MONTHLY

Business Review

FEDERAL RESERVE BANK of CLEVELAND

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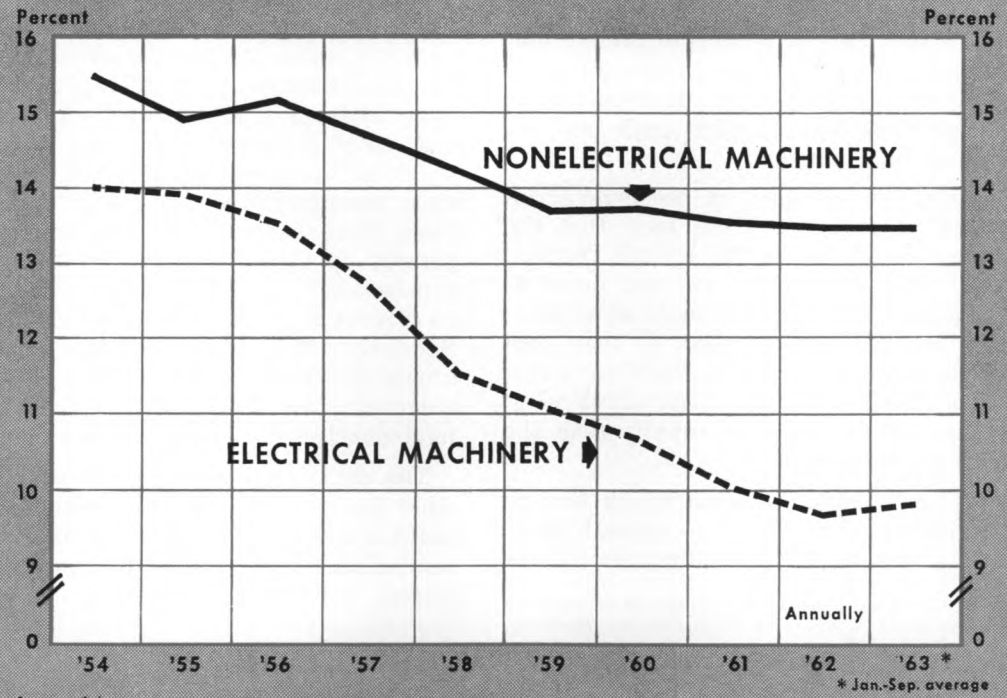
IN THIS ISSUE

The Fourth District's share of employment in both the electrical and nonelectrical machinery industries has been declining since 1954.



Source of data:
U.S. Bureau of Labor Statistics, Ohio Bureau of Unemployment Compensation, Pennsylvania Bureau of Employment Security

THE MACHINERY INDUSTRIES

IMPORTANT CONTRIBUTORS TO FOURTH DISTRICT INDUSTRIAL ACTIVITY

TWO MAJOR industry groups, nonelectrical machinery and electrical machinery, make a significant contribution to manufacturing activity in the Fourth Federal Reserve District and the United States.[1] The importance of the machinery industries is reflected in the fact that they account for over one-fifth of manufacturing employment in the District and over one-sixth in the nation.

The purpose of this article is to identify the distinguishing characteristics of both major sectors of the machinery industry, i.e., nonelectrical and electrical machinery, and to compare the relative performances of these sectors within the Fourth District and the United States. Several aspects of the machinery industries are discussed, including the composition of employment, the behavior of wages, price patterns, foreign trade, and recent trends in production.

A variety of comparative economic series is presented to support the view that the machinery industries in the Fourth District, especially the electrical, have not fared as well in activity rates as their national counterparts since 1957. The reason is that each major machinery industry in the Fourth District has a relatively larger share of subindustries that have grown less rapidly than the entire machinery group.

Before examining the data which lead to the foregoing conclusions, a general background of the machinery industries will be helpful in understanding the significance of the findings.

Structure of the Industries

In terms of employment and value added by manufacture, both machinery industries are of approximately equal size.

The nonelectrical machinery industry encompasses a variety of subindustries that are engaged in the manufacture of machinery and equipment primarily for other producers. The title "nonelectrical" may be somewhat misleading because the industry's output includes machines and tools powered by electric motors. Virtually all productive sectors of the economy are represented in the markets for nonelectrical machinery. It should be borne in mind, however, that data for the nonelectrical machinery industry as a whole are heavily weighted by three subindustries which produce manufacturing machinery.[2] In 1961, these three subindustries accounted for 46 percent of the employment in the nation's nonelectrical machinery industry as well as 46 percent of its value added by manufacture. Similarly, the manufacturing machinery grouping ranks high in the Fourth District, accounting for 57 percent of the District's total nonelectrical machinery employment.

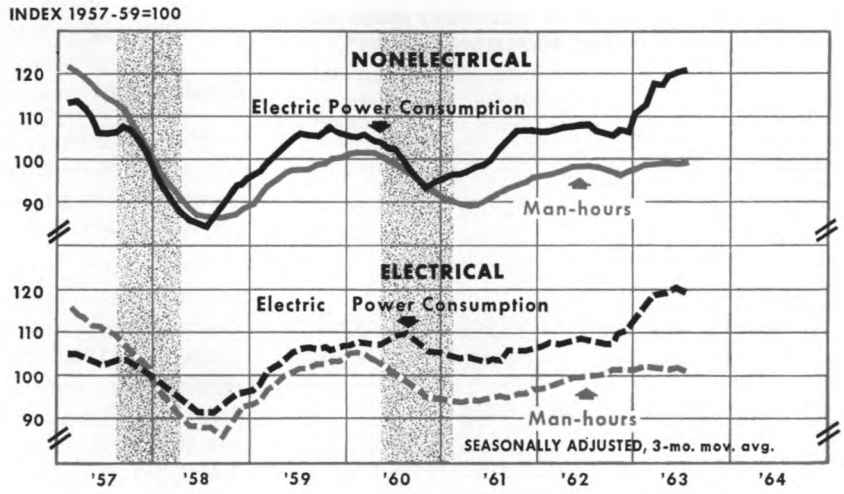
The electrical machinery industry, on the other hand, consists of those establishments engaged in manufacturing machinery for the generation, storage, transmission, transformation, and utilization of electrical energy.

[1] The official Standard Industrial Classifications of the machinery industries by the U. S. Bureau of the Budget are: *Machinery, Except Electrical* and *Electrical Machinery, Equipment and Supplies.* The shorter versions will be used in this article.

[2] Metalworking machinery, special industry machinery, and general industrial machinery.

Chart 1.

