4.

GOVERNMENT ORGANIZATIONS

Government purchases refer to the acquisition of products and services for agencies of the federal, state, and local (county and municipality) levels. Government purchases differ from other purchases in three major respects: (1) governments are nonprofit organizations, (2) few products are reworked, undergo additional manufacturing, or are resold, and (3) most government agencies are final consumers of goods and services [1].

DATA SOURCES AND LIMITATIONS

All of the information presented in tables 14-1 through 14-4 came from Commerce Department publications. The Standard Industrial Classification (SIC) system does not divide governments into federal, state, and local categories. Instead, it is divided into various functions

Table 14-1: GOVERNMENT: TYPES OF PURCHASES (Millions \$)

TYPE OF GOVERNMENT	TYPE OF PURCHASE					TOTAL PURCHASES
	Materials and Supplies	Energy	Resale Equipment	Buildings and Equipment	Other Items	
SIC Code: 91-97						
Federal	\$18,595	\$9,542	n/a	\$63,337	\$66,112	\$157,586
Defense	4,179	9,542	n/a	53,468	43,834	111,023
Nondefense	14,416	n/a	n/a	9,869	22,278	46,563
State and Local	28,513	2,708	47,971	54,333	33,960	167,485
TOTALS: (\$)	\$47,108	\$12,250	\$47,971	\$117,670	\$100,072	\$325,071
(%)	14.5%	3.8%	14.8%	36.2%	30.8%	100%

Table 14-2: GOVERNMENT: TYPES OF PURCHASES BY PERCENT OF TOTAL PURCHASES

TYPE OF GOVERNMENT SIC Code: 91-97	TYPE OF PURCHASE			
	Materials and Supplies	Energy	Resale Equipment	Buildings and Other Items
Federal	11.8%	6.1%	n/a	40.2%
Defense	3.8%	8.6%	n/a	48.2%
Nondefense	31.0%	n/a	n/a	21.2%
State and Local	17.0%	1.6%	28.6%	32.4%
GOVERNMENT AVERAGE	14.5%	3.8%	14.8%	36.2%

30.8%

Table 14-3: GOVERNMENT: REVENUES AND EXPENDITURES (Millions \$)

TYPE OF GOVERNMENT SIC Code: 91-97	REVENUES	EXPENDITURES		
		Purchases	Salaries	Wages & Other Payments
Federal	\$685,800	\$157,586	\$101,162	\$427,052
Defense	189,300	111,023	68,404	9,873
Nondefense	496,500	46,563	32,758	417,179
State and Local	460,400	167,485	223,010	69,905
TOTALS: (\$)	\$1,146,200	\$325,071	\$324,172	\$496,957
(%)	100%	28.4%	28.3%	43.4%

Table 14-4: GOVERNMENT: EXPENDITURES AS A PERCENT OF REVENUES
plus PURCHASE/WAGE AND SALARY RATIO

TYPE OF GOVERNMENT	EXPENDITURES			P/W&S \$ RATIO
	Purchases	Wages & Salaries	Other Payments	
SIC Code: 91-97				
Federal	23.0%	14.8%	62.3%	1.6
Defense	58.6%	36.1%	5.2%	1.6
Nondefense	9.4%	6.6%	84.0%	1.4
State and Local	36.4%	48.4%	15.2%	0.8
GOVERNMENT AVERAGE	28.4%	28.3%	43.4%	1.0

within government. There was no distinction made between federal, state, or local governments. Examples include: SIC 91; executive, legislative and general government, SIC 92; courts, public order, and safety, and SIC 94; covers the administration of human resources. Therefore, tables 14-1 through 14-4 collectively cover SIC codes 91-97.

Total purchase figures were available at both the federal and state and local level. The exact composition of these purchases, however, was not available.

PURCHASES

Purchases made up the second largest expenditure in government operations. The amount spent on purchases was \$325 billion, which accounts for 28% of the total expenditures. The amount spent on purchases was slightly greater than the \$324 billion spent on wages and salaries.

Tables 14-1 and 14-2 show that purchases for Materials and Supplies were \$47 billion. In the Federal sector the amount was \$18.6 billion. This was divided between defense (\$4.2 billion) and nondefense (\$14.4 billion). In defense materials and supplies include: ammunition, clothing and textiles, and other nondurable goods [2]. This defense figure of \$4.2 billion is understated because many of the materials and supplies associated with defense systems were included within the category of buildings and equipment [3]. Other nondurable defense purchases include food for troops in all services, which was estimated to be \$822 million [4].

The nondefense federal purchase of materials and supplies was \$14.4 billion. In state and local government, the amount was \$28.5 billion for nondurable goods [5].

Energy, at \$12.2 billion, accounted for less than four percent of the total purchases. The federal figure of \$9.5 billion is composed entirely of defense petroleum products for military vehicles, aircraft, and ships [6]. Other energy expenditures were not separately provided but would fall under the category of purchased services found under the heading of Other Items.

In state and local government, the amount spent on gas and electric utilities was \$2.7 billion [7]. Fuel expenditures for state and local government vehicles were not available (n/a).

The Resale figure of \$48 billion is for purchases made by liquor stores (\$2.8 billion) and utilities (\$45 billion) operated by state and local governments [8]. Military commissary and exchange purchases were not included. They were discussed under retail trade in chapter 12.

Purchases for Buildings and Equipment were \$118 billion and made up 36 percent of total purchases. The federal portion was \$63.3 billion. Defense was \$53.5 billion. This type of purchase included: (1) structures (\$3.8 billion), and (2) durable goods (\$49.6 billion) for items such as aircraft, missiles, ships, vehicles and electronic equipment [9]. In nondefense, the total was \$9.9 billion (\$6.7 billion for structures and \$3.1 for durable goods) [10].

For state and local governments, the purchases for buildings and equipment was \$54 billion. This was divided between structures (\$41 billion) and durable goods (\$13 billion).

Other Item purchases were \$100 billion. This category accounted for about 30 percent of the total purchases and was entirely for purchased services.

The federal government total was \$66 billion (\$43.8 billion for defense and \$22 billion for nondefense) [11]. In defense, the purchased services included: research and development (\$13.8 billion), travel (\$2.6 billion), transportation (\$3.2 billion), communications (\$1 billion) and depot maintenance (\$4.7 billion) [12].

In state and local governments, the purchased services were \$34 billion) [13]. This figure included the purchase of medical services (\$27.5 billion) on behalf of indigents [14].

REVENUES AND EXPENDITURES

Table 14-3 presents purchases in relation to revenues, wages and salaries, and other payments. The \$325 billion spent on purchases was larger than wages and salaries but was smaller than the other payments category.

The Revenues were \$1,146 billion in 1982 and represent receipts from diverse sources. In the federal government the main sources for the \$686 billion in revenues were individual and corporate income taxes, user fees, insurance

programs, and other taxes. In the federal government, \$189 billion went to defense (27.6% of the budget) and \$497 billion went to nondefense activities (72.4% of the budget).

In state and local governments, the \$460 billion in revenues (\$261 billion for states and \$199 billion for local governments) came from property and sales taxes, utility and liquor store operations, transfers from the federal government, insurance programs, and miscellaneous charges and taxes [15].

Wages and Salaries includes all wages, salaries, commissions, bonuses and allowances for hourly, supervisory, and executive personnel. In the federal government, this came to \$101 billion. The defense total was \$68 billion (\$41 billion for military personnel and \$27 billion for civilians working within the department of defense) The nondefense employee wages and salaries were \$33 billion. In state and local governments, wages and salaries were \$223 billion [16].

The expenditures for Other Payments represent all expenses not covered under purchases and wages and salaries. The following items would be representative of this category: transfer payments to persons and foreign governments, grants-in-aid, interest paid, benefits, subsidies, and social security. The other payment figures were derived by subtracting the sum of purchases and wages and salaries from revenues. Total other payments came to \$496 billion which was 43 percent of the expenditures.

This category was larger than either purchases or wages and salaries.

SUMMARY

Tables 14-3 and 14-4 shows that purchases in government were a substantial portion of government expenditures (28%). State and local purchases represent a majority of the total government purchases (52%). Table 14-4 also shows that the purchases to wages and salary ratio was one-to-one with purchases only slightly larger than wages and salaries. In state and local governments, labor costs exceeded purchases.

ENDNOTES

- [1]. Cavinato, Joseph L., Purchasing and Materials Management. (St. Paul MN: West Publishing Co.) p. 391.
- [2] U.S. Department of Commerce. Survey of Current Business. (Washington, D.C.: U.S. Government Printing Office, July 1984). p. 48.
- [3] When defense systems are purchased there is a significant amount supporting materials and supplies that accompany them. This is frequently bought as part of equipment contracts and are not shown separately. The author bases this on his six years of government procurement experience.
- [4] U.S. Department of Agriculture. Agriculture Statistics. (Washington, D.C.: U.S. Government Printing Office, 1985), p. 506. The U.S. Department of Agriculture, Economic Research service estimated the sale of meals and snacks to military troops to be \$1.644 billion. The \$1.281 billion purchase figure was derived by using the mark-up in educational feeding provided by the National Restaurant Association (also on p. 777). Purchases were 77% of sales.

- [5] U.S. Department of Commerce. Survey of Current Business. (Washington, D.C.: U.S. Government Printing Office, July 1983). p. 47. Note: The \$31.349 billion state and local figure for nondurables was reduced by \$2.836 billion for the purchase of liquor, which is discussed under resale.
- [6] U.S. Department of Commerce. Survey of Current Business. (Washington, D.C.: U.S. Government Printing Office, July 1984). p. 48.
- [7] U.S. Department of Commerce. Survey of Current Business. (Washington, D.C.: U.S. Government Printing Office, July 1984). p. 56.
- [8] U.S. Department of Commerce. Statistical Abstract of the United States. (Washington, D.C.: U.S. Government Printing Office, 1985). p. 264.
- [9] U.S. Department of Commerce. Survey of Current Business. (Washington, D.C.: U.S. Government Printing Office, July 1984). p. 48.
- [10] U.S. Department of Commerce. Survey of Current Business. (Washington, D.C.: U.S. Government Printing Office, July 1983). p. 47.
- [11] U.S. Department of Commerce. Survey of Current Business. (Washington, D.C.: U.S. Government Printing Office, July 1983). p. 47.
- [12] U.S. Department of Commerce. Survey of Current Business. (Washington, D.C.: U.S. Government Printing Office, July 1984). p. 48.
- [13] U.S. Department of Commerce. Survey of Current Business. (Washington, D.C.: U.S. Government Printing Office, July 1983). p. 47. Note: The other services figure of \$81.803 billion was reduced by \$2.708 billion for energy and by \$45.135 billion for utility resales.
- [14] U.S. Department of Commerce. Survey of Current Business. (Washington, D.C.: U.S. Government Printing Office, January 1984). p. 31 and 32.
- [15] U.S. Department of Commerce. Statistical Abstract of the United States. (Washington, D.C.: U.S. Government Printing Office, 1986). p. 263.
- [16] U.S. Department of Commerce. Survey of Current Business. (Washington, D.C.: U.S. Government Printing Office, July 1983). p. 47.

CHAPTER 15: TOTAL MAGNITUDE OF BUSINESS AND GOVERNMENT PURCHASES

INTRODUCTION

This chapter will present the total dollar magnitude of purchases for American businesses and governments. The total is based on the individual findings at the two-digit Standard Industrial Classification (SIC) level for each of the eleven industries presented in chapters 4-14.

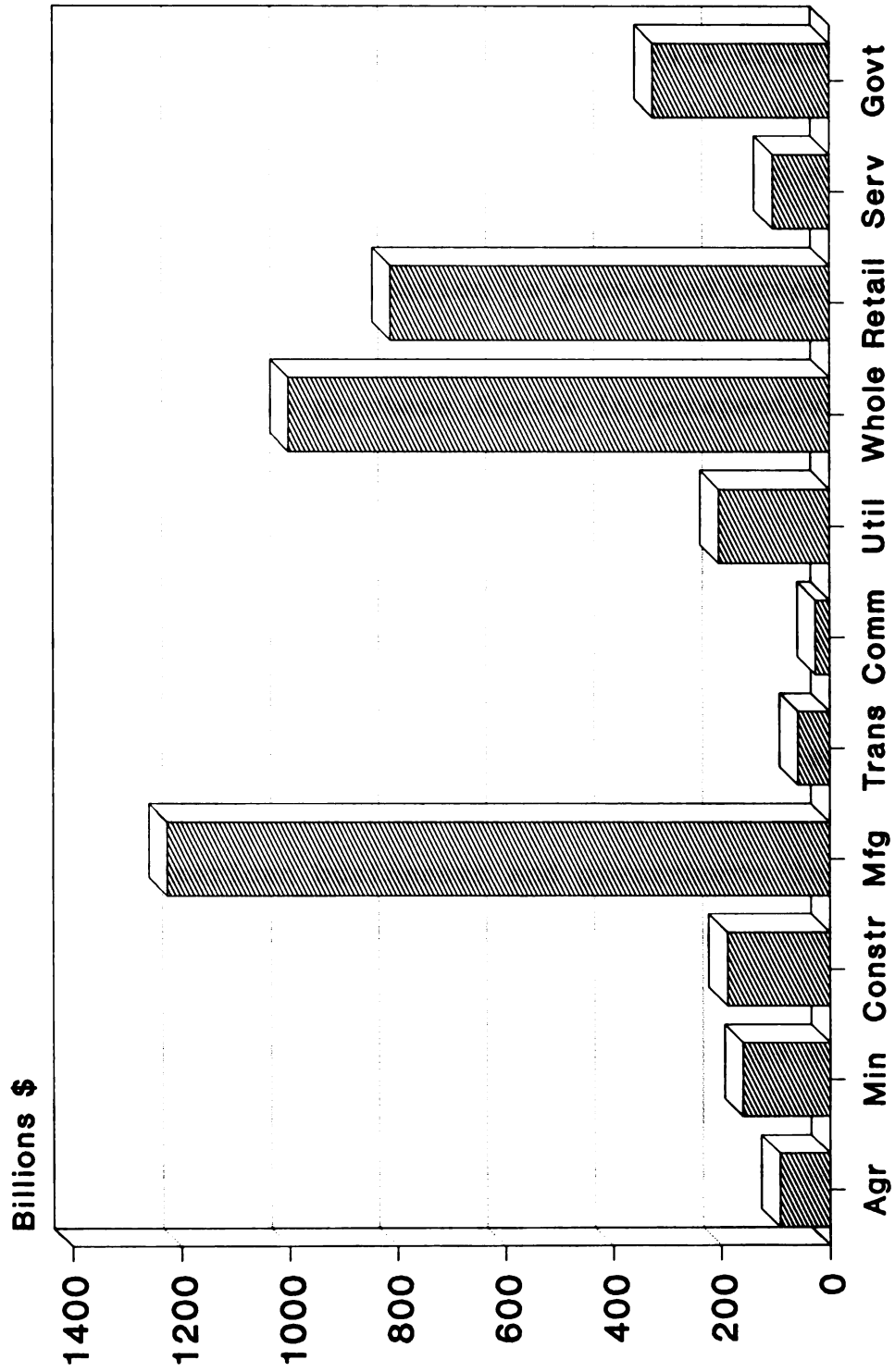
TOTAL MAGNITUDE OF PURCHASES

Earlier in Chapter 1, it was stated that there has been no research that provides an estimate of the total magnitude of dollars spent for purchases by American businesses and governments. Chapters 4-14 have rectified that situation by determining the dollar magnitude of purchases in 1982 for eleven major industries: agriculture, mineral, construction, manufacturing, transportation carriers, communication, utilities, wholesale trade, retail trade, services, and governments. Census data from the year 1982 provided the most current and complete purchase information. Therefore, this research was based on the year 1982. Other government and private sources, also from the year 1982, were used to supplement the Commerce Department's census data on purchases in American businesses and governments. The cumulative findings, for the above eleven industries reveal that the dollar magnitude of business and government

