

MANUFACTURING EMPLOYMENT AND INDUSTRIAL LOCATION
IN
SAN FRANCISCO ,

by

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FOREWORD

This study focuses on assessing basic economic variables that may have influenced the decline of manufacturing in the City of San Francisco. The analysis stresses manufacturing because this sector has provided the largest number of opportunities for blue-collar workers (defined here as the skilled, semiskilled, and the unskilled). In 1960, for example, the manufacturing sector in the six-county San Francisco-Oakland Metropolitan Area employed about 38 percent of all the males in these occupations.

The implication of the reduction in job opportunities in manufacturing is two-fold. It has meant that for persons with few skills this port of entry to the job market has diminished in actual size in San Francisco. It has had a direct effect on workers whose actual jobs have been eliminated because of plant shutdowns in the city. Either effect could create a policy issue. In the first case, migrants to the city who had hoped to find jobs in manufacturing could enlarge the unemployed group if they do not fit into other sectors of industry. In the second case, workers affected by the job elimination, if they are not to remain unemployed, are faced with several alternatives. They can move or commute to areas where blue-collar opportunities are available; or, they can try to find jobs in local industries that are expanding. Making the latter choice could involve an occupational shift that may either be difficult to achieve in the short run or may not be feasible from the worker's point of view. For example, the employment growth

in San Francisco has centered in those industries that are major users of white-collar workers.

The framework of analysis developed by Mr. Flanagan provides a background for understanding the magnitude and the nature of the industrial job problem in San Francisco.

In Section I of the report he describes changes in employment that have occurred. He shows changes in detail for manufacturing employment since 1947 not only for San Francisco but also for surrounding counties. Manufacturing employment has declined in absolute terms since 1947 and now provides a smaller share of the total employment base of the city than was the case in earlier years. However, the level of the share of manufacturing employment has also consistently been smaller in San Francisco than, for example, in the United States as a whole. For example, in 1947, when manufacturing jobs accounted for 21 percent of all of the jobs in the private sector in San Francisco, manufacturing accounted for about 40 percent of the private employment in the United States. In 1965, the levels were still substantially different: 17 percent for San Francisco and 36 percent in the United States. In a sense, this difference between the percentages may indicate the nature of the problem confronting San Francisco. One can say that San Francisco has never been primarily a manufacturing city. However, if the manufacturing job base has typically been low comparatively, then any further contraction could have more significance to the labor force than would be the case if the job base were much larger.

After describing recent changes in employment, Mr. Flanagan shifts

the focus to the inter-relationships that exist among the six Bay Area counties, which for this purpose he regards as an integrated economic unit. His approach is to show the occupational specialization that can be observed between residents and jobs in the six counties. In this part of the report, therefore, there is a recognition that workers may live in one county but work in another. The inter-relationships are shown by presenting indexes of the relative importance of major occupations in each of the counties with respect to the entire Bay Area. Two indexes have been computed, one for residents and one for jobs. The reader can, therefore, observe whether a county is over- or under-represented in any occupation from the standpoint of residents and from the standpoint of the actual jobs found in a county. For example, as compared with the Bay Area as a whole, San Francisco is over-represented in the proportion of its male residents that are in the service occupations. On the other hand, the county does not provide sufficient job opportunities for its male resident population engaged in service occupations. Consequently, some of these workers must commute to other counties to work.

The final section of Part I of the report describes the industrial distribution of capital investments in new plant and new equipment made in San Francisco, in the six-county San Francisco-Oakland Metropolitan Area, and in the San Jose Metropolitan Area (Santa Clara County). These data provide an indication of the potential growth of manufacturing in an area. Each area's investment pattern is compared to that for the United States as a whole. From these data, the reader can observe that the pattern of development in San Francisco is not as favorable as that in the other areas examined. The major finding is that industries making

important investments nationally are not doing so in San Francisco.

After the descriptive background, Section II of the report discusses the economic forces that could be responsible for the trends. This section deals with each important cost variable separately because of the complexity of the issue under examination. To explain adequately the inter-related forces that have contributed to the decline in San Francisco's manufacturing jobs, one would have to construct a rigorous framework that would include the major economic variables and then obtain required data to test the framework. Even if this strategy were possible, meaningful solutions to the problem would be complicated by the fact that cities within an economic area are inter-related in a complex fashion. Workers live in one city and work in another. Producers of goods locate to optimize their competitive advantage and rely on any number of transportation methods to market their goods. Nor is the complication restricted to a city and its relationship to the remainder of the economic area to which it belongs. Relationships among inter-regional economic areas in the nation may obscure the nature of underlying economic forces within one region. Workers and goods can easily cross regional lines. As long as this mobility exists, a region's economic activity, as well as a specific city's economic activity, is influenced by both internal and external forces. Considering these limitations, Mr. Flanagan has selected key variables that influence location decisions as documented in various studies in location theory and has related available evidence to help develop an understanding of San Francisco's changing employment pattern.

The orientation of Section II of the report is, therefore, to provide necessary tools of analysis for further discussions. Viewed with this perspective, this paper should serve an educational purpose.

Before discussing the various cost factors, Mr. Flanagan attempts to determine why the decline in manufacturing occurred. He examines the issues with respect to business cycle developments and concludes that the decline in manufacturing jobs has resulted from more than these cyclical factors. He then turns to the impact of changing production methods and industrial mix. A combination of two forces has been responsible for the decline in the proportion of blue collar workers in manufacturing -- changing methods of production and the shift in the composition of manufacturing from heavy to light industries.

Against this background, attention is turned to economic forces that underlie industrial location. To understand this phenomenon, it is necessary to distinguish between long-run and short-run forces. As is pointed out, the location issue arises at the time the firm faces an investment decision. It is then that a firm can view the entire cost calculus to decide on a plant location. At the time of the investment decision the firm must weigh the importance of various costs to its operation. Which cost (or costs) receives emphasis is related in part to the firm's marketing area, the number of competitors, and the nature of the factor markets in which it operates. Because each firm is faced by its unique set of product and factor market variables, the calculus involved in the initial investment decision must necessarily vary among firms.

Mr. Flanagan approaches this complex problem by providing some background on four major costs faced by firms -- land, wages, transportation and taxes -- and he relates the discussion of each to available evidence. Readers with specialized knowledge in a particular industry should then be able to apply this general discussion to the particular industry. Because of the lack of much relevant data, the discussion of the cost factors is not balanced. For example, more attention is paid to land costs and wages than to transportation. The reader, however, is given a variety of data that are available and in several cases is given necessary qualifications regarding the data so that meaningful interpretations can be made. In this way the value of this document as a basic educational tool is enhanced. Economic analysis, however, while useful for developing an understanding of the issues involved in a city's development, does not provide a solution to the problems that a city faces. Further, while an understanding of the economic forces of the problem is necessary, this does not imply that the past record need be a yardstick for the future. Hopefully, the record provided in this study should enable decision makers to see where the city has been and how it may have reached its present course.

Sara Behman
Director of Research

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SUMMARY OF FINDINGS

1. There has been a postwar decline in jobs in virtually every manufacturing industry in San Francisco. In contrast to San Francisco, employment in most manufacturing industries in the remainder of the San Francisco-Oakland Metropolitan Area and in the San Jose Metropolitan Area increased throughout the 1947-1963 period.
2. Much of the decline in San Francisco has occurred in heavy industry. At the same time, much of the increase in manufacturing employment in other Bay Area locations with a greater supply of industrial land has been in the heavy industries.
3. Available evidence indicates that the general movement of industry from the central city to the suburbs, which has been noted in the San Francisco Area, is generally typical of urban areas in the United States today.
4. In San Francisco as in the U.S. there has been a change in the mixture of skills utilized in manufacturing favoring employees engaged in clerical, research, management, and other overhead activities. However, the proportion of white-collar personnel in San Francisco manufacturing has historically been greater than in other urban areas, since many firms locate their headquarters and administrative units in the city.
5. As a result of several of these trends, both the share of industries providing blue-collar employment and the employment of blue-collar workers within traditionally blue-collar firms has decreased.

6. In each of the Bay Area counties there are imbalances between the occupational requirements of jobs and the current occupational skills of the residents of the county. For instance, many male service workers who reside in San Francisco must commute to other counties to obtain employment, while many craftsmen and operative jobs in the city are filled by men who commute from other counties.

7. There is an industrial land shortage reflected in the cost of land in San Francisco relative to other Bay Area locations. This shortage places a severe constraint on industrial expansion in the city and may encourage industries which are tied to this region to locate in more suburban Bay Area locations.

8. Blue-collar wage rates examined in this study are similar throughout the Bay Area so that variations in these rates do not appear to offer any locational advantages within the Bay Area. With respect to other urban areas, however, the San Francisco Area is the highest wage rate area in the country. Wages may therefore encourage industries which serve a national market to locate elsewhere unless the skill, education, and training of the local labor force is such that it is more productive than that found in areas with lower money wages.

INTRODUCTION

For several decades the Bay Area* has experienced fundamental changes in the economic and social characteristics of its central cities, San Francisco and Oakland, in relation to the surrounding areas.

Demographically, although Bay Area population increased steadily between 1900 and 1960, the percent of the population residing in the two central cities declined continuously. (See Table 1.) This movement out of the central cities into the suburbs has characterized most large metropolitan areas. As can be seen in Table 1, Appendix A, each of the selected large metropolitan areas except Houston and Dallas central cities lost population to surrounding areas over the 60 years. Over the same period, 1900-1960, the nonwhite population increased relative to the white population in the San Francisco-Oakland Area. Contrary to the behavior of the white group, however, the proportion of the nonwhite population residing in the two central cities increased through 1960. Again, the Bay Area was typical of the changes that have occurred between the white and nonwhite groups.

These broad social trends were associated with substantial changes in the location of economic activity within the area and the nature of employment opportunities in the cities and suburban areas. Many of the economic changes have not previously been documented systematically. This paper represents an

* Because of data problems in this paper the "Bay Area" is identical with the San Francisco-Oakland Metropolitan Area as defined in the 1960 Census. This Metropolitan Area included the counties of Alameda, Contra Costa, Marin, San Francisco, San Mateo, and Solano. The present definition of this Area excludes Solano County. Throughout the paper data for the San Jose Metropolitan Area (Santa Clara County) are also provided for comparative purposes in recognition of the economic interdependence that exists among all the counties surrounding San Francisco Bay.