Electric power consumption and aggregate man-hours show marked cyclical behavior in the Fourth District's machinery industries. In addition, electric power consumption has been increasing relative to man-hours in both the electrical and nonelectrical sectors.



Source of data: Ohio Bureau of Unemployment Compensation, Pennsylvania Bureau of Employment Security, Federal Reserve Bank of Cleveland

The electrical sector, like the nonelectrical machinery industry, produces for other manufacturers; however, unlike nonelectrical machinery, the electrical machinery industry is heavily dependent upon the ultimate consumer because electrical household appliances, along with radio, television, and phonograph sets, are classified as electrical machinery. Moreover, the government is a significant purchaser of products such as missile and aircraft electronics and communication equipment.

Performance of Fourth District Machinery Industries

A direct measure of the output of Fourth District machinery industries is not available. However, two important production inputs, aggregate man-hours and electric power consumption, serve as useful indicators of activity in the major part of the District's machinery industries.

The man-hour series illustrated in Chart 1 were compiled from estimates of employment in Ohio plus the corresponding figures for the Pittsburgh and Erie, Pennsylvania Metropolitan Areas. In 1961, these regions accounted for approximately 91 percent of total employment in Fourth District machinery industries. Similar aggregate man-hour series, not illustrated here, were constructed for the nation's machinery industries for purposes of comparison. The District's series fluctuate in close conformity to national performances. However, Fourth District machinery industries are more sensitive to cyclical downswings, as suggested in Table I.

Percentage declines in nonelectrical machinery man-hours during the past two recessions were slightly greater for the District than for the U. S.; but in the electrical machinery industry percentage differences between the District and the U. S. are outstanding.[3]

Electric power consumption is shown in Chart 1 as an alternative indicator of output in the Fourth District's machinery industries.

[3] A more detailed description of the man-hour and electric power series, together with the limitations of their uses, is contained in the Technical Appendix.

Table I

AGGREGATE MAN-HOURS IN MACHINERY INDUSTRIES, TWO MOST RECENT RECESSION PERIODS*

	United States	Fourth District
Nonelectrical Machinery		
1957-58 recession	−23.0%	−29.3%
1960-61 recession	−10.0%	−12.7%
Electrical Machinery		
1957-58 recession	−13.7%	−27.0%
1960-61 recession	− 8.4%	−13.3%

* Calculated from peak month to trough month.

Sources: U. S. Bureau of Labor Statistics, Ohio Bureau of Unemployment Compensation, Pennsylvania Bureau of Employment Security

The electric power series were derived from monthly reports submitted by nine investor-owned utilities in the Fourth District and by three large machinery companies that generate a sizeable portion of their own electric power requirements. The geographical area covered by the electric power series, although not strictly comparable to the man-hour series, is representative of the District as a whole.

Chart 1 indicates that in each of the District's machinery industries the use of electric power has been increasing in relation to man-hours. Electric power tends to overstate production, whereas man-hours tend to understate production. Thus, the electric power and man-hours series presumably set the upper and lower limits, respectively, of an actual District index of machinery output. This observation would also hold true for the nation's machinery industries.

While Chart 1 illustrates the short-run cyclical behavior in the District's machinery industries, other information is needed for a long-run view of the performances in the District's machinery industries in relation to their U. S. counterparts. For this purpose, it is necessary to examine annual data on employment, value added, and new capital expenditures.

Employment

The cover chart shows long-run changes in the District's share of the nation's employment in each of the two primary sectors of the machinery industry.[4]

The Fourth District's share of employment in the nonelectrical machinery industry has declined from nearly 16 percent in 1954 to 13 percent in 1963. This represents an 8 percent contraction (from 219,000 to 203,000) in contrast to a 7 percent expansion of the nation's nonelectrical machinery employment (from 1,418,000 to 1,515,000) over the same period.[5] Both Ohio and the Pittsburgh Metropolitan Area experienced moderate employment losses, while the Erie Metropolitan Area suffered more than a 40 percent decline in nonelectrical machinery employment.

Between 1954 and 1963 the Fourth District's electrical machinery industry incurred substantial losses in employment, both in absolute and relative terms. In that period electrical machinery employment declined 7 percent in the District (from 166,000 to 155,000), while it expanded 33 percent in the nation (from 1,190,000 to 1,580,000). As a result, the District's share of electrical machinery employment declined from 14 percent in 1954 to less than 10 percent in 1963, a relatively greater loss than that experienced in the nonelectrical machinery industry.

Value Added

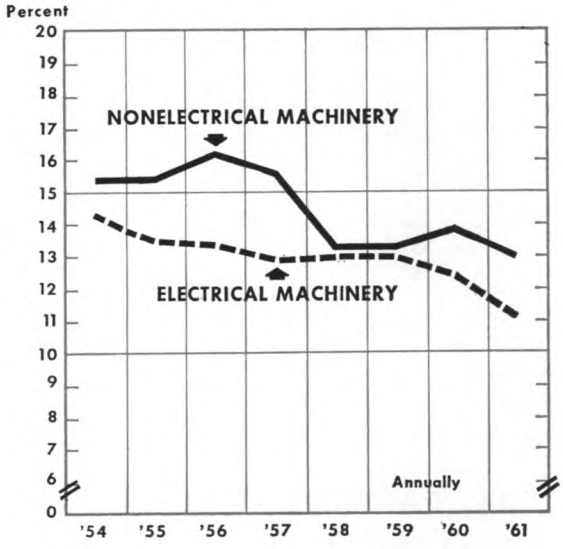
The record of value added by manufacture, as shown on Chart 2, provides additional evidence that the machinery industries in the

[4] Because annual averages of employment for Ohio plus the Pittsburgh and Erie Metropolitan Areas (91 percent of the District's total machinery employment) were used in the computations to represent the entire Fourth District, the actual shares are systematically understated. The year-to-year changes, however, would probably not be substantially affected by a complete District coverage.

[5] The figures for 1963 are based on the monthly average for January through September.

Chart 2.

The Fourth District's share of value added by manufacture in the nation's machinery industries has declined.



Source of data: Annual Surveys of Manufactures, Census of Manufacturers, 1958

Fourth District have lost ground relative to those in the nation.[6]

Value added by manufacture in the Fourth District's nonelectrical machinery industry reached its peak in both relative and absolute terms in 1956. In that year, the District accounted for $2.6 billion of the $16.2 billion of value added by the nation's nonelectrical machinery industry. The District fared particularly well in 1956 because the capital goods spending boom at that time resulted in the largest post-Korean output for the metalworking machinery industry, in which the District has a considerably larger proportion of employment than does the entire nation. During the 1957-58 recession, the District's share of value added by manufacture in the nonelectrical machinery industry declined sharply and as of 1961, had not recovered to the pre-recession level.

The loss in the District's share of value added by manufacture in electrical machinery has been even more severe. The District's relative performance in electrical machinery as measured by its share of value added declined without interruption between 1954 and 1961.

New Capital Expenditures

Expenditures by machinery manufacturers for the replacement and modernization of capital equipment from 1954 to 1961 are summarized in Table II.[7]

Between 1958 and 1961 new capital expenditures in the nonelectrical machinery industry fell well below the level of 1954-57, both in the Fourth District and in the U. S. In addition, the District's share of total new capital outlays in the nonelectrical machinery industry declined from roughly 18 percent in 1954 to 12 percent in 1961.

In contrast, new capital expenditures in the electrical machinery industry on a nationwide basis clearly indicate an upward trend, while electrical machinery manufacturers in the Fourth District have cut back on their new capital expenditures since 1958.

Average Hourly and Weekly Earnings

Chart 3 indicates the wide pay differentials between the two machinery industries in the Fourth District and in the U. S.[8]

[6] The concept of value added, which is considered one of the best value measures for comparing the relative economic importance of various manufacturing activities, measures an industry's net contribution to the nation's total output of goods and services. Because value added data for Ohio plus the Pittsburgh Metropolitan Area were used in the computations, the figures for the entire Fourth District are systematically understated. The same applies to the forthcoming discussion of new capital expenditures.

[7] New capital expenditures consist of outlays for new machinery and equipment and for permanent additions or alterations to plants.

[8] The Fourth District is represented by a weighted average of the data for Ohio plus the Pittsburgh and Erie Metropolitan Areas. Figures for the western Pennsylvania regions prior to 1958 are unavailable.

Table II

New Capital Expenditures in the Machinery Industries (millions of dollars)

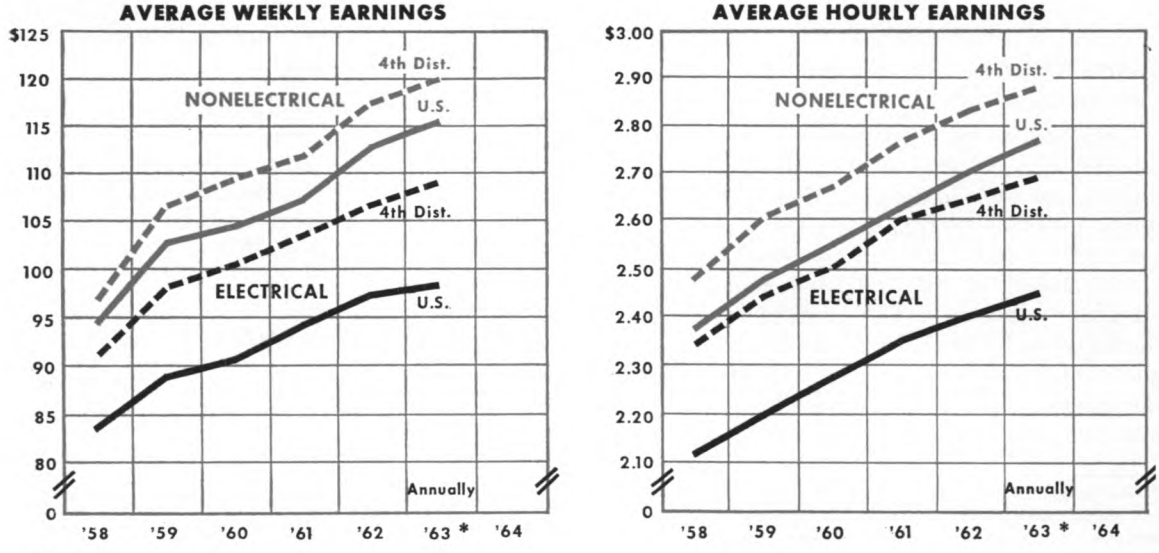
	Nonelectrical			Electrical		
	U. S.	4th District*	4th District % of U. S.	U. S.	4th District*	4th District % of U. S.
1954	734	131	17.8	355	36	10.1
1955	670	97	14.4	358	31	8.7
1956	912	124	13.6	489	40	8.2
1957	1,038	139	13.4	549	46	8.3
1958	676	93	13.7	450	62	13.7
1959	624	79	12.6	525	59	11.3
1960	694	100	14.3	618	53	8.5
1961	679	82	12.1	613	49	7.9

* Ohio plus Pittsburgh Metropolitan Area

Source: U. S. Department of Commerce, Annual Survey of Manufacturers

Chart 3.

PRODUCTION WORKERS' EARNINGS in Machinery Industries

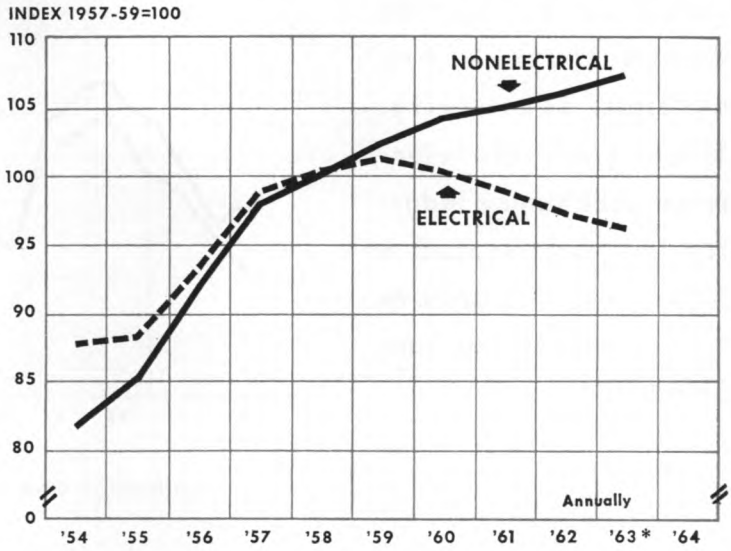


* January-August average

Source of data: U. S. Bureau of Labor Statistics, Ohio Bureau of Unemployment Compensation, Pennsylvania Bureau of Employment Security

From 1958 to 1963 hourly wages and average weekly earnings of production workers in the District's nonelectrical machinery industry ranged from 4 to 5 percent higher than the national average. Hourly wages and weekly earnings of electrical machinery production workers in the Fourth District have been more than 10 percent higher than the national average.

Chart 4.
WHOLESALE PRICE INDEXES
Machinery Industries



* January-June average
Source of data: U. S. Bureau of Labor Statistics

Wholesale Prices

Due to the lack of any regional breakdown of the wholesale price index groupings, discussion here is confined to a national view of machinery prices.

Chart 4 compares the price trends of the machinery industries since the end of the Korean period.[9] The sharp rise in machinery prices during the capital goods investment boom of 1956-57 is outstanding. Also noteworthy are the divergent price movements of the two machinery industries since 1959. From 1954 to 1959 machinery prices increased more than the composite wholesale price index. Since 1959, however, the steady decline in electrical machinery prices has been offset by the moderate advance in nonelectrical machinery prices so that, on balance, the machinery industries have contributed to relative price stability.

Exports and Imports

U. S. exports of electrical and nonelectrical machinery have increased from $2.8 billion in 1954 to $5.2 billion in 1962. About three-

[9] See Technical Appendix for the procedure used in constructing the nonelectrical and electrical machinery wholesale price indexes.

Table III
U. S. MACHINERY EXPORTS

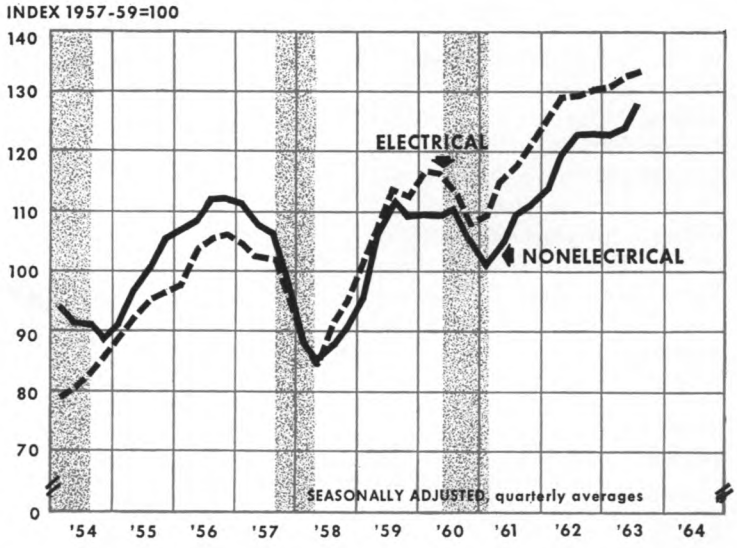
	Percent of total machinery sales	Percent of total U.S. merchandise exports
1954	7.2	18.4
1955	7.4	20.0
1956	8.0	20.3
1957	8.3	20.4
1958	8.5	21.9
1959	7.2	22.3
1960	7.6	21.1
1961	8.1	22.9
1962	8.1	24.3
1963*	8.2	24.2

* January through August

Source: U. S. Department of Commerce, Office of Business Economics

Chart 5.

The machinery groupings of the Index of Industrial Production demonstrate sharp cyclical sensitivity. Since 1954, the electrical machinery industry has experienced a higher rate of growth than nonelectrical machinery.



Source of data: Board of Governors of the Federal Reserve System

fourths of total machinery exports are nonelectrical. As shown in Table III, machinery exports have constituted a fairly stable share of manufacturers' total machinery sales. In contrast, machinery exports have been capturing an increasing share of total U. S. merchandise exports.

In 1960, the most recent year for which regional export data are available, machinery exports from Ohio plus the Pittsburgh Metropolitan Area were valued at $551 million, or 13 percent of total U. S. machinery exports. In 1960 Ohio and Pittsburgh also accounted for 13 percent of total value added by manufacture in the machinery industries.

U. S. imports of machinery in 1962 were $1 billion. Almost one-half of the total was attributable to electrical machinery imports, a large part of which represent imports of radio, TV, phonograph, and tape recorder sets from Japan and West Germany.

The difference between the value of machinery exports and the value of machinery imports (over $4 billion in 1962) ostensibly accounts for a substantial portion of the U. S. foreign trade surplus. On the other hand, the machinery industries are directly or indirectly dependent upon large quantities of imported ores, metals, and other materials.

National Trends in the Machinery Industries

Chart 5 compares the post-Korean production records of the nation's two machinery industries. Incorporated in the aggregate indexes are the diverse performances of the machinery subindustries.

The key to an understanding of why the machinery industries in the Fourth District have not performed as well as their national counterparts lies partly in the composition of the industry in the District. In general, the District has a relatively larger share of that part of the industry that has experienced a slower rate of growth.

Table IV shows the national and District employment composition of each major ma-

Table IV

Distribution of Employment in Selected Machinery Components of the Index of Industrial Production, 1961

NONELECTRICAL MACHINERY	Percent of Nonelectrical Machinery Employment	
	United States	4th District
NONELECTRICAL MACHINERY PARTS . . .	29.5	29.5
Internal combustion engines, machine tool parts, power transmission equipment, misc. machinery parts		
GENERAL HEAVY INDUSTRY	17.7	16.4
Steam engines and turbines construction and mining machinery, general industry finished equipment		
SPECIAL INDUSTRY MACHINERY	12.5	7.7
Food products, textile, woodworking, paper industries, and printing trades machinery		
OFFICE AND SERVICE EQUIPMENT	10.2	12.5
Office machines, commercial laundry and refrigeration equipment, vending machines, misc. service industry machinery		
METALWORKING MACHINERY	8.3	17.2
Machine tools and presses		
FARM EQUIPMENT	7.4	2.0
Farm machinery and equipment		
	85.6*	85.3*

ELECTRICAL MACHINERY	Percent of Electrical Machinery Employment	
	United States	4th District
MISC. ELECTRICAL MACHINERY PARTS . . .	34.1	47.5
Motors and generators, wiring devices, insulated wire, light bulbs, and allied industries		
TRANSFORMERS AND CONTROL APPARATUS .	10.5	15.7
Transformers and electrical control apparatus		
HOUSEHOLD APPLIANCES .	10.4	20.0
Kitchen, laundry, and misc. household appliances		
(Refrigeration Appliances) .	(3.1)	(12.2)
(Laundry Appliances)	(1.6)	(3.0)
TELEPHONE AND MISC. COMMUNICATION EQUIP.	29.9	7.9
Electrical measuring instruments, x-ray and communication equipment		
TELEVISION AND RADIO SETS	5.6	1.3
T.V. and radio receiving sets		
ELECTRONIC TUBES	4.2	3.5
Receiving and transmitting tubes, picture tubes		
	94.7*	95.9*

* Percentages do not total 100 because not all subindustries are directly represented in the F.R.B.'s major machinery groupings.

Sources of data: Board of Governors of the Federal Reserve System;
Annual Survey of Manufactures, 1961; and the
Ohio, Pennsylvania, Kentucky, and West Virginia State Directories of Manufactures.

chinery grouping. The individual machinery series are listed in the order of their importance as determined by value added data in the Federal Reserve Board's nonelectrical and electrical machinery indexes of production.

The metalworking machinery and special industry machinery series have been chiefly responsible for the lag in the District's nonelectrical machinery industry. Metalworking machinery has more than twice the employment weight in the District than in the U.S. During the 1957-58 recession the metalworking machinery industry suffered extremely heavy cutbacks in production and employment, and in the following years output remained well below the previous high levels. Despite improvements in 1963, output had not yet recovered to the peak post-Korean year of 1956. Special industry machinery is less heavily concentrated in the District than in the U. S. Since 1959 the special industry machinery series has demonstrated a more favorable growth rate than the nonelectrical machinery index.

The subindustries that have been primarily responsible for retarding the growth of the Fourth District's electrical machinery industry are household appliances, particularly refrigeration appliances, and telephone and miscellaneous communication equipment.

The employment share of the household appliance series is twice as large in the District as in the U. S. Since 1959 the production of household appliances has been unfavorable compared to electrical machinery output. The refrigeration appliances subindustry, heavily concentrated in the District, experienced more severe production declines during the past two recessions than the output of household appliances as a whole.

The nation's share of employment in the telephone and miscellaneous communication equipment subindustry is almost four times the District's proportion. As a result of automation in the communications field and the development of the nation's space program, production of telephone and miscellaneous communication equipment has undergone an extremely sharp rate of growth, far above that of the entire electrical machinery industry.

TECHNICAL APPENDIX

Man-Hours

THE AGGREGATE man-hour series for the Fourth District were calculated by multiplying *total employment* by average weekly hours of *production workers* for each month. A breakdown between production and nonproduction workers was not available. Nonproduction workers include factory supervisors above the working foreman level, and personnel engaged in clerical, executive, technical, legal, or other professional activities. Total employment and average weekly hours encompass paid sick leave, paid holidays, and paid vacations.

Aggregate monthly man-hours were seasonally adjusted and converted to index numbers with the average for 1957-59 taken as 100.

In the computation of aggregate man-hours it was assumed that nonproduction employees work the same number of hours per week as production workers. Furthermore, the greater stability of nonproduction worker employment in the short run has a tendency to dampen the amplitudes of the man-hour cycles. In the long run, the increasing proportion of nonproduction workers to production workers in the machinery industries contributes to an upward bias in the series. The Bureau of the Census estimates that the nonproduction workers' share of total nonelectrical machinery employment in Ohio and the Pittsburgh Metropolitan Area rose from 22.3 percent to 29.1 percent between 1955 and 1961. Similarly, the ratio of nonproduction workers to production workers in electrical machinery increased from 23.6 percent to 26.0 percent.

The major limitation of using the man-hour series as a basis for estimating machinery output in the District is that adjustments for regional changes in labor productivity are not possible because the data are not available. Thus, both the trend and cycle components of the man-hour series in Chart 1 have a strong downward bias that more than offsets the small element of upward bias previously noted.

Aggregate man-hours do not usually rise and fall by as large a percentage as production because labor is utilized with varying degrees of efficiency. In the early stages of industrial expansion, the efficiency or productivity of workers increases rapidly because capital equipment has been operating at less than optimum capacity. At the peak of the cycle, labor productivity levels off or declines slightly as more inexperienced workers are hired and less efficient equipment is utilized. Conversely, during the period of contraction, management may lay off the less efficient workers and inactivate antiquated capital equipment; consequently, output per man-hour once again begins to rise, although at a lesser rate than in the previous expansion.

Electric Power

Plants that manufacture machinery and equipment consume electricity for lighting, heating, air conditioning, and similar overhead requirements. Short-run changes in these components are minimized by the seasonal adjustment program. The major portion of electric power consumption, ranging between 65 percent and 75 percent, is used for driving motors, running electric furnaces, and operating other instruments of production.

Electric power, as a long-run indicator of production, has a strong upward bias. As plants acquire more machinery and equipment per worker, the need for electric power increases relative to man-power. For example, in 1954 the nation's machinery industries used 3.60 kilowatt hours of electricity per production worker man-hour; by 1961 the ratio had increased to 5.26.

An additional shortcoming of the electric power series is that not all machinery industries consume the same quantity of electricity per dollar of output. The ideal electric power index, therefore, should be weighted by each subindustry's share of total value added in the District's machinery industries during some base period. This procedure was not employed, however, because of incomplete reporting by the District's electric utilities.

As in the case of aggregate man-hours, the electric power data were converted to a 1957-59 index base. The electric power and man-hour series are each plotted as three-month moving averages because of erratic month-to-month changes.

Wholesale Prices

The Bureau of Labor Statistics does not publish wholesale price indexes that correspond to the machinery industry classifications as established by the Bureau of the Census. It is possible, however, to obtain wholesale price indexes for the machinery industries by combining selected index groupings.

The price index for nonelectrical machinery was derived by removing the weighted indexes of "electrical machinery and equipment" and "motor vehicles" from the "machinery and motive products grouping". Index groupings are assigned weights according to value of shipments in 1958. The "transportation equipment, railroad rolling stock" grouping was not deleted. However, its weight in the nonelectrical machinery index, as illustrated in Chart 4, is only 0.04 percent.

A composite wholesale price index for the electrical machinery industry was obtained by adding the weighted indexes of "household appliances" and "television, radio receivers, and phonographs" to "electrical machinery and equipment."

MONTHLY BUSINESS REVIEW SURVEY REPORT

Many questions have arisen concerning the nature and interests of *Monthly Business Review* readers; but reliable information has not been available. The lack of information prompted this bank to find out who reads the publication.

Most readers will recall receiving their July issue of the *Monthly Business Review*, because included in that mailing was a questionnaire asking readers for opinions concerning the publication.

Many of those who returned questionnaires requested that the results of the survey be published. Following are some of the survey findings.

As Table I shows, about three-quarters of the *Review* is mailed to individuals, with the remaining one-quarter mailed to banks. The *Review* is also sent to other Federal Reserve Banks and Fourth District member banks. Questionnaires were sent to everyone on the *Review* mailing list in July 1963. Of the 8,296 questionnaires mailed 3,863 or 46.6 percent were returned. Responses were tabulated for nearly all of the completed questionnaires or 45.1 percent of all people who receive the *Review*.

Readers and Their Interests

Analysis of the survey data revealed that nearly two-thirds of the readers are employed in banking, finance, manufacturing, industry, and education. Table II lists the employment of the 3,742 people whose questionnaires were tabulated. Table III shows that the majority of readers indicated they were interested most in industry studies and business trends, both on the national and local levels.

What We Have Learned

It is interesting that many of the respondents to the questionnaire indicated that they pass the *Review* on to others to read, while a considerable number stated that they used it for reference purposes. Many respondents stated that they have been reading the *Review* for one to four years, and close to 40 percent have been reading it for more than four years. More than 1,000 of the questionnaires returned offered suggestions, criticism, or comments. This means that more than 28 percent of the respondents were interested enough, after having answered thirteen questions, to take the time to elaborate on their views.

The Federal Reserve Bank of Cleveland wishes to thank those individuals who participated in the survey.

Table I

MONTHLY BUSINESS REVIEW SURVEY

Mailing List Composition and Corresponding Rates of Return

Questionnaires Mailed To:	No. of Q'rs Mailed	Percent of Mailing List Composition	No. of Q'rs Tabulated (By Group)	Q'rs Tabbed as % of Mailing (By Group)*	Q'rs Tabbed as % of Total Tab	No. Q'rs Returned as % of Total No. Mailed
Individuals (Continental U.S.A.) . . .	6,072	73.2%	2,935	48.3%	78.4%	35.4%
Individuals (Foreign) . . .	186	2.3	31	16.7	0.8	0.4
Banks	2,038	24.5	776	38.1	20.8	9.3
Sub Total	8,296	100.0	3,742	45.1	100.0	45.1
Unusable Questionnaires** (Not Tabulated)			121			1.5
TOTAL	8,296		3,863			46.6%

* Not additive

** An unusable questionnaire was one that was returned too late for tabulation or was incomplete. An incomplete questionnaire is defined as one with less than one-half of the questions answered. There were 46 late questionnaires (0.6 percent), and 75 incomplete (0.9 percent).

Table II

AREAS OF EMPLOYMENT

OF READERS OF MONTHLY BUSINESS REVIEW

	Percent of Respondents
Banking & Financial Institutions .	27.4
Manufacturing & Industry . . .	18.7
Education	17.3
Government.	5.1
Investment	4.3
Trade	3.8
Media	3.8
Consulting & Research	3.2
Insurance	2.7
Utilities.	2.3
Self-employed.	1.7
Trade & Labor Associations . .	1.1
Real Estate & Construction . . .	1.1
Other	2.2
Not stated	5.3
TOTAL	100.0

Table III

TOPICS OF INTEREST

TO READERS OF MONTHLY BUSINESS REVIEW

	Percent of Respondents*
Industry Studies	53.8
National Business Trends . . .	50.2
Regional Business Trends. . . .	44.9
Money Markets	42.6
Business Finance	40.6
Monetary Policy	38.9
Consumer Credit & Savings . .	38.8
Employment	37.8
Banking Trends & Structures . .	33.2
Federal Finance	27.1
International Trade & Finance .	23.2
Capital Markets	21.4
State & Local Government Finance	21.3
Agriculture	20.4
Trade	20.3
Other	5.5
Interest Not Stated	1.1

* More than one response permitted

LIQUIDITY OF STATE AND LOCAL GOVERNMENTS

THE RESEARCH DEPARTMENT of the Federal Reserve Bank of Cleveland recently conducted a survey to obtain detailed data on the sources and uses of short-term funds of state and local governments in the U. S.[1] The survey also attempted to determine the principal legal and economic factors that influence the cash management practices of these political units. It should be noted that there is little published information on the amount or composition of liquid assets held by state and local governments, the primary sources of funds so invested, or the distribution of liquid assets between state and local governments and their political subdivisions.

Background

During the postwar period state and local governments faced growing demands to expand the number of services provided as well as to improve the quality of existing services. Rapid population growth, increasing family formation, suburbanization, and the surge in home and automobile ownership, among other factors, have brought a need at both the state and local government levels for considerably larger outlays for education, highways, public health, sanitation and public safety. The need to supply more and better services has been accompanied by an increase in costs, both of administering new and expanded programs and constructing capital projects.

[1] The survey was carried out in connection with this bank's participation, along with the other Federal Reserve banks, in the work of the Federal Reserve System's Committee on Financial Analysis, whose membership includes representatives of the District banks and the Board of Governors.

Providing more and better services has had a pronounced impact on the scale of operations of state and local governments. From 1951 through 1962, for example, total revenues of state governments more than doubled, increasing from $15.6 billion to $37.6 billion. Even more indicative perhaps, was the nearly threefold increase (from $6.0 billion to $16.7 billion) in the revenues of cities with populations of more than 25,000.

State and local government purchases of goods and services aggregated $59.1 billion in 1962, representing nearly two-thirds of all government outlays for nondefense purposes and accounting for approximately one-ninth of total Gross National Product. Looking at it another way, state and local purchases contributed about $3.5 billion to the $36.7 billion advance in GNP in 1962. In recent years, state and local government purchases have advanced at a faster pace than that of consumer expenditures for either nondurable goods or for services, both of which have experienced persistent upward trends.

About one-fourth of the total outlays for goods and services by state and local governments is for new construction that has required increasing borrowing. The total volume of state and local government long-term security offerings in the past two years has averaged nearly $8½ billion per annum, and the total amount of securities outstanding reached an estimated all-time high of $85.8 billion as of June 30, 1963.

While there is a relatively steady flow of expenditures, there is a marked seasonal pat-

tern in the receipts of both state and local governments. Temporary cash surpluses that result from tax collections, proceeds from bond sales, and grants-in-aid are associated with more regular disbursements for operating expenses and progress payments on capital projects. Such surpluses have grown larger because of the increasing magnitude of state and local government financial operations.

Faced with a mounting volume of cash inflow, finance officers have attempted to obtain additional income from investment of temporarily idle funds. It is not surprising, therefore, that state and local governments reduced their holdings of cash and demand deposits from $16.9 billion in 1952 to $14.6 billion in 1962 — despite the large increases in both revenues and expenditures. In marked contrast, holdings of U. S. Government securities increased from $11.1 billion to $20.5 billion, and time deposit balances in commercial banks climbed sharply from $1.6 billion to $7.1 billion.[2]

Importance of State and Local Liquidity

The temporary surpluses of funds resulting from the interaction of steady spending and sporadic receipts quite clearly provide a pool of short-term assets that comprises the liquidity of state and local governments. Surpluses from current operations would be considered as a significant supplement to the liquidity pool, except that on balance budgetary surpluses have been infrequent in recent years. Since 1957, state and local governments have incurred average annual deficits of $2.2 billion, despite the fact that deficits in the most recent three fiscal years have narrowed appreciably.

Survey Scope. In order to appraise the possible impact of financial management practices of state and local governments, it was necessary to approximate by a sample survey the amount and composition of short-term investments held by state and local governments.

The sample selected included all 50 states, 323 cities with populations in excess of 50,000 and 50 of the nation's largest county governments.[3] While many political subdivisions such as school districts, smaller cities, townships, and counties were not included, the sample did cover the governmental units that are the largest in terms of population and financial resources. The survey questionnaire was completed by 280 respondents, representing 66 percent of the total number of governmental units that received a copy of the questionnaire.

The respondents reported aggregate liquid asset holdings of $9.2 billion as of various reporting dates in 1962.[4] While the data cannot be placed in historical perspective, the survey results do provide a useful approximation of the size and composition of the sources and short-term uses of funds of state and local governments.[5]

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[2] State and local governments held $3.3 billion of Treasury bills at year-end 1962, and by June 30, 1963, the total had reached $4.2 billion, or 20 percent of U. S. Government issues held by state and local governments. Data on other U. S. Government securities due to mature in less than one year are not published elsewhere, although they were obtained in this bank's survey.

[3] This bank acknowledges the cooperation of Mr. Joseph F. Clark, Executive Director, Municipal Finance Officers' Association, in conducting the survey.

[4] The lack of published detailed information concerning holdings of liquid assets by state and local governments makes it impossible to ascertain the proportion of total *liquid* assets obtained in the survey. The fiscal years of all but two of the reporting states ended on June 30, 1962. A majority of the cities and counties ended their fiscal years on December 31, 1962, with the next most common period being the 12 months ended June 30.

[5] The results of the survey can serve only as a rough guide to the size and composition of state and local government liquidity. In addition to limited sample coverage, the data obtained were as of the end of the fiscal years of each of the respondents. Depending upon the income and expenditure patterns of individual respondents, year-end figures for liquid asset holdings could be at either a high, a low, or an average level. The published report of an annual range in the liquid asset holdings of one of the largest respondents emphasizes this point. During 1962, total liquid resources of this respondent varied from a low of $418 million to a high of $919 million. The daily average figure was $463 million and the total at the end of the fiscal year was $728 million. A wide range such as this may be common to the pool of liquid resources of many large state and local governments, and proportionate variation may exist for smaller units. The possible existence of this type of pattern shows the need for considerably more detailed data before the maximum impact of state and local government liquidity can be completely appraised.

Table I

Liquid Assets of State and Local Governments

Governmental Unit	Number of Respondents	Percent of Total Respondents	Reported Liquid Assets* (in millions of dollars)	Percent of Total Reported Liquid Assets
States**	37	13.2%	$6,005	65.1%
Counties	34	12.2	873	9.5
Cities	209	74.6	2,347	25.4
Total	280	100.0%	$9,225	100.0%

* Data reported as of the close of each respondent's fiscal year in 1962.

** Reporting states include District of Columbia.

Summary Figures. Table I provides a summary of the results of the survey, indicating the relative importance of the three types of governmental units included in the coverage. The 36 states and District of Columbia, while comprising only 13 percent of the number of respondents, accounted for nearly two-thirds of reported liquid asset holdings. Cities accounted for nearly three-quarters of the number of respondents, but only one-quarter of liquid asset holdings. County governments accounted for a relatively small share of both totals.

Sources and Short-term Uses of Funds

Table II presents the aggregate sources and short-term uses of funds of the 280 respondents. The principal sources, accounting for nearly nine-tenths of the total, were tax revenues, undisbursed proceeds from bond sales, and "other" funds.[6] The smallness of the five remaining specific sources reflects the fact that the bulk of these funds are, for the most part, eligible for longer-term investment.

The data on short-term uses of funds shows a similar concentration, with three specific media (cash and demand deposits, time deposits, and U. S. Treasury bills) accounting for more than three-quarters of the total. This concentration is partly a result of legal restrictions that govern the short-term investment practices of state and local governments.

Table III shows the investment preference of the respondents and the reported incidence of ineligibility of the various investment media. There is, of course, a correlation between the types of investments most popularly used and the investment media with the widest eligibility. Aside from time deposits and obligations of the U. S. Government, there was surprisingly little variation in reported investment policy, as reflected in the fact that the incidence of use of alternative investments was far below the incidence of eligibility of these media. The limited range of the investment practices of state and local governments is, in part, a reflection of the emphasis placed upon quality and marketability by investors of public funds.

Lack of historical data prohibits an appraisal of changes in investment procedures that have occurred over the years. Responses to the survey suggest, however, that the current range of investment alternatives is broader than in former years. Three-quarters of the respondents reported that there has been recent emphasis on improving cash management techniques, and nearly two-thirds of those indicated that this was initiated in large part because of the availability of higher rates of return on alternative investments.

Approximately 20 percent of the respondents stated that laws governing short-term investment policy had been amended within the past ten years, with the majority of the changes providing either a broader choice of investments or greater discretion concerning the types of funds that can be invested.

(6) "Other" funds represent commingled cash resources that were not identified as to specific source. This practice is particularly wide-spread among larger governmental units that place more emphasis on efficient cash management.

Table II

**Sources and Short-Term Uses of Funds*
280 State and Local Government Respondents
(in millions of dollars)**

Sources		% of Total	Uses		% of Total
Tax Revenues	$2,752	29.8%	Cash and Demand Deposits	$1,729	18.8%
Undisbursed Proceeds from Bond Sales	1,821	19.7	Time Deposits	2,294	24.9
Sinking Funds and Bond Reserves	387	4.2	Treasury Bills	3,233	35.0
Refunding Bond Accounts	11	0.1	Treasury Certificates of Indebtedness	499	5.4
Federal Grants-in-Aid	79	0.9	Other Treasury Issues Due in One Year	749	8.1
Retirement System Contributions	531	5.8	Federal Agency Issues Due in One Year	267	2.9
Industrial Commission Funds	56	0.6	Commercial Paper	250	2.7
Other Funds**	3,588	38.9	Municipal Securities Due in One Year	204	2.2
Total	$9,225	100.0%	Total	$9,225	100.0%

* Data reported as of the close of each respondent's fiscal year in 1962.

** The major portion of these funds represent commingled receipts, which are not segregated by source of funds.

Importance of Size

An examination of the composition of the liquid asset holdings of state governments reveals variations in the uses of short-term funds that in large part reflect size differences. Comparisons of the sources of short-term funds are not as meaningful, however, since many finance officers commingle cash receipts and report them as "other funds", giving no source identity. The relative importance of the various income sources of the respondents is thus obscured. From other data, however, it is possible to determine that tax revenues (e. g., sales and gross receipts taxes, license taxes, and individual and corporate income taxes) constitute the largest single source of income to state governments.[7] Such taxes have provided on average about 55 percent of total income of states in the past five years. Intergovernmental revenues — principally Federal grants — have accounted for about 20 percent, with the remaining one-quarter from miscellaneous sources. Borrowing by states has provided approximately 7 percent of total funds available from all sources.

Table IV presents a comparison of the manner in which state respondents of varying population size employ short-term funds.[8] The table highlights the importance of size of state governments in the distribution of liquid asset holdings. Holdings of cash and demand deposits averaged nearly one-third of total liquid asset holdings of the smaller states (Code I), about one-fifth of the total for Code II respondents, and approximately one-eighth for Code III respondents.

[7] See *Compendium of State Government Finances in 1962*, U. S. Department of Commerce, Bureau of the Census, United States Government Printing Office, Washington, D.C., 1963.

[8] The population groupings were designed to facilitate tabulation of the results.

Table III

Incidence of Use of Various Short-Term Investments 280 State and Local Governments*

Investment Media	Respondents Reporting Use	% of Total	Respondents Reporting Ineligible	% of Total
Time Deposits . . .	200	71.4%	31	11.1%
Treasury Bills . . .	254	90.7	2	0.7
Treasury Certificates of Indebtedness .	128	45.7	9	3.2
Other Treasury Issues Due in One Year.	149	53.2	7	2.5
Federal Agency Issues Due in One Year . . .	35	12.5	87	31.1
Commercial Paper .	13	4.6	189	67.5
Own Municipal Securities Due in One Year . . .	35	12.5	56	20.0
Other Municipal Securities Due in One Year . . .	10	3.6	142	50.7

* Data reported as of the close of each respondent's fiscal year in 1962.

This comparison strongly suggests that larger governmental units tend to place relatively more emphasis on keeping liquid assets actively employed "at interest." The table also suggests that larger respondents utilize a wider variety of investment media to accomplish this purpose. For example, time deposits were the most popular medium for smaller respondents, while readily marketable interest-bearing obligations (chiefly U. S. Government securities) accounted for the bulk of the holdings of Codes II and III respondents. Larger respondents appeared to have more willingness and wider opportunity to diversify holdings of marketable obligations among alternative media, e. g., Treasury issues, Federal Agency issues and commercial paper.

It is important to note that Codes II and III respondents, accounting for over nine-tenths of reported liquid assets of all state respondents, exhibited a strong preference for negotiable, interest-bearing instruments. This preference, in turn, may have an important influence on the ownership and distribution of commercial bank deposits. The state governments that hold the largest amounts of liquid assets are those which apparently prefer to acquire interest-bearing assets outside the banking system. The introduction of negotiable time certificates of deposit by larger commercial banks was specifically designed to increase the banks' ability to compete for these types of funds.

Table V summarizes the pattern of liquid asset holdings of all respondents (state, county and city). The respondents are grouped according to population size. The pattern that emerged in Table IV is also evident in Table V, lending further support to the premise that variations in investment patterns are closely associated with the size of the governmental unit.

Tables IV and V show that, regardless of population size, short-term liquid asset holdings are concentrated in demand and time deposits and in U. S. Treasury bills. Holdings of these assets range from a low of 70 percent (Table IV, Code II) to a high of 93 percent (Table V, Code I) of the total liquid assets of the six population groupings in the two tables. The average proportion of deposits and Treasury bills for the six groupings is slightly over four-fifths of the total.

Some Implications

If the rate of growth in the revenues of state and local governments continues at the pace of recent years, the pool of temporarily idle resources will expand further. The existence of a larger liquid asset pool requires the increased attention of financial officers. If these officials continue to improve cash management techniques, important changes in short-term investment patterns may occur, with the rates of return on alternative short-term investments being a major factor.

Greater emphasis on cash management by state and local governments may result in a larger proportion of their liquid assets being held outside the banking system. As major depositories for idle balances of the nation's

largest corporations, money market banks, primarily those in New York City, have absorbed the burden of deposit shifts resulting from an intensification of cash management practices by corporate treasurers. Since the deposits of state and local governments are relatively widely distributed, however, the changes in both the ownership and distribution of deposits would be diffused throughout the banking system.

Table IV

Percentage Distribution of Short-Term Investments 37 State Respondents* (as of end of fiscal year 1962)

Investments	Population Groups**		
	11— Code I	22— Code II	4— Code III
Cash and Demand Deposits	30.0%	20.3%	13.0%
Time Deposits . . .	34.5	11.4	27.4
Treasury Bills . . .	24.1	38.0	35.2
Treasury Certificates of Indebtedness .	1.9	5.1	8.6
Other Treasury Issues Due in One Year.	5.8	7.7	13.2
Federal Agency Issues Due in One Year . . .	1.2	6.8	0.6
Commercial Paper .	0.3	6.5	2.0
Municipal Securities Due in One Year.	2.2	4.2	—
Total	100.0%	100.0%	100.0%
Total Liquid Assets (millions of dollars)	$452	$3,006	$2,547
Percentage of 37-State Total . . .	7.5%	50.1%	42.4%

* Includes District of Columbia.

** Population Codes as follows: I — 50,000 - 1,000,000
II — 1,000,000 - 10,000,000
III — 10,000,000 & over.

Note: Codes are preceded by the number of respondents falling within that code.

Table V

Percentage Distribution of Short-Term Investments 280 Respondents (as of end of fiscal year 1962)

Investments	Population Groups*		
	168— Code I	77— Code II	35— Code III
Cash and Demand Deposits	21.5%	21.0%	17.7%
Time Deposits . . .	34.2	32.8	21.5
Treasury Bills . . .	37.0	32.0	35.6
Treasury Certificates of Indebtedness .	2.4	4.0	6.2
Other Treasury Issues Due in One Year . . .	3.4	6.8	9.1
Federal Agency Issues Due in One Year . . .	0.1	2.0	3.5
Commercial Paper .	1.1	—	3.8
Municipal Securities Due in One Year.	1.3	1.4	2.6
Total	100.0%	100.0%	100.0%
Total Liquid Assets .	$890	$1,832	$6,503
Percentage of Total Reported . . .	9.6%	19.9%	70.5%

* Population Codes as follows: I — 50,000 - 250,000
II — 250,000 - 1,000,000
III — 1,000,000 & over.

Note: Codes are preceded by the number of respondents falling within that code.

FOURTH FEDERAL RESERVE DISTRICT