Table 15-1: BUSINESSES AND GOVERNMENTS: TYPES OF PURCHASES (Millions \$)

SIC Code	TYPE OF INDUSTRY	TYPE OF PURCHASE					TOTAL PURCHASES
		Materials and Supplies	Energy	Resale	Buildings and Equipment	Other Items	
01-07 10-14	Agriculture Mineral	\$42,958 77,822	\$10,422 7,441	n/a 658	\$27,094 49,707	\$11,185 23,974	\$91,659 159,602
15-17 20-39	Construction Manufacturing	89,891 990,084	6,030 56,334	n/a 52,020	13,277 108,383	79,473 38,125	188,671 1,244,946
40-47 48	Transportation Communication	6,375 1,542	16,540 1,170	n/a n/a	19,329 22,525	15,412 n/a	57,656 25,237
49 50-51	Utility Wholesale	11,074 5,534	41,311 4,063	89,624 952,970	61,873 24,799	n/a 11,615	203,882 998,981
52-59 70-89	Retail Service	8,585 19,521	12,773 7,883	720,356 7,093	48,950 50,447	20,427 19,299	811,091 104,243
91-97	Governments	47,108	12,250	47,971	117,670	100,072	325,071
TOTALS: (\$)		\$1,300,494	\$176,217	\$1,870,692	\$544,054	\$319,582	\$4,211,039
(%)		30.9%	4.2%	44.4%	12.9%	7.6%	100%

Figure 15-1: PURCHASES BY INDUSTRY TYPE



TYPE OF INDUSTRY

(1982)

purchases in 1982 was immense. This research estimates that the total dollar magnitude of purchases by businesses and governments was at least \$4,211 billion (\$4.2 trillion). The reader may refer to the tables in Chapters 4-14 for the derivation of the individual purchase figures for each of the eleven industries. A composite presentation is found in Table 15-1. The same information is presented graphically in Figure 15-1.

To put the above purchase figure in perspective, the Gross National Product (GNP) for that same year (1982) was only \$3,073 billion [1].

To further illustrate the magnitude of business and government purchases, consider the B-1 bomber. This was one of the major defense acquisition programs in 1982. The B-1 bomber and its associated logistical support were estimated to cost \$205 million for each aircraft [2]. The total purchases by American businesses and governments in 1982 would be roughly equivalent to the purchase of 20,542 B-1 bombers.

As another example of the importance of this magnitude, consider that a purchase change of only one percent by the nation's industries would represent a \$42 billion change in economic activity. A change in the purchase lead time by 1 week throughout the system represents an \$81 billion change in purchases. Minor changes in business conditions can result in major shifts in industry purchases.

The dollar magnitudes and the relationships of

purchases by type of purchase and by type of industry for American businesses and governments are presented in Table 15-1. Table 15-2 presents a rank order of purchases by eleven industries based on their respective dollar magnitude of purchases.

**Table 15-2: RANK ORDER OF INDUSTRIES
BY DOLLAR MAGNITUDE OF PURCHASES**

SIC Code	INDUSTRY	(Billions \$)
20-39	Manufacturing	\$1,244
50-51	Wholesale	999
52-59	Retail	811
91-97	Governments	325
49	Utility	204
15-17	Construction	189
10-14	Mineral	160
70-89	Service	104
01-02	Agriculture	92
40-47	Transportation	58
48	Communication	25
TOTAL		\$4,211

The \$4.2 trillion dollar figure is a conservative estimate, since there was limited purchase information available for the service industries and information was not collected for financial industries.

The dollar magnitude of business and government purchases that could be verified, however, exceeded all of the estimates presented in the literature review. It also far exceeds figures presented in the press. For example, The Wall Street Journal in an article on ethical purchasing practices stated in 1989: "With an estimated \$700 billion a year at stake in their decisions, purchasing managers face a continual battle to define ethical behavior [3]." This

figure was in error by at least a factor of six using the 1982 figures. Due to the expansion of the economy and inflation, this error would be even greater if 1989 purchase figures had been available.

SUMMARY

This research has shown that the total dollar magnitude of purchases by American businesses and governments was estimated to be at least \$4.2 trillion. Subsequent chapters will further analyze the findings of chapters 4-14. Chapter 16 will cover comparative magnitudes by types of purchase and by types of industry. Chapter 17 will address comparative measures such as revenues, and wages plus salaries, Chapter 18 will then compare business operational purchases with consumer purchases.

ENDNOTES

- [1] Carson, Carol S. "Gross National Product and Related Measures." Editors: Frank J. Fabozzi and Harry I. Greenfield. The Handbook of Economic and Financial Measures. (Homewood, IL: Dow Jones-Irwin, 1984). p. 5.
- [2] The United States Air Force Summary. Directorate of Cost, Comptroller of the Air Force, Headquarters, United States Air Force. (Washington, D.C.: U.S. Government Printing Office, 1986). p. B7.
- [3] Sebastian, Pamela. "Vendors' Gifts Pose Problems For Purchasers." Wall Street Journal. June 26, 1989. p. B1.

CHAPTER 16: COMPARATIVE MAGNITUDES - INDUSTRIAL CONCENTRATION OF PURCHASES

INTRODUCTION

A review of the dollar magnitudes of purchases by American businesses and governments in 1982 shows that purchases were concentrated in two types of purchases: resales, and materials and supplies; and in three industries: manufacturing, wholesale trade, and retail trade. Table 16-2 presents business and government purchases as a percent of total industrial purchases.

CONCENTRATION BY TYPE OF PURCHASE

The sections that follow will present the magnitude of business and government purchases by five major types: 1. Materials and Supplies, 2. Energy, 3. Resales, 4. Buildings and Equipment, and 5. Other Items.

Table 16-1 shows that Resales and Materials and Supplies purchases accounted for over 75 percent of all the

**Table 16-1: CONCENTRATION OF PURCHASES BY TYPE OF PURCHASE
(For All Industries)**

TYPE OF PURCHASE	BILLIONS \$	PCT OF TOTAL PURCHASES	CUMULATIVE PCT TOTAL
1. Resales	\$1,871	44.4%	44.4%
2. Materials and Supplies	1,300	30.9	75.3
3. Buildings and Equipment	544	12.9	88.2
4. Other Items	320	7.6	95.8
5. Energy	176	4.2	100.0
TOTALS	\$4,211	100.0%	

**Table 16-2: BUSINESSES AND GOVERNMENTS: PERCENT OF ALL TOTAL PURCHASES
BY INDUSTRY AND BY PURCHASE TYPES**

TYPE OF INDUSTRY	TYPE OF PURCHASE					TOTAL BY TYPE OF INDUSTRY
	Materials and Supplies	Energy	Resale	Buildings and Equipment	Other Items	
Agriculture	1.0%	0.2%	n/a	0.6%	0.3%	2.2%
Mineral	1.8%	0.2%	0.0%	1.2%	0.6%	3.8%
Construction	2.1%	0.1%	n/a	0.3%	1.9%	4.5%
Manufacturing	23.5%	1.3%	1.2%	2.6%	0.9%	29.6%
Transportation	0.2%	0.4%	n/a	0.5%	0.4%	1.4%
Communication	0.0%	0.0%	n/a	0.5%	n/a	0.6%
Utility	0.3%	1.0%	2.1%	1.5%	n/a	4.8%
Wholesale	0.1%	0.1%	22.6%	0.6%	0.3%	23.7%
Retail	0.2%	0.3%	17.1%	1.2%	0.5%	19.3%
Service	0.5%	0.2%	0.2%	1.2%	0.5%	2.5%
Governments	1.1%	0.3%	1.1%	2.8%	2.4%	7.7%
TOTAL BY TYPE OF PURCHASE	30.9%	4.2%	44.4%	12.9%	7.6%	100.0%

business and government purchases. Due to the concentration of purchases, business managers and others concerned with purchase trends should consider directing their attention to these two types of purchases.

RESALE PURCHASES

Resale purchases were the largest type of purchase in businesses and governments. They totaled \$1.9 trillion or 44 percent of the total business and government purchases (See Figure 16-1). Wholesale and retail trade accounted for the overwhelming majority of the resale purchases. Wholesale resale purchases were \$953 billion and for retail industries the resale purchases were \$720 billion. These two industries together accounted for \$1.7 trillion or 89 percent of the total resale purchases.

It should be noted that the wholesale trade had \$233 billion more in resale purchases than did retail trade (See Figure 16-2). This apparent discrepancy can be explained. The retail trade industry primarily sells merchandise for personal or household consumption. Wholesale trade, in addition to selling to retail trade, also sells to service industries, institutions, manufacturing firms, governments, and to contractors. Also, many wholesale firms operate as retail firms and sell merchandise directly for personal or household consumption. The combined wholesale and retail resale purchases represented 40% of all business and government purchases.

Figure 16-1: TOTAL PURCHASES BY TYPE

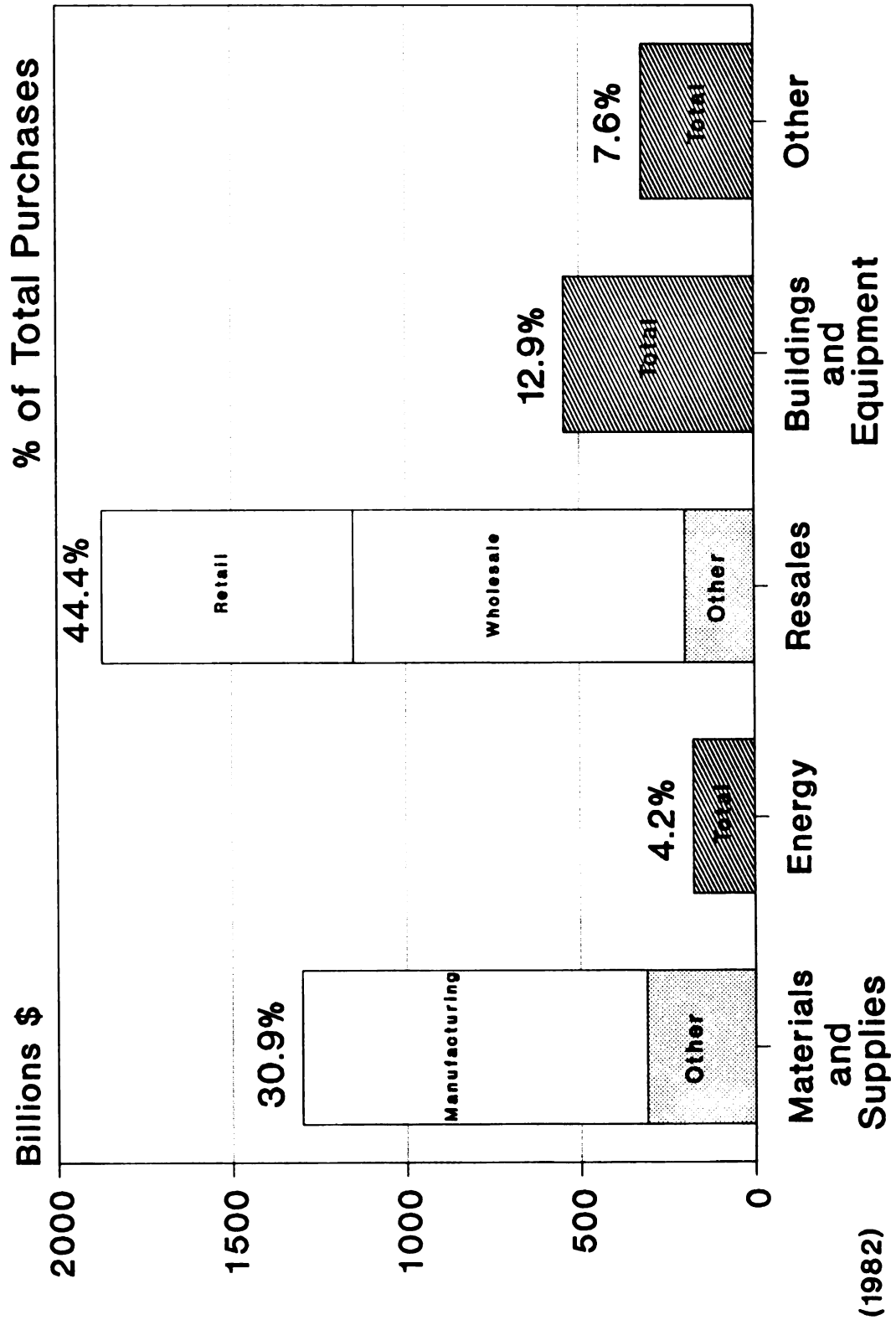
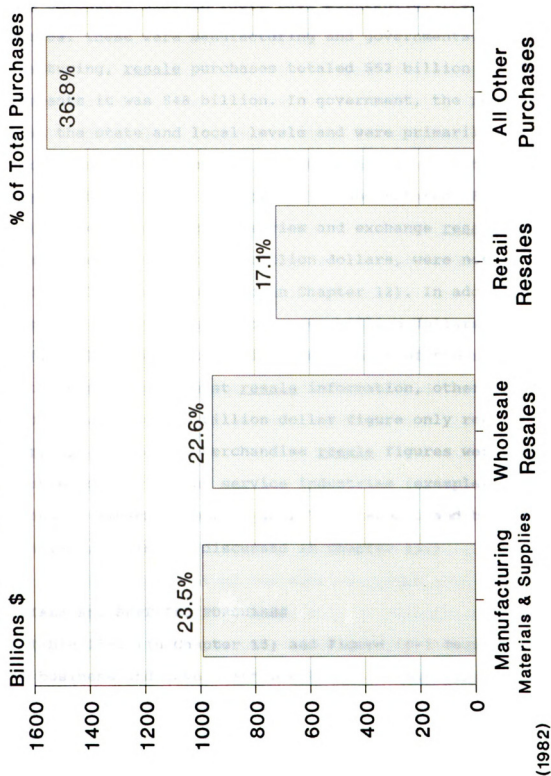


Figure 16-2: CONCENTRATION OF PURCHASES



Two industries that are not normally associated with resale purchases did, in fact, have substantial resale purchases. These were manufacturing and governments. In manufacturing, resale purchases totaled \$52 billion and for governments it was \$48 billion. In government, the resales were at the state and local levels and were primarily for liquor and utility purchases (See Chapter 14). The total resale purchase figure is known to be understated. For example, the military commissaries and exchange resale purchases, estimated at six billion dollars, were not included. (This was discussed in Chapter 12). In addition, the service industry figure of seven billion dollars is significantly understated. Since the census of the service industries did not request resale information, other sources were sought. The seven billion dollar figure only represents food resale purchases. Merchandise resale figures were not available for any of the service industries (examples: hotel gift shops, amusement parks, golf "pro" shops, and hospital pharmacies). (This was discussed in Chapter 13.)