TABLE I

POPULATION INSIDE AND OUTSIDE CENTRAL CITIES* OF

SAN FRANCISCO-OAKLAND STANDARD METROPOLITAN STATISTICAL AREA, BY RACE

San Francisco-Oakland Year	Total Population (000)	Percent by Residence and Race								
		All Classes			White			Negro		
		Total	Central Cities	Outside Central Cities	Total	Central Cities	Outside Central Cities	Total	Central Cities	Outside Central Cities
1960	2,783	100.0	39.8	60.2	87.5	31.4	56.1	8.6	5.7	2.9
1950	2,241	100.0	51.8	48.2	90.6	45.6	45.0	6.6	4.1	2.5
1940	1,462	100.0	64.1	35.9	95.6	60.9	34.6	1.4	0.9	0.4
1930	1,348	100.0	68.1	31.9	95.3	64.8	30.5	1.1	0.8	0.3
1920	1,009	100.0	71.6	28.4	96.1	68.8	27.4	1.0	0.8	0.2
1910	774	100.0	73.3	26.7	95.6	70.0	25.6	0.8	0.6	0.1
1900	543	100.0	75.5	24.5	95.2	71.9	23.3	0.6	0.5	0.1
Change in percent points 1900-1960			-35.7	35.7	-7.7	-40.5	32.8	8.0	5.2	2.8

*Central cities are San Francisco and Oakland.

Source: U.S. Bureau of the Census. U.S. Census of Population: 1960. Selected Area Reports. Standard Metropolitan Statistical Areas. Final Report PC (3)-1D.

attempt to describe recent trends in manufacturing employment opportunities, particularly for production workers in San Francisco County, and to assess the economic forces underlying these trends. The reader should be clear that this report does not imply or prescribe any specific policy action. Any prescription of that nature must necessarily depend on the application of a specific set of value judgments (which we decline to make) to the contents of this report.

Much of the data used in this study were obtained from the Census of Manufactures conducted every five years by the U. S. Bureau of the Census and the supplemental Annual Survey of Manufactures. The Census contains data on employment, number of establishments, payrolls, value added by manufacture, and investment from all manufacturing establishments employing one or more persons during the Census year. The data are available by industry for states, standard metropolitan statistical areas, and counties. Individual industries are classified according to the Standard Industrial Classification system which is used in most government and private research.

A few points should be kept in mind when interpreting the data.

1. Because of a revision of the industrial classification system in 1957, many of the definitions of individual industries were changed so that it

is generally not accurate to compare pre-1957 data for certain industries with later data for the same classification. However, the data for total manufacturing should be essentially comparable for the entire postwar period, and the data for individual industries is comparable between 1947 and 1954 and between 1958 and 1963.

2. The Bureau of the Census is prohibited by law from publishing any statistics that disclose information reported by individual companies. Data are not made available, therefore, for some industries which are present but have very few firms in San Francisco. For instance, in 1963 there was no detailed information published for the Tobacco Manufacturing Industry although there were three establishments in San Francisco (each with less than 20 employees).
3. Because Census data are collected from firms, employment data are a count of paid jobs. This is not the same as a count of the total number of people employed in manufacturing for at least two reasons. First, a person holding more than one manufacturing job at a given time (moonlighting) will be counted twice. Second, a person who works part of the year in a firm which closes and then moves on to another manufacturing firm may be counted twice.

The Census of Manufactures provides data on total employment and production worker employment by manufacturing industry. Production worker employment includes workers through the working foreman level engaged in fabricating, processing, assembling, inspection, receiving, storage, handling, packing, warehousing, shipping (but not delivering), maintenance, repair, janitorial, watchman services, product development, and other services closely associated with these production operations.

This group of workers is generally analogous to blue-collar employment. Non-production personnel of manufacturing plants include those engaged in: Factory supervision above the working foreman level, sales, sales delivery, advertising, credit, collection, installation and servicing of own products, clerical functions, executive, purchasing, financing, legal, personnel, professional, and technical. In addition, this group includes employees engaged in the construction of major additions or alterations to the plant and utilized as a separate work force.

In this report the terms "blue-collar" and "production worker" will be used interchangeably, and white-collar employment will be used to denote the non-production personnel, or the difference between reported total employment and production worker employment.

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SECTION I: THE POSTWAR TRENDS IN JOBS IN SAN FRANCISCO

A. Employment

1. Manufacturing employment in San Francisco County.

Twenty years ago there were over 71,500 manufacturing jobs in San Francisco. Some 47,700 or 67 percent of the jobs were for production workers up to the level of a working foreman. Between 1947 and 1963 the interplay of general business conditions, industrial relocation, changes in production methods, and other economic forces had worked to reduce the number of manufacturing jobs in San Francisco by 11,000.

A portion of the general decrease occurred among industries (including novelties and leather) whose national as well as local markets have been diminished by effective foreign competition or the appearance of substitute products which are closer to the preferences of consumers. Other industries, most notably lumber, moved when their local supply of critical resources was depleted.

However, the employment decline in San Francisco manufacturing has not been confined to obsolete or inefficient industries. As the data in Table 2 show (see columns 5 and 7 in particular), the general downward trend is reflected in the experience of almost every industry in the city. It is also clear from the data that much of the net job loss in manufacturing occurred in the food products and ship and boat building industries, formerly two major sources of manufacturing employment in the city. The decline in employment in the food products industry has been particularly rapid since 1958. The decrease in ship and boat building employment was part of a general decline in heavy industry (see also the data on the machinery and metals industries).

Only the women's outerwear, commercial printing, and newspaper publishing industries show substantial net employment gains over the 1947-63 period. However, of these, only the women's outerwear industry has expanded employment throughout the period. For the years shown in Table 2, employment in the commercial printing industry was at a peak in 1958 but declined by 1,316 between 1958 and 1963 (see column 7). The fact that there were still more jobs in the industry in 1963 than in 1947 must be weighed against the fact that since around 1958 there has been a substantial decline in jobs. In the newspaper publishing industry, the job gains indicated in Table 2 have no

TABLE 2

TOTAL JOBS IN MANUFACTURING IN

SAN FRANCISCO COUNTY BY INDUSTRY

	1947	1954	1958	1963	1947-1963		1947-1954**		1958-1963	
					Total	%	Total	%	Total	%
TOTAL	71,643	64,300*	65,299	60,639	-11,004	-15.4	-7,343	-10.2	-4,660	-7.1
Food	14,006	14,168	13,058	10,960	-3,046	-21.7	162	1.2	-2,098	-16.1
Meat Products	1,250	n.a.	1,598	1,254	4	0.3	n.a.	n.a.	-344	-21.5
Dairies ^b	129	n.a.	1,433	1,397	n.a.	n.a.	n.a.	n.a.	-36	-2.5
Bakery Products	2,939	n.a.	2,774	2,383	-565	-18.9	n.a.	n.a.	-391	-14.1
Candy	1,857	n.a.	n.a.	641	-1,216	-65.5	n.a.	n.a.	n.a.	n.a.
Beverages	3,222	n.a.	2,967	2,315	-907	-28.2	n.a.	n.a.	-652	-22.0
Miscellaneous Foods	2,804	n.a.	2,239	2,122	-682	-24.3	n.a.	n.a.	-117	-5.2
Apparel	7,785	7,852	6,906	7,007	-778	-10.0	67	.9	101	1.5
Women's Outerwear	3,237	n.a.	3,458	4,318	1,081	33.4	n.a.	n.a.	860	24.9
Fabricated Textiles	n.a.	n.a.	1,206	1,044	n.a.	n.a.	n.a.	n.a.	-162	-13.4
Lumber and Wood	871	548	n.a.	n.a.	-871	-100.0	-323	-37.1	n.a.	n.a.
Furniture & Fixtures	2,868	2,432	2,193	2,021	-847	-29.5	-436	-15.2	-172	-7.8
Household Furniture	2,143	n.a.	1,725	1,476	-667	-31.1	n.a.	n.a.	-249	-14.4
Paper and Allied Prod.	1,776	1,340	1,068	925	-851	-47.9	-436	-24.5	-143	-13.4
Printing & Publishing	9,726	10,295	12,314	11,516	1,790	18.4	569	5.9	-798	-6.5
Newspapers	3,195	n.a.	4,308	4,615	1,420	44.4	n.a.	n.a.	307	7.1
Commercial Printing	2,459	n.a.	5,670	4,354	1,895	77.1	n.a.	n.a.	-1,316	-23.2
Printing Trades	670	n.a.	688	654	-16	-2.4	n.a.	n.a.	-34	-4.9

TABLE 2 (Continued)

	<u>1947</u>	<u>1954**</u>	<u>1958</u>	<u>1963</u>	<u>1947-1963</u>		<u>1947-1954**</u>		<u>1958-1963</u>	
					Total	%	Total	%	Total	%
Chemicals	2,325	2,268	1,233	1,201	- 1,124	-48.3	- 57	- 2.5	- 32	- 2.6
Paints & Allied Products	1,033	n.a.	604	542	- 491	-47.5	n.a.	n.a.	- 62	- 9.7
Leather	701	382	n.a.	n.a.	n.a.	n.a.	- 319	-45.5	n.a.	n.a.
Stone, Clay, Glass	360	235	786	527	+ 167	46.4	- 125	-34.7	- 259	- 33.0
Primary Metals	995	779	721	678	- 317	-31.9	- 216	-21.7	- 43	- 6.0
Fabricated Metals	6,511	5,658	6,176	6,084	- 427	- 6.6	- 853	-13.1	- 92	- 1.5
Plumbing	1,052	n.a.	618	601	- 451	-42.9	n.a.	n.a.	- 17	- 2.8
Structural	1,989	n.a.	1,405	1,259	- 730	-36.7	n.a.	n.a.	- 146	- 10.4
Fabricated	n.a.	n.a.	586	584	n.a.	n.a.	n.a.	-n.a.	- 2	- .3
Machinery	3,841	3,157	2,846	2,410	-1,431	-37.3	- 684	-17.8	- 436	- 15.3
Electrical Machinery	1,347	1,443	1,680	1,384	+ 37	2.7	96	7.1	- 296	- 17.6
Transportation Equip.	5,571	n.a.	4,086	2,805	-2,766	-49.6	n.a.	n.a.	-1,281	- 31.4
Ship and Boat Bldg.	5,221	n.a.	3,795	2,465	-2,756	-52.8	n.a.	n.a.	-1,330	- 35.0
Instruments	360	292	n.a.	n.a.	n.a.	n.a.	- 68	-18.9	n.a.	n.a.
Miscellaneous Mfg.	1,416	1,474	1,066	990	- 426	-30.1	16	1.1	- 76	-7.1

Note: Components do not always add to totals because industry figures are withheld if the information would disclose confidential data.

TABLE 3

PRODUCTION WORKER JOBS IN MANUFACTURING

IN SAN FRANCISCO COUNTY BY INDUSTRY

	1947	1954*	1958	1947-1963		1947-1954*		1958-1963		
				Total	%	Total	%	Total	%	
TOTAL	47,781	40,984	39,667	35,350	-12,431	-26.0	-6,797	-14.2	-4,317	-10.9
Food Products	10,261	8,947	8,013	6,605	-3,656	-35.6	-1,314	-12.8	-1,408	-17.6
Meat Products	982	n.a.	1,128	886	-96	-9.8	n.a.	n.a.	-242	-21.5
Dairies ^b	82	n.a.	518	520	-438	-534.2	n.a.	n.a.	2	.4
Bakery Products	2,049	n.a.	1,628	1,299	-750	-36.6	n.a.	n.a.	-329	-20.2
Candy	1,427	n.a.	n.a.	531	-896	-62.8	n.a.	n.a.	n.a.	n.a.
Beverages	2,511	n.a.	1,973	1,544	-967	-38.5	n.a.	n.a.	-429	-21.7
Miscellaneous Foods	1,665	n.a.	1,313	1,096	-569	-34.2	n.a.	n.a.	-217	-16.5
Apparel	6,676	6,666	5,576	5,882	-794	-11.9	-10	.1	306	5.5
Women's Outerwear	2,782	n.a.	2,731	2,667	-115	-4.1	n.a.	n.a.	64	-2.3
Fabricated Textiles	n.a.	n.a.	967	798	-169	n.a.	n.a.	n.a.	-169	-17.5
Lumber and Wood	774	443	n.a.	n.a.	-774	-100.0	-331	-42.8	n.a.	n.a.
Furniture & Fixtures	2,437	1,981	1,783	1,572	-865	-35.5	-456	-18.7	-211	-11.8
Household Furniture	1,822	n.a.	1,434	1,155	-667	-36.6	n.a.	n.a.	-279	-19.5
Paper & Allied Prod.	1,438	1,099	864	736	-702	-48.8	-339	-23.6	-128	-14.8
Printing & Publishing	6,088	6,610	8,054	7,618	-1,530	-25.1	522	8.6	-436	-5.4
Newspapers	1,511	n.a.	2,310	2,867	-1,356	-89.7	n.a.	n.a.	557	24.1
Commercial Print.	1,957	n.a.	4,309	3,358	-1,401	-71.6	n.a.	n.a.	-951	-22.1
Printing Trades	525	n.a.	529	465	-60	-11.4	n.a.	n.a.	-64	-12.1
Chemicals	1,489	1,416	728	689	-800	-53.7	-73	-4.9	-39	-5.4
Paints & Allied Products	577	n.a.	351	329	-248	-43.0	n.a.	n.a.	-22	-6.3

TABLE 3 (Continued)

	1947	1954*	1958	1947-1963		1947-1954*		1958-1963	
				Total	%	Total	%	Total	%
Leather	538	321	n.a.	n.a.	n.a.	- 217	-40.3	n.a.	n.a.
Stone, Clay, Glass	317	191	623	- 47	14.8	- 126	-39.7	- 353	- 56.7
Primary Metals	828	603	544	-271	- 32.7	- 225	-27.2	13	2.4
Fabricated Metals	5,459	4,386	4,728	-869	- 15.9	-1,073	-19.7	- 138	- 2.9
Plumbing	858	n.a.	485	-432	- 50.3	n.a.	n.a.	- 59	- 12.2
Structural	1,660	n.a.	904	-855	- 51.5	n.a.	n.a.	- 99	- 11.0
Fabricated	n.a.	n.a.	426	- 17	n.a.	n.a.	n.a.	- 17	- 4.0
Machinery	2,831	2,168	1,973	-1,095	-38.7	- 663	-23.4	- 237	- 12.0
Electrical Machinery	1,070	1,097	1,095	- 131	-12.2	27	2.5	- 156	- 14.2
Transportation Equip.	5,106	n.a.	3,648	-2,819	-55.2	n.a.	n.a.	-1,361	- 37.3
Ship & Boat Bldg.	4,809	n.a.	3,412	-2,778	-57.8	n.a.	n.a.	-1,381	- 40.5
Instruments	274	190	n.a.	n.a.	n.a.	- 84	-30.7	n.a.	n.a.
Miscellaneous Mfg.	1,216	1,168	816	-505	-41.5	- 48	- 3.9	-105	-12.9

Note: Components do not always add to totals because figures are withheld if the information would disclose confidential data.

n. a. Not available.
 b Major definitional change.

* Data published for 1954 by the Census Bureau are not as detailed as in other years.

Source: Bureau of the Census, Census of Manufactures, Vol. III, Area Statistics, 1947, 1954, 1958, 1963.

doubt been modified by mergers in the industry in the past three years.

Moving from the industrial to the occupational-dimension impact of the general decline of manufacturing jobs, it is evident from the data in Tables 2 and 3 that blue-collar workers suffered relatively greater job loss than others. Production worker employment in manufacturing decreased by 12,431 or by 26 percent from 1947 to 1963, while employment in the remaining predominantly white-collar occupations increased somewhat from 2,386 to 2,529. The net result of the divergent employment trends for these two groups of workers is that the proportion of production worker employment to total employment in manufacturing has declined from 67 percent in 1947 to 58 percent in 1963. This trend corresponds to national experience for during the same period production worker employment declined from 84 to 74 percent of total U. S. manufacturing employment.*

These data on the ratio of production workers to total employment indicate in part that San Francisco County's manufacturing employment has consistently been heavily weighted by administrative and auxiliary personnel. (These are the workers employed at central administrative offices and auxiliary units such as warehouses, research laboratories, and maintenance locations.) In 1950, San Francisco County alone accounted for 22 percent of the entire State's employment in this category although the County accounted for only 9 percent of the State's total private manufacturing employment. In 1964, San Francisco County had 19 percent of the State's administrative and auxiliary personnel in manufacturing but only 4½ percent of the State's private manufacturing employment.

2. Manufacturing employment in other Bay Area counties.

In contrast to San Francisco, both production worker and nonproduction worker

*The national data are derived from the Manpower Report of the President, March 1966, Table C-4.

jobs increased during the postwar period in the five other Bay Area counties (Alameda, Contra Costa, Marin, San Mateo, and Solano). However, the data in Tables 4 and 5 indicate that from 1947 to 1963 total manufacturing employment rose faster (50 percent) than production worker employment (10 percent). As a result, the other Bay Area counties experienced a change in the proportion of blue-collar and white-collar jobs similar to San Francisco and the nation as a whole as production worker jobs dropped from 91 percent of manufacturing employment in 1947 to 70 percent in 1963.

The general advance in manufacturing jobs in these counties tends to mask the divergent trends for individual industries. Several industries, including electrical machinery, food products, paper, and printing and publishing, registered employment gains throughout the period. Only a few (textiles, petroleum and probably lumber) exhibited a continuous decline. In others, (fabricated metals, chemicals, and apparel), an early postwar rise in employment gave way to declines in the mid-1950's.

In Santa Clara County, a rapidly industrializing area in California, the postwar gains in both white-collar and blue-collar manufacturing jobs exceeded the increases in the five aforementioned Bay Area counties combined. (See Tables 6 and 7.) Nevertheless, nonproduction jobs increased at a more rapid rate than blue-collar jobs so that the proportion of production workers in manufacturing decreased 84 percent in 1947 to 50 percent in 1963.

TABLE 4

TOTAL JOBS IN MANUFACTURING IN
FIVE BAY AREA COUNTIES* BY INDUSTRY

	1947	1954	1958	1947-1963		1947-1954		1958-1963		
				Total	%	Total	%	Total	%	
TOTAL	91,698	108,835	112,654	137,555	45,857	50.0	17,137	18.7	24,901	22.1
Food	17,612	20,659	23,770	24,034	6,422	36.5	3,047	17.3	264	1.1
Textiles	1,918	1,380	909	776	-1,142	-59.5	538	-28.0	133	-14.6
Apparel	695	905	1,170	917	222	31.9	210	30.2	253	-21.6
Lumber	1,795	1,466	n.a.	n.a.	n.a.	n.a.	329	-18.3	n.a.	n.a.
Furniture	1,449	2,069	2,031	2,722	1,273	87.9	620	42.8	691	34.0
Paper	2,786	5,251	6,430	6,532	3,746	134.5	2,465	88.5	102	1.6
Printing & Publishing	4,509	5,623	6,418	7,501	2,992	66.4	1,114	24.7	1,083	16.9
Chemicals	8,176	9,077	9,380	8,966	790	9.7	901	11.0	414	-4.4
Petroleum	9,439	7,692	7,497	-6,546	-2,893	-30.6	-1,747	-18.5	951	-12.7
Rubber	792	n.a.	2,068	2,218	1,426	180.0	n.a.	n.a.	150	7.3
Leather	984	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Stone, Clay, Glass	4,649	4,896	6,053	6,613	1,964	42.2	247	5.3	560	9.3
Primary Metals	10,157	10,659	10,042	9,689	468	-4.6	502	4.9	353	-3.5

TABLE 4 (Continued)

	1947	1954	1958	1963	1947-1963		1947-1954		1958-1963	
					Total	%	Total	%	Total	%
Fabricated Metals	8,906	12,193	14,346	13,350	4,444	15.0	3,287	36.9	-996	-6.9
Nonelectrical Machinery	10,120	10,694	10,027	10,040	- 80	. 8	574	5.7	13	. 1
Electrical Machinery	2,874	6,022	9,313	14,046	11,172	388.7	3,148	109.5	4,733	50.8
Transportation Equip.	14,258	n.a.	7,939	10,354	-3,904	-27.4	n.a.	n.a.	2,415	30.4
Instruments	593	709	n.a.	n.a.	n.a.	n.a.	116	19.6	n.a.	n.a.
Miscellaneous Mfg.	869	2,567	2,423	1,802	933	107.4	1,698	195.4	- 621	-25.6

Note: Components do not add to totals because industry figures are withheld if the information would disclose confidential data.

n. a. Not available

* Alameda, Contra Costa, Marin, San Mateo, Solano

Source: Bureau of the Census, Census of Manufactures, Vol. III, Area Statistics, 1947, 1954, 1958, 1963.

TABLE 5

PRODUCTION WORKER JOBS IN MANUFACTURING IN

FIVE BAY AREA COUNTIES* BY INDUSTRY

	1947	1954	1958	1963	1947-1963		1947-1954		1958-1963	
					Total	% Change	Total	% Change	Total	% Change
TOTAL	83,380	87,762	87,961	92,049	8,669	10.4	4,382	5.3	4,088	4.6
Food	14,191	14,736	16,515	17,001	2,810	19.8	545	3.8	486	2.9
Textiles	1,632	1,138	708	597	-1,036	-63.4	-495	-30.3	-111	-15.7
Apparel	657	793	941	847	190	28.9	136	20.7	-94	-10.0
Lumber	1,609	1,225	n.a.	n.a.	n.a.	n.a.	-384	-23.9	n.a.	n.a.
Furniture	1,279	1,684	1,676	2,237	958	74.9	405	31.7	561	33.5
Paper	2,428	4,135	5,125	5,188	2,760	113.7	1,707	70.3	63	1.2
Printing & Publishing	2,505	3,107	3,774	4,640	2,135	85.2	602	24.0	866	22.9
Chemicals	6,071	6,216	5,921	5,322	-749	-12.3	145	2.4	-599	-10.1
Petroleum	7,841	5,546	5,435	4,742	-3,099	-39.5	-2,295	-29.3	-693	-12.8
Rubber	654	n.a.	1,579	1,686	1,032	157.8	n.a.	n.a.	107	6.8
Leather	804	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Stone, Clay, Glass	4,012	4,206	4,799	5,355	1,343	33.5	194	4.8	556	11.6

TABLE 5 (Continued)

	1947	1954	1958	1963	1947-1963		1947-1954		1958-1963	
					Total	%	Total	%	Total	%
Primary Metals	8,740	8,729	7,911	7,604	-1,136	-13.0	-11	-.1	-307	-3.9
Fabricated Metals	7,399	9,712	10,865	10,470	3,071	41.5	2,313	31.3	-395	-3.6
Nonelectrical Machinery	8,048	8,001	7,052	6,934	-1,114	-13.8	-47	-.6	-118	-1.7
Electrical Machinery	2,271	4,359	6,242	8,298	6,027	265.4	2,088	91.9	2,056	32.9
Transportation Equipment	12,522	n.a.	6,005	7,618	-4,904	-39.2	n.a.	n.a.	1,613	26.9
Instruments	432	428	n.a.	n.a.	n.a.	n.a.	-4	-.9	n.a.	n.a.
Miscellaneous Mfg.	729	2,074	1,581	1,176	447	61.3	1,345	184.5	-405	-25.6

Note: Components do not add to totals because industry figures are withheld if the information would disclose confidential data.

n.a. Not available

* Alameda, Contra Costa, Marin, San Mateo, Solano

Source: Bureau of the Census, Census of Manufacturers, Vol. III, Area Statistics, 1947, 1954, 1958, 1963,

TABLE 6
TOTAL JOBS IN MANUFACTURING IN
SANTA CLARA COUNTY BY INDUSTRY

	1947*	1954**	1958	1963	1958-1963	
					Total Change	% Change
TOTAL	18,543	27,942	53,921	94,743	40,822	75.7
Food		11,876	12,122	12,688	566	4.7
Apparel		n.a.	358	417	59	16.5
Lumber		1,036	480	653	173	36.0
Furniture		132	719	465	-254	-35.3
Paper		414	1,111	1,711	600	54.0
Printing & Publishing		1,556	2,279	3,113	834	36.6
Chemicals		698	771	777	6	.8
Petroleum		n.a.	38	113	75	197.4
Rubber		108	210	552	342	162.9
Leather		n.a.	n.a.	n.a.	n.a.	n.a.
Stone, Clay, Glass		1,540	2,192	2,595	403	18.4
Primary Metals		186	551	512	- 39	-7.1
Fabricated Metals		1,367	2,191	1,838	- 353	-16.1
Nonelectrical Machinery		2,143	8,124	7,583	- 541	-6.7
Electrical Machinery		4,727	5,956	17,255	11,299	189.7
Transportation Equip.		n.a.	n.a.	4,683	n.a.	n.a.
Instruments		n.a.	290	1,035	745	256.9
Miscellaneous Mfg.		n.a.	n.a.	411	n.a.	n.a.

Table 6 (Continued)

Note: Components do not add to totals because industry figures are withheld if the information would disclose confidential data. A major discrepancy occurs when individual entries are not shown for transportation equipment and ordnance.

n.a. Not available

* Data on individual industries were not published for Santa Clara County in 1947.

** 1954 data for industries are not strictly comparable with data for later years.

Source: Bureau of the Census, Census of Manufactures, Vol. III, Area Statistics, 1947, 1954, 1958, 1963.

TABLE 7
 PRODUCTION WORKER JOBS IN MANUFACTURING IN
 SANTA CLARA COUNTY BY INDUSTRY

	<u>1947*</u>	<u>1954</u>	<u>1958</u>	<u>1963</u>	<u>1958-1963</u>	
					<u>Total</u> <u>Change</u>	<u>%</u> <u>Change</u>
TOTAL	<u>15,519</u>	<u>21,304</u>	<u>36,184</u>	<u>47,296</u>	<u>11,112</u>	<u>30.7</u>
Food		9,892	9,879	10,287	408	4.1
Apparel		n.a.	n.a.	393	n.a.	n.a.
Lumber		869	422	550	128	30.3
Furniture		110	589	396	- 193	-32.8
Pulp and Paper		302	842	1,325	483	57.4
Printing & Publishing		833	1,232	1,703	471	38.2
Chemicals		408	436	435	- 1	-.2
Petroleum		n.a.	25	76	51	204.0
Rubber		82	165	430	265	160.6
Leather		n.a.	n.a.	n.a.	n.a.	n.a.
Stone, Clay, Glass		1,164	1,569	1,703	134	8.5
Primary Metals		154	435	417	- 18	-4.1
Fabricated Metals		1,030	1,664	1,485	- 179	-10.8
Nonelectrical Machinery		1,477	4,106	3,187	- 919	-22.4
Electrical Machinery		3,287	3,984	9,984	6,000	150.6
Transportation		n.a.	n.a.	2,463	n.a.	n.a.
Instruments		n.a.	158	634	476	301.3
Miscellaneous Mfg.		n.a.	n.a.	339	n.a.	n.a.

TABLE 7 (Continued)

Note: Components do not add to totals because industry figures are withheld if the information would disclose confidential data. A major discrepancy occurs when individual entries are not shown for transportation equipment and ordnance.

n.a. Not available

* Data on individual industries were not published for Santa Clara County in 1947.

Source: Bureau of the Census, Census of Manufactures, Vol. III, Area Statistics, 1947, 1954, 1958, 1963.

In general, the data indicate that in the Bay Area and nationally there has been a change in the factor proportions utilized in manufacturing favoring employees engaged in clerical, research, management, and other overhead activities.

The data also indicate a fundamental difference between recent employment trends in a central city, San Francisco, and the surrounding suburban areas. Not only has the city steadily lost manufacturing jobs to suburban locations, but increasingly in the postwar period the new manufacturing firms and industries which locate within the region have located in areas which are peripheral to the city.

The effect on the structure of employment in San Francisco is explored in the following section.

3. The structure of private wage and salary employment in San Francisco, 1947-1965. The employment trends in the manufacturing sector have contributed to a general realignment of the industrial distribution of employment in San Francisco. The analysis of postwar changes in the structure of employment in this section must, however, be restricted to private wage and salary employment because of data limitations. In the next section (4), however, the analysis will relate to total employment for the county. Hence, in Section 4 a more complete picture of San Francisco's employment composition is available, although the initial data year is 1958.

The data in Table 8 are introduced to place manufacturing employment in perspective with total private wage and salary employment in San Francisco County. Although employment in each broad industry group has tended to fluctuate with general business conditions during the postwar period, on balance there was a net decline in employment in San Francisco between 1947 and 1963, the period covered in the preceding sections. In general,

TABLE 8
 AVERAGE ANNUAL PRIVATE WAGE AND SALARY EMPLOYMENT IN
 SAN FRANCISCO COUNTY, BY INDUSTRY, SELECTED YEARS*

	EMPLOYMENT			PERCENT DISTRIBUTION		
	1947	1963	1965	1947	1963	1965
TOTAL	348,176	341,833	346,952	100.0	100.0	100.0
Agriculture, Forestry & Fishing	611	580	693	.2	.2	.2
Mining	714	254	309	.2	.1	.1
Contract Construction	24,692	19,534	19,995	7.1	5.7	5.8
Manufacturing	72,460	61,407	58,345	20.8	18.0	16.8
Transportation, Communication & Utilities	50,458	44,497	46,156	14.5	13.0	13.3
Trade	117,297	98,982	97,534	33.7	29.0	28.1
Finance, Insurance, & Real Estate	33,785	50,478	52,265	9.7	14.8	15.1
Services	47,147	65,277	70,854	13.5	19.2	20.4

Source: State of California, Department of Employment Reports #127, 1947, 1963, 1965.

* Relates to employment subject to the California Unemployment Insurance Code. Hence, this employment excludes that in interstate railroads, government agencies, domestic service and unpaid family arrangements and the self-employed.

TABLE 9
 AVERAGE ANNUAL PRIVATE, NONAGRICULTURAL EMPLOYMENT IN
 THE UNITED STATES, BY INDUSTRY, SELECTED YEARS

	Employment (In Thousands)			Percent Distribution		
	1947	1963	1965	1947	1963	1965
TOTAL	38,407	47,444	50,385	100.0	100.0	100.0
Mining	955	635	628	2.5	1.3	1.2
Construct. Construction	1,982	2,983	3,211	5.2	6.3	6.4
Manufacturing	15,545	17,005	17,984	40.5	35.8	35.7
Transportation, Communication, & Utilities	4,166	3,914	4,031	10.8	8.2	8.0
Trade	8,955	11,803	12,585	23.3	24.9	25.0
Finance, Insurance & Real Estate	1,754	2,873	3,043	4.7	6.1	6.0
Services	5,050	8,230	8,903	13.1	17.3	17.7

Source: Manpower Report of the President, March 1966, Table C-1.

industries such as manufacturing, contract construction, and transportation, which are normally the major source of blue-collar employment, contracted; while finance, insurance, real estate, and other service industries expanded employment.

The total net employment decline which appears for the 1947-63 period and the declines for some industries may be attributed in part to differences in the general state of the economy between the two years. In 1947, with aggregate demand high, as business enjoyed the postwar surge in expenditures for purchases which had been postponed during the war, the national unemployment rate was 3.9 percent. In 1963, however, the nation's capacity to produce goods and services exceeded aggregate private and public demand, with the result that productive resources such as labor were unemployed or underutilized. The 1963 national unemployment rate was, therefore, 5.7 percent. Since 1963, various monetary and fiscal policies have stimulated aggregate demand, reduced excess industrial capacity, and increased employment. The data in Table 8, for example, indicate that employment increases between 1963 and 1965 brought private wage and salary employment in the latter year close to the 1947 level in San Francisco County. The fact that the manufacturing sector did not share in the recent cyclical expansion will be discussed in detail in a subsequent section.

In conclusion, the employment data identify two effects which, working simultaneously, have resulted in an absolute and relative decline of blue-collar jobs in San Francisco. The share of industries which provide employment for blue-collar workers has declined. At the same time, the evidence on manufacturing in the preceding sections indicates that the employment of blue-collar workers has been curtailed within traditionally blue-collar industries.

4. The structure of total employment in San Francisco, 1958-1965.

The preceding analysis, restricted to private wage and salary employment subject to the California Unemployment Insurance Code, excluded workers that are self-employed, those that are employed by nonprofit organizations, government agencies, and interstate railroads, and domestic service and unpaid family workers. When these workers are added to those that are shown in Table 8, employment figures for the County are increased substantially, for example, in 1963 by almost 150,000 workers. These data, however, are not available prior to 1958, hence that is the first year shown in Table 10. Further, the data relate to the month of July only.

The trends described in the preceding section continue to be observed when total employment is examined. Between 1958 and 1965, employment reductions took place in construction, manufacturing, the transportation complex, and wholesale trade. In contrast, the number of jobs in the dominant white-collar complex of industries increased. From July 1958 to July 1965 the finance group added 11,200 jobs, the services group, 19,600, and the government sector, 10,000 jobs.

From Table 10 we can also see the importance of the government sector to the industrial structure of San Francisco. In each of the selected years, government employment ranked as the third leading sector. Further by 1965 the trade sector, historically the leading industry for the number of available jobs, fell to second place in the industrial complex. (However, the margin of difference between trade and service employment is narrow. Inasmuch as these figures are estimates and not head counts it is probably safer to say that the two industries are now tied for first place.) An absolute decline in wholesale trade jobs from 1958 to 1965 and no change in the retail sector moved trade employment to second place. This decline in whole-

TABLE 10
ESTIMATED TOTAL EMPLOYMENT IN SAN FRANCISCO COUNTY,
BY INDUSTRY, FOR JULY OF SELECTED YEARS

	<u>Employment (In Thousands)</u>			<u>Percent Distribution</u>		
	<u>1958</u>	<u>1963</u>	<u>1965</u>	<u>1958</u>	<u>1963</u>	<u>1965</u>
TOTAL	467.0	484.3	493.6	100.0	100.0	100.0
Agriculture, Forestry, & Fishing	*	*	*	*	*	*
Mining	.5	.3	.4	0.1	0.1	0.1
Contract Construction	21.0	22.0	19.9	4.5	4.5	4.0
Manufacturing	69.5	64.1	61.0	14.9	13.2	12.4
Transportation, Communication & Utilities	55.1	52.6	53.9	11.8	10.9	10.9
Trade	111.8	111.2	108.3	23.9	23.0	21.9
Wholesale	49.1	49.0	45.6	10.5	10.1	9.2
Retail	62.7	62.2	62.7	13.4	12.8	12.7
Finance, Insurance & Real Estate	46.8	55.2	58.0	10.0	11.4	11.8
Services	90.3	103.5	109.9	19.3	21.4	22.3
Government	71.5	74.9	81.5	15.3	15.5	16.5
All Other	.5	.5	.7	0.1	0.1	0.1

* Negligible number

Source: California Department of Employment, Coastal Area, Research and Statistics, January 1967.

sale trade is consistent with reports regarding the movement of warehouse facilities outside the city environs to more spacious facilities in suburban areas where the land constraint is not as severe as in San Francisco.

B. Occupational Distribution and Commuting Patterns

It is possible to examine the occupational effects of the industrial composition of the city and metropolitan area in more detail, and incidentally, to gain some knowledge of the commuting patterns of several occupational groups. In Tables 11 and 12 we have developed ratios of occupational specialization for each Bay Area county by jobs and by residents. (See Appendix C for technical detail on the derivation of the ratios.) The object of the ratios is to determine the extent to which there is an imbalance between the occupational structure of employment opportunities in a county and the occupational skills of the residents of the county.

Line a under each occupation listed in Tables 11 and 12 contains the Job Specialization Ratio for that occupation in each Bay Area county. Each number represents the ratio of the share of a given occupation in the total number of jobs in the county to the share of the same occupation in total Bay Area (six county) jobs. Therefore, a ratio of 100.0 for a given occupation in a given county indicates that the share of that occupation in total jobs in the county is precisely the same as the share of the occupation in total Bay Area employment. A number greater than 100.0 indicates that jobs in the occupation account for a greater share of county employment than of Bay Area employment. The converse is true, of course, if the ratio is less than 100.0. By way of example, the data indicate (the ratio is 105.8 in Table 11) that the employment of male professional and technical workers is proportionately greater in Alameda County than in six counties as a whole. (This finding is consistent with the fact that Alameda County contains the

TABLE 11

OCCUPATIONAL SPECIALIZATION OF JOBS AND RESIDENTS

BY BAY AREA COUNTIES, 1960 AND 1962, MALES

Occupational Category	Counties					
	Alameda	Contra Costa	Marin	San Francisco	San Mateo	Solano
<u>Professional and Technical</u>						
a. Job specialization ratio	105.8	102.5	108.9	98.8	102.4	109.5
b. Residence specialization ratio	98.9	108.5	143.1	85.4	114.2	64.2
c. Row <u>a</u> divided by row <u>b</u>	107.0	94.5	76.1	108.7	89.7	170.6
<u>Salaried Managers</u>						
a. Job specialization ratio	93.8	85.6	85.0	112.8	92.6	81.1
b. Residence specialization ratio	90.2	102.5	148.7	83.6	134.4	74.7
c. Row <u>a</u> divided by row <u>b</u>	104.0	83.5	57.2	134.9	68.9	108.6
<u>Self-Employed Managers</u>						
a. Job specialization ratio	96.6	115.9	135.7	93.0	100.1	134.1
b. Residence specialization ratio	88.1	94.6	152.3	105.0	103.2	97.8
c. Row <u>a</u> divided by row <u>b</u>	109.6	122.5	89.1	88.6	97.0	137.1
<u>Clerical</u>						
a. Job specialization ratio	97.5	79.3	78.9	112.0	86.4	99.0
b. Residence specialization ratio	92.2	69.3	83.5	136.0	94.4	60.8
c. Row <u>a</u> divided by row <u>b</u>	105.7	114.4	94.5	82.4	91.5	162.8
<u>Sales</u>						
a. Job specialization ratio	91.8	83.0	79.8	118.3	86.5	66.8
b. Residence specialization ratio	89.2	93.0	140.4	97.9	125.5	64.2
c. Row <u>a</u> divided by row <u>b</u>	102.9	89.2	56.8	120.8	68.9	104.0
<u>Craftsmen and Foremen</u>						
a. Job specialization ratio	100.6	113.8	117.2	92.8	109.9	95.2
b. Residence specialization ratio	105.0	113.8	82.9	79.9	109.7	133.9
c. Row <u>a</u> divided by row <u>b</u>	95.8	100.0	141.4	116.1	100.1	71.1
<u>Operatives (Excluding Drivers, etc.)</u>						
a. Job specialization ratio	100.0	109.0	75.0	95.2	116.4	99.7
b. Residence specialization ratio	115.0	141.6	43.7	85.7	75.5	106.7
c. Row <u>a</u> divided by row <u>b</u>	87.0	77.0	171.6	111.1	154.2	93.4

TABLE 11 (Continued)

<u>Occupational Category</u>	<u>Counties</u>					
	<u>Alameda</u>	<u>Contra Costa</u>	<u>Marin</u>	<u>San Francisco</u>	<u>San Mateo</u>	<u>Solano</u>
<u>Drivers and Deliverymen</u>						
a. Job specialization ratio	126.7	102.2	88.8	83.7	84.8	115.3
b. Residence specialization ratio	108.1	96.4	73.4	103.6	90.2	98.9
c. Row <u>a</u> divided by row <u>b</u>	117.2	106.0	121.0	80.8	94.0	116.6
<u>Service Workers</u>						
a. Job specialization ratio	101.7	91.8	116.00	101.0	94.7	98.5
b. Residence specialization ratio	81.8	63.9	74.4	157.9	76.7	96.8
c. Row <u>a</u> divided by row <u>b</u>	124.3	143.6	155.9	64.0	123.5	101.8
<u>Laborers (Nonfarm and Farm)</u>						
a. Job specialization ratio	100.0	113.1	109.3	91.3	106.1	135.1
b. Residence specialization ratio	111.1	103.8	84.9	96.4	75.6	150.3
c. Row <u>a</u> divided by row <u>b</u>	90.0	109.0	128.7	94.7	140.3	89.9
<u>Occupations Not Reported</u>						
a. Job specialization ratio	79.4	78.4	98.1	127.7	80.5	79.4
b. Residence specialization ratio	113.9	60.0	84.3	126.4	68.0	106.2
c. Row <u>a</u> divided by row <u>b</u>	69.7	130.7	116.4	118.4	118.4	74.8

Source: See Appendix C.

TABLE 12

OCCUPATIONAL SPECIALIZATION OF JOBS AND RESIDENTS

BY BAY AREA COUNTIES, 1960 and 1962, FEMALES

<u>Occupational Category</u>	<u>Counties</u>					
	<u>Alameda</u>	<u>Contra Costa</u>	<u>Marin</u>	<u>San Francisco</u>	<u>San Mateo</u>	<u>Solano</u>
<u>Professional and Technical</u>						
a. Job specialization ratio	121.9	120.2	122.6	75.1	109.5	92.7
b. Residence specialization ratio	105.4	111.4	122.6	87.9	100.0	111.0
c. Row <u>a</u> divided by row <u>b</u>	115.7	107.9	100.0	85.4	109.5	83.5
<u>Salaried Managers</u>						
a. Job specialization ratio	92.4	86.6	90.4	113.4	89.6	88.7
b. Residence specialization ratio	92.7	91.6	115.5	112.9	88.0	90.9
c. Row <u>a</u> divided by row <u>b</u>	99.7	94.5	78.3	100.4	101.8	97.6
<u>Self-Employed Managers</u>						
a. Job specialization ratio	92.4	107.3	115.5	101.3	103.0	108.7
b. Residence specialization ratio	91.5	100.2	127.2	103.3	95.5	128.8
c. Row <u>a</u> divided by row <u>b</u>	101.0	107.1	90.8	98.1	107.9	84.4
<u>Clerical</u>						
a. Job specialization ratio	92.7	82.9	83.3	114.1	88.2	98.3
b. Residence specialization ratio	92.0	93.7	96.8	108.3	103.1	96.2
c. Row <u>a</u> divided by row <u>b</u>	100.8	88.5	86.1	105.4	85.5	102.2
<u>Sales</u>						
a. Job specialization ratio	96.1	104.4	112.4	101.1	101.0	94.6
b. Residence specialization ratio	100.4	126.2	119.6	85.0	111.8	92.5
c. Row <u>a</u> divided by row <u>b</u>	95.7	82.7	94.0	118.9	90.3	102.3
<u>Craftsmen and Foremen</u>						
a. Job specialization ratio	88.9	101.3	76.0	111.1	95.5	104.2
b. Residence specialization ratio	97.7	87.6	69.6	102.8	121.1	75.2
c. Row <u>a</u> divided by row <u>b</u>	91.0	115.6	109.2	108.1	78.9	138.6

TABLE 12 (Continued)

<u>Occupational Category</u>	<u>Counties</u>					
	<u>Alameda</u>	<u>Contra Costa</u>	<u>Marin</u>	<u>San Francisco</u>	<u>San Mateo</u>	<u>Solano</u>
<u>Operatives (Total)</u>						
a. Job specialization ratio	102.6	122.2	65.5	90.7	112.5	123.4
b. Residence specialization ratio	105.9	106.9	47.3	100.1	105.8	62.7
c. Row <u>a</u> divided by row <u>b</u>	96.9	114.3	138.5	90.6	106.3	196.8
<u>Service Workers</u>						
a. Job specialization ratio	101.6	110.5	131.4	89.9	114.9	96.9
b. Residence specialization ratio	104.2	106.9	109.1	89.6	101.1	133.5
c. Row <u>a</u> divided by row <u>b</u>	97.5	103.4	120.4	100.3	113.6	72.6
<u>Laborers (Nonfarm and Farm)</u>						
a. Job specialization ratio	91.4	156.6	109.3	77.3	110.4	256.1
b. Residence specialization ratio	141.9	87.4	65.5	60.8	102.2	206.9
c. Row <u>a</u> divided by row <u>b</u>	64.4	179.2	166.9	127.1	108.0	123.8
<u>Occupations Not Reported</u>						
a. Job specialization ratio	93.2	94.5	129.1	103.5	100.2	102.3
b. Residence specialization ratio	117.3	60.3	85.6	118.9	61.1	56.4
c. Row <u>a</u> divided by row <u>b</u>	79.5	156.7	150.8	87.0	164.0	181.4

Source: See Appendix C.

University of California which, of course, gives this county numerous jobs in the professional category so that we would expect the county to be over-represented in this category not only for male jobs but also for female jobs, as is the case.)

When read horizontally, the data provide an indication of the counties which provide the proportionately greatest number of jobs for the occupation in question. Thus the relative employment of male laborers is greatest in Solano County (mainly because of farm laborers) followed by Contra Costa, Marin, San Mateo and so on. In this example, the difference between counties is large. On the other hand, inter-county differences in the proportionate employment of male professional workers is narrow.

Similarly, line b under each occupation in Tables 11 and 12 contains the Residence Specialization Ratio for that occupation in each Bay Area county. The interpretation of this index is similar to the Job Specialization Ratio. Each number represents the ratio of the share of residents of a county who work at a given occupation to the share of all Bay Area residents in the same occupation. For example, Table 11 indicates that the proportion of male Alameda County residents who are operatives is greater (the ratio is 115.0) than the proportion of all male Bay Area residents in that occupation. This evidence is consistent with the hypothesis that this income group has found suitable housing within its means in the tracts that developed in the southern part of the county during the 1950's.

In evaluating these ratios several cautions are necessary. The residence ratios are based on the 1960 Census while those for jobs are based on 1962 data and are estimates. Some margin of error may be introduced because of the two-year gap; however, because the occupational structure is generally considered as slow in changing because of the inertia common to the labor

market, the error from this source is not expected to be large. Further, to develop the occupational job ratio for each county, it was necessary to allocate total employment in each industrial sector first by sex and then by occupations. Fixed coefficients derived from the 1960 Census were used to make the required allocations. Any time fixed coefficients are applied to data, a source of error is introduced. In this case, there is no way of knowing how much error this methodology introduces because no benchmark is available for such a refined breakdown of the data. Consequently, the reader should not ascribe significance to small differences between the job and residence ratios. These tables do provide, however, interesting information in cases where differences between the two ratios are sufficiently large.

Individually the Job Specialization Ratio or the Residence Specialization Ratio indicates only the presence or absence of a concentration of jobs or residents in a particular occupation in a given Bay Area county. By dividing the first index by the second, however, it is possible to obtain an indication of the extent to which there is an imbalance between the occupational requirements of jobs and the occupational skills of the residents in each county. Imbalance between the two ratios indicates that daily commuting is required to match workers with jobs in their occupation..

The results of dividing the Job Specialization Ratio by the Residence Specialization Ratio are presented in row c under each occupation in Tables 11 and 12. A number of 100.0 for a particular occupation indicates that there is a general balance between the supply and demand for the occupation in the county. Thus, Table 12 indicates that in Marin County there are sufficient female professional and technical workers among the residents to fill the available jobs for female professional and technical workers in the county.

An index number in row c greater than 100.0 indicates that the jobs available in the county cannot be filled solely by county residents. In other words, some jobs in the occupation must be filled by people who commute from another county. Conversely, if the index number is less than unity, it indicates that some of the residents in the county working in that occupation must commute to jobs in other counties. The data are based on net flows and the actual gross flow of commuters may be substantially larger than the data indicate..

Using the data in Tables 11 and 12 we can now determine the balance between the number of jobs and the available labor supply for several broad occupational groups in San Francisco County.

For males, the data in Table 11 indicate that the share of blue-collar jobs in total employment in San Francisco is smaller for all four blue-collar occupations (craftsmen, operatives, truckdrivers, and laborers) than in the Bay Area as a whole and most of the other counties individually. (The Job Specialization Ratio for each blue-collar occupation in San Francisco is: craftsmen--92.8; operatives--95.2; truckdrivers and deliverymen--83.7; and, laborers--91.3.) This evidence implies that with the exception of Marin, the other Bay Area counties have a greater proportion of industries employing blue-collar labor. The evidence also supports the earlier indications of relatively greater industrialization in the suburban areas.

At the same time San Francisco male residents were under-represented in the blue-collar occupations (except truckdrivers) with respect to the entire Bay Area. (See the Residence Specialization Ratio for these occupations in Table 11.) For craftsmen and operatives the under-representation was proportionately greater in residents than in jobs with the result that the composite index presented in row c under each occupation is greater than 100.0.

This indicates that the city tends to draw workers in these occupations from other counties to fill the available jobs. The opposite appears to be true for truckdrivers (the composite index in row c is 80.8) so that some male residents in this occupation must commute to places of employment in other counties.

In the white-collar occupations, the data for San Francisco indicate that there is a net inflow of male professional workers and salaried managers into the city. At the same time the data for Marin and San Mateo Counties indicate the presence of more white-collar residents than jobs and imply a daily commuting pattern to the central city.

The largest disparity between supply and demand is found for service workers. Although San Francisco County's job specialization ratio for male service workers is 101.0, the residence ratio is 157.9. Hence, the county is significantly over-represented by residents in the service occupations. One conclusion is that many service workers residing in San Francisco, to be fully employed, must commute to other counties.*

*Median dollar earnings of male service workers, excluding private household workers, are among the lowest for any of the major occupational groups, \$4,193 according to the 1960 Census in the entire Bay Area. Only private household workers, farmers, and farm laborers had lower median earnings. See Bureau of the Census, Census of Population, 1960, California, Detailed Characteristics, PC (1)6D, Table 124.

The data for females appear in Table 12 and may be interpreted in a similar fashion. In brief, the data for San Francisco indicate that on balance net in-commuting occurs in the clerical, sales, craftsmen, and laboring occupations. Net out-commuting, however, occurs in the professional and operatives classes. For service occupations, in contrast, a balance exists between demand and supply.

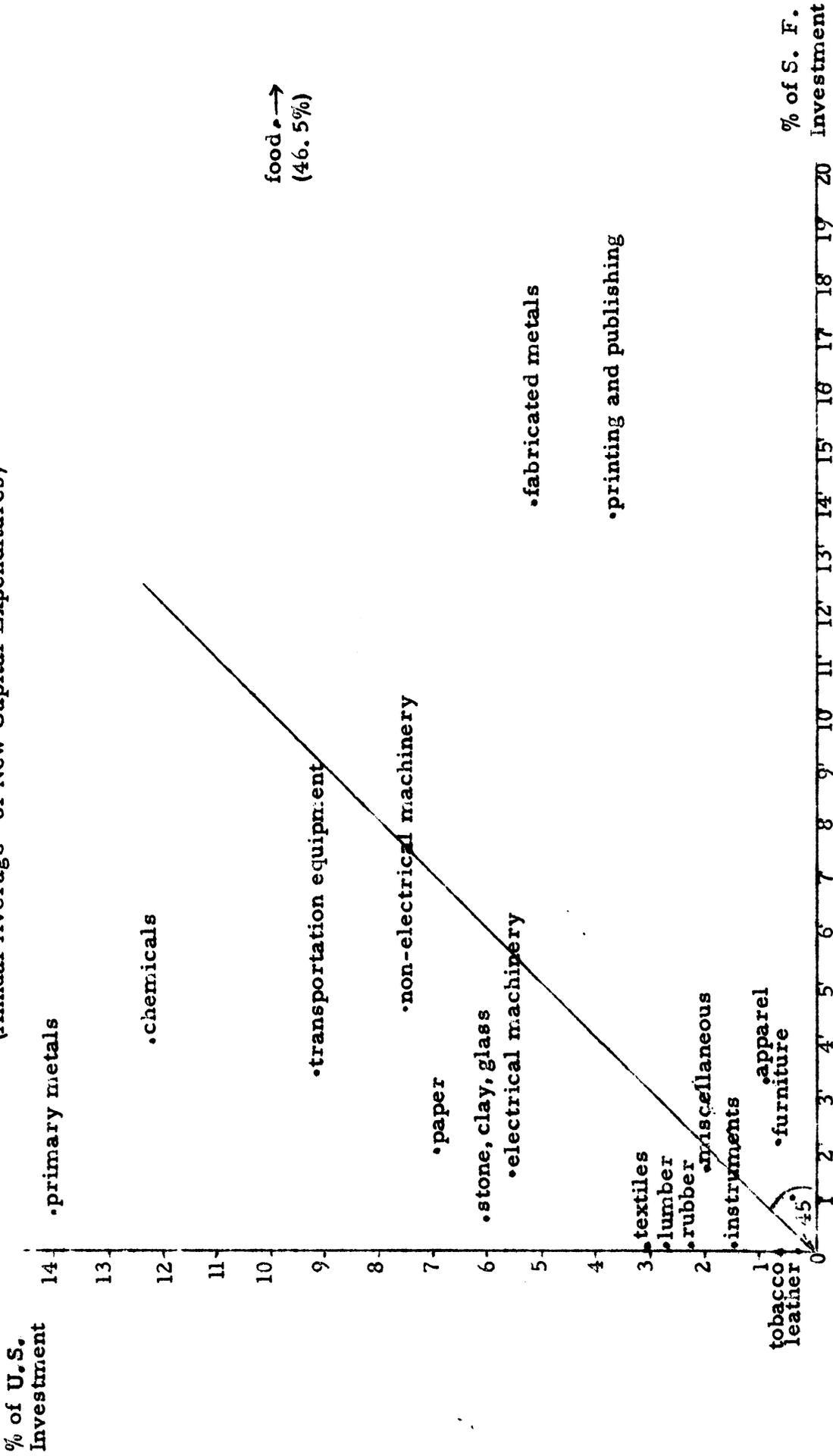
In concluding this section one should note that although each ratio was developed for a single point in time, the data do not and need not remain unchanged over time. In particular, the data on residence specialization by occupation refer to the occupation in which each resident was employed at the time of the enumeration. The data do not necessarily reflect the best occupation a resident could hold if jobs in that occupation were present and available without discrimination. Nor do the data reflect the occupations for which a resident could qualify if he received the appropriate education and training. In fact, the data suggest areas where the application of public and private policies might be considered to effect changes in the balance between occupational and residential specialization.

C. Investment

A preceding section presented an analysis of postwar employment changes and their influence on the industrial and occupational distribution of employment in San Francisco. With use of investment (new capital expenditures) data we can move from the past to the potential growth of manufacturing in the city. By using the new capital expenditures data as an indicator of growth and expansion, it is possible to determine the extent to which manufacturing industries with high growth potential are prevalent in the San Francisco area.

In Chart 1, each manufacturing industry's share of average annual new

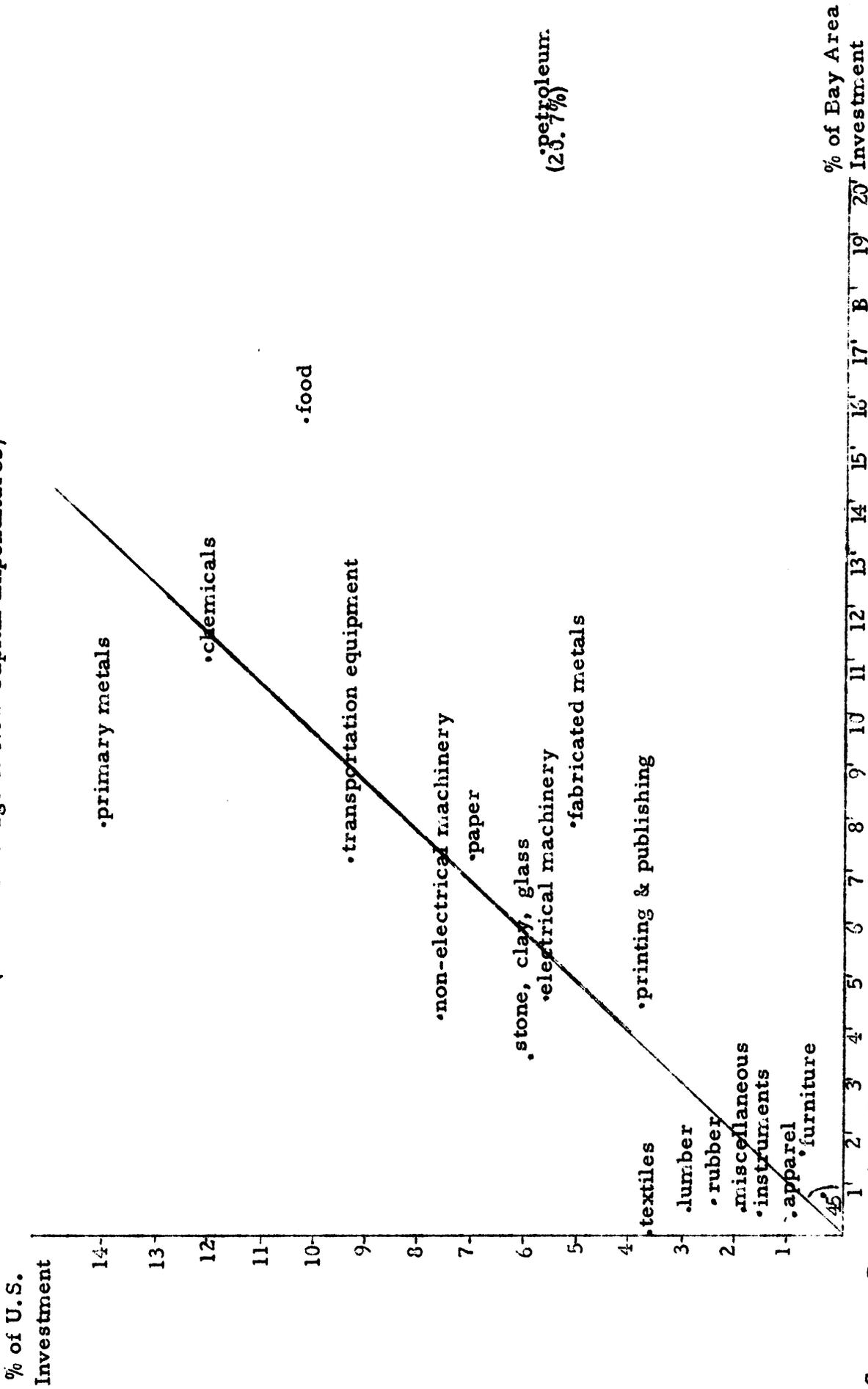
Chart 1: Industrial Distribution of Postwar Investment in San Francisco and the United States
(Annual Average of New Capital Expenditures)



Source: Bureau of the Census, Census of Manufactures and Annual Survey of Manufactures.

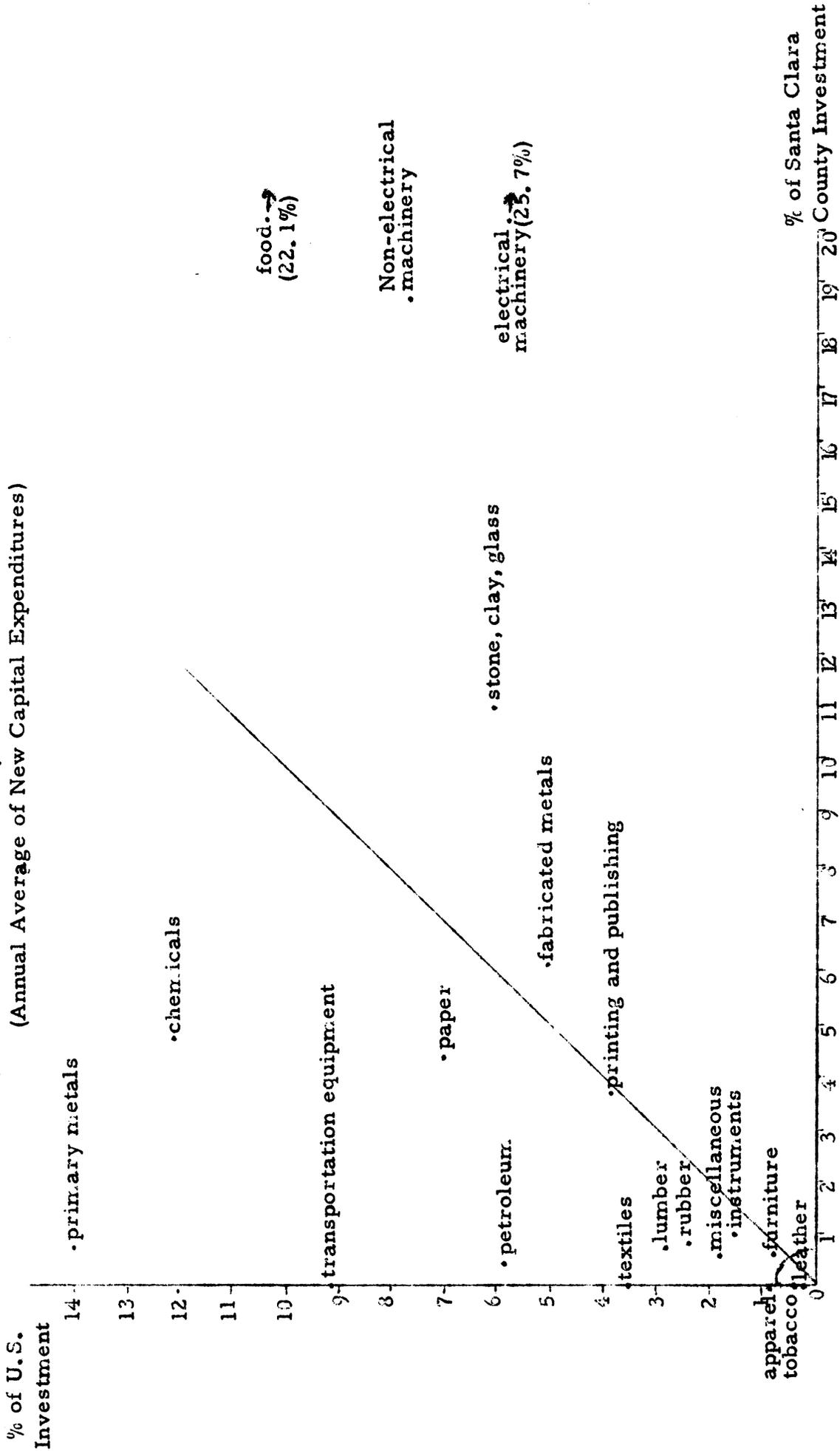
Note: Annual average capital expenditures for the U.S. are based on the entire period 1954-1963. For San Francisco, annual averages are based on data of the four census years, 1947, 1954, 1958, and 1963, because two-digit industry detail is not available for counties in the annual reports.

Chart 2: Industrial Distribution of Postwar Investment in the Bay Area and the United States
(Annual Average of New Capital Expenditures)



Source: Bureau of the Census, Census of Manufactures and Annual Survey of Manufactures
 Note: Annual average capital expenditures for the U.S. and the San Francisco-Oakland Metropolitan Area are based on the entire period 1954-1963.

Chart 3: Industrial Distribution of Postwar Investment in Santa Clara County and the United States (Annual Average of New Capital Expenditures)



Source: Bureau of the Census, Census of Manufactures and Annual Survey of Manufactures.

Note: Annual average capital expenditures for the U.S. are based on the entire period 1954-1963. For Santa Clara County, annual averages are based on data of the three census years, 1954, 1958, and 1963.

capital expenditures in manufacturing for the United States are plotted against the share of total manufacturing investment in San Francisco accounted for by each individual industry in the city. For example, the transportation equipment industry accounts for 9 percent of total manufacturing investment nationally, but only $3\frac{1}{2}$ percent of total manufacturing investment in San Francisco County. If the share of each industry locally was precisely the same as its national share, all observations would be along the 45° line.

From a viewpoint of increasing future employment opportunities, a favorable scatter would occur with most points in the lower left and upper right sections of the chart, indicating a proportionately greater investment in high growth potential firms and proportionately smaller investment in low growth potential firms locally than nationally. A favorable scatter would indicate a proportionately greater number or size of growth firms in San Francisco manufacturing than in U. S. manufacturing, or greater than average investment (expansion or renovation) by existing firms. In either case the result is enlarged productive capacity and, frequently, increased employment opportunities.

Chart 1 does not present a particularly favorable scatter. Most of the industries investing heaviest nationally (e.g. primary metals, chemicals, transportation equipment) are not making major investments in San Francisco. On the other hand there is negligible local investment in industries with little investment nationally (e.g. leather, tobacco, lumber). It is clear from the chart that the largest proportion of local manufacturing investment is in the food products industry (46.5 percent). However, the fact that employment in the industry has declined during the same period (see Tables 1 and 2 and the accompanying text) suggests that the investment may consist

largely of labor-saving technological change or substitution of capital for labor.

When the investment pattern for the entire Bay Area (six county metropolitan area) is taken into account, a far different pattern emerges than is the case for San Francisco County alone. As can be seen in Chart 2, the scatter of points parallels roughly the 45° line. Of the 20 industries shown, new capital expenditures in nine accounted for three percent or less of the total expenditures made in both the U. S. and in the Bay Area. The proportionate share of total investment for eight industries closely parallels the diagonal line. In contrast with the U. S., however, proportionately more investment dollars in the Bay Area were spent by the food and petroleum industries but a smaller share of total capital expenditures went to investments in primary metals.

The employment expansion noted earlier in Santa Clara County's manufacturing sector was based, of course, on the rapid development of new industries, especially in the electronics sector of electrical machinery. The investment in the electrical machinery group accounted for almost 26 percent of all capital expenditures in the three census years. The second largest expenditure total on investment of new plant and equipment was made by the food industry. This industry has, of course, been basic to this county's economy for many years but provides only moderate employment gains (see Tables 6 and 7) despite the large investment expenditures.

In Table 13 the magnitude of spending for new plant and equipment is shown for both San Francisco and Santa Clara Counties. Summarizing spending for only three selected years provides, of course, only incomplete evidence on total spending over a consecutive number of years. Nevertheless, the data are consistent with the findings in the employment section. Even for the three years, manufacturers spent \$48,713,000 more for new plant and equipment in Santa Clara County than in San Francisco County. The data in Table 13,

TABLE 13

MANUFACTURERS' EXPENDITURES FOR NEW PLANT AND NEW EQUIPMENT
BY MAJOR INDUSTRY GROUP, SAN FRANCISCO AND SANTA CLARA COUNTIES

FOR THE YEARS 1954, 1958, AND 1963

(In thousands of dollars)

Industry	San Francisco County			Santa Clara County			
	1954	1958	1963	1954	1958	1963	
			Three Yr. Total			Three Yr. Total	
TOTAL	\$26,645	\$21,690	\$23,887	\$19,914	\$36,769	\$64,252	\$120,935
Food	16,955	6,706	10,468	6,747	5,574	7,801	20,122
Textiles	-	-	-	-	-	-	-
Apparel	770	620	753	-	-	26	26
Paper	360	320	308	1,147	1,856	845	3,848
Printing and Publishing	2,193	4,399	3,901	367	1,262	1,503	3,132
Chemicals	894	1,052	565	423	720	2,887	4,030
Petroleum	-	-	-	-	53	181	234
Rubber	18	-	-	47	133	545	725
Leather	129	-	-	-	-	-	-

TABLE 13 (Continued)

Industry	San Francisco County				Santa Clara County			
	1954	1958	1963	Three Yr. Total	1954	1958	1963	Three Yr. Total
	\$	\$	\$	\$	\$	\$	\$	\$
Lumber and Wood	222	-	-	222	329	107	232	668
Furniture and Fixtures	356	315	282	953	9	240	174	423
Stone, Clay, Glass	44	167	259	470	3,326	3,095	3,480	9,901
Primary Metals	129	60	217	406	58	215	285	558
Fabricated Metals	2,445	3,966	4,286	10,697	3,030	1,085	1,373	5,488
Nonelectrical Machinery	968	1,401	878	3,247	1,216	8,012	7,899	17,127
Electrical Machinery	332	743	448	1,523	2,552	4,664	16,253	23,469
Transportation Equipment	-	1,172	496	1,668	-	-	-	-
Instruments	94	-	-	94	-	154	467	621
Miscellaneous Mfg.	302	296	342	940	-	-	135	135

Note: Components do not add to totals because industry figures are withheld if the information would disclose confidential data. The major discrepancy between the subgroups and the total occurs for Santa Clara County in 1963 because individual entries are not shown for transportation equipment and ordnance.

Source: Bureau of the Census, Census of Manufactures, Vol. III, Area Statistics, 1954, 1958, 1963.

however, suggest that the long-important manufacturing industries to San Francisco--food, printing and publishing, and fabricated metals--are continuing to invest in plant and equipment in the city. In fact, the food industry, spending more than \$34,000,000, some of which may have been for office buildings, over the three years, accounted for nearly one-half of all the investments in the city. Unfortunately, changes in the standard industrial classification make it impossible to evaluate the meaning of these investments to the capital-labor ratio of the plants in operation so that the data cannot be used to assert that new plant and equipment could be substituted in part for production workers. The data do indicate, however, that certain industries are continuing to invest in San Francisco.

SECTION II: THE FORCES BEHIND THE TRENDS

The reasons underlying an observed economic trend are always more difficult to isolate than the trend itself. The observed absolute decline in manufacturing employment and the simultaneous change in the relative employment of white-collar and blue-collar workers could result from the following effects working together or independently. (These are summarized below and discussed in greater detail in the subsequent sections):

1. Differences in general business conditions between 1947 and 1963. The former year was generally regarded as a good year for business, while in the latter the economy was operating considerably below its productive capacity. The national unemployment rate, for example, was 3.9 percent in 1947 but 5.7 percent in 1963.
2. Changing production methods.
3. Industrial relocation and the impact of declining industries. An out-migration of manufacturing firms using the largest proportions of production workers accompanied by the movement of a few manufacturing firms

employing a large proportion of white-collar workers into San Francisco would produce the observed trends. (Loss of jobs in industries which are declining nationally is a phenomenon common to all areas, and hence, is not explored further in this study.)

A. Cyclical Effects

Even in the absence of technological change or industrial relocation, changes in the relation of the general level of total public and private demand to existing production capacity can result in substantial fluctuations in the level and structure of employment. Although the effects of business fluctuations on the level of employment are well known, it is less well understood in some quarters that the employment effects of a business recession are typically distributed unevenly among the various skills, occupations, and industries.

For example, the demand for consumer and producer durable goods declines more rapidly than other demands during a recession, because it is relatively easy to postpone expenditures for these products until business conditions improve. Since the durable goods industries are large employers of blue-collar workers, the employment status of this group also deteriorates relative to others in a recession. Moreover, in virtually all manufacturing industries there is a certain amount of clerical, supervisory and other general overhead labor employed even when employment is slack. This also favors a proportionately greater reduction in blue-collar employment in a recession. Finally, even in a slack economy, firms will attempt to minimize the loss or turnover of highly skilled or educated personnel--particularly if the firm has itself paid for the training. The relatively unskilled and uneducated, therefore, suffer the greatest job loss when the economy develops slack.

These facts of cyclical behavior were misunderstood by some in the recent past and gave rise to an extended debate over the appropriate policy mix to reduce unemployment. The point which is important in this study, however, is that the recent behavior of the U. S. economy has demonstrated that the industries, occupations, and skills which suffer the proportionately greater employment losses during a recession experience the proportionately greater employment gains during an upswing in business activity. Thus, for the nation as a whole, blue-collar employment accelerated substantially during the recent recovery.

We noted earlier with the support of data in Table 8 that total employment in San Francisco has fluctuated with national economic conditions. It is also clear, however, that the cyclical influences do not explain the decline in San Francisco manufacturing employment between 1947, a "boom" year for the economy, and 1963, a year of productive slack. Generally, the industries which employ large proportions of blue-collar workers continued to have a smaller share of total employment in 1963 and 1965 than in 1947. In particular and contrary to national trends, the recent upswing appears to have had a negligible influence on private wage and salary manufacturing employment in San Francisco. Although manufacturing employment in the United States increased sufficiently during the 1963-65 upswing to maintain the sector's 1963 share of total employment (see Table 9), manufacturing employment in San Francisco continued to decline with the result that the share of manufacturing dropped from 18.0 percent to 16.8 percent of private employment in the city in two years. Thus, although the maintenance of aggregate demand sufficient to match normal productive capacity is a necessary condition for avoiding major fluctuations in blue-collar employment, it appears that differences in general business conditions in 1947 and 1963 are

not a major reason for the decline in production worker employment in San Francisco. The sources of the decline must be found elsewhere.

B. Changing Production Methods and Industrial Mix

The shift which has been noted in the proportion of production workers to white-collar workers for total manufacturing may reflect (1) the increased use of production methods or technology requiring relatively fewer production workers, (2) a change in the structure of San Francisco manufacturing in favor of industries whose technology has always required a lower proportion of nonproduction workers, or (3) some combination of the two effects. To analyze the recent employment changes it is necessary to disaggregate the manufacturing sector, and to look at the trend in the ratio of production worker employment to total employment in each sector. (See Table 14.) If changes in production methods or technology are major reasons for the observed change in aggregate factor proportions, there will be a decline in the ratio in the sectors affected by these changes. At the other extreme, if a change in the industrial composition of total manufacturing is the only effect, the ratios will remain constant, but the share in total manufacturing employment of industries using relatively few production workers will increase.

The impact of technological change on the relative employment of blue-collar and white-collar workers varied considerably among San Francisco manufacturing industries for the 1958-1963 period. Data in Table 14 indicate that the proportion was virtually unchanged in the meat products, dairy, beverage, commercial printing, and structural metal products industries. Among the remaining industries, the experience was mixed, with the proportion of blue-collar workers declining sharply in some industries (e.g. ship and boat building, plumbing and heating appliances, printing trades services,

TABLE 14
 RATIO OF PRODUCTION WORKERS TO TOTAL EMPLOYMENT IN
 SELECTED MANUFACTURING INDUSTRIES, SAN FRANCISCO COUNTY*

	<u>1947**</u>	<u>1958</u>	<u>1963</u>
Total Manufacturing	.67	.61	.58
Meat Products	.79	.71	.71
Dairies	.64	.36	.37
Bakery Products	.70	.59	.55
Beverages	.78	.66	.67
Miscellaneous Foods	.59	.59	.52
Women's Outerwