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GROWTH AND COMPOSITION OF GOVERNMENT SPENDING, 1958-1967

In recent years, the growth of government spending has received a great deal of attention. Concern over the growth of Federal spending, in particular, was a major issue in the controversy about the imposition of a Federal income tax surcharge. The surtax was finally passed with the condition that spending in the fiscal year 1969 budget would be reduced by $6 billion. It should be noted, however, that some major exemptions were provided in this legislation so that the total net reduction from the January budget estimate may be less than $6 billion.

There is little quarrel with the fact that aggregate dollar expenditures (National Income Accounts basis) at all levels of government (Federal, state, and local) have risen rapidly in recent years. For example, in calendar year 1967, total government spending amounted to $241 billion, in contrast to $127 billion in 1958, representing an increase of 89.6 percent. On the other hand, there may be some quarrel with the possibility that government spending over the next ten-year period will increase at the same rate. This article attempts to put government spending in perspective. The article examines the major growth areas within government spending during the 1958-1967 period (calendar year) and analyzes the changing patterns in government spending.

GROWTH OF EXPENDITURES

Although total government spending expanded markedly in the last decade, the growth rates of spending at Federal and state and local levels varied widely. As shown in Table I, total government expenditures rose by $114 billion during 1958-1967, or at an average annual rate of 7 percent. The Federal Government accounted for about two-thirds ($74.7 billion) of the dollar growth in total government spending. In relative terms, however, state and local level expenditures grew

TABLE I
Changes in Government Expenditures Between Calendar Year 1958 and 1967

	Current Dollars (Bil. of $)			Average Annual Rate of Growth 1958-1967		
	1958	1967	Change 1958-1967	Current Dollars	1958 Dollars	Per Capita 1958 Dollars
Total Expenditures						
Total government	$127.2	$241.2	$114.0	7.0%	4.5%	3.0%
Federal	88.9	163.6	74.7	6.6	4.2	2.5
State and local*	38.3	77.6	39.3	8.1	5.3	3.5
Purchases of Goods and Services						
Total government	94.2	178.4	84.2	7.1	4.2	2.7
Federal	53.6	90.6	37.0	5.5	3.2	1.8
State and local†	40.6	87.8	47.2	8.9	5.4	3.7
Transfers						
Total government	32.1	61.3	29.2	6.8	5.4	3.8
Federal	26.9	52.5	25.6	7.0	5.6	3.8
State and local†	5.2	8.8	3.6	5.6	4.2	2.5
GNP	$447.3	$789.7	$342.4	6.5%	4.7%	3.2%

NOTE: Data are on a National Income Accounts basis. Government subsidies less the current surplus of government enterprises must be added to purchases and transfers in order to equal total expenditures.

* Excludes Federal grants-in-aid.

† Includes Federal grants-in-aid.

Source: U. S. Department of Commerce

more rapidly than Federal Government expenditures. During 1958-1967, Federal expenditures rose at an average annual rate of 6.6 percent, compared with 8.1 percent for state and local spending.

Much of the growth in government expenditures is apparent rather than real, since it reflects increases in prices and salaries rather than expansion of the actual scope of government activity. It should be noted that in deflating government expenditures, no allowance is made for changes in the productivity of government workers; as a result, the total increase in wage costs per employee is in effect taken as a price increase. The likelihood, however, is high that productivity of government workers has increased over this period, although the measurement of the amount is obviously subject to more difficulties than in other sectors. When expressed in 1958 dollars, total government expenditures increased at an average annual rate of 4.5 percent, in contrast to 7 percent in current prices. Similarly, Federal spending grew at a 4.2 percent annual rate in constant dollars, and state and local expenditures grew at a 5.3 percent annual rate.

Constant dollar expenditures, however, will grow even if new activities are not undertaken or past activities are not expanded. Simply providing the same services for an increasing population requires an increase in expenditures. During the period under review, total government expenditures in

1958 dollars, on a per capita basis, grew at an average annual rate of 3.0 percent, a growth rate almost identical to that of Gross National Product (GNP) in constant dollars, on a per capita basis (3.2 percent). In other words, when total government expenditures are deflated for price changes and adjusted for population growth, the growth rate of government expenditures is virtually identical with the growth rate of the economy. However, in per capita 1958 dollars, the growth of Federal spending was *slower* than the growth of GNP (2.5 percent average annual growth rate compared with 3.2 percent). In contrast, state and local spending grew somewhat faster (3.5 percent average annual growth rate) than GNP (see Table I).

A breakdown of total expenditures into the major components—purchases and transfers—gives additional insight into the growth and composition of government spending. Government purchases of goods and services absorb resources and represent a net drain on resources otherwise available to the private sector. Transfer payments, on the other hand, represent government activities that shift resources within the private sector either to different individuals (welfare payments) or over time to the same individuals (social security payments).

GOVERNMENT PURCHASES

Between 1958 and 1967, total government purchases of goods and services increased by $84 billion, or at an average annual rate of growth of 7.1 percent. State and local governments provided the bulk of the increase in government purchases, exceeding Federal Government purchases both absolutely and relatively. In fact, state and local government purchases, in per capita constant dollars, grew at an average annual rate twice that of Federal purchases (3.7 percent compared with 1.8 percent). Thus, in terms of resource absorption, state and local governments showed the greatest rate of growth.

While price increases affected almost every sector of the economy in recent years, government purchases of goods and services were especially hard hit, as wages and salaries of public employees were increased substantially in an attempt to catch up with comparable private occupations. For example, in 1967, the GNP deflator for personal consumption expenditures was 114.3 (1958=100), while the deflator for total government purchases of goods and services was 126.8. Within the government sector, the deflator for Federal purchases was 121.2, and for state and local government purchases, 133.3. In other words, state and local purchases cost 33.3 percent more in 1967 than in 1958, Federal purchases cost 21.2 percent more, and consumer purchases only 14.3 percent more. Despite higher prices, state and local purchases (in real terms) still increased faster than Federal purchases and the economy as a whole.

GOVERNMENT TRANSFERS

Government transfer payments[1] grew rapidly over the past decade, rising by $29 billion, which was a virtual doubling. Nearly all of the growth in transfer payments occurred at the Federal level; state and local transfers

[1] Total transfer payments include a number of items, such as social security payments, unemployment compensation, net interest paid, and veterans' benefits at the Federal level, and various types of special welfare payments at the state and local level.

experienced a steady but only gradual increase.

In current dollars, Federal transfers grew at a substantially faster rate (7.0 percent) than both state and local transfers (5.6 percent), and the economy as a whole (6.5 percent). However, price increases also inflate transfer payments. To approximate the effect of price changes, transfer payments can be deflated by the index for personal consumption expenditures. After correcting for price increases, that is, expressing the figures in 1958 dollars, the growth of Federal transfers (5.6 percent) still substantially exceeded the growth of state and local transfers (4.2 percent).

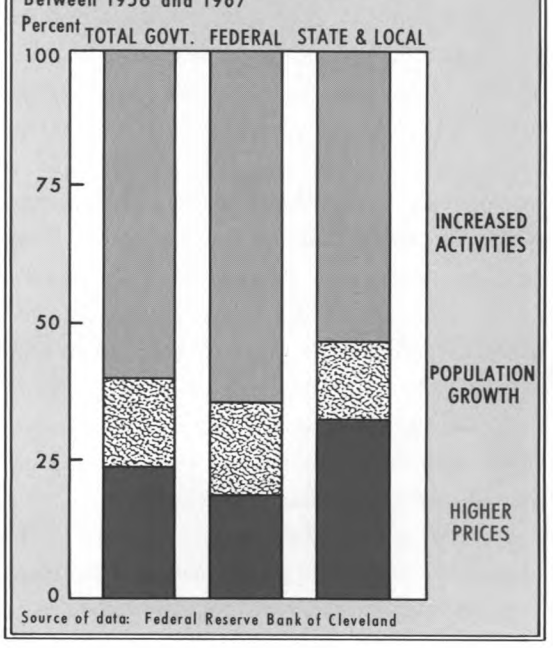
Although total government purchases of goods and services and transfer payments grew at the same rate in current dollars, the growth rate of transfers exceeded the growth of purchases after price changes and population growth are taken into account. In fact, after adjusting for price increases and population growth, transfer payments were the fastest growing category of Federal spending. At the state and local level, however, purchases of goods and services showed more rapid growth than transfers. In fact, both total expenditures and purchases by state and local governments experienced *higher* average annual rates of growth than comparable expenditures at the Federal level.

When the increase in government spending between 1958 and 1967 is explained in terms of higher prices, population growth, and increased activities, the sources of growth in government expenditures are more evident. As shown in Chart 1, increased activities accounted for only 60 percent of the growth

Chart 1.

SOURCES of GROWTH in GOVERNMENT EXPENDITURES

Between 1958 and 1967



Source of data: Federal Reserve Bank of Cleveland

in government expenditures from 1958 to 1967. Higher prices accounted for nearly one-fourth of each additional dollar spent, while population growth accounted for about one-sixth of the increase in expenditures.[2] State and local governments incurred sharper price and salary increases than the Federal Government. Consequently, higher prices accounted for fully one-third of the spending increase at the state and local level between 1958 and 1967, in contrast to slightly less than one-fifth at the Federal level. After population growth is taken into account, 65 percent of the increase in Federal spending

[2] The expenditure increase attributable to population growth assumes that the amount of 1958 per capita expenditures is provided to the additional population.

and 53 percent of the increase in state and local expenditures represented an expansion of activities.

GOVERNMENT EXPENDITURES BY FUNCTION

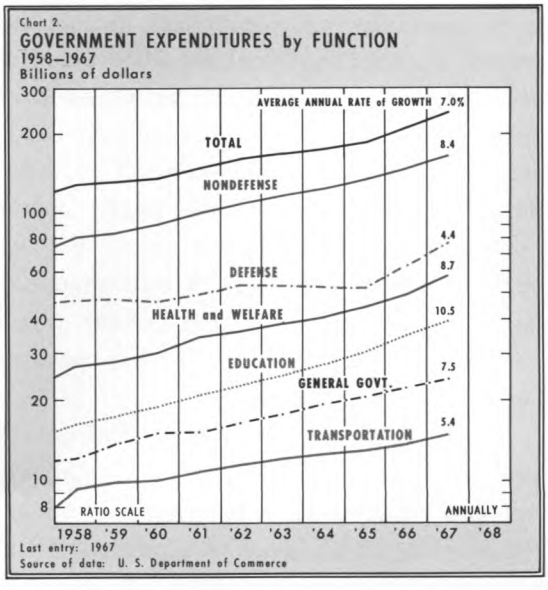
As discussed earlier, not all of the increase in government expenditures represents an increase in the actual scope of government activity—price changes and population growth account for a large proportion of the increase in dollar expenditures. This section examines the growth and composition of government spending by major function during 1958-1967. Unless otherwise noted, expenditure figures refer to total government, that is, Federal plus state and local. The spending totals are in aggregate money terms, that is, the totals are not deflated for price increases or corrected for population growth.[3]

Total government expenditures by function during 1958-1967 are shown in Chart 2. With the exception of defense spending, all major functions increased steadily throughout the period under review. In fact, defense spending was virtually constant from 1962 until mid-1965, when the Vietnam buildup began to accelerate sharply. For the entire period, the average annual rate of increase of defense expenditures (4.4 percent) was the lowest among the major governmental functions and was about one-half that of total nondefense expenditures (8.4 percent).

Within the nondefense sector, education exhibited the most rapid growth during 1958-1967, increasing at an average annual rate of 10.5 percent. Expenditures for health and welfare also rose rapidly, increasing at an average of 8.7 percent a year. Expenditures for general government rose only slightly faster than total expenditures (7.5 percent compared with 7.0 percent). Finally, spending for transportation, largely for highways, grew at an average annual rate of 5.4 percent.

A breakdown of spending for major functions by level of government is presented in Table II. At the Federal level, the largest dollar increase in spending between 1958 and 1967 was for defense ($28.0 billion), followed by expenditures for health and welfare ($24.1 billion). Federal spending for education showed the largest growth rate, but the starting base was relatively small. At the state and local level, education accounted for the largest dollar increase ($20.5 billion) as well as the fastest growth rate.

One way of illustrating the priorities of



[3] To be entirely accurate, deflation of government expenditures for specific functions (for example, education) would require a separate price index for each function and a determination of the appropriate population base for each function.

TABLE II
Government Expenditures by Function
Between Calendar Year 1958 and 1967

	Total Government			Federal			State and Local		
	Current Dollars (Bil. of $)		Average Annual Rate of Growth	Current Dollars (Bil. of $)		Average Annual Rate of Growth	Current Dollars (Bil. of $)		Average Annual Rate of Growth
	1958	1967		1958	1967		1958	1967	
Total expenditures	$127.2	$241.2	7.0%	$88.9	$163.6	6.6%	$38.3	$77.6	8.1%
Defense	46.9	74.9	4.4	46.7	74.5	4.4	n.a.	n.a.	n.a.
Nondefense	80.3	166.3	8.4	42.1	89.1	8.7	n.a.	n.a.	n.a.
Health and welfare	26.5	58.9	8.7	16.8	40.9	9.6	9.7	18.0	6.8
Education	16.0	39.7	10.5	0.6	3.8	22.2	15.5	35.9	9.8
General government	12.1	24.0	7.5	7.4	14.5	7.2	4.7	9.5	8.0
Transportation	9.1	14.9	5.4	3.0	5.6	6.7	6.1	9.4	4.7

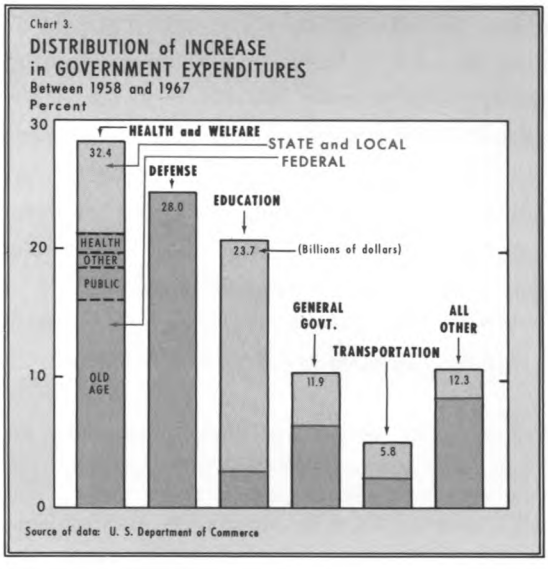
NOTE: Data are on a National Income Accounts basis. Federal grants-in-aid are treated as Federal expenditures for the appropriate function.

n.a. Not applicable.

Source: U. S. Department of Commerce

public spending during the 1958-1967 period is to distribute the increase in total government spending among the major functions (see Chart 3). The bars represent the proportion of the increase in total expenditures accounted for by the various functions. Expenditures for health and welfare increased more than any other function during the period, accounting for about 28½ cents of each additional dollar spent by all levels of government. Defense spending ranked second, accounting for about 24½ cents of each additional dollar spent by the public sector during the period, with the remainder accounted for by spending for education (21 cents), general government (10 cents), transportation (5 cents), and all other governmental functions (11 cents).

Within Federal welfare expenditures, old age assistance (including Medicare) accounted for about 16 cents of each additional dollar spent by all levels of government and amounted to more than one-half of the increase in total welfare expenditures. Federal spending for public assistance, such as aid to families with dependent children and other general assistance, accounted for about 2.5 percent of the increase in total government



spending during the period and less than one-tenth of the increase in total welfare expenditures. The "war on poverty program" is included in the "other" category, accounting for less than 1 cent of each additional dollar spent by all levels of government for all functions between 1958 and 1967. The increase in Federal expenditures for health programs accounted for about 1.5 percent of the increase in total government expenditures.

Although Federal spending for education rose $3.2 billion during the period under review, state and local governments provided about 87 percent ($20.5 billion) of the increase in expenditures for education. In contrast, virtually all defense spending was provided by the Federal Government.

The expenditure increases for the support of general government were divided about 60-40 between the Federal and state and local governments. In contrast, the Federal Government provided about 44 percent of the increase in spending for transportation. Finally, the Federal Government accounted for about 80 percent of the expenditure increase for the "all other" category. The space program received one-half of the increase in "all other" expenditures by the Federal Government.

In the nondefense public sector, health and welfare showed the largest absolute increase in spending, while spending for education showed the greatest percent increase. Furthermore, the Federal Government provided the bulk of the increase in health and welfare expenditures, while state and local governments provided the bulk of the increase in spending for education.

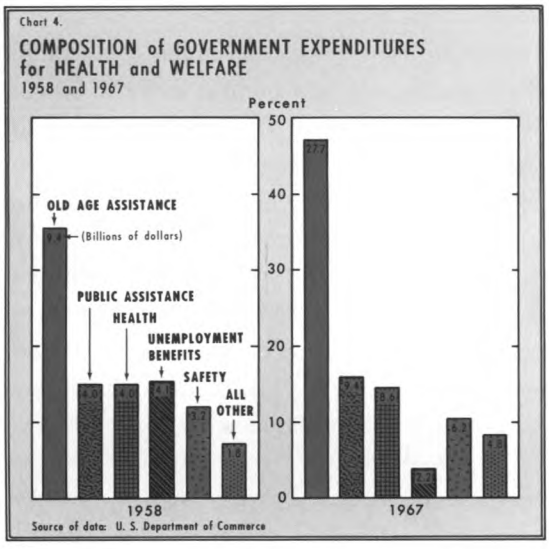
GOVERNMENT WELFARE EXPENDITURES

The direction of health and welfare expenditures over the past decade is more clearly evident from a comparison of the composition of the public welfare budget in 1958 and in 1967 (see Chart 4). The rapid increase in old age assistance expanded the relative importance of old age assistance within the total welfare budget (from 36 percent in 1958 to 47 percent in 1967). In sharp contrast, public assistance and health outlays each retained a constant proportion (about 15 percent) of the welfare dollar, while unemployment benefits dropped sharply.[4]

Despite seemingly large expenditures for health and welfare by all levels of government, such expenditures were not specifically designed to eliminate poverty. Consequently, poverty is still a serious problem in this country. In 1966, 30 million people (one-seventh of the population) were officially defined as poor.[5] However, only about one-fourth (8 million) of those in poverty receive any form of welfare payment. The problem of poverty is made even more serious since it is highly concentrated both geographically and demographically. Most of the poor people live in the central cities of large metropolitan areas and in certain rural districts, especially

[4] The decline in the relative importance of unemployment benefits in 1967 is due to the fact that unemployment was relatively high during 1958 (a recession year) and very low in 1967.

[5] For statistical purposes, households are defined as poor if their income falls below the cost of a certain minimum consumption standard — $2,185 in 1966 for a nonfarm couple under 65 years of age and $3,335 for a nonfarm family of four. Mollie Orshansky, "The Shape of Poverty in 1966," *Social Security Bulletin*, March 1968, pp. 3-32.



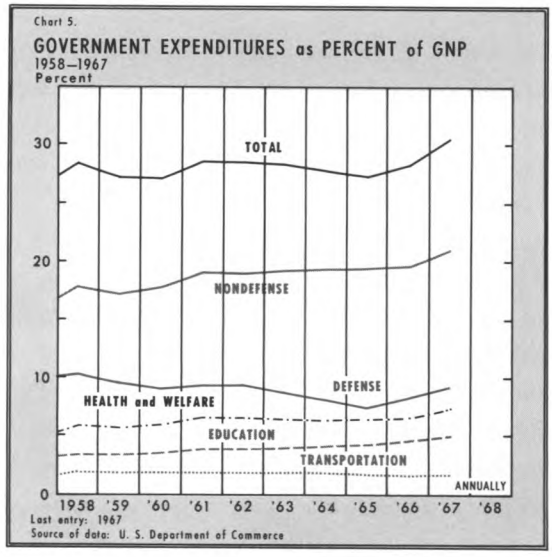
in the South. Moreover, poverty is concentrated in the aged, the nonwhite, and in households headed by a woman. The solution to the poverty problem will not only require more money, but may also require new concepts, such as a guaranteed minimum income or a negative income tax. Efforts to reduce poverty and improve economic opportunity must deal with the particular problems caused by inadequacies in education, housing, and health care.

CONCLUDING COMMENTS

While the growth in government spending during 1958-1967 was fairly rapid for all functions, the greatest growth occurred in the areas of health and welfare, defense, and education. However, when the increases in government spending are related to the growth in the economy over the period, the expenditure growth is much less dramatic. Chart 5 portrays total government spending and spending for the major functions as a percent of GNP during 1958-1967.

Total government expenditures, as a percent of GNP, fluctuated slightly during the 1958-1967 period, but on balance amounted to about 28 percent of GNP until mid-1965, when defense spending for Vietnam rose sharply, pushing total expenditures to 30.5 percent of GNP in 1967. In fact, until the Vietnam buildup, defense spending represented a declining proportion of GNP, as shown in Chart 5.

During the period under review, total nondefense expenditures rose from 17.9 percent of GNP in 1958 to 21.1 percent in 1967, an increase of slightly more than 3 percentage points. Increased Federal outlays accounted for about two-thirds of the rise in nondefense spending relative to GNP, with most of the increase concentrated in the



health and welfare function, especially old age assistance.[6] Consequently, although nondefense government spending increased substantially in money terms during the period, the increase was only slightly faster than the overall growth of the economy.

Total government health and welfare expenditures rose relative to GNP during the period (from 5.9 percent in 1958 to 7.5 percent in 1967), with virtually all of the growth at the Federal level. In contrast, state and local governments financed the growth of education spending relative to GNP (from 3.6 percent in 1958 to 5.0 percent in 1967). The growth of state and local spending for education during the period accounted for virtually all of the growth of total state and local expenditures relative to GNP (one percentage point). In other words, only in education did state and local spending grow faster than the economy during 1958-1967.

When the growth of total government expenditures during 1958-1967 is compared with overall economic growth, rising prices, and an expanded population, the gains in government spending are reduced appreciably. Whether the gains in government spending in the period ahead are of a similar magnitude is indeed an important question. In view of the pressing need for more and better public services at all levels of government, it may be that government spending will take a larger share of GNP in the future.

[6] Over the decade, Federal nondefense expenditures rose from 9.4 percent of GNP in 1958 to 11.3 percent in 1967, an increase of 1.9 percentage points. Federal health and welfare expenditures rose 1.4 percentage points, from 3.8 percent of GNP in 1958 to 5.2 percent in 1967.

REGIONAL PATTERNS OF INDUSTRIAL ACTIVITY AND FREIGHT TRANSPORTATION IN THE UNITED STATES

The industrial development of a region depends upon available resources and the ability to stimulate a flow of products and additional resources that helps overcome regional imbalances. The transportation of such products and resources to the various regions provides the means for assembling the inputs necessary for the industrial growth of a region. This article discusses the growth and composition of regional manufacturing activity between 1956 and 1966 and describes regional patterns in freight shipments in an effort to explain the differing rates of growth among regions in the United States.

REGIONAL MANUFACTURING ACTIVITY

Growth. Between 1956 and 1966, value added by manufacture in the United States increased at an average annual rate of 5.1 percent. In general, regional rates of growth reflected the extent of industrialization in each region at the beginning of the period.

During 1956-1966, value added by manufacture in the Middle Atlantic region (New York, New Jersey, and Pennsylvania) increased at an average annual rate of growth of 4 percent, the slowest rate of increase in the nation (see Table I). The region's share of total value added in the nation lost ground to some of the faster growing areas, declining from 25.1 percent in 1956 to 22.1 percent in 1966 (see Table I). The East North Central States (Ohio, Indiana, Illinois, Michigan, and Wisconsin) also experienced relatively slow growth in value added (4.7 percent), and the region's share of value added declined from 31.2 percent in 1956 to 29.7 percent in 1966. The slower-than-average growth of both the Middle Atlantic and East North Central regions was due largely to a higher

TABLE I
Value Added by Manufacture, United States and by Region
Selected Years
1956-1966

	1956	1958*	1960	1962	1964	1966	Average Annual Rate of Growth 1956-1966
Value Added (Mil. $)							
United States	$144,854	$141,531	$164,297	$179,520	$206,531	$251,638	5.1%
New England	10,881	10,440	12,329	13,458	14,431	18,307	4.8
Middle Atlantic	36,288	34,814	39,570	41,749	46,462	55,741	4.0
East North Central	45,198	40,962	48,315	52,418	60,816	74,677	4.7
West North Central	8,560	8,870	10,100	11,132	12,888	15,862	5.8
South Atlantic	13,519	14,355	17,072	19,259	22,767	27,556	6.7
East South Central	6,139	6,389	7,188	8,147	10,286	13,273	7.3
West South Central	7,680	7,791	8,952	9,729	12,133	14,892	6.2
Mountain	2,199	2,244	2,711	3,177	3,500	4,291	6.3
Pacific	14,390	15,666	18,060	20,451	23,248	27,039	5.9
Percent Distribution							
United States	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
New England	7.5	7.4	7.5	7.5	7.0	7.3	
Middle Atlantic	25.1	24.6	24.1	23.3	22.5	22.1	
East North Central	31.2	28.9	29.4	29.2	29.4	29.7	
West North Central	5.9	6.3	6.1	6.2	6.2	6.3	
South Atlantic	9.4	10.1	10.4	10.7	11.0	11.0	
East South Central	4.2	4.5	4.4	4.5	5.0	5.3	
West South Central	5.3	5.5	5.4	5.4	5.9	5.9	
Mountain	1.5	1.6	1.7	1.8	1.7	1.7	
Pacific	9.9	11.1	11.0	11.4	11.3	10.7	

* First year in which data for Alaska and Hawaii are included in the Pacific region and United States totals. In 1958, total value added for the two states was approximately $229 million, which increased the Pacific region and United States totals by less than 1.5 percent and 0.2 percent, respectively.

Sources: U. S. Department of Commerce, Bureau of the Census and Federal Reserve Bank of Cleveland

base at the beginning of the period. Nevertheless, in 1966, these two regions still accounted for slightly more than half of value added by manufacture in the United States.

The New England region (Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut) experienced lower-than-average growth in value added (4.8 percent). The share of value added accounted for by the New England region remained fairly stable during 1956-1966, however, declining only from 7.5 percent to 7.3 percent.

The East South Central region (Kentucky, Tennessee, Alabama, and Mississippi) was the fastest growing region in terms of value added by manufacture (7.3 percent) during 1956-1966. Although the region increased its share of value added from 4.2 percent to 5.3 percent, the area still ranked eighth among the nine regions at the end of the period. The Mountain region (Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, and Nevada) also experienced rapid growth (6.3 percent average annual rate) during the

1956-1966 period. Despite such rapid growth, the area contributed only 1.7 percent of total value added by manufacture in the United States in 1966.

The South Atlantic region (Delaware, Maryland, the District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, and Florida) had an average annual rate of growth of 6.7 percent from 1956 to 1966. The area increased its share of total value added from 9.4 percent in 1956 to 11.0 percent in 1966 and ranked as the third most important industrial region in the nation.

Washington, Oregon, California, Alaska, and Hawaii are included in the Pacific region, which grew at an average annual rate of 5.8 percent from 1956 to 1966. The Pacific region increased its share of value added from 9.9 percent in 1956 to a high of 11.5 percent in 1963; however, late in the period, the area lost some ground and in 1966, only accounted for 10.7 percent of value added in the nation. As a result of the reduction in share, the area slipped to fourth place in the distribution of value added among the regions.

Growth of value added in the two remaining regions—West North Central (Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas) and West South Central (Arkansas, Louisiana, Oklahoma, and Texas)—was also above the United States average during the period under review; however, both areas account for relatively small proportions of total value added by manufacture (see Table I).

Industrial Composition. The Middle Atlantic and East North Central regions contributed the largest shares of value added by manufacture in the United States in 1963.[1] As shown in Table II, these two regions also accounted for the largest shares of total value added by each industry, with the exception of lumber, ordnance, petroleum, and textiles.

The Middle Atlantic region produced nearly 23 percent of total value added in 1963, with nondurable goods industries providing a slightly larger share than durable goods industries. The region accounted for 49 percent of value added by the apparel industry and 45 percent of value added by the instrument industry. Several other industries in the area accounted for the highest

[1] Nineteen sixty-three is the latest year for which the *Census of Manufactures* and the *Census of Transportation* are available. The information is restricted to manufactures because data presented in the *Census of Transportation*, the source used in this article, are limited to manufactured commodities. This restriction does not seem serious in terms of the largest aggregates. Manufactured goods account for the bulk of commodities moved by the nation's freight transportation system generally. See "Freight Transportation and Industrial Activity in the United States," *Economic Review*, Federal Reserve Bank of Cleveland, July 1968. For example, value added by mining accounted for less than 8 percent of value added by manufacture and mining combined in 1963. However, value added by mining accounted for almost 42 percent of value added by manufacture and mining in the West South Central region and for nearly 38 percent of the combined total in the Mountain region. Therefore, the omission of mining in the *Census of Transportation* leaves a serious gap in representing commodity traffic originating from these two regions. In addition, mining output accounted for almost half of total tonnage hauled by rail in recent years and for nearly all of commodities moved by pipeline. As a result, the omission of mining output from the *Census of Transportation* also distorts measures of volume and of patterns in traffic flow for these modes of freight transportation.

proportion of value added in the overall industry groups, including furniture (28 percent), printing and publishing (35 percent), and chemical products (25 percent).

The East North Central region, which generated 29 percent of value added by manufacture in 1963, dominates the nation in the production of durable goods, accounting for nearly 36 percent of the value added by durable goods industries in the nation. Within the durable goods industries, in 1963, the region had the greatest concentration of primary and fabricated metals production (41 percent and 39 percent, respectively); stone, clay, and glass (27 percent); nonelectrical machinery (45 percent); electrical equipment (32 percent); and transportation equipment (44 percent). The East North Central area follows the Middle Atlantic area in nondurable goods production. In 1963, the East North Central region had the largest share of value added by manufacture by the food and

TABLE II
Percent Distribution of Value Added by Manufacture, United States and by Region and Industry Division
1963

Industry Division	All Regions (mil. $)	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific
Manufacturing*	$192,103	7.1%	22.7%	29.3%	6.1%	11.0%	4.9%	5.7%	1.8%	11.5%
Durable goods	108,710	7.4	20.8	35.6	5.5	7.0	3.9	4.0	1.9	13.8
Lumber and wood	4,021	4.1	6.1	10.8	3.5	13.7	9.0	7.9	5.7	39.4
Furniture and miscellaneous	6,630	11.9	27.6	24.6	4.4	12.7	4.7	3.4	0.8	10.1
Stone, clay, and glass	7,044	4.3	21.2	27.0	7.9	12.7	5.5	7.4	3.1	11.1
Primary metals	15,261	4.2	26.1	41.1	2.4	7.2	6.6	3.6	3.1	5.7
Fabricated metals	11,791	8.3	22.4	38.8	5.3	6.0	3.9	4.3	1.0	10.0
Nonelectrical machinery	17,311	9.5	19.9	44.5	8.1	3.6	2.5	4.0	1.0	7.1
Electrical equipment	17,011	9.7	26.3	32.0	4.7	6.5	3.9	2.8	0.9	13.4
Transportation equipment	22,766	5.4	12.0	44.1	7.2	6.8	2.2	3.6	2.3	16.4
Instruments	3,992	14.3	44.9	22.6	5.0	2.9	0.9	1.8	1.0	6.8
Ordnance	2,883	5.0	2.9	D	D	6.8	2.3	4.7	4.4	84.5
Nondurable goods	83,395	6.5	25.0	20.6	6.7	16.1	6.2	8.1	1.7	9.2
Food and tobacco	23,507	3.9	18.5	22.3	10.9	14.9	6.1	6.8	2.8	13.7
Textiles and leather	8,202	16.0	21.1	7.4	3.0	41.3	7.6	1.4	0.4	1.8
Apparel	7,861	6.2	48.9	9.1	3.7	13.3	8.0	4.1	0.4	6.3
Paper products	7,396	10.6	20.0	24.5	5.0	15.7	5.5	6.6	0.8	11.5
Printing and publishing	10,476	6.8	34.7	25.1	7.3	7.9	2.7	4.1	2.0	9.5
Chemical products	17,586	3.3	25.4	21.0	5.3	17.4	8.1	12.3	1.0	6.2
Petroleum and coal products	3,713	0.9	13.3	17.9	6.0	3.7	1.8	38.2	3.2	15.0
Rubber and plastics	4,654	13.4	17.4	39.2	5.1	5.7	6.1	3.7	2.1	7.4

D Not shown to avoid disclosure of information for individual companies.

* Details may not add to totals because of rounding and independent derivation of national aggregates.

Sources: U. S. Department of Commerce, Bureau of the Census and Federal Reserve Bank of Cleveland

tobacco industry (22 percent), paper products industry (25 percent), and rubber and plastics industry (39 percent). The region's share in most industries—durable and nondurable—was only exceeded by the Middle Atlantic region (see Table II).

The Pacific region accounted for the third largest share of value added by manufacture in the nation in 1963 (nearly 12 percent). Durable goods industries in the area were slightly more important than nondurable goods industries (14 percent and 9 percent, respectively). The Pacific region accounted for nearly 85 percent of value added by manufacture by the ordnance industry and 39 percent of value added by lumber and wood products—the highest share in the nation. The region ranked second in the nation in production of transportation equipment (16 percent). Within the nondurable goods group, the Pacific region had relatively high shares in food and tobacco (14 percent), paper products (12 percent), and petroleum and coal products (15 percent).

Although recent data indicate that, in 1966, the South Atlantic region moved into third place in the distribution of value added by manufacture, in 1963, the area contributed 11 percent to value added, slightly less than the Pacific region. Manufacturing activity in the area in 1963 was centered in the production of nondurable goods (16 percent of total value added). The South Atlantic region led the nation in output of textiles and leather goods (41 percent). The area also ranked fairly high in food and tobacco, apparel, paper products, and chemical products (see Table II).

The New England region accounted for 7 percent of the nation's total value added in 1963. Durable goods industries contributed slightly more to national output than nondurable goods industries. Instruments (14 percent) and furniture (12 percent) were the predominant industries within the durable goods group, while textiles (16 percent), paper products (11 percent), and rubber and plastics (13 percent) led in the nondurables group.

In the West North Central, East South Central, West South Central, and Mountain regions, the respective shares of value added were fairly small in most of the industries. The West South Central region was the only area of the four regions that showed a dominant individual industry, with the petroleum industry accounting for more than 38 percent of the nation's value added by that industry. In three of the regions, nondurable goods production was slightly higher than durable goods production.

VALUE ADDED AND FREIGHT TONNAGE BY REGION

Regions that account for the highest share of value added tend to have a correspondingly high share of freight shipments in the United States. For example, in 1963, the East North Central region contributed 29 percent of total value added and shipped 22 percent of total manufactured goods (see Tables II and IIIa). Except for the West South Central and New England areas, regional shares of total value added and freight shipments in 1963 were fairly similar. The differences in share of value added and share of freight shipments

TABLE IIIa
Percent Distribution of Freight Shipments,
United States and by Region of Origin and Industry Division
1963

Industry Division	All Regions (Thousands of Tons)	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific
Manufacturing	1,334,836	1.9%	14.8%	21.7%	7.0%	11.6%	6.0%	23.1%	2.0%	11.9%
Durable goods	495,824	1.5	17.7	32.2	6.4	11.5	7.1	5.6	2.9	15.0
Lumber and wood	70,380	2.5	0.9	5.5	1.5	20.4	12.9	6.6	7.3	42.4
Furniture and miscellaneous	9,494	5.6	28.6	25.6	2.4	23.4	6.7	4.9	–0–	2.8
Stone, clay, and glass	175,597	0.3	13.5	23.9	10.4	14.7	7.1	8.9	1.8	19.4
Primary metals	139,383	1.7	32.3	41.1	1.8	6.3	6.8	2.8	3.8	3.3
Fabricated metals	29,085	2.9	17.2	39.0	6.3	11.2	4.3	5.6	2.3	11.3
Nonelectrical machinery	20,006	3.7	15.1	48.2	21.4	2.6	2.8	2.8	0.6	2.8
Electrical equipment	12,497	4.5	24.6	51.0	5.3	1.9	7.5	2.2	0.1	2.9
Transportation equipment	37,959	0.5	10.7	69.5	7.4	4.6	2.1	1.3	–0–	3.8
Instruments	1,423	7.5	50.2	23.7	3.7	9.0	0.2	1.9	0.6	3.2
Nondurable goods	839,012	2.1	13.1	15.6	7.4	11.7	5.3	33.4	1.4	10.0
Food and tobacco	209,762	2.7	11.0	22.3	20.0	13.7	8.0	11.2	1.6	9.4
Textiles and leather	12,609	12.9	11.6	6.9	0.3	53.3	12.6	2.2	–0–	0.2
Apparel	3,906	8.0	29.2	16.4	1.9	30.6	6.9	6.1	–0–	0.9
Paper products	65,551	6.7	18.0	23.1	5.4	18.9	10.5	5.8	–0–	11.6
Chemical products	140,234	1.6	11.9	26.8	3.9	22.4	8.4	18.3	0.9	6.0
Petroleum and coal products	398,066	0.5	13.6	6.6	2.7	4.3	1.7	56.8	1.8	12.0
Rubber and plastics	8,884	11.3	19.8	40.9	6.2	3.9	7.0	5.2	1.3	4.4

Sources: U. S. Department of Commerce Bureau of the Census and Federal Reserve Bank of Cleveland

in a region can be attributed to the stage of processing that usually occurs in a region's industries. Since production costs tend to mount at higher stages of processing, regions dominated by advanced processing will tend to have disproportionate shares of value added and freight shipments.

In New England, for example, many of the area's industries, including the metal products, machinery, electrical equipment, transportation equipment, and instruments industries, add value by manufacture that is out of proportion to the weight of raw materials and supplies consumed and finished products shipped. The opposite pattern occurs in the West South Central States, where industries, such as petroleum, are predominantly engaged in primary processing.

INDUSTRIAL COMPOSITION OF FREIGHT TONNAGE BY REGION

Freight Originated. The relative importance of the various manufacturing industries of each region in 1963, in terms of tons of freight shipped, is shown by the data on distribution of freight shipments in Table IIIa. In the New England region, the textile and leather industries originated 12.9 percent of total freight shipments in the United

States. Other industries in the area with substantial proportions were rubber and plastics, apparel, instruments, paper products, and furniture.

In the Middle Atlantic region, instruments accounted for over 50 percent of United States tonnage. The primary metals group, with 32 percent of the industry's shipments in the nation, accounted for the largest volume of goods shipped from the Middle Atlantic States, but not for the largest proportion of primary metals products shipped from any region. Other industries with important tonnage shares in the Middle Atlantic region in 1963 included apparel, furniture, electrical equipment, rubber and plastics, paper products, fabricated metal products, and nonelectrical machinery.

Many industries gave rise to substantial shares of total shipments from the East North Central region. As shown in Table IIIa, transportation equipment was the region's most important industry, in terms of shipments, with nearly 70 percent of the United States total. Also of considerable weight in the region's shipments were electrical equipment (51 percent), nonelectrical machinery (48 percent), primary metals (41 percent), rubber and plastics (41 percent), and fabricated metal products (39 percent). The chemicals, furniture, stone, clay, and glass, instruments, paper products, and food products industries in the East North Central region originated nearly one-fourth of the nation's shipments for each industry.

Nonelectrical machinery was the West North Central region's most important industry in 1963 (21 percent). Although the share of tonnage originated by food products was roughly similar to that of nonelectrical machinery, actual tonnage volume of food products was about ten times the tonnage of nonelectrical machinery, which emphasizes the importance of agriculture in the region.

Overall, the South Atlantic States accounted for 12 percent of freight tons originated in the United States during 1963. The textile and leather products industries of the region originated 53 percent of the nation's shipments of these commodities. In addition, the region accounted for 31 percent of total shipments of apparel. Furniture, chemical products, lumber and wood products, paper products, stone, clay, and glass, and food and tobacco products all had reasonably high shares of shipments.

As shown in Table IIIa, industries with the largest tonnage shares in the East South Central States were lumber and wood, textiles and leather, and paper products. In the West South Central States, petroleum refining, with a 57-percent share of national freight shipments, was the only category that outpaced the region's overall share of 23 percent. This group obviously dominates industry in the region, since the West South Central States account for the bulk of petroleum products produced in the nation. Although much less important in the region itself, the region's chemical industry generated a substantial share (18 percent) of the nation's shipments in this category.

Within the Mountain region, which accounted for only 2 percent of total United States freight shipments in 1963, lumber and wood products (with only 7 percent of the national total) was the leading industry. The only other important industries in the region,

in terms of shipments, were primary metals and fabricated metal products; however, the region accounted for a very small proportion of the nation's shipments in both industries.

Lumber and wood products (42 percent) was the dominant industry in the Pacific States in 1963. Although the paper products and fabricated metals groups contributed fairly substantially to national freight tonnage, the only other industries of any importance in the Pacific region were stone, clay, and glass (19 percent) and petroleum products (12 percent).

Freight Received. The share of total freight shipments received in each region, as shown in Table IIIb, are reasonably similar to the proportion of the total resident population in each region in 1963, suggesting the importance of population in determining general patterns of consumption.

Percent Distribution of Population by Region
1963

New England	5.8%
Middle Atlantic	19.0
East North Central	19.8
West North Central	8.4
South Atlantic	14.8
East South Central	6.7
West South Central	9.6
Mountain	4.0
Pacific	11.9
TOTAL	100.0%

Source: U. S. Department of Commerce, Bureau of the Census

The range between the lowest and highest share of shipments received in each region

TABLE IIIb
Percent Distribution of Freight Shipments,
United States and by Region of Destination and Industry Division
1963

Industry Division	All Regions (Thousands of Tons)	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific
Manufacturing	1,334,838	6.2%	20.2%	20.3%	7.1%	17.8%	5.9%	9.0%	2.2%	11.3%
Durable goods	495,824	3.4	15.2	29.3	7.3	13.7	6.6	7.8	3.0	13.8
Lumber and wood	70,380	2.7	6.4	13.8	6.5	23.8	9.2	8.6	5.7	23.3
Furniture and miscellaneous	9,494	5.6	23.0	20.1	8.3	19.9	5.9	8.0	2.2	7.0
Stone, clay, and glass	175,597	2.3	12.9	21.7	8.3	16.2	8.2	8.9	2.8	18.7
Primary metals	139,383	4.9	20.4	45.4	5.2	5.9	4.6	6.4	1.9	5.3
Fabricated metals	29,085	4.2	17.4	29.0	7.1	12.9	5.3	7.0	4.5	12.6
Nonelectrical machinery	20,006	3.3	18.0	29.2	10.1	11.8	6.2	8.2	3.6	9.5
Electrical equipment	12,497	5.6	20.3	28.5	8.5	11.3	5.3	7.3	2.5	10.7
Transportation equipment	37,959	2.3	15.9	36.6	10.5	12.4	3.8	6.6	1.9	10.0
Instruments	1,423	4.9	23.0	24.3	5.3	15.3	3.7	6.3	1.7	15.5
Nondurable goods	839,012	7.8	23.3	15.2	6.9	20.3	5.4	9.7	1.6	9.8
Food and tobacco	209,762	5.1	16.1	20.6	12.1	16.3	7.1	12.8	1.7	8.3
Textiles and leather	12,609	10.0	25.2	13.2	3.9	29.1	7.1	4.8	0.4	6.3
Apparel	3,906	6.7	23.8	25.1	8.3	15.9	5.3	5.5	2.5	6.9
Paper products	65,551	5.6	23.0	28.5	6.2	13.7	5.4	5.3	1.1	11.2
Chemical products	140,234	3.8	15.7	22.6	7.1	22.1	6.8	12.6	1.4	8.0
Petroleum and coal products	398,066	11.0	29.9	7.2	4.2	22.8	4.0	8.0	1.8	11.1
Rubber and plastics	8,884	7.3	19.8	30.1	10.1	10.0	5.0	6.9	2.4	8.4

Sources: U. S. Department of Commerce, Bureau of the Census and Federal Reserve Bank of Cleveland

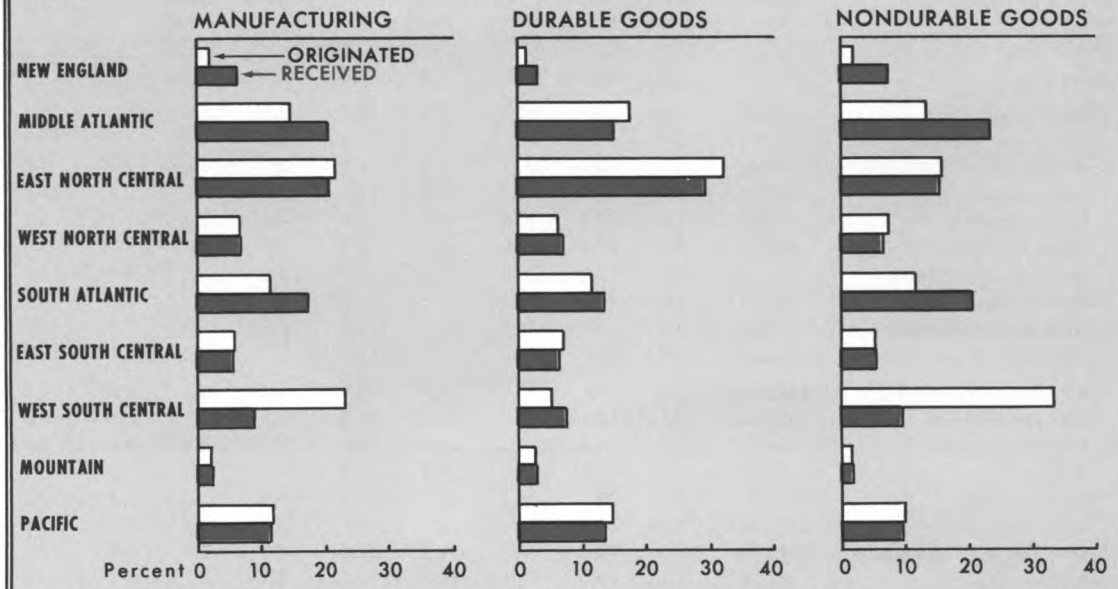
in 1963 was considerably smaller than the range for shipments originated (see Tables IIIa and IIIb). The influence of population appears to be strong enough to restrict the range of the share of shipments received in each region. In contrast, the range of shipments originated in each region is relatively wide, reflecting the role of technical conditions of production and the variable composition of regional resources.

In the New England, Middle Atlantic, and South Atlantic regions, the proportion of commodities received was greater than the proportion shipped by each region in 1963 (see Table IIIa, Table IIIb, and Chart 1). In contrast, in the East North Central and West South Central regions, shipments originated exceeded shipments received. The West South Central region's position as a net supplier of commodities was due primarily to the region's high volume of petroleum products and, to a lesser extent, the volume of chemical products shipped from the region. In the Pacific, Mountain, West North Central, and East South Central regions, the respective proportions of shipments originated and received were reasonably similar.

Shipments Originated/Received, by Region. The general similarity between proportions of freight originated (supply) and received (consumption) for regional aggregates does not indicate an industry by industry pattern

Chart 1.

FREIGHT SHIPMENTS ORIGINATED and RECEIVED, UNITED STATES by REGION
1963



Sources of data: U. S. Department of Commerce and Federal Reserve Bank of Cleveland

TABLE IIIc
Percent of Freight Shipments Originated to Freight Shipments Received by Region and Industry Division
1963

Industry Division	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific
Manufacturing	31%	73%	107%	99%	65%	102%	257%	91%	105%
Durable goods	44	116	110	88	84	108	72	97	109
Lumber and wood	93	14	40	23	86	140	77	128	182
Furniture and miscellaneous	100	124	127	29	118	114	61	–0–	40
Stone, clay, and glass	13	105	110	125	91	87	100	64	104
Primary metals	35	158	91	35	107	148	44	200	62
Fabricated metals	69	99	134	89	87	81	80	51	90
Nonelectrical machinery	112	84	165	212	22	45	34	17	29
Electrical equipment	80	121	179	62	17	142	30	4	27
Transportation equipment	22	67	190	70	37	55	20	–0–	38
Instruments	153	218	98	70	59	5	30	35	21
Nondurable goods	27	56	103	107	58	98	344	88	102
Food and tobacco	53	68	108	165	84	113	88	94	113
Textiles and leather	129	46	52	8	183	177	46	–0–	3
Apparel	119	123	65	23	192	130	111	–0–	13
Paper products	120	78	81	87	138	194	109	–0–	104
Chemical products	42	76	119	55	101	124	145	64	75
Petroleum and coal products	5	45	92	64	19	43	710	100	108
Rubber and plastics	155	100	136	61	39	140	75	54	40

Sources: U. S. Department of Commerce, Bureau of the Census and Federal Reserve Bank of Cleveland

of balance.[2] As Table IIIc shows, at the individual industry level, there is wide dispersion[3] of the ratios of tonnages of freight originated to freight received.

In the New England region, for example, supply was 155 percent of consumption for rubber and plastics products, but only 5 percent for petroleum and coal products. Other industries in the region that were in a position of net supply during 1963 include instruments, textiles and leather, paper, apparel, and nonelectrical machinery (see Table IIIc and Chart 2). Ten of the 16 industry groups, however, were in a position of net consumption, as was the total of the region's manufacturing shipments.

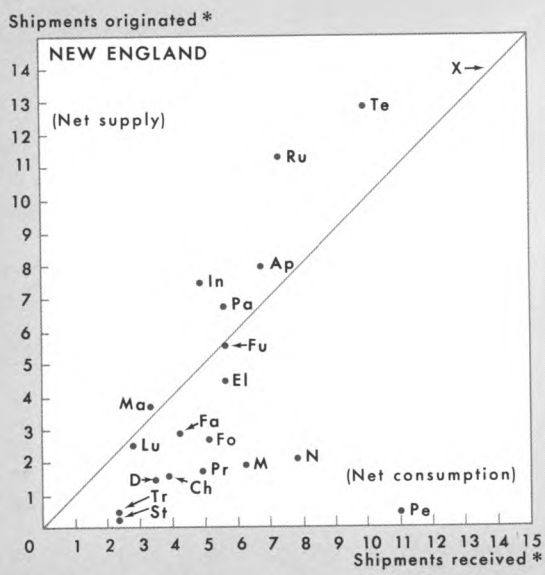
While the Middle Atlantic region supplied only 73 percent of the tonnage it consumed in 1963, the instruments industry within the region supplied 118 percent more than regional consumption, indicating net exports

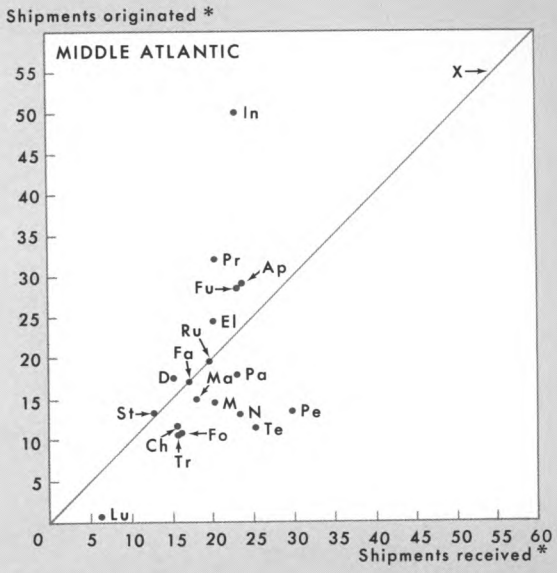
[2] "Supply" and "consumption," as used here, do not denote total supply or consumption of all or any single class of commodities, to the extent that the basic Census Bureau data employed in the study are restricted to interchanges of goods within the 48 continental states and the District of Columbia.

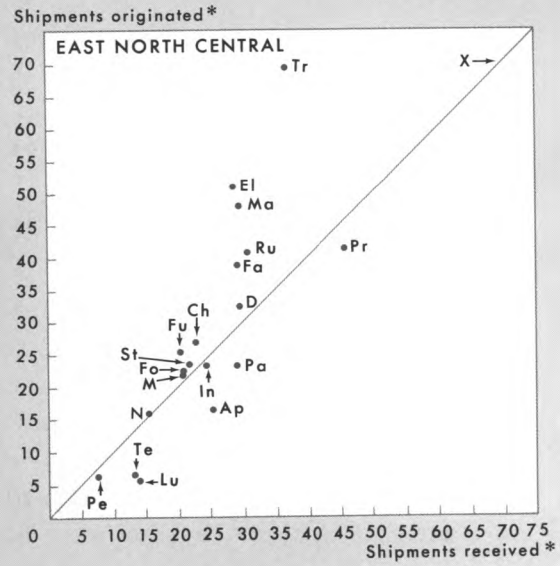
[3] Dispersion (as measured by the coefficient of variation, which is the ratio of the standard deviation to the mean of a series) of the percents for shipments received is less than that of the percents for shipments originated, in every region.

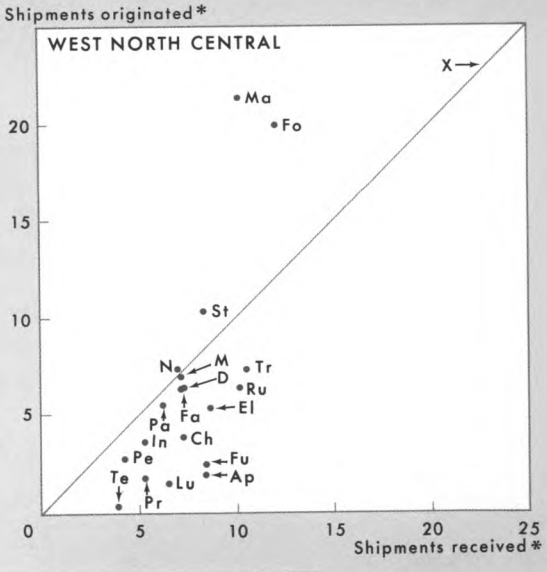
Chart 2.

RELATIONSHIPS of SHIPMENTS ORIGINATED and RECEIVED









LEGEND

M = Manufacturing, total

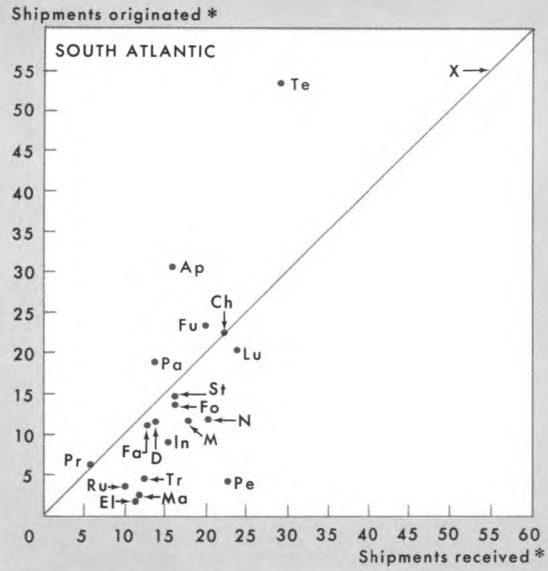
D = Durables
- Lu = Lumber and wood
- Fu = Furniture and miscellaneous
- St = Stone, clay, and glass
- Pr = Primary metals
- Fa = Fabricated metals
- Ma = Machinery, excluding electrical
- El = Electrical equipment
- Tr = Transportation equipment
- In = Instruments

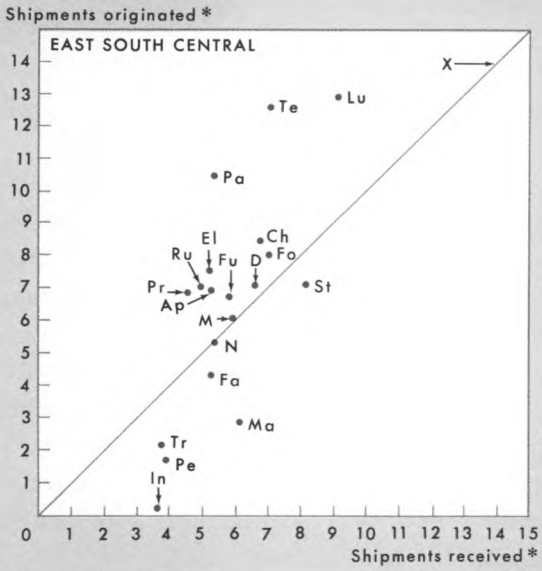
N = Nondurables
- Fo = Food and tobacco
- Te = Textiles and leather
- Ap = Apparel
- Pa = Paper products
- Ch = Chemical products
- Pe = Petroleum and coal products
- Ru = Rubber and plastics

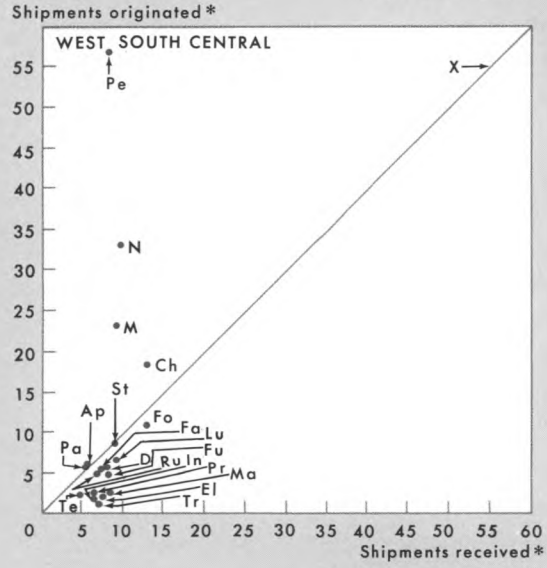
* Represented by percent of total United States tonnage originated or received within the region, by industry, 1963.

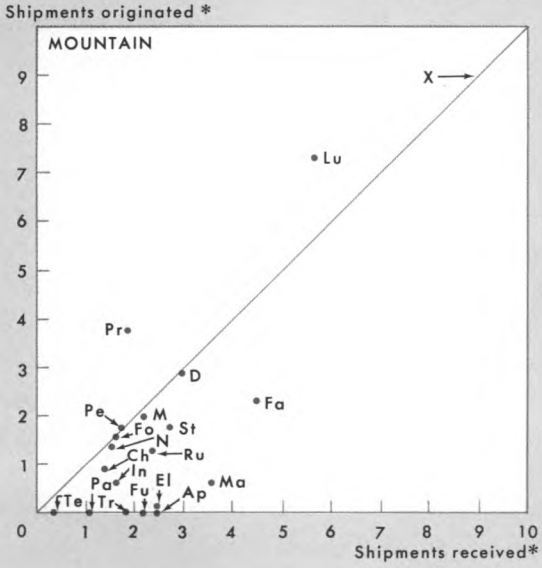
X The diagonal represents the (45°) slope at which shipments originated equal shipments received.

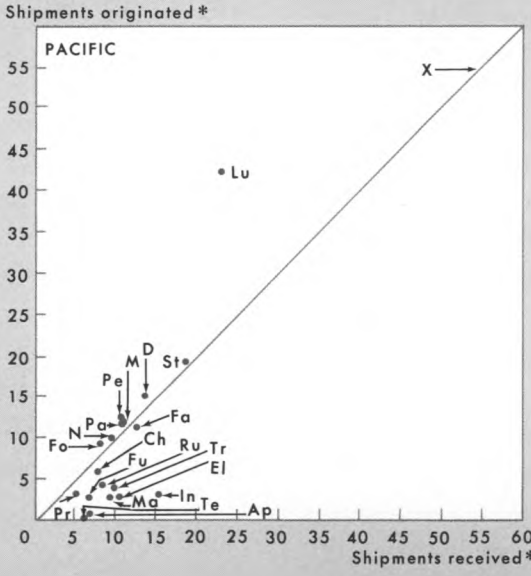
Sources of data: U. S. Department of Commerce, Bureau of the Census and Federal Reserve Bank of Cleveland











to other regions of the United States. The durable goods industries as a group were net suppliers in the Middle Atlantic region because of the importance of primary metals, furniture, electrical equipment, stone, clay, and glass, and instruments (see Chart 2). The apparel group was the only nondurable goods industry supplying more than consumption in the Middle Atlantic region, while rubber and plastics producers supplied as much as was consumed.

The East North Central region was generally a net supplier both of durable and nondurable goods in 1963 (see Chart 2). The transportation equipment industry led in the durable goods group. Other net supplier industries in the durable goods category were electrical equipment, nonelectrical machinery, fabricated metals, furniture, and stone, clay, and glass. The region was principally a net consumer (or importer) of nondurable commodities, such as textiles, apparel, paper products, and, to a smaller extent, petroleum and coal products. Rubber and plastics, chemicals, and food products were in net supply in the nondurable goods group.

In the West North Central States, supply was generally in close balance with consumption (see Chart 2). Nondurable goods were in slight excess, due solely to the large net export position of the food products industry. Although supply of durable goods as a group was 12 percent less than consumption within the region, the nonelectrical machinery industry produced a 112-percent export surplus and the stone, clay, and glass group a 25-percent surplus.

The South Atlantic region supplied only 65 percent of the region's requirements in 1963, placing it second only to the New England region as a net consumer of manufactured commodities. Only 6 of the 16 industries represented in the region were net suppliers —apparel, textiles and leather, paper products, furniture, primary metals, and chemicals (see Chart 2).

While the East South Central region accounted for only 6 percent of total tonnage of manufactured goods originated in the United States during 1963, consumption was closely balanced with supply. Nevertheless, the region had a number of industries with a large surplus, including paper products, textiles and leather, primary metals, electrical equipment, rubber and plastics, and lumber and wood products (see Chart 2). The region was a net consumer in only six product categories (stone, clay, and glass, fabricated metals, nonelectrical machinery, transportation equipment, instruments, and petroleum and coal products).

The West South Central region supplied over two and one-half times the volume of manufactured goods in 1963 as was consumed; however, this record was heavily biased by the petroleum industry (see Chart 2). Outside of petroleum, the region is predominantly a net consumer of commodities.

In the Mountain region, consumption generally exceeded supply, except for primary metals and lumber and wood products. The region supplied nothing for itself or other regions from the furniture, transportation equipment, textiles and leather, apparel, and paper products industries and almost nothing from the electrical equipment industry (see Chart 2 and Table IIIc).

Shipments from the Pacific region slightly

exceeded shipments into the area in 1963. Only five industry groups, however, were in a net supply position (see Chart 2 and Table IIIc): lumber and wood products, food and tobacco, petroleum and coal products, paper products, and stone, clay, and glass. The lumber and wood products group was the only substantial net supplier, exceeding regional consumption by 82 percent. The primary metals and metal-using industries in the region produced less than the region consumed, and the region supplied negligible proportions of the Pacific area's needs for textiles and apparel.

INTERREGIONAL FREIGHT SHIPMENTS

Interregional Patterns. The broad dispersion of regional supply-consumption relationships demonstrates that shipments originated are not necessarily closely associated with (or dependent on) shipments received. That is, the regional distribution of resources (especially raw materials and energy sources) and other technical conditions of production appear to be strong factors in determining variations in supply relative to consumption. The tendency of most of the regional supply-consumption relationships to cluster on the net consumption side and to conform to a positive slope suggests that demand within a region plays a role, however muted, in regulating the supply of manufactured commodities from that region (see Chart 2). This is further indicated by the large proportion of freight shipments originated within a region that is destined for the same region. For example, nearly 44 percent of the shipments originated in the New England region in 1963 were terminated within the region (see Table IV). Similarly, 58 percent of the volume of commodities originated in the Middle Atlantic States was received in those states. In fact, in no region except the West South Central area did the proportion of shipments terminating within the same region fall significantly below 40 percent. In 1963, only 26 percent of

TABLE IV
Percent Distribution of Freight Shipments, United States and by Region of Destination and Origin
1963

Region of Origin	All Regions (Thousands of Tons)	Region of Destination: New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific
United States	1,334,838	6.2%	20.2%	20.3%	7.1%	17.8%	5.9%	9.0%	2.2%	11.3%
New England	24,908	43.7	28.4	11.7	2.7	7.4	1.7	1.8	0.4	2.2
Middle Atlantic	197,931	9.2	58.2	14.6	1.3	12.4	1.3	1.2	0.3	1.5
East North Central	290,255	1.6	10.7	60.2	8.3	7.6	4.5	3.5	1.0	2.6
West North Central	93,990	1.9	6.5	20.7	47.3	4.0	6.8	8.1	1.7	3.0
South Atlantic	155,087	3.4	19.1	8.2	3.3	56.6	4.6	3.2	0.2	1.4
East South Central	79,825	1.4	7.0	13.8	4.0	22.1	39.4	9.8	0.7	1.8
West South Central	307,958	12.7	22.2	4.5	2.3	24.8	5.1	26.2	1.0	1.2
Mountain	26,233	0.9	2.8	8.4	11.0	1.8	1.1	6.7	51.2	16.1
Pacific	158,649	0.7	4.2	4.0	2.6	1.9	0.7	2.3	4.6	79.0

Source: U. S. Department of Commerce, Bureau of the Census

the tonnage orginated in the West South Central States was destined for the region. Because of the large quantities of petroleum products and chemicals produced in excess of the West South Central region's own needs, the region was the principal net exporter of these commodities to other regions (see Table IIIc).

The large proportion of a region's shipments that terminate within the same area appears to reflect not only the force of the region's indigenous demands but also the impact of distance and time in increasing the cost of transport, and thus the total unit cost (or realized price) of a commodity at the point of purchase. This "friction" is further reflected in the tendency for the largest proportions of a region's freight shipments to terminate in contiguous regions. For example, the greatest shares of shipments out of the New England region were destined for the Middle Atlantic region and East North Central States (see Table IV). Similarly, shipments from the Middle Atlantic region flowed predominantly into the East North Central and South Atlantic States. The greatest proportions of freight shipments from the East North Central region went to the Middle Atlantic, West North Central, and South Atlantic States. The West North Central region shipped mainly into the East North Central and West South Central States. The South Atlantic region sent most of its products, beyond those required by its own industry and consumers, to customers in the Middle Atlantic and East North Central States. Shipments out of the East South Central region were destined mainly for the South Atlantic, East North Central, and West South Central States. Commodity flows from the Mountain States, as would be expected, went mostly to the Pacific and West North Central States. The largest proportion (only 4.6 percent) of shipments from the Pacific region was destined for the Mountain States. Again, the West South Central region was unique because of the area's rich resources of petroleum and relative specialization in chemical manufactures. The major proportions of these commodities not consumed within the region were shipped by tanker and pipeline to the South Atlantic, Middle Atlantic, and New England States.

Distance. Typically, regional demand and the increasing cost of supply with distance and time combine to direct supply to the area of nearest demand, with a gradual diffusion of an area's supply into adjoining areas. As shown in Table V, the largest proportion of freight tonnage (56.7 percent) is typically shipped to destinations within 300 miles of the point of origin. This pattern is particularly true in the more compact Census regions. For example, over 75 percent of freight shipped from production area 1[4] and 57 percent from production area 2 were to points within 300 miles. In a slight majority of production areas, in fact, the proportion of tonnage shipped within 100 miles exceeds that shipped into the 100 to 299 mile range.

The major exceptions to this tendency are the production areas in the western part of the Middle Atlantic region (areas 8, 9, 10, and 12) and production area 11 (which covers Cleveland, Ohio, and adjoining Standard Metropolitan Statistical Areas in eastern Ohio

[4] See Appendix for description of production areas.

TABLE V
Percent Distribution of Freight Shipments,
United States and by Distance Shipped and Production Areas
1963

Region	Production Area Number*	(Thousands of Tons)	Distance Shipped: Under 100 miles	100-299 miles	300-499 miles	500-999 miles	1,000-1,499 miles	1,500 miles or over
United States		1,334,838†	30.0%	26.7%	11.6%	13.9%	12.7%	5.1%
New England	1	8,879	42.5	32.9	4.7	12.9	4.0	3.0
	2	4,187	34.6	22.4	6.4	24.8	5.9	5.9
Middle Atlantic	3	9,767	55.9	21.7	6.7	8.7	3.3	3.7
	4	25,321	51.9	26.6	6.8	8.5	3.5	2.7
	5	67,847	68.6	20.3	6.2	3.6	0.6	0.7
	7	6,372	56.9	28.3	5.3	4.7	1.9	2.9
	8	10,460	29.0	47.7	9.6	8.8	2.6	2.3
	9	4,397	21.7	45.8	6.3	17.9	3.4	4.9
	10	13,960	16.9	48.6	22.4	7.5	2.0	2.6
	12	33,502	26.8	40.9	18.6	7.3	3.6	2.8
East North Central	11	31,934	27.4	34.8	22.5	9.3	3.0	3.0
	13	35,443	38.3	26.4	18.4	10.9	1.4	4.6
	14	12,061	28.1	36.5	14.0	16.8	1.4	3.2
	15	70,281	38.9	33.3	11.3	13.3	1.0	2.2
	16	8,520	16.7	23.2	17.8	30.8	7.7	3.8
West North Central	17	12,080	37.9	36.9	11.1	9.2	4.0	0.9
	18	23,229	28.2	42.9	13.2	12.5	1.6	1.6
South Atlantic	6	17,833	36.5	37.0	11.6	12.5	1.1	1.3
	19	2,105	21.0	34.3	24.2	17.8	0.1	2.6
East South Central	*							
West South Central	20	9,380	24.2	39.1	17.9	12.2	6.0	0.6
	21	194,537	4.0	4.4	4.7	12.7	62.8	11.4
Mountain	22	2,847	23.3	22.6	13.7	27.6	3.0	9.8
Pacific	23	7,490	55.9	13.7	1.3	14.0	4.6	10.5
	24	36,009	54.2	14.3	7.5	13.4	1.5	9.1
	25	49,573	57.3	14.3	14.2	3.9	0.8	9.5

* See Appendix for description of production areas.

† The United States total exceeds the sum of tons shipped from the 25 production areas by the quantity shipped from SMSAs not included in the 25 production areas and from all places located outside of SMSAs.

Sources: U. S. Department of Commerce, Bureau of the Census and Federal Reserve Bank of Cleveland

and western Pennsylvania). These areas are dominated by heavy industries (primary metals and machinery) that serve the entire nation. Other exceptions to the tendency to ship to nearby areas within a region include area 14 (Cincinnati, Ohio, and contiguous SMSAs in southwestern Ohio), area 18 (St. Louis, Missouri), area 19 (Atlanta, Georgia), and area 20 (Dallas-Fort Worth, Texas). All of these areas are relatively isolated (geographically) from other major centers of population and industry in the United States. Of major interest is area 21, covering the major petroleum shipping centers of southeastern Texas, from which a large proportion of oil is transported by tanker

TABLE VI
Percent Distribution of Freight Shipments, United States and by Mode of Transport and Production Areas
1963

Region	Production Area Number*	(Thousands of Tons)	Mode of Transport: Rail	Motor Carrier (regulated)	Motor Carrier (private)	Air	Water	Other
United States		1,334,838†	32.8%	25.9%	16.2%	‡	24.5%	0.6%
New England	1	8,879	11.7	50.9	27.8	0.1%	7.8	1.7
	2	4,187	22.4	53.5	18.7	0.3	2.3	2.8
Middle Atlantic	3	9,767	9.1	49.2	37.3	0.2	1.2	3.0
	4	25,321	15.3	47.7	10.1	0.1	25.6	1.2
	5	67,847	12.0	20.6	8.9	0.1	58.0	0.4
	7	6,372	40.6	47.6	11.1	–0–	0.2	0.5
	8	10,460	42.9	32.8	22.8	–0–	0.3	1.2
	9	4,397	36.6	34.7	26.4	–0–	1.0	1.3
	10	13,960	45.0	34.3	10.9	0.1	8.1	1.6
	12	33,502	51.5	33.2	4.8	–0–	9.8	0.7
East North Central	11	31,934	43.3	46.5	8.1	–0–	1.2	0.9
	13	35,443	45.6	29.5	21.6	0.1	2.8	0.4
	14	12,061	29.9	48.3	15.2	0.1	5.9	0.6
	15	70,281	35.4	44.5	9.2	–0–	10.1	0.8
	16	8,520	53.8	31.2	12.9	0.4	0.4	1.3
West North Central	17	12,080	35.9	40.0	10.0	–0–	8.3	5.8
	18	23,229	32.5	35.1	8.8	–0–	23.1	0.5
South Atlantic	6	17,833	20.9	52.1	13.8	–0–	12.6	0.6
	19	2,105	23.0	46.8	28.6	–0–	–0–	1.6
East South Central	*							
West South Central	20	9,380	25.6	52.2	21.9	–0–	–0–	0.3
	21	194,537	4.0	2.9	0.6	–0–	92.4	0.1
Mountain	22	2,847	33.2	37.8	28.6	0.1	0.2	0.1
Pacific	23	7,490	25.5	24.0	37.2	0.1	13.0	0.2
	24	36,009	27.5	25.7	15.4	–0–	30.5	0.9
	25	49,573	15.5	34.6	29.9	0.1	19.3	0.6

* See Appendix for description of production areas.

† The United States total exceeds the sum of tons shipped from the 25 production areas by the quantity shipped from SMSAs not included in the 25 production areas and from all places located outside of SMSAs.

‡ Less than 0.1 percent.

Sources: U. S. Department of Commerce, Bureau of the Census and Federal Reserve Bank of Cleveland

around the Gulf coast to the South Atlantic, Middle Atlantic, and New England coasts. All of the foregoing production areas tend to ship a greater share of their freight to destinations of 300 to 999 miles from origin. Denver, Colorado (area 22), is another example of the effects of isolation from other important market centers. While almost 46 percent of the Denver area's freight shipments terminates within 300 miles, about 28 percent goes to points from 500 to 999 miles away. The distance distributions for the Milwaukee-Kenosha-Racine area (number 16) and for the Baltimore area (number 6) also provide examples of relative isolation and market dispersion.

Mode of Transportation. The tendency for the greatest proportion of the volume of freight shipments to terminate within 300 miles of the shipping point favors the trucking industry. Regulated and private truckers accounted for about 42 percent of the total volume of manufactured goods shipped in 1963 (see Table VI). All but one of the production areas with a large share of shipments terminating within 100 miles shipped predominantly by truck. Area 5 (Philadelphia, Pennsylvania, and surrounding SMSAs) shipped 58 percent of the volume of freight by water from the major ports on the Delaware River. Nevertheless, almost 30 percent of shipments from area 5 were moved by truck. Where longer distances are involved, rail tended to account for noticeably larger proportions of freight movement, except where proximity to rivers, the Great Lakes, or ocean harbors facilitated traffic by water.

APPENDIX

PRODUCTION AREAS BY REGION

The U. S. Department of Commerce, Bureau of the Census, developed a list of 25 production areas for the 1963 *Census of Transportation*. Each production area consists of one or more Standard Metropolitan Statistical Areas (SMSAs) and represents a compact geographic concentration of manufacturing activity. The production areas are grouped by the nine Census regions. Five areas (numbers 5, 11, 12, 14, and 18) extend into two or more regions.

Region	Production Area
New England	1. Boston, Massachusetts; Worcester, Massachusetts; Providence-Pawtucket-Warwick, Rhode Island-Massachusetts; Brockton, Massachusetts; Lawrence-Haverhill, Massachusetts-New Hampshire; Lowell, Massachusetts.
	2. Hartford, Connecticut; New Britain, Connecticut; Meriden, Connecticut; Waterbury, Connecticut; New Haven, Connecticut; Bridgeport, Connecticut; Norwalk, Connecticut; Stamford, Connecticut; Springfield-Chicopee-Holyoke, Massachusetts-Connecticut.
Middle Atlantic	3. New York, New York.
	4. Newark, New Jersey; Jersey City, New Jersey; Paterson-Clifton-Passaic, New Jersey; Middlesex and Somerset Counties, New Jersey.
	5. Philadelphia, Pennsylvania-New Jersey; Wilmington, Delaware-New Jersey-Maryland; Trenton, New Jersey.
	7. Allentown-Bethlehem-Easton, Pennsylvania-New Jersey; Reading, Pennsylvania.
	8. Harrisburg, Pennsylvania; Lancaster, Pennsylvania; York, Pennsylvania.
	9. Syracuse, New York; Utica-Rome, New York; Albany-Schenectady-Troy, New York.
	10. Buffalo, New York; Rochester, New York.
	12. Pittsburgh, Pennsylvania; Steubenville-Weirton, Ohio-West Virginia; Wheeling, West Virginia-Ohio.
East North Central	11. Cleveland, Ohio; Akron, Ohio; Canton, Ohio; Lorain-Elyria, Ohio; Youngstown-Warren, Ohio; Erie, Pennsylvania.
	13. Detroit, Michigan; Flint, Michigan; Toledo, Ohio-Michigan; Ann Arbor, Michigan.
	14. Cincinnati, Ohio-Kentucky-Indiana; Dayton, Ohio; Hamilton-Middletown, Ohio; Springfield, Ohio.
	15. Chicago, Illinois; Gary-Hammond-East Chicago, Indiana.
	16. Milwaukee, Wisconsin; Kenosha, Wisconsin; Racine, Wisconsin.
West North Central	17. Minneapolis-St. Paul, Minnesota.
	18. St. Louis, Missouri-Illinois.
South Atlantic	6. Baltimore, Maryland.
	19. Atlanta, Georgia.
East South Central	No SMSA within the East South Central region was selected as a production area for Census year 1963, although data for the region as a whole (see Tables I through IV) were compiled and published.
West South Central	20. Dallas, Texas; Fort Worth, Texas.
	21. Houston, Texas; Beaumont-Port Arthur, Texas; Galveston-Texas City, Texas.
Mountain	22. Denver, Colorado.
Pacific	23. Seattle-Everett, Washington; Tacoma, Washington.
	24. San Francisco-Oakland, California; Vallejo-Napa, California; San Jose, California.
	25. Los Angeles-Long Beach, California; Anaheim-Santa Ana-Garden Grove, California; San Bernardino-Riverside-Ontario, California.

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