MATERIALS AND SUPPLIES PURCHASES

Table 15-1 (in Chapter 15) and Figure 16-1 show that total business and government purchases for Materials and Supplies were \$1.3 trillion. This type of purchase constituted 31 percent of the total business and government purchases. Manufacturing (SICs 20-39) dominated, accounting for 76 percent of all the materials and supplies purchases.

Table 16-2 shows that manufacturing purchases of materials and supplies accounted for 24% of the total purchases by businesses and governments.

A distant second, in the amount spent for materials and supplies purchases, was the construction industry (SICs 15-17), with \$90 billion (seven percent), followed by mineral industries (SICs 10-14) with \$78 billion (six percent), and governments (SICs 91-97) with \$47 billion (four percent). (See Figure 16-1).

Materials and supplies accounted for the largest percentage of all the purchases in the agriculture (SICs 01-02), mineral (SICs 10-14), construction (SICs 15-17), and manufacturing (SICs 20-39) industries. Purchases of only materials and supplies exceeded the expenditures for wages and salaries in agriculture, mineral, and manufacturing industries.

BUILDINGS AND EQUIPMENT PURCHASES

Purchases for buildings and equipment were \$544 billion and comprised 13 percent of the total business and government purchases. The relationship of building and equipment purchases to the other types of purchases is shown in Figure 16-1. Governments seem to have spent the most for building and equipment purchases (\$118 billion). This accounted for 22 percent of the total building and equipment purchases. As was discussed in Chapter 14, many of the government material and supply purchases were included

within this category. The figures were not separately broken out in the government publications. This results in the government purchase type materials and supplies being understated, and the purchase type buildings and equipment being overstated.

Manufacturing had the second highest building and equipment purchases (\$108 billion). This was twenty percent of the total building and equipment purchases.

The building and equipment type of purchase is analogous to the gross private domestic (nonresidential) investments, or capital expenditures, in the National Income and Product Accounts of Gross National Product (GNP). In 1982, GNP business capital expenditures were \$348.3 billion. This was composed of structures (\$141.9 billion), and durable equipment (\$206.4 billion) [1]. The GNP figure for capital expenditures is \$196 billion lower than the Buildings and Equipment figure of \$544 billion used in this research for two reasons. First, the GNP capital expenditures figure does not include government buildings and equipment. All government purchases (both capital and non-capital) are collected together in a separate "Government Purchases" category of the National Income and Products Accounts of GNP. Secondly, in this dissertation the Buildings and Equipment figure (unlike the GNP capital expenditures figure) includes repair and rental expenses associated with buildings and equipment. Chapter 18 will further amplify the relationship between business and

government purchases, and GNP.

"OTHER ITEM" PURCHASES

The last type of purchase, Other Items, represented purchases that did not fall within any of the other four types of purchases and accounted for 7.6 percent of the total business and government purchases. This was meant to be a catch-all category. Two types of purchases, however, were dominant: (1) subcontract and (2) purchased services.

Subcontract purchases were estimated to be \$133 billion. In manufacturing the magnitude of the subcontract purchases was \$31 billion, in construction it was \$78 billion, in mineral industries it was \$24 billion, and in the trucking industry it was at least \$9 billion (Class I and II only). (Note: This was discussed earlier in Chapter 8.)

Jerome Mark has stated that purchased services are becoming increasingly important in industry. Unfortunately, data on purchased "...services are relatively scant in the United States" [2]. The Commerce Census of business asked for very little information on purchased services. There were requests for information on communication services and in some cases on advertising. There was, however, no information on other purchased services such as: accounting, legal, security, engineering, or janitorial services.

Governments were the one industry that had rather extensive purchased service information. For governments,

purchased services exceeded \$100 billion. Due to the limited purchased services information in the other non-government industries, the \$320 billion for other item purchases is a conservative estimate of the total.

ENERGY PURCHASES

Energy purchases, primarily for power and heating, were estimated to be \$176 billion. This accounted for four percent of the total business and government purchases. The dollars spent for energy purchases were the smallest of the five purchase types (See Figure 16-1).

The manufacturing industry had the most energy purchases (\$56 billion). Manufacturing energy purchases accounted for 32 percent of all the energy purchases. The utility industry was second with \$41 billion (23%). It should be noted that the utility total does not include purchased natural gas for resale. The transportation carrier industry was third with \$17 billion (9%) in energy purchases. The transportation figure is known to be understated because the non-ICC regulated and local trucking energy purchase figures were not available. (This was discussed in Chapter 8.)

When energy purchases are analyzed as a percent of the total purchases for each industry, they are the largest dollar amount in three industries: transportation carriers (28.7%), the utilities (20.3), and in agriculture (11.4%). Disruptions or other problems in energy supplies could have

a greater percentage impact on these industries than in the other eight industries.

Energy Purchases in Manufacturing

Energy purchases account for only 4.5 percent of all the manufacturing purchases. In certain four-digit SIC manufacturing industries, however, energy purchases represent a large percentage of the purchase dollars. The four manufacturing industries that had the highest percentage of energy purchases were in paper (SIC 26), chemicals (SIC 28), glass and stone (SIC 32), and primary metals (SIC 33). Table 16-3 illustrates that energy expenditures can make up a substantial portion of the purchase dollars in certain four-digit manufacturing industries.

A knowledge of the cost structure in suppliers with high energy expenditures could be of value to purchase

Table 16-3: FOUR-DIGIT SIC MANUFACTURING INDUSTRIES WITH LARGE ENERGY PURCHASES AS A PERCENT OF TOTAL PURCHASES

Manufacturing Industry	Energy as a Percent of each Industries' Total Purchases
=====	
PAPER (SIC 26):	
Building Paper Mills (SIC 2661)	32.6%
Pressed, Molded Pulp Goods (SIC 2646)	34.7
CHEMICALS (SIC 28):	
Alkalies and Chlorine (SIC 2812)	44.3
Industrial Gases (SIC 2813)	53.2
GLASS AND STONE (SIC 32):	
Hydraulic Cement (SIC 3241)	41.2
Brick and Clay Tile (SIC 3251)	41.6
Lime (SIC 3274)	51.5
PRIMARY METALS (SIC 33):	
Malleable Iron Foundries (SIC 3322)	33.8
Aluminum (SIC 3344)	32.1

managers. They could use this information to estimate the impact of changes (up or down) in energy supply/prices on their suppliers' products.

CONCENTRATION OF PURCHASES BY INDUSTRY

This section will present findings on the concentration of purchases for eleven major two-digit industries: agriculture, mineral, construction, manufacturing, transportation carriers, communication, utilities, wholesale, retail, services, and governments. Due to the size of the manufacturing industry, there will be a separate section on its four-digit SIC industries.

Table 16-4 shows that of the eleven industries researched, the majority of the purchase dollars were concentrated in three industries. Nearly three-quarters (73%) of the total purchase dollars took place in manufacturing, wholesale trade, and retail trade.

Table 16-4: CONCENTRATION OF PURCHASES BY MAJOR INDUSTRY

SIC Code	INDUSTRY	PURCHASES (Billions \$)	PERCENT OF TOTAL	CUMULATIVE PCT TOTAL
20-39	Manufacturing	\$1,244	30%	30%
50-51	Wholesale	999	24	54
52-59	Retail	811	19	73
91-97	Governments	325	8	81
49	Utility	204	5	86
15-17	Construction	189	4	90
10-14	Mineral	160	4	94
70-89	Service	104	2	96
01-02	Agriculture	92	2	98
40-47	Transportation	58	1	99
48	Communication	25	1	100
All Industries		\$4,211	100%	

Table 16-5: ALL MANUFACTURING PURCHASES (Millions \$);
Rank; and Percent of Total Manufacturing Purchases

SIC Code	TYPE OF MANUFACTURING	PURCHASES	RANK	% TOT MFG PURCHASES
20	Food	\$202,756	1	16.3%
21	Tobacco	7,892	19	0.6%
22	Textiles	31,140	12	2.5%
23	Apparel	28,874	14	2.3%
24	Lumber	29,323	13	2.4%
25	Furniture	12,290	17	1.0%
26	Paper	53,500	9	4.3%
27	Printing	38,052	10	3.1%
28	Chemicals	105,211	4	8.5%
29	Petroleum	193,383	2	15.5%
30	Plastics	32,006	11	2.6%
31	Leather	5,208	20	0.4%
32	Glass	25,769	15	2.1%
33	Primary Metals	76,440	6	6.1%
34	Fabricated Metals	67,208	8	5.4%
35	Machinery	96,396	5	7.7%
36	Electric Equipment	73,985	7	5.9%
37	Transportation	130,683	3	10.5%
38	Instruments	20,968	16	1.7%
39	Miscellaneous	13,862	18	1.1%
TOTALS:		\$1,244,946		100%

Table 16-6: TOP MANUFACTURING PURCHASES (Millions \$); Rank; Percent of Total Manufacturing Purchases; And Cumulative Percent Total

SIC Code	TYPE OF MANUFACTURING	PURCHASES	RANK	% TOT MFG PURCHASES	CUMULATIVE % TOTAL
2911	Petroleum Refining	\$186,807	1	15.0%	15.0%
3711	Motor Vehicles	58,467	2	4.7%	19.7%
2011	Meat Packing Plants	39,509	3	3.2%	22.9%
3312	Steel Mills	26,607	4	2.1%	25.0%
2869	Organic Chemicals	23,241	5	1.9%	26.9%
3079	Plastic Products	22,198	6	1.8%	28.7%
3714	Motor Vehicle Parts	21,883	7	1.8%	30.4%
3573	Electronic Computing	20,660	8	1.7%	32.1%
3721	Aircraft	16,933	9	1.4%	33.4%
2026	Fluid Milk	15,440	10	1.2%	34.7%
3662	Radio & TV Equipment	14,649	11	1.2%	35.9%
2621	Paper Mills	14,459	12	1.2%	37.0%
2821	Plastics and Resins	11,924	13	1.0%	38.0%
2086	Soft Drinks	11,478	14	0.9%	38.9%
2752	Commercial Printing	9,785	15	0.8%	39.7%

Table 16-6 Continued: TOP MANUFACTURING PURCHASES (Millions \$);
Rank; Percent of Total Mfg Purchases; And Cumulative Percent Total

SIC Code	TYPE OF MANUFACTURING	PURCHASES	RANK	% TOT MFG PURCHASES	CUMULATIVE % TOTAL
2013	Sausages & Prepared Meats	\$9,672	16	0.8%	40.5%
2048	Prepared Feeds (Animals)	9,332	17	0.7%	41.2%
2022	Cheese	9,249	18	0.7%	42.0%
2711	Newspapers	8,185	19	0.7%	42.6%
2075	Soybean Oil Mills	8,146	20	0.7%	43.3%
2082	Malt Beverages	7,705	21	0.6%	43.9%
3679	Electronic Components	7,596	22	0.6%	44.5%
2631	Paperboard Mills	7,484	23	0.6%	45.1%
3411	Metal Cans	7,454	24	0.6%	45.7%
2016	Poultry Dressing Plants	7,433	25	0.6%	46.3%
2653	Corrugated Boxes	7,430	26	0.6%	46.9%
2421	Sawmills	7,371	27	0.6%	47.5%
3724	Aircraft Engines & Parts	7,172	28	0.6%	48.1%
3661	Telephone Apparatus	7,128	29	0.6%	48.7%
3861	Photographic Equipment	6,846	30	0.5%	49.1%
3531	Construction Machinery	6,777	31	0.5%	49.6%
3585	Refrigeration & Heating	6,678	32	0.5%	50.2%
All Other Manufacturing		619,248		49.8%	100%
Mfg Purchase Totals:		\$1,244,946		100%	

The sections that follow will address the dollar magnitude of purchases in each of the eleven major industries.

MANUFACTURING (SIC 20-39)

Manufacturing was the most important industry in terms of its dollar magnitude of purchases. The amount spent for all manufacturing purchases was \$1.24 trillion, based on the findings in Chapter 7. This figure accounted for 30 percent of all the business and government purchases.

As in the agriculture, mineral, and construction industries, the largest type of purchase in manufacturing was materials and supplies, which totaled \$990 billion. This was 80% of all the materials and supplies purchases in the eleven industries researched.

Within manufacturing, just four of the two-digit industries accounted for over 50% of the total manufacturing purchases. These industries were: food manufacturing (16.3%), petroleum refining (15.5%), transportation (10.5%), and chemical production (8.5%) (See Table 16-5).

An analysis of the 448 four-digit manufacturing industries also showed that there was a high concentration of purchase dollars in only a small percentage of the industries. Table 16-6 shows that fifty percent of the purchases took place in 32 (7%) of the 448 industries. Four industries accounted for 25 percent of all the manufacturing purchases: Petroleum Refining (15%), Motor Vehicles (4.7%),

Meat Packing Plants (3.2%), and Steel Mills (2.1%).

WHOLESALE (SIC 50-51)

In the wholesale trade industry, the amount spent on purchases was nearly one trillion dollars, based on the findings in Chapter 11. Not surprisingly, resales were the most significant type of purchase. The \$953 billion for resales represented 95 percent of the total purchases in wholesale trade. Durable goods accounted for 38 percent of the resales and nondurable goods accounted for 62 percent.

In wholesale trade, four industries accounted for 70 percent of the purchases: machinery (automotive and non-automotive), groceries, farm products (such as grains and livestock), and petroleum.

RETAIL (SIC 52-59)

Retail trade was very similar to the wholesale trade. Total purchases in this industry were \$811 billion, based on the findings in Chapter 12. The largest type of purchase was resales, which totaled \$720 billion. As was discussed earlier in the section on Resales, wholesale resale purchases were greater than resales in retail trade by \$232 billion.

In retail trade, durable goods accounted for 33 percent of the resales and nondurable goods accounted for 67 percent. It should be noted that the percent of durable good resale purchases was higher in the wholesale trade (38%)

than in retail (33%). Conversely, for nondurable goods purchased for resale, the percentage was higher in retail (67%) than in wholesale (62%).

In retail trade, two industries accounted for 55 percent of the purchases: food stores (SIC 54) and automotive (SIC 55) (Note: this includes gasoline service stations.)

GOVERNMENTS (SIC 91-97)

Government purchases were over \$325 billion, based on the findings in Chapter 14. Governments were divided into: 1. federal, and 2. state and local categories. The state and local purchases were greater than the federal purchases by \$10 billion (\$167 billion versus \$157 billion).

Federal purchases were divided into two categories: 1. defense, and 2. non-defense. Defense purchases were over two times greater than non-defense purchases (\$111 billion versus \$47 billion).

One surprising finding in this research was that there were substantial resale purchases in state and local governments. This totaled \$48 billion and was predominately for liquor and utility purchases. This figure, however, does not include the estimated \$6.4 billion in military exchange and commissary resale purchases which were discussed under retail purchases in chapter 12.

It should also be noted that in the National Income and Product Accounts of Gross National Product (GNP), government

purchases of goods and services include the compensation of government employees. For this research, the government employee compensation figures (\$324 billion) will be discussed under the category of wages and salaries in Chapter 17, to be consistent with the other industries. The amount spent for government purchases was nearly identical to the amount spent on wages and salaries.

UTILITY (SIC 49)

Purchases in the utility industry were \$204 billion, based on the findings in Chapter 10. Energy made up the majority of the purchases (64%) in the utility industry. Energy purchases were divided between energy purchased to produce new energy as in the electric utility industry (\$41 billion) and energy purchased for resale as in the gas utility industry (\$90 billion).

CONSTRUCTION (SIC 15-17)

In the construction industry, the amount spent on purchases was \$189 billion, based on the findings in Chapter 6. As in the agriculture and mineral industries, the largest type of purchase was materials and supplies. Purchases for materials and supplies were \$90 billion (48% of the total purchases in construction).

The next largest type of purchase was subcontract work. This totaled \$78 billion and accounted for 41 percent of all the construction purchases. Subcontract work is frequently a

significant expenditure for construction firms because of the high costs for some machinery and equipment. Due to the specialized nature, and in some cases the requirements for highly skilled operators, contractors who require the use of this type of equipment, often subcontract rather than purchase the equipment.

MINERAL (SIC 10-14)

Purchases in the mineral industry were \$160 billion, based on the findings in Chapter 5. The \$78 billion spent on materials and supplies made this the largest type of purchase (49% of the total). The buildings and equipment purchases were \$49.7 billion and were 31 percent of the total mineral industry purchases. Subcontract work was also important in the mineral industry. This type of purchase accounted for 13 percent of the total.

SERVICE (SIC 70-89)

Purchases in the service industry were estimated to be at least \$104 billion, based on the findings in Chapter 13. This figure is, however, known to be understated. Due to inconsistencies in the census data collection, much of the purchase information on service industries was not available. For example, there was no data on Resale purchases and there was very little information on Material and Supply purchases. These two types of purchases were significant in the lodging, recreation, auto repair, and

health care industries.

AGRICULTURE (SIC 01-02)

The amount spent for purchases in agriculture was \$92 billion, based on the findings in Chapter 4. Materials and supplies were the principle type of purchase (47% of the total). Buildings and equipment purchases were the second most important type of purchase (30% of the total). Energy purchases were important in this industry. As a percentage of the total agriculture purchases, energy expenditures were 11 percent of the total. This percentage was third behind transportation carriers (28%) and the utility companies (20%).

TRANSPORTATION CARRIERS (SIC 40-47)

In the three largest transportation carriers: railroads, trucking, and airlines, purchases were \$58 billion, based on the findings in Chapter 8. This figure is known to be understated because the purchase figures for the trucking industry only include regulated trucking firms. Within the larger trucking firms, there was significant subcontract work. This totaled \$9 billion and represented 16 percent of the trucking purchases. This figure is probably higher than for the trucking industry as a whole. The larger trucking companies (i.e. Class I and II firms) may be more likely to subcontract than would the smaller firms or the owner-operators.

COMMUNICATION (SIC 48)

Based on the findings in Chapter 9, the communication industry was the smallest industry to be researched, both in terms of revenues and in terms of the dollar magnitude of purchases (\$25 billion). Within the industry, however, purchases were an important expenditure slightly exceeding wages and salaries.

CONCENTRATION BY BOTH TYPE OF PURCHASE AND BY TYPE OF INDUSTRY

Figure 16-1 graphically presented the dollar relationships of the five purchase types. Materials and Supplies, and Resale purchases dominate. They accounted for 75 percent of all the purchases. Figure 16-2 showed that these two types of purchases are concentrated in manufacturing, wholesale, and retail industries. Manufacturing represents 76 percent of all material and supply purchases. The wholesale and retail trade accounted

Table 16-7: CONCENTRATION OF PURCHASES BY TYPE OF PURCHASE AND TYPE OF INDUSTRY

TYPE OF INDUSTRY/PURCHASE	BILLIONS \$	PERCENT OF TOTAL PURCHASES	CUMULATIVE PCT TOTAL
1. Manufacturing Materials and Supplies	\$990	23.5%	23.5%
2. Wholesale Resales	953	22.6	46.1
3. Retail Resales	720	17.1	63.2
TOTALS	\$2,663	63.2%	

for 89 percent of the resale purchases. A further break out of purchases in Table 16-7 by purchase type and by industry shows that the majority of the purchases occur in three areas: manufacturing material and supply purchases, wholesale resale purchases, and retail resale purchases.

CONCENTRATION FLOW

A review of the purchases in manufacturing, wholesale, and retail shows that similar types of products dominate these industries. These are food products, petroleum products, and automotive related products. Figure 16-3 shows the importance of food purchases in relation to other purchases. (The extreme right bar of the figure shows that food purchases accounted for 20% of the personal consumption expenditures [3].)

Figure 16-4 presents the purchases for automotive related products and Figure 16-5 presents petroleum related purchases. The flow of purchases in food and automotive related products shows a general upward trend from manufacturing to the final consumer. This was not the case in the flow of petroleum purchases (See figure 16-5). The trend decreases from manufacturing to the final consumer. This occurs because a large portion of the petroleum purchases are consumed in transportation, utilities, and in the government (exp. military ships and aircraft). Petroleum is also a major component in many manufacturing industries (exp. plastic and chemical products).

Figure 16-3: FLOW OF FOOD PURCHASES

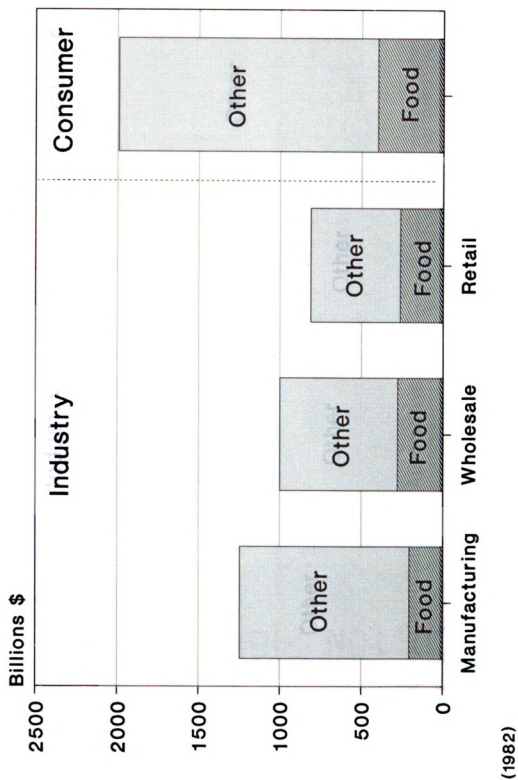
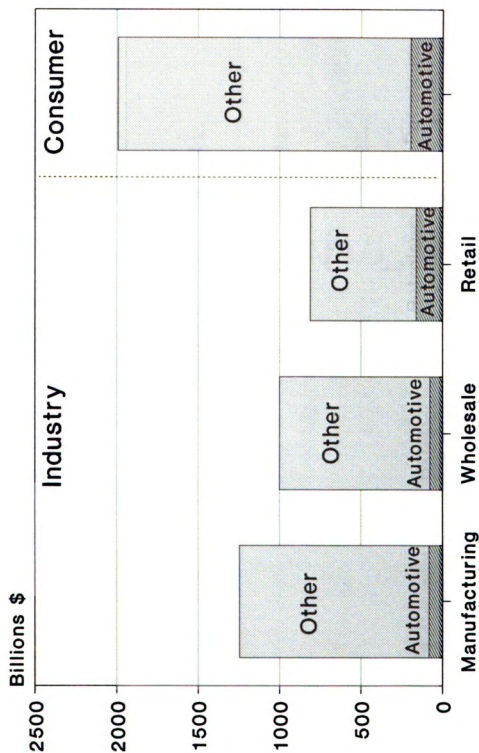
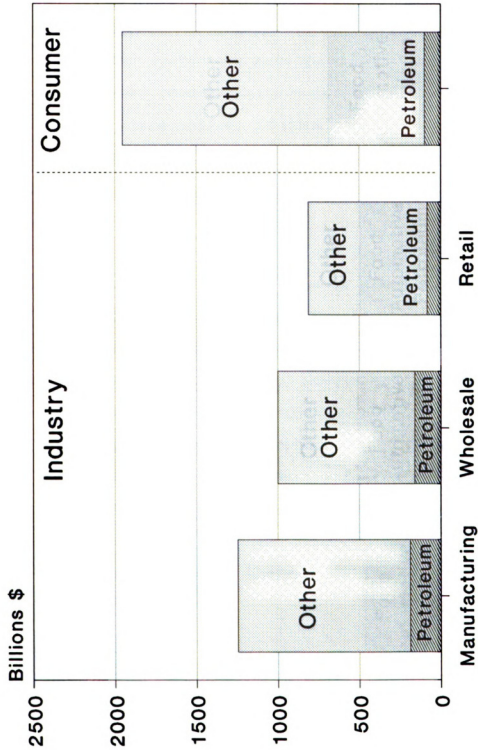


FIGURE 16-4: FLOW OF AUTOMOTIVE PURCHASES



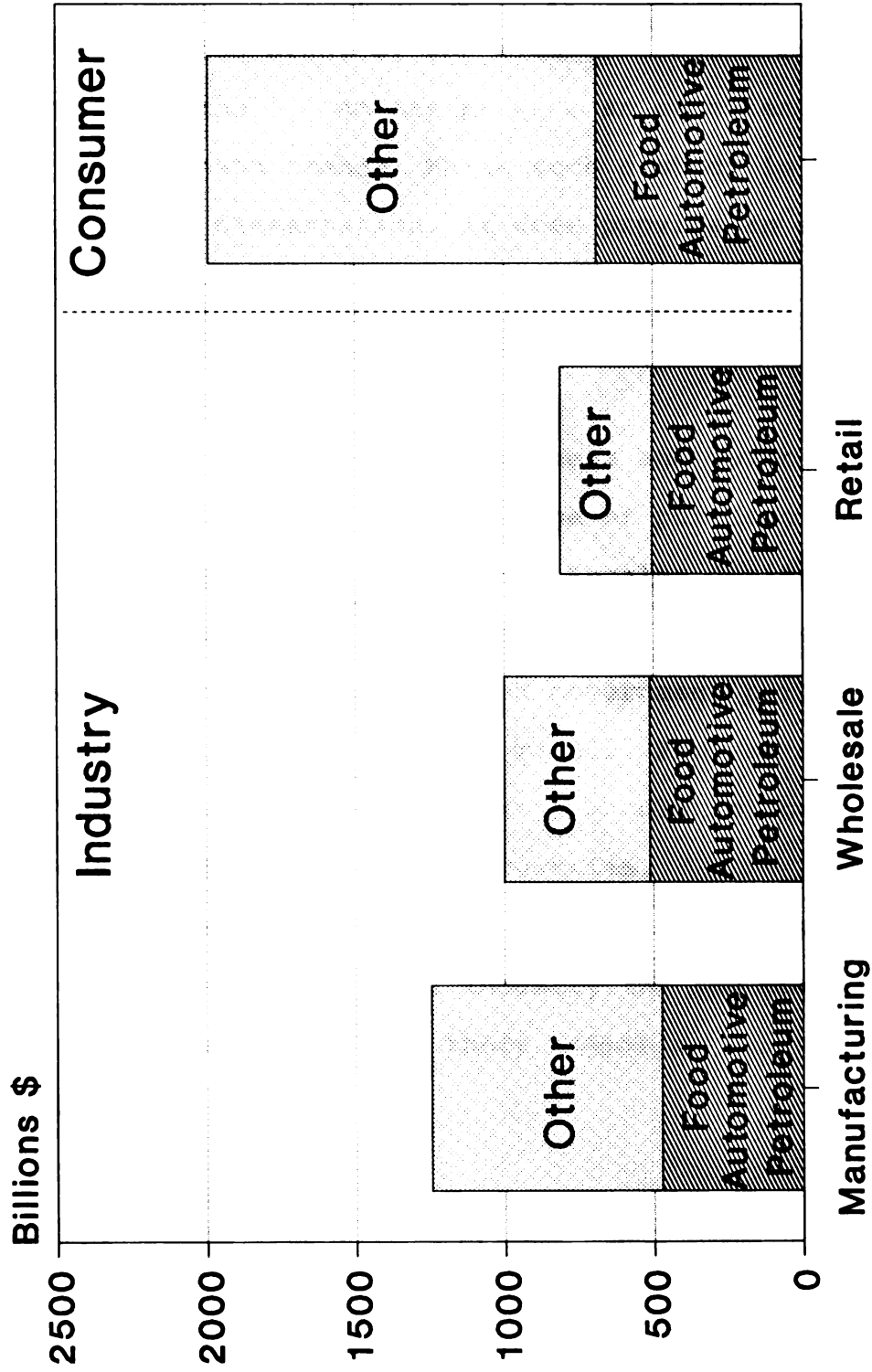
(1982)

Figure 16-5: FLOW OF PETROLEUM PURCHASES



(1982)

Figure 16-6: FLOW OF FOOD, AUTOMOTIVE, AND PETROLEUM PURCHASES



(1982)

Figure 16-6 shows the importance of these three products (food, automotive, and petroleum) when they are combined. A detailed study of the flow of these three products through the system may provide an excellent indicator of business trends. While such a study is beyond the scope of this dissertation, it does provide an excellent area for future research.

CONCLUSIONS

This chapter has shown that business and government purchases are concentrated both by type of purchase and by industry. Materials and Supplies, and Resales dominate the type of purchase categories. The industries that accounted for the majority of the business and government purchases were manufacturing, wholesale, and retail. From an overall business trend perspective, management should follow the purchase changes in these three industries.

Individual managers, however, should assess the composition of their individual industry for the dominate types of purchases both within their companies and within their suppliers.

ENDNOTES

- [1] Carson, Carol S. "Gross National Product and Related Measures." Editors: Frank J. Fabozzi and Harry I. Greenfield. The Handbook of Economic and Financial Measures. (Homewood, IL: Dow Jones-Irwin, 1984). p. 5.
- [2] Mark, Jerome A. "Problems Encountered in Measuring Single- and Multi-factor Productivity." Monthly Labor Review. December, 1986. p. 9.
- [3] Carson, p. 13.
- [4] U.S. Department of Commerce. Statistical Abstract of the United States. (Washington, DC: U.S. Government Printing Office, 1985). p. 589.

CHAPTER 17: COMPARATIVE MEASURES - PURCHASES VERSUS REVENUES, AND WAGES AND SALARIES

INTRODUCTION

The importance of business and government purchases can be illustrated by presenting them within the context of revenues and other expenditures. Tables 17-1, 17-2, and 17-3 show the relationships of expenditures to revenues.

REVENUES

The Revenues for the eleven major industries totaled \$6.9 trillion. In all industries, except governments, revenues represented receipts from the sale of products or services. In governments, revenues primarily came from taxes: individual and corporate income, property, and sales taxes.

Manufacturing revenues ranked first, with 29 percent of the total revenues, followed by wholesale trade with 17 percent, governments also with 17 percent, and retail trade with 15 percent. The service industries, which have recently received much attention, had only 6 percent of the total revenues.

WAGES AND SALARIES

The literature review, in Chapter 2, revealed that management frequently places an inordinate amount of attention on labor costs to the exclusion of other larger cost elements, such as purchases. This research (based on

Table 17-1: BUSINESSES AND GOVERNMENTS: REVENUES & EXPENDITURES (Millions \$)

TYPE OF INDUSTRY	REVENUES	EXPENDITURES		
		Purchases	Wages & Salaries	Other Payments
Agriculture	\$148,254	\$91,659	\$10,835	\$45,760
Mineral	249,999	159,602	35,235	55,162
Construction	310,167	188,671	92,431	29,065
Manufacturing	1,960,207	1,244,946	423,403	291,858
Transportation	111,087	57,656	46,508	6,923
Communication	77,100	25,237	24,776	27,087
Utility	236,937	203,882	16,950	16,105
Wholesale	1,162,814	998,981	88,873	74,960
Retail	1,039,029	811,091	157,250	70,688
Service	417,579	104,243	166,507	146,829
Government	1,146,200	325,071	324,172	496,957
TOTALS: (\$)	\$6,859,373	\$4,211,039	\$1,386,940	\$1,261,394
(%)	100%	61.4%	20.2%	18.4%

Table 17-2: BUSINESSES AND GOVERNMENTS: EXPENDITURES AS A PERCENT OF REVENUES, plus PURCHASE/WAGE AND SALARY RATIO

SIC Code	TYPE OF INDUSTRY	EXPENDITURES			P/W&S \$ RATIO
		Purchases	Wages & Salaries	Other Payments	
01-02 10-14	Agriculture Mineral	61.8% 63.8%	7.3% 14.1%	30.9% 22.1%	8.5 4.5
15-17 20-39	Construction Manufacturing	60.8% 63.5%	29.8% 21.6%	9.4% 14.9%	2.0 2.9
40-47 48	Transportation Communication	51.9% 32.7%	41.9% 32.1%	6.2% 35.1%	1.2 1.0
49 50-51	Utility Wholesale	86.0% 85.9%	7.2% 7.6%	6.8% 6.4%	12.0 11.2
52-59 70-89	Retail Service	78.1% 25.0%	15.1% 39.9%	6.8% 35.2%	5.2 0.6
91-97	Governments	28.4%	28.3%	43.4%	1.0
AVERAGE		61.4%	20.2%	18.4%	3.0

Table 17-3: BUSINESSES AND GOVERNMENTS: PERCENT OF ALL
REVENUES BY INDUSTRY AND EXPENDITURE TYPES

TYPE OF INDUSTRY	TOTAL REVENUES BY TYPE OF INDUSTRY	EXPENDITURES		
		Purchases	Salaries	Wages & Other Payments
Agriculture	2.2%	1.3%	0.2%	0.7%
Mineral	3.6%	2.3%	0.5%	0.8%
Construction	4.5%	2.8%	1.3%	0.4%
Manufacturing	28.6%	18.1%	6.2%	4.3%
Transportation	1.6%	0.8%	0.7%	0.1%
Communication	1.1%	0.4%	0.4%	0.4%
Utility	3.5%	3.0%	0.2%	0.2%
Wholesale	17.0%	14.6%	1.3%	1.1%
Retail	15.1%	11.8%	2.3%	1.0%
Service	6.1%	1.5%	2.4%	2.1%
Government	16.7%	4.7%	4.7%	7.2%
TOTAL BY TYPE OF EXPENDITURE	100.0%	61.4%	20.2%	18.4%

the findings presented in Tables 17-1 and 17-2) has established that the expenditures for purchases in eleven industries was three times greater than the amount spent for wages and salaries.

In 1982 wages and salaries were \$1.4 trillion and accounted for 20 percent of all the expenditures in businesses and governments. In contrast, total business and government purchases were \$4.2 trillion.

Manufacturing industries and governments together made up the majority of the total business and government labor expenditures (54%). Manufacturing had expenditures of \$423 billion for wages and salaries (31% of the total) and governments had expenditures of \$324 billion (23% of the total). Services were third with wage and salary expenditures of \$167 billion (12% of the total).

To establish the actual importance of business and government purchases relative to labor, a purchase/wage and salary dollar ratio was calculated for each of the two-digit industries and for the 448 four-digit manufacturing industries.

In this ratio, the purchase figure represented the total dollar purchases (materials and supplies, energy, resales, buildings and equipment, and other purchases). The wages and salaries represented the labor expenditures for all employees (hourly and salaried) as well as the associated fringe benefits.

In the eleven industries that were researched, the

overall purchase/wage and salary dollar ratio was 3-to-1.

The three industries with the highest ratios were:

1. utilities (12-to-1), 2. wholesale trade (11.2-to-1), and agriculture (8.5-to-1). The manufacturing ratio (2.9-to-1) was, in fact, slightly less than the overall average of 3-to-1. Table 17-4 presents the ratios for each of the eleven industries.

The only ratio that was less than 1-to-1 was in the service industry (0.6-to-1). As was stated in Chapter 13, the service industry dollar purchase figure is known to be understated due to incomplete material and supply, and resale purchase information. If full purchase data had been available for the service industries, it might have shown that purchases exceeded wages and salaries.

Table 17-4: INDUSTRY PURCHASE/WAGE AND SALARY DOLLAR RATIOS

Industry	Purchase/Wage and Salary Dollar Ratio
1. Utility	12.0-to-1
2. Wholesale	11.2-to-1
3. Agriculture	8.5-to-1
4. Retail	5.2-to-1
5. Mineral	4.5-to-1
6. Manufacturing	2.9-to-1
7. Construction	2.0-to-1
8. Transportation	1.2-to-1
9. Government	1.0-to-1
10. Communication	1.0-to-1
11. Service	0.6-to-1
ALL INDUSTRIES	3.0-to-1

Manufacturing Purchase/Wage and Salary Dollar Ratios.

The figures in Table 17-4 show that overall manufacturing had a purchase/wage and salary ratio of 2.9-to-1. A review of the 448 manufacturing industries showed that some were highly purchase intensive relative to wages and salaries. The highest of these are presented in Table 17-5. Of the ten industries with the highest purchase/wage and salary ratios, eight were in food manufacturing. The other two were petroleum refining and tobacco stemming.

Table 17-5: HIGHEST PURCHASE/WAGE AND SALARY DOLLAR RATIOS IN MANUFACTURING

Industry	Purchase/Wage and Salary Dollar Ratio
1. Petroleum Refining	43.1-to-1
2. Soybean Oil Mills	35.6-to-1
3. Creamery/Butter	31.0-to-1
4. Vegetable Oil Mills	20.4-to-1
5. Tobacco Stemming and Redrying	18.4-to-1
6. Cheese	16.0-to-1
7. Rice Milling	13.5-to-1
8. Prepared Feeds	12.7-to-1
9. Meat Packing Plants	12.6-to-1
10. Roasted Coffee	11.8-to-1

Of the 448 manufacturing industries, there were only 18 that had wage and salary expenditures greater than purchase expenditures. These industries are presented in Table 17-6. The fact that only four percent of the 448 manufacturing industries had wages and salaries greater than purchases highlights the importance of purchases as a an area for management attention. (For further details see Chapter 7.)

One final point should be made concerning wages and

salaries. Labor figures might be more correct than the purchase information. Due to Social Security, businesses and governments are required to keep accurate and standardized figures on their employees. There is no comparable requirement for purchase expenditures. Ironically, many labor benefits are actually purchases (medical, dental, and insurance packages). Unfortunately, these "benefit" purchases could not be separately broken out. They are included within the wages and salaries figures.

**Table 17-6: LOWEST PURCHASE/WAGE AND SALARY DOLLAR RATIOS
IN MANUFACTURING**

Industry	Purchase/Wage and Salary Dollar Ratio
=====	=====
431. Small Arms	0.9-to-1
432. Electronic Resistors	0.9-to-1
433. Lace Goods	0.9-to-1
434. Misc Nonelectrical Machinery	0.9-to-1
435. Process Control Instruments	0.9-to-1
436. Porcelain Electric Supplies	0.9-to-1
437. Machine Tool Accessories	0.9-to-1
438. Lithographic Platemaking	0.8-to-1
439. Engraving	0.8-to-1
440. Malleable Iron Foundries	0.7-to-1
441. Special Dies, Tools, Jigs	0.7-to-1
442. Bookbinding	0.6-to-1
443. Earthenware	0.6-to-1
444. Photoengraving	0.6-to-1
445. Industrial Patterns	0.5-to-1
446. Vitreous China Utensils	0.5-to-1
447. Typesetting	0.5-to-1
448. Ordnance and Accessories	0.4-to-1

OTHER PAYMENTS

The expenditures for Other Payments represent all expenses not covered under purchases or wages and salaries. The following items would be representative of this

category: taxes, depreciation, interest paid, dividends, insurance, and retained earnings. In governments, this represents transfer payments, grants, and interest on the debt.

The Other Payment figures were derived by subtracting the sum of purchases plus wages and salaries from revenues. Total Other Payments came to \$1.3 trillion, which was 35 percent of the expenditures.

Government other payments were the largest both in terms of dollar magnitude and as a percent of revenues. Manufacturing was second in terms of dollar magnitude and services were third. In services, and to a lesser extent in other industries, the other payments figure is probably overstated. As discussed earlier in Chapter 13, many of the service purchases (resales, and materials and supplies) could not be entirely accounted for. Consequently, many of these "unaccounted for" purchases were included within the other payments category by default.

For example, in services, which were the most labor intensive industries, wages and salaries did not make up the majority of the expenditures. They represented only 40 percent. The lack of complete purchase information in the service industries distorted the importance of wages and salaries relative to purchases. The purchases that were unaccounted for, ended up as part of the other payments category, thereby, making the other payments category larger than it would otherwise be.

SUMMARY

This research has shown that purchases were the largest expenditure by American businesses and governments in 1982. Purchases accounted for 61% of all the revenues for the eleven industries that were researched in this dissertation. The expenditures for purchases exceeded the expenditures for wages and salaries by a ratio of three-to-one. Services were the only industry where the expenditures for wages and salaries exceeded purchases.

ENDNOTES

- [1] Carson, Carol S. "Gross National Product and Related Measures." Editors: Frank J. Fabozzi and Harry I. Greenfield. The Handbook of Economic and Financial Measures. (Homewood, IL: Dow Jones-Irwin, 1984). p. 5.
- [2] Kendrick, John W. Economic Accounts and Their Uses. (New York: McGraw-Hill, 1972). p. 22.
- [3] Carson p. 23.

CHAPTER 18: PURCHASES IN THE CONTEXT OF TOTAL BUSINESS/ECONOMIC ACTIVITY

INTRODUCTION

This chapter will establish the relationship between purchases of businesses and governments, and Gross National Product (GNP). There will be a discussion of business operational purchases and specific components of GNP: capital expenditure purchases; government purchases; and consumer purchases. The relationship of purchases by business, government, and personal consumer will be presented using the framework established in Figure 2-1 of Chapter 2. This will be followed by a discussion of the theoretical framework for business/economic activity that was originally presented in Figure 1-1 of Chapter 1. The chapter will conclude by addressing the relationship of purchases to total business/economic activity.

BUSINESS AND GOVERNMENT PURCHASES VS GROSS NATIONAL PRODUCT

"GNP is the most widely used measure of the nation's production [1]." Due to the frequent use of GNP in discussions of business/economic activity, it is appropriate to show how total business and government purchases relate to GNP.

The Commerce Department defines GNP as the "...total national output of goods and services valued at market prices. GNP can be viewed in terms of expenditure categories which comprise purchases of goods and services by consumers

and government, gross private domestic investment, and net exports of goods and services. The goods and services included are largely those bought for final use in the market economy [2]."

Note that GNP by definition considers items for final use. GNP does not consider many of the economic activities that occur prior to final consumption.

The economist Wallace Peterson states that GNP "...is the monetary value of all goods and services produced in the economy in a current time period. ...GNP is obtained by adding up the expenditures made for the vast variety of goods and services produced and sold in the economy in a given period of time [3]."

Kendrick [4] states that according to the U.S. Department of Commerce, business purchases of goods and services are excluded from GNP to avoid double counting. The rationale for their exclusion is based on the premise that "...the value of the raw materials or semifinished goods purchased by business for further processing is already included in the value of the final products into which the goods are incorporated, and their cost should not be added to the value of [the] final product."

Peterson [5] makes a point of discussing "appropriate" and "inappropriate" [that is, business] purchases in the calculation of GNP. "...in the adding up to get GNP figures, intermediate products purchased by business firms are not counted since their value is included in the price of goods

and services destined for sale to the ultimate user."

The GNP emphasis on final goods and services ignores a substantial dollar magnitude of economic activity in the form of business purchases that occur prior to final sales. This dissertation looked at purchases that were both part of the GNP calculations and also (as Peterson would say) "inappropriate" business purchases. The purpose of this dissertation was neither to challenge the concept, nor the methodology, for calculating GNP. Rather, the purpose was to calculate the magnitude and components of business and government purchases irrespective of GNP.

Government and Business Purchases Included in GNP

Although the majority of the \$4,211 billion in total business and government purchases calculated in this research (See Chapter 15) were excluded from the \$3,073 billion 1982 GNP figure [6], there was some overlap in the two calculations. The purchases that were included both in this research and in GNP totaled \$673 billion. The areas of overlap were as follows: 1. government purchases totaling \$325 billion (See Chapter 14), and 2. \$348.3 billion of business capital expenditures (buildings, \$141.9 billion and equipment, \$206.4 billion) [6].

The GNP figure for business capital expenditures of \$348.3 billion, differs from this research business Buildings and Equipment purchase figure of \$426 billion for a number of reasons. As was discussed in Chapters 3 and 16, Buildings and Equipment in this research includes: 1.

purchased repair services to, and 2. rental payments for, fixed assets, such as buildings, structures, machinery and equipment. The GNP capital expenditure figure, however, does not include rentals and repairs.

It was noted in chapter 3 that GNP figures are based on data pulled together from diverse sources that undergo considerable processing. Gaps in information may have to be filled by referring to sources that are themselves incomplete. Conflicting evidence may be received from different sources or from slightly differing periods. George Jaszi felt that the GNP statistics provided a logical framework for the order-of-magnitude analysis of the major forces that determine the working of the economy.

Consequently, using the Jaszi terminology, both figures are "order-of-magnitude" estimates for buildings and equipment purchases.

When government purchases and business capital expenditures are removed from the \$4.2 trillion total business and government purchase figure, the result is \$3.56 trillion. This \$3.56 trillion figure represents the dollar magnitude of business purchases excluded from GNP calculations. It should be noted that the excluded purchases (\$3.56 Trillion) were, in fact, greater than total GNP by about \$490 billion.

Government Purchases

The definition of the term "government purchases" used in this dissertation differs from that used by the U.S.

Department of Commerce. According to the U. S. Department of Commerce, government purchases of goods and services include not only goods and services, but also all government employee compensation [7]. The compensation portion includes all civil service and military employees at the local, state, and federal levels of government.

Of the \$649 billion that constitutes the government portion of GNP (21% of the total), only \$325 billion (or 10.5% of the total GNP) were for purchases of "goods and services." It is the "goods and services" portion of GNP (\$325 billion) that overlaps with this research on total business and government purchases. The remaining \$324 billion in GNP government "purchases" (for government employee compensation) was addressed in the wages and salaries section of Chapter 17.

Capital Expenditure Purchases (Buildings and Equipment)

Capital expenditures fall under the major component of GNP called nonresidential fixed investment. Capital expenditures are composed of structures and producers' durable equipment. Capital expenditures frequently receive extensive attention by economists. For example, according to Peterson: "Investment expenditures involve the acquisition of capital goods, the procreative element in an industrial society." He also states that, "Investment expenditures play an especially strategic role in the economy, because changes in both income and employment are more likely to result from fluctuations in spending for capital goods than from

fluctuations in spending for consumer goods." Peterson goes on to write that "Students of change and growth have long been aware that fluctuations in capital goods production are more violent than fluctuations in the production of consumer goods and services [8]."

The emphasis on the purchase of capital expenditures continues even though other types of purchases, such as materials and supplies, represent a far larger annual investment. For example, in the manufacturing industry, capital expenditures for buildings and equipment were \$81 billion in 1982 (See Chapter 7). In contrast, the investment that the manufacturing industry made in material and supply purchases was \$990 billion (twelve times the amount spent on capital expenditures).

In the wholesale (Chapter 11) and retail (Chapter 12) industries, capital expenditures, as in manufacturing, represent only a small percentage of the total purchases (2%). These two industries together had total resales purchases of \$1.67 trillion. In contrast, wholesale/resale capital expenditure purchases were \$35.4 billion. The investment in resale purchases in the wholesale/resale industries was 47 times greater than capital expenditures.

Consumer Purchases

Due to the emphasis that is placed on consumer purchases by economists, it is appropriate to discuss some of the assumptions (and misconceptions) associated with this component of GNP. The latter part of this chapter will then

show how personal consumption (consumer purchases) compares to "business and government consumption."

Personal consumption expenditures are the largest component of GNP, accounting for almost two thirds of the total. They represent goods and services purchased by individuals (including the net purchase of used goods), operating expenses of nonprofit institutions, and the value of food, clothing, rent of dwellings, and financial services received "in kind" by individuals. Of the total personal consumption purchases, food accounted for 20%, housing 17%, household operation (which is mainly utilities) 7%, and clothing 6% [9].

Leftwich [10] writes: "Consumption goods and services are those placed in the hands of consumers during the year to be used directly in satisfying consumer wants. They are divided into three groups: (1) durable goods, (2) nondurable goods, and (3) services. Durable goods include such items as automobiles, furniture, and household equipment -- products that are expected to last the consumer for several years. The nondurable goods group is composed of items used up more rapidly -- clothing, food, gasoline, and the like. A wide variety of services can be listed. Some, such as barbers and beauty services, are readily identified and their values easily determined. The quantities of others, such as household services are more difficult to estimate. All of these items are valued at their current market prices in estimating personal consumption for any given year."

BUSINESS OPERATIONAL PURCHASES

The concept of business operational purchases addresses the majority of the business purchases that are down played in the economic literature. Chapter 2 introduced a framework (Figure 2-1) that presented the relationship of business purchases (both operational and capital equipment) to purchases by governments and personal consumers. The "Purchases by American Businesses, Governments, and Personal Consumers" framework is now presented as Figure 18-1 with dollar figures for each component.

To assist in comparing the findings of this research with economic literature, a criteria for the framework in Figure 2-1 was the time frame in which a product or service was "consumed". For example, among personal consumers, nondurables (\$761 Billion) and services (\$986 Billion) were "consumed" in one year or less. In contrast, durables (automobiles, appliances, etc.) (\$245 Billion), and residential investment (houses) (\$91 Billion) [11] were "consumed" in greater than one year.

On the "Business Consumption" side of the framework, the economic literature focuses on the capital expenditures: buildings (\$142 Billion), equipment (\$206 Billion) [11], and the rental and repair of capital equipment (\$78 Billion) which were "consumed" in greater than one year. Those business purchases that were consumed in one year or less were excluded from the economic literature (See Chapter 2). This research defines those business purchases that were

Figure 18-1: Purchases By American Business, Government, and Personal Consumers: 1982, (Billions \$) and Percent of Total

TIME / TYPE	Business *	Government	Personal	TOTALS
Consumption Time Frame:				
One Year Or Less	Operational Purchases: 1. Materials and Supplies 2. Energy 3. Resales 4. Other \$3,460 55.0%	Operational Purchases: 1. Materials and Supplies 2. Energy 3. Resales 4. Other \$207 3.3%	Nondurables and Services: 1. Food 2. Clothes 3. Energy 4. Other \$1,747 27.8%	\$5,414 86.1%
Greater Than One Year	Capital Expenditures: 1. Buildings 2. Equipment \$426 6.7%	Capital Expenditures: 1. Buildings, Etc 2. Equipment \$118 1.9%	Durables and Residential: 1. Automobiles 2. Appliances 3. Housing \$336 / 5.3%	\$880 13.9%
TOTALS	\$3,886 61.7%	\$325 5.2%	\$2,083 33.1%	\$6,294 100%

* Excludes Financial Institutions

"consumed" in one period, or less, as "Business Operational Purchases." The business operational purchases (\$3,460 Billion) include materials and supplies, energy, resales, and other items, including many purchased services.

The government (local, state, and federal) portion of the framework is classified in the same manner as the business portion. They are both composed of operational and capital equipment purchases. Operational purchases by governments were \$207.4 billion and capital equipment purchases were \$117.7 billion.

Figure 18-1 shows that the business operational cell was the largest. Note: Business operational purchases were nearly twice as large as the personal consumption counterpart of nondurables and services, which totaled \$1,747 billion.

Also, within the major category of "Business Consumption," business operational purchases were over eight times larger than the business capital expenditures of \$426 billion. It should be noted that five of the six cells are included in GNP calculations. The one cell that is not included (business operational purchases) is the largest and amounts to 55% of the total purchases by business, government, and personal consumers. This significant portion of business activity has been overlooked by many economic writers. Business operational purchases totaled \$3.46 trillion in 1982. In contrast, personal consumer purchases for nondurables and services were only \$1.7 trillion.

Personal Consumption Makes Up Two Thirds of GNP
(But Not of Total Economic Activity)

Care must be taken so as to not confuse GNP and total economic activity. There is a marked difference between these two concepts, as this research has illustrated. Keiser writes: "GNP does not account for all the spending in our economy. The amount of money spent by businesses on raw materials, labor, etc., does not show up as business expenditures, but rather are counted in the price that consumers pay for automobiles, refrigerators, etc. [12]."

There are, however, frequent errors made regarding these concepts in the media and even in economic publications. It should be emphasized that personal consumption expenditures are equal to about two-thirds of the final product or GNP, but not two-thirds of total economic activity. In spite of this fact, personal consumption is frequently, but erroneously, cited as making up the majority of the nation's total economic activity. For example, Dye, Moore, and Holly in their book: Economics: Principles, Problems, and Perspectives, wrote: "Consumption expenditures, the purchase of goods and services by individuals and households, for their own satisfaction, constitute the largest single category of spending in the American economy"[13]. In the book Understanding Macro-Economics, Heibroner wrote "Consumption is the largest sector of economic activity..."[14].

This research has shown, in Figure 18-1, that personal

consumption purchases were significantly less than business purchases (33% versus 62% of the total purchases). In terms of total economic activity, personal consumption makes up an even smaller percentage.

THEORETICAL FRAMEWORK (Revisited)

Chapter 1 introduced the theoretical framework for this dissertation. Based on the findings in Chapters 4 through 14, the information needed to complete the framework is now available. Figure 18-2 presents information on both GNP and business purchases.

The top six portions of the framework represent the components of GNP: Net Exports (\$17 billion), Change in Business Inventories (\$-24 billion), Personal Consumption (\$1,992 billion), Personal Residential Investment (\$91 billion), Government "Purchases" which are composed of 1. Government Employee Compensation (\$324 billion) and 2. Government Purchases (\$325 billion), and Business Capital Expenditures (\$348 billion).

The last two items, listed above, overlap with the focus of this research: purchases by businesses and governments. The GNP government purchase figure presented above agrees with the government purchase total presented in Chapter 14. However, the GNP capital expenditure figure of \$348 billion differs from the business capital expenditures figure in this research of \$426 (See Figure 18-1) due to the inclusion of expenses for the rental and repair of capital

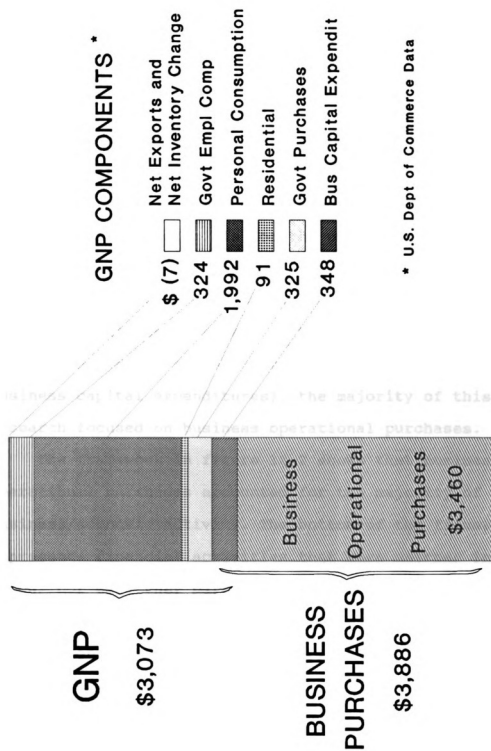


Figure 18-2: Business Purchases and GNP in 1982 (Billions \$)

equipment (\$78 billion) included in the later figure.

It should be noted that the change in business inventories (\$-24.5 billion) was a negative number. This research did not address purchases that were made in prior years, only those purchases made in 1982. The overall inventory change in 1982, however, was found to be less than 1% of the total purchasing costs. Therefore, the amount of purchased cost that might be related to inventory changes was regarded as negligible for the purpose of this research.

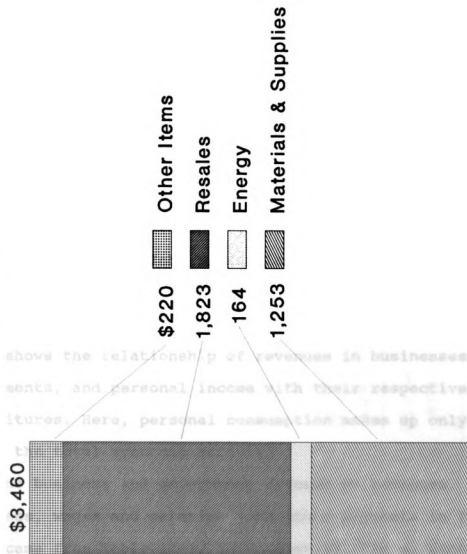
The completed framework in figure 18-2 shows that GNP represents less than half of the total business/economic activity. While the research of this dissertation included some of the GNP components (government purchases and business capital expenditures), the majority of this research focused on business operational purchases.

The framework in figure 18-2 shows that business operational purchases accounted for the majority of the business/economic activity. The bottom of the framework represents financial activities that were neither included in GNP nor were they part of this research.

An objective of this dissertation was to estimate the dollar magnitude of purchases by American businesses and governments. In addition, this research sought to estimate the dollar magnitude of business purchases that were excluded from the GNP figures. Figure 18-2 graphically illustrates a summary of these findings.

Figure 18-3 presents a breakout of the business

**Figure 18-3: Total Operational Purchases
By Businesses In 1982 (Billions \$)**



operational purchases portion of Figure 18-2. The total operational purchases by businesses in 1982 was \$3,460 billion. This was composed of: 1. Materials and Supplies (\$1,253 Billion), 2. Energy (\$164 Billion), 3. Resales (\$1,823 Billion), and 4. Other Items (\$220 Billion). The business operational figures were obtained from Table 15-1.

TOTAL BUSINESS/ECONOMIC ACTIVITY

Table 18-1 was developed jointly by the author of this dissertation and Dr. John H. Hoagland. It expands upon the relationship presented in Figure 18-2 by showing purchases in the context of total business/economic activity. The table shows the relationship of revenues in businesses, governments, and personal income with their respective expenditures. Here, personal consumption makes up only about 22% of the total economic activity.

The business and government figures on revenues, purchases, wages and salaries, and other payments in Table 18-1, came from Table 17-1, in Chapter 17. The personal revenues (or income) and personal purchases (or personal consumption expenditures) figure came from the article "Gross National Product and Related Measures" by Carson [15]. The personal other payments figure of \$496 billion was derived using the same methodology established in Chapter 3. It is the difference between the revenue figure of \$2,579 billion and the purchase figure of \$2,083 billion. The wages and salaries paid by personal consumers is listed as "not

Table 18-1: TOTAL BUSINESS/ECONOMIC ACTIVITY: 1982, (Billions \$)
and Percent of Total Revenues

BUSINESS/ ECONOMIC ACTIVITY	REVENUES	EXPENDITURES		
		PURCHASES	WAGES AND SALARIES PAID	OTHER PAYMENTS
BUSINESS *	\$5,713 60%	\$3,886 41%	\$1,063 11%	\$764 8%
GOVERNMENT	\$1,146 13%	\$325 4%	\$324 4%	\$497 5%
PERSONAL	\$2,579 27%	\$2,083 22%	N/A	\$496 5%
TOTALS	\$9,438 100%	\$6,294 67%	\$1,387 15%	\$1,757 18%

• Excludes Financial Institutions

available" (N/A). This category represents wages paid for work such as: wall papering, building a deck, or baby sitting.

Table 18-1 shows that personal consumption is neither the largest sector of economic activity, nor is it the largest single category of spending in the American economy. These two titles rightfully belong to: business purchases.

CONCLUSIONS

This chapter firmly established the relationship between the purchases of businesses, governments, and personal consumers. The business sector made up the overwhelming majority of the purchases (62% of the total) in 1982. Personal consumer purchases, in contrast, made up only 33% of the total.

This chapter also established the relationship between purchases, Gross National Product (GNP), and total business/economic activity. In 1982, GNP was \$3.0 trillion. However, the GNP figure excludes the vast majority of America's business purchases. Figure 18-1 presented a purchase matrix that addressed business, government, and personal consumer purchases. The one cell not included in GNP calculations was the largest cell: business operational purchases, which totaled \$3.46 trillion. The business operational purchases figure exceeded GNP by \$490 billion.

Table 18-1 presented purchases in the context of total business/economic activity. Contrary to many statements in

the economic literature and in the media, business operational purchases made up the largest single category of spending in the U.S. economy.

ENDNOTES

- [1] U.S. Department of Commerce. Bureau of Economic Analysis. GNP: An Overview of Source Data and Estimating Methods. Methodology Paper Series MP-4. Washington, DC: U.S. Government Printing Office, September 1987. p. 1.
- [2] U.S. Bureau of the Census, Statistical Abstract of the United States: 1986. (106th edition.) Washington, DC, 1985. p. 427.
- [3] Peterson, Wallace C. Income, Employment, and Economic Growth. (New York: W. W. Norton & Co., 1984). p. 5.
- [4] Kendrick, John W. Economic Accounts and Their Uses. (New York: McGraw-Hill, 1972). p. 22.
- [5] Peterson, p. 5.
- [6] Carson, Carol S. "Gross National Product and Related Measures." Editors: Frank J. Fabozzi and Harry I. Greenfield. The Handbook of Economic and Financial Measures. (Homewood, IL: Dow Jones-Irwin, 1984). p. 5.
- [7] U.S. Department of Commerce. Bureau of Economic Analysis. GNP: An Overview of Source Data and Estimating Methods. p. 3.
- [8] Peterson, p. 165.
- [9] Carson, p. 13.
- [10] Leftwich, Richard. An Introduction to Economic Thinking. (New York: Holt, Rinehart, and Winston, Inc., 1969) p. 510.
- [11] Carson, pp. 5, 9, and 12.
- [12] Keiser, Norman F. Economics: Analysis and Policy. (New York: John Wiley and Sons, Inc., 1965) p. 192.
- [13] Dye, Howard S., Moore, John R. and Holly, J.F. Economics: Principles, Problems, and Perspectives. (Boston, MA: Allyn and Bacon, Inc., 1966). p. 39.

- [14] Heibroner, Robert L. Understanding Macro-Economics.
(Englewood Cliffs, NJ: Prentice-Hall, Inc., 1972). p.
85.
- [15] Carson, p. 5.

CHAPTER 19: CONCLUSIONS AND RECOMMENDATIONS

INTRODUCTION

This final chapter will summarize the significant findings of chapters 4 through 18. Initially, this chapter will readdress the five hypotheses (first presented in chapter 3) to determine whether they should be accepted or rejected. Next, the chapter will present Significant Other Findings and Potential Implications of this Research. This chapter will then conclude with sections on Recommendations and Areas for Future Research.

HYPOTHESES

The five hypotheses that directed this research will now be addressed to determine whether they should be accepted or rejected.

Hypothesis 1:

Purchases for materials and supplies, and resale purchases constitute the largest portion of total purchases by American businesses and governments.

There were five purchase types that were researched: materials and supplies, energy, resales, buildings and equipment, and other items. Of these, purchases for materials and supplies and resale purchases collectively accounted for 75% of the \$4.2 trillion in purchases for the eleven industries researched in this dissertation.

Materials and supplies made up 31 percent of the total

purchases. The category material and supply purchases was the most significant type of purchase in the following industries: agriculture, mineral, construction, and manufacturing.

Resale purchases, at \$1.8 trillion, were the largest type of purchase and made up 44% of the total business and government purchases. The vast majority of the resale purchases (89%) were in the wholesale and retail industries.

Based on the findings presented in chapter 16 of this research, hypothesis one is accepted.

Hypothesis 2:

The dollar magnitude of purchases for materials and supplies is considerably greater than purchases for buildings and equipment.

In the eleven industries that were researched, the purchase of materials and supplies (\$1.3 trillion) was 2.4 times greater than purchases for buildings and equipment (\$.544 trillion). Building and equipment purchases includes capital equipment, and the rentals and repairs of capital equipment.

In the manufacturing industry, capital expenditures for buildings and equipment were \$81 billion in 1982. In contrast, the investment that the manufacturing industry made in material and supply purchases was \$990 billion (twelve times the amount spent for capital equipment).

Based on the findings in chapters 15 and 18, hypothesis two is accepted.

Hypothesis 3:

The dollars spent for purchases exceed the dollars spent for wages and salaries for most American businesses and governments.

Chapter 17 showed that purchase expenditures were greater than the expenditures for wages and salaries in ten of the eleven industries researched. Only among the service industries were labor expenditures greater than purchases.

Although manufacturing had the most dollars spent for purchases, this was not the most purchase intensive industry. Based on the industry purchase/wage and salary dollar ratios presented in chapter 17, the most purchase intensive industries were: utilities (12-to-1), wholesale (11.2-to-1), and agriculture (8.5-to-1). The average purchase/wage and salary dollar ratio for all eleven industries was 3.0-to-1. Manufacturing, at 2.9-to-1, was actually slightly less than the industry average.

Therefore, based on the findings in chapter 17, hypothesis three is accepted.

Hypothesis 4:

Purchases are the largest dollar component of expenditures by American businesses and governments.

Based on the findings in chapter 17, there were \$6.9 trillion in revenues for the eleven industries that were researched. Purchases accounted for 61% of all the expenditures. Wages and salaries accounted for 20.2% and all other expenditures accounted for 18.4% of the revenues.

Therefore, hypothesis 4 is accepted.

Hypothesis 5:

The total dollar magnitudes of purchases by American businesses exceeds gross national product (GNP).

In 1982 GNP was \$3.1 trillion. This was substantially less than the \$4.2 trillion purchase figure that was derived in this research. Chapter 18 showed that GNP is only a summary of part of the nation's economic activity, representing the market value of the final sales of goods and services. The vast majority of the business purchases are excluded from GNP calculations.

The GNP figures represent the sum of personal consumption expenditures, gross private domestic investment, net exports of goods and services, and government purchases of goods and services. Of these components, the only purchases that were included in GNP were the following: 1. all government purchases, \$325 billion (this excludes government employee compensation), and 2. private business capital expenditures, \$348.3 billion (structures, \$141.9 billion and equipment, 206.4 billion).

The total purchases by business and governments, that were included in GNP equaled \$673.3 billion. This figure represented only 16% of the estimated total \$4.2 trillion purchase figure. When all GNP purchases are removed from the purchase total, the result is \$3.5 trillion. These purchases were designated as business operational purchases in this dissertation. Their relationship to other purchases

was presented in figures 2-1 and 18-1.

Therefore, Hypothesis 5 is accepted. Business operational purchases (those excluded from GNP) were greater than GNP by \$500 billion in 1982.

SIGNIFICANT OTHER FINDINGS

In addition to the hypotheses findings discussed above, there were numerous other findings worthy of discussion.

Concentration of Purchases

One of the additional findings of this research was the degree to which purchases were concentrated by commodity and within industries.

In manufacturing, purchases were analyzed at the four digit SIC level. Of the 448 industries in manufacturing, just 32 industries accounted for 50% of all the manufacturing purchases. Only four industries accounted for 25% of all manufacturing purchases: 1. petroleum refining (15%), 2. motor vehicles (4.7%), 3. meat packing plants (3.2%), and 4. steel mills (2.1%).

At the two digit SIC level, four of the twenty manufacturing industries accounted for over 50% of all manufacturing purchases. These were: 1. food (16.3%), 2. petroleum (15.5%), 3. transportation (10.5%), and 4. chemicals (8.5%). It should be noted that this relationship continued in the wholesale and retail industries as well. This finding suggests that a detailed study of the flow of these products may provide an excellent indicator of

business trends. Although such a study was beyond the scope of this dissertation, it does provide an excellent area for future research.

Business Purchases and Total Spending

Contrary to many statements in the economic literature and in the media, business operational purchases made up the largest single category of spending in the U.S. economy. In addition, this research has shown that business purchases were the largest sector of business/economic activity. The relationship of purchases to total business/economic activity was presented in Table 18-1. Business purchases accounted for 41% of the total business/economic activity compared to 22% for personal consumers.

Resale Purchases

Resale purchases were not restricted to Wholesale and Retail trade. There was a total of \$200 billion in resale purchases in the following industries: manufacturing, utilities, services, and governments. This figure is a conservative estimate, since there was incomplete resale purchase data for the service industries. In addition, military resale purchases, which were estimated to be over six billion dollars, were excluded from the census figures.

One surprising finding was that wholesale resale purchases were greater than retail resale purchases by \$233 billion. This apparent discrepancy can be explained by the fact that the retail trade industry sells merchandise for personal or household consumption. In contrast, the

wholesale trade industry, in addition to selling to retail trade, also sells to service industries, institutions, manufacturing firms, governments, and to contractors. Also, many wholesale firms operate as retail firms and sell merchandise directly for personal or household consumption.

Government Purchases

There were two interesting findings on government purchases. The first deals with the way the National Income and Product Accounts treat government purchases. From a purchasing perspective, the GNP terminology "government purchases of goods and services" is a misnomer. Besides including what is traditionally viewed as purchases, the GNP figure for "purchases" includes all government (local, state, and federal) employee compensation. In fact, the government employee compensation accounted for slightly less than 50% of the total "government purchases goods and services" component of GNP in 1982.

The second finding deals with the breakout of purchases at the various levels of government. This research showed that purchases at the state and local level were actually greater than at the federal level by \$10 billion dollars.

Subcontract Purchases

Though not intended to be part of this dissertation, subcontract purchases proved to be substantial (\$133 billion). In manufacturing this was \$31 billion, in construction it was \$78 billion, and in the trucking industry it was at least \$9 billion (Class I and II only).

Purchased Services

Purchased services figures were also a large and understated type of purchase. Jerome Mark [1] stated that "directly collected data on purchased business services are relatively scant in the United States. The inclusion of purchased services is important because there is ample evidence of increased use by industry of such services." Examples of purchased services would include such areas as: consulting, accounting, legal, security, engineering, and janitorial services.

This research verified Mark's statement. There was little information on purchased services other than for advertising and communication. The only industry which did have extensive purchased service figures was the government, where the total exceeded \$100 billion.

Data Limitations in Purchase Total

The dollar magnitude of purchases by American businesses and governments in this dissertation came to over four trillion dollars. This final figure is only an "order-of-magnitude" estimate of the total.

Due to limitations in the 1982 economic census, this research is known to have incomplete purchase information for the service and transportation carrier industries. Also, there was no purchase information on any of the financial industries (banking, insurance, and real estate) included in this dissertation. Finally, many of the fringe benefits that were included as part of wages and salaries were actually

purchased services.

In the service industries, there was limited information on purchases of materials and supplies, and resale purchases. Within transportation carriers, the purchase information for the trucking industry was incomplete. While the whole trucking industry had revenues of \$173 billion in 1982, only \$47 billion of the total revenues had a detailed cost structure that included purchases. This detailed information came from the larger labor intensive Class I and II truck carriers. The smaller Class III and owner-operators firms made up the remaining \$126 billion in trucking revenues. There was no detailed cost structure available for these smaller trucking operations. These smaller firms were estimated to be less labor intensive and more purchase intensive than the larger Class I and II carriers. This issue was discussed at length in Chapter 8.

Many purchase expenditures were included within the wages and salaries category as part of fringe benefits. The fringe benefits paid by employers include not only those benefits required by state and federal regulations, but they also include many voluntary fringe benefits. Some of these fringe benefits are actually purchased services, such as medical, dental, and insurance plans.

POTENTIAL IMPLICATIONS OF THIS RESEARCH

The findings of this research may serve as a catalyst for change in the treatment of the purchasing function at

both the 1. "micro" or management level, and at 2. the "macro" or total business/economic activity level.

The dollar magnitude of purchases in American industry has significant management implications. Management needs to accord purchasing an even greater level of attention than that which is currently reserved for labor expenditures. This research has shown that purchases account for the majority of the cost in eight of the eleven industries researched. Also, purchases exceeded wages and salaries in all industries except services.

As was stated in the literature review, numerous authors felt that managers did not realize that purchases dominate the cost of operations. Management has elaborate systems to control minor elements of total cost while ignoring more important cost elements, such as purchases. This research has shown that purchases are not just an important cost element in some companies nor is its importance restricted to manufacturing industries. Purchases are the dominant cost element in the vast majority of America's industry. In manufacturing, which was researched at the four-digit SIC level, purchases were the major expenditure in 96 percent of the 448 manufacturing industries.

Management should view all purchases collectively and not just from the perspective of the purchasing department. In this light, management should view purchases as major area of investment. By determining purchase costs in all

departments, management can establish goals for cost reductions based on total purchases (and not just those purchases made by the purchasing department). By viewing purchase costs in total, they will be in a better position to manage the majority of the company's total costs.

Much of the focus of current economic thinking is directed at the final consumer. This occurs even though a substantial portion of the total business/economic activity (in the form of business purchases) occurs prior to final consumption. This research has shown that the current attention given to final consumers is disproportionate to their role in the total business/economic activity. Economic analysis should include the role of business purchases on the nation's economy. Since Gross National Product focuses on the final output, GNP excluded over \$3.5 trillion of economic activity in the form of business operational purchases that took place in 1982.

The Dominance of Industrial Purchases

Chapter 2 introduced Dr. John Hoagland's theory on the Dominance of Industrial Purchases. His theory stated that industrial purchasers are usually more influential than final consumers in determining changes in business trends. According to Hoagland, the analysis of business trends is contingent upon an understanding of purchases in terms of their: 1. dynamics (or fluctuations), and 2. dollar magnitude.

Dr. Hoagland's extensive work on change indexes has

substantiated the dynamics of business purchases. Prior to this dissertation, however, there had been no definitive research on the dollar magnitude of business purchases. With data on the dollar magnitude of purchases now available as a result of this research, the credibility of the dominance of industrial purchases theory on business trends is substantially strengthened.

Based on: 1. this research, and 2. assuming that Dr. Hoagland's theory is correct, business trends can be better predicted by focusing on the purchases in just a handful of industries. This research has shown that the dollar magnitude of purchases are highly concentrated in only a few industries. This research would suggest that business trend forecasting needs to focus on the purchase activities in the food, petroleum, chemical, transportation, and steel industries.

RECOMMENDATIONS

The recommendations that follow are in addition to those already stated earlier in this chapter. In this section, the recommendations deal with education and future government economic surveys.

Education

Expand the current educational focus of purchases beyond that which is currently reserved for manufacturing. Research needs to be done on the purchasing process to determine the application in different industries. The

literature review illustrated the fact that purchases in industries, other than manufacturing, were given only a cursory treatment.

Future Government Economic Surveys

There is a need for better and consistent data collection on purchases by America's industries. This research has shown that many of the purchase activities are similar in differing industries. Although the percentages vary, all of the industries had purchased services, materials and supplies, and energy. Also, resale purchases take place in other industries besides wholesale and retail trade. Unfortunately, the only standardized questions on purchases in the 1982 census dealt with energy and capital expenditures.

Information on purchases in industry is important because, as this research has shown, purchases account for the majority of the cost in business operations. Excellent information was readily available for labor, even though it accounted for only 20 percent of the cost.

Based on findings in this research, it is recommended that the Commerce Department standardize the survey questions for all industries in future quinquennial (five year) economic census programs. Similar purchase activities occur in different industries (i.e. advertising, resales, subcontract, services, etc.).

The following presents a rationale for making changes to the existing economic surveys:

Manufacturing

Future manufacturing surveys should include questions on expenditures for advertising and other business services. Advertising is not limited to wholesale, retail, and service industries. Advertising expenditures can be substantial in such industries as tobacco, food, and automobile manufacturing. In addition, the census needs to better delineate purchases between internal purchases (interdivisional transfers) and external purchases (that is, those purchases made outside the firm).

Wholesale and Retail Trade

The question in the census that requested information on office supplies should be changed. By requesting only information on office supplies, stationery, and postage, businesses may inadvertently fail to report other supply purchases. There are other supplies that are used in the day-to-day operation of businesses besides office supplies. These would include items such as MRO supplies, or as a specific example, linens, tableware, and food in hotels.

The Service Industry

The service industry surveys should be made identical to wholesale and retail surveys. In particular, a question on resale purchases should be included as well as the modified question on materials and supplies (which was discussed under wholesale and retail trade above).

It is also recommended that hospitals be included in any Service Industry census. Hospitals were not included in

the 1982 census even though they made up about 50% of the health care industry.

Transportation Carriers

A complete economic survey of the transportation industry is needed. The 1982 census provided no financial data. It was limited to such information as truck registration, distances travelled, and shipments of commodities by type of transport and distanced shipped. This industry has experienced extensive turmoil as a result of deregulation. The survey of the trucking industry should not be limited to the Class I and II carriers. It should also include the Class III (small business) carriers and the owner-operators. Future surveys should also include a question on subcontract work.

AREAS FOR FUTURE RESEARCH

Subcontract Purchases

This research revealed that subcontract purchases were an important type of purchase. In manufacturing this was \$31 billion, in construction it was \$78 billion, and in the trucking industry it was at least \$9 billion.

Purchased Services

One of the growing types of purchases that was only briefly addressed in this research was the purchase of business services. While there is evidence of increasing use by business and governments, there was little data to measure its magnitude.

Ongoing Research on the Dollar Magnitude of Purchases

Since this research was for only one year, 1982, it is impossible to determine trends in purchases. A longitudinal, or time, study is needed to determine whether purchases are increasing or decreasing as percent of industry expenditures. In view of the enormity of the task, this might be more appropriate for a university or the Center for Advanced Purchasing Studies (CAPS) as an ongoing project.

CONCLUSION

It is hoped that this dissertation will serve as a foundation for future research on purchases. Due to the size of this research project, an exact total purchase figure was not achievable. However, an "order-of-magnitude" estimate of \$4.2 trillion was established for 1982. This figure, however, is suspected to be understated. Two large industries, transportation and services, had incomplete purchase information. In addition, purchased services figures for the majority of industries were incomplete. Finally, all of the financial industries (banking, insurance, and real estate) were excluded from this research.

This research, however, does for the first time establish the role and magnitude of purchases within: 1. individual industries, and 2. within the nation's total economic activity. This research has shown that the economic activity, in the form of business purchases, was greater

than the nation's gross national product in 1982.

Prior to this research, purchases were known to be an important expenditure in manufacturing. This research has also shown that purchases were the most significant expenditure in the majority of the other ten major industries as well.

The management of individual companies need to reassess their perceptions of purchases. Management should view purchases as a major area of investment. Purchases should be managed in total (and not just those activities that take place in the purchasing department). By managing total purchases, the firm will be in a better position to manage the majority of the their total costs.

ENDNOTES

- [1] Mark, Jerome A. "Problems Encountered in Measuring Single- and Multi-factor Productivity." Monthly Labor Review. December, 1986. p. 9.

LIST OF REFERENCES

LIST OF REFERENCES

- Air Transport, 1983. (Washington D.C.: Air Transport Association of America, June 1983).
- Aljian, George W. Purchasing Handbook. (New York: McGraw-Hill, 1973).
- Barro, Robert J. Macroeconomics. (New York: John Wiley and Sons, 1984).
- Beierlein, Geneva. 1982 Annual Report On Utility And Carrier Regulation of The National Association of Regulatory Utility Commissioners. (Washington DC: The National Association of Regulatory Utility Commissioners. 1983).
- Borneman, Alfred H. Essentials of Purchasing. (Columbus, OH: Grid Inc., 1974).
- Carpenter, Myron A. and Beckman, Neal W. Purchasing For Profit. (St Louis , MO: Warren H. Gree, 1977).
- Carson, Carol S. "Gross National Product and Related Measures." Editors: Frank J. Fabozzi and Harry I. Greenfield. The Handbook of Economic and Financial Measures. (Homewood, IL: Dow Jones-Irwin, 1984).
- Cavinato, Joseph L. Purchasing and Materials Management. (St. Paul, MN: West Publishing Co., 1984).
- Chew W. Bruce, "No-Nonsense Guide to Measuring Productivity." Harvard Business Review. January-February, 1988.
- Cooper, Robin and Kaplan, Robert S. "How Cost Accounting Distorts Costs." Management Accounting. April 1988.
- Dobler, Donald W., Lee, Lamar, and Burt, David N. Purchasing and Materials Management. (New York: McGraw-Hill Book Company, 1984).
- Duncan, Joseph W. "Statistics Corner." Business Economics. October, 1987.

- Dye, Howard S., Moore, John R. and Holly, J.F. Economics: Principles, Problems, and Perspectives. (Boston, MA: Allyn and Bacon, Inc., 1966).
- Eiler, Robert G., Goletz, Walter K. and Keegan, Daniel P. "Is Your Cost Accounting Up To Date?" Harvard Business Review. July-August, 1982.
- England, Wilbur B. Modern Procurement Management. (Homewood, IL: Richard D. Irwin, Inc., 1970).
- Friedman, Milton. A Theory of the Consumption Function. (Princeton, NJ: Princeton University Press, 1957).
- Gas Facts, A Statistical Record for 1982 of the Gas Utility Industry. (American Gas Association, 1983),
- Green, H.A. John. Consumer Theory. (New York: Academic Press, 1978).
- Hanson, Robert P. Moody's Transportation Manual. (New York: Moody's Investor Service, Inc., 1988).
- Hanson, Robert P. Moody's Public Utility Manual (New York: Moody's Investor Service, Inc., 1984).
- Heibroner, Robert L. Understanding Macro-Economics. (Englewood Cliffs, NJ: Prentice-Hall, Inc., 1972).
- Heinritz, S.F. and Farrell, P.V. Purchasing Principles and Applications. (Englewood Cliffs, NJ: Prentice Hall, Inc., 1965).
- Helfert, Erich A. Techniques of Financial Analysis. (Homewood, IL: Richard D. Irwin, Inc., 1972).
- Hoagland, John, H. "Strikes, Politics and Business Cycles." Paper presented at the annual meeting of the American Statistical Association, Illinois, December 27-30, 1964, under the sponsorship of the Business and Economic Statistics Section.
- Hoagland, John H. "Purchasing, Forward Buying, and Hedging." Editor, Purchasing Handbook. Farrell, Paul V., Coordinating Editor. (New York: McGraw-Hill, Inc., 1982).
- Hoagland, John H. "Monthly Change Indices and Other Measures of Business Fluctuations." Paper presented at the Business and Economic Statistical Section of the American Statistical Association. (Washington DC, December 29, 1959).

- Hoagland, John H. "Purchasing and Inventory Forecasting." Unpublished paper presented at the Business and Economic Statistical Section of the American Statistical Association. December, 1960).
- Hoagland, John H. "Forecasting Purchasing and Business Trends." Paper presented at the Forty-Ninth Annual International Convention of the National Association of Purchasing Agents. (Dallas, Texas, May 3-6, 1964).
- Hoagland, John H. "Forecast For 1975." Address at Kellogg Center, Michigan State University. (East Lansing MI, March 11, 1975).
- Hoagland, John H. "Strikes and Other Supply Problems." Papers and Proceedings of the Symposium on Inflation. University of Tennessee, March 20-21, 1978
- Hoagland, John H. "Business/Purchasing Environment--Today and Tomorrow." Proceedings of the 65th Annual International Purchasing Conference. (Atlanta, GA: National Association of Purchasing Management, May 19, 1980).
- Hoagland, John H. "Purchasing, Forward Buying, and Hedging." Editor, Purchasing Handbook. Farrell, Paul V., Coordinating Editor. (New York: McGraw-Hill, Inc., 1982).
- Hoagland, John H. and Taylor, Barbara E., "Purchasing Business Surveys: Uses and Improvements." Proceedings of the 72nd annual International Purchasing Conference. (New York: National Association of Purchasing Management, May 3-6, 1987).
- Hoagland, John H., Buddress, Lee A., and Heberling, Michael E., "Pyramid Power of Purchases." Proceedings of the 75th Annual International Purchasing Conference and Educational Exhibit. (New Orleans: National Association of Purchasing Management, April 29 - May 2, 1990).
- Hodges, Henry G. The Modern Science of Purchasing. (New York: Harper and Brothers, 1961).
- Kaplan, Robert S. "Yesterday's Accounting Undermines Production." Harvard Business Review. July-August, 1984.
- Keiser, Norman F. Economics: Analysis and Policy. (New York: John Wiley and Sons, Inc., 1965).
- Kendrick, John W. Economic Accounts and Their Uses. (New York: McGraw-Hill, 1972).

- Keynes, John M. The General Theory of Employment Interest and Money. (New York: Harcourt, Brace and Company, 1936).
- Leenders, Michiel R., Fearon, Harold E., and England Wilbur B. Purchasing and Materials Management. (Homewood, IL: Irwin, 1989).
- Leftwich, Richard. An Introduction to Economic Thinking. (New York: Holt, Rinehart, and Winston, Inc., 1969).
- Mack, Ruth P. Consumption and Business Fluctuations: A Case Study of the Shoe, Leather, Hide Sequence. (New York: National Bureau of Economic Research, 1956).
- Mahon, James, J. Mahon's Industry Guides For Accountants and Auditors: Guide to Hotels and Motels. (Boston MA: Warren, Gorham and Lamont, 1980).
- Mark, Jerome A. "Problems Encountered in Measuring Single- and Multi-factor Productivity." Monthly Labor Review. December, 1986.
- Mathieu, Renee and Rubinstein, Nathan. "The 1982 Census of Construction: A Wealth of Economic Data." Construction Review. (Washington, D.C.: U.S. Government Printing Office, September/October 1985).
- Monthly Economic News Letter. First National City Bank of New York. August, 1964.
- Morgan, James N. Consumer Economics. (Englewood Cliffs, NJ: Prentice-Hall, Inc., 1955).
- Nystrom, Paul H. Economic Principles of Consumption. (New York: The Ronald Press Company, 1931).
- Peterson, Wallace C. Income, Employment, and Economic Growth. (New York: W. W. Norton and Co., 1984).
- Pooler, Victor H. The Purchasing Man and His Job. (New York: American Management Association, 1964).
- Restaurant Industry Operations Report '83. (National Restaurant Association and Leventhol & Horwath, 1983).
- Ruggles, Nancy, and Ruggles, Richard. The Design of Economic Accounts. (New York: Columbia University Press, 1970).
- Samuelson, Paul A. Economics. (New York: McGraw-Hill, 1980).

Sandretto, Michael J. "What Kind of Cost System Do You Have?" Harvard Business Review. January-February, 1985. pp. 110-118.

Schmenner, Roger W. "Escaping the Black Holes of Cost Accounting." Business Horizons. January-February, 1988. pp. 66-72.

Sebastian, Pamela. "Vendors' Gifts Pose Problems For Purchasers." Wall Street Journal. June 26, 1989.

Shapiro, Edward. Macroeconomic Analysis. (New York: Harcourt Brace Jovanovich, Inc. 1982).

Standard Industrial Classification Manual 1972. (Washington, D.C.: U.S. Government Printing Office, 1972).

Statistical Yearbook of the Electric Utility Industry, 1982. (Edison Electric Institute, 1983).

Stout, Hilary. "U.S. Statistics Mills Grind Out More Data That Are Then Revised." The Wall Street Journal. August 31, 1989.

Trends in the Hotel Industry. (Houston, TX: Pannell Kerr Forster, 1983).

Trinc's Blue Book of the Trucking Industry. (McLean VA: Trinc Transportation Consultants, 1983).

The United States Air Force Summary. Directorate of Cost, Comptroller of the Air Force, Headquarters, United States Air Force. (Washington, D.C.: U.S. Government Printing Office, 1986).

U.S. Bureau of the Census, 1982 Census of Construction. Geographic Area Series Series (Washington, D.C.: U.S. Government Printing Office, 1984).

U.S. Bureau of the Census, 1982 Census of Manufactures. Subject Series. General Summary. Part 1. (Washington, D.C.: U.S. Government Printing Office, 1986).

U.S. Bureau of the Census, 1982 Census of Mineral Industries. Subject Series (Washington, D.C.: U.S. Government Printing Office, 1984).

U.S. Bureau of the Census, 1982 Census of Service Industries. Industry Series: Capital Expenditures. (Washington, D.C.: U.S. Government Printing Office, 1985).

- U.S. Bureau of the Census, 1982 Census of Retail Trade. Industry Series (RC82-I-2): Measures of Value Produced Capital Expenditures, Depreciable Assets, and Operating Expenses. (Washington, D.C.: U.S. Government Printing Office, 1985).
- U.S. Bureau of the Census, 1982 Census of Wholesale Trade. Industry Series. (Washington, D.C.: U.S. Government Printing Office, 1985).
- U.S. Bureau of the Census, 1982 Census of Transportation. (Washington, D.C.: U.S. Government Printing Office, 1985).
- U.S. Bureau of the Census, Current Business Reports, 1985 Motor Freight Transportation and Warehousing Survey. (Washington, D.C.: U.S. Government Printing Office, 1986).
- U.S. Department of Agriculture. Agriculture Statistics. (Washington, D.C.: U.S. Government Printing Office, 1985).
- U.S. Department of Agriculture. Economic Indicators of the Farm Sector: Income and Balance Sheet Statistics, 1983. National Economics Division, Economic Research Service, (Washington, D.C. U.S. Government Printing Office, 1985).
- U.S. Department of Commerce, 1982 Census of Agriculture. Volume 2, Subject Series. Part 1. (Washington, D.C. U.S. Government Printing Office, 1985).
- U.S. Department of Commerce. Current Business Reports, 1986 Service Annual Survey. (Washington, D.C.: U.S. Government Printing Office, 1987).
- U.S. Department of Commerce. "Input-Output Accounts of the U.S. Economy, 1982." Survey of Current Business. (Washington, DC: U.S. Government Printing Office, April, 1988).
- U.S. Department of Commerce. Statistical Abstract of the United States, 1986. (Washington, D.C.: U.S. Government Printing Office, 1986).
- U.S. Department of Commerce. Survey of Current Business. (Washington, D.C.: U.S. Government Printing Office, July 1983).
- U.S. Department of Commerce. Survey of Current Business. (Washington, D.C.: U.S. Government Printing Office, July 1984).

- U.S. Department of Commerce. Survey of Current Business. (Washington, D.C.: U.S. Government Printing Office, July 1986).
- U.S. Department of Commerce. 1983 U.S. Industrial Outlook. (Washington, D.C.: U.S. Government Printing Office, 1983).
- U.S. Department of Commerce. 1984 U.S. Industrial Outlook. (Washington, D.C.: U.S. Government Printing Office, 1984).
- U.S. Department of Commerce. 1985 U.S. Industrial Outlook. (Washington, D.C.: U.S. Government Printing Office, 1985).
- U.S. Department of Energy. State Energy Price and Expenditure Report 1986. Energy Information Administration, Office of Energy Markets and End Use. (Washington, D.C.: U.S. Government Printing Office, 1986).
- U.S. Department of Health and Human Services. Health Care Financing Review. (Washington, D.C.: U.S. Government Printing Office, Spring 1988, Vol. 9, Number 3).
- U.S. Department of Labor. Employment and Wages: Annual Averages 1982. (Washington, D.C.: U.S. Government Printing Office, June, 1984).
- U.S. Department of Labor. Employment and Wages, Annual Averages 1982. (Washington, D.C.: U.S. Government Printing Office, 1984).
- U.S. Department of the Treasury. Treasury Bulletin, 50th Anniversary. (Washington, D.C.: U.S. Government Printing Office, 1989).
- U.S. Internal Revenue Service. 1982 Corporation Source Book of Statistics of Income. (Washington, D.C.: U.S. Government Printing Office, 1985).
- U.S. Interstate Commerce Commission. Transport Statistics in the United States, Part 1: Railroads. (Washington, D.C.: U.S. Government Printing Office, 1983).
- 1983-84 Worldwide Directory. (Washington, D.C.: American Logistics Association, 1984).
- Yardeni, Edward. "Money and Business Alert." Economics. Prudential-Bache Securities. January 1, 1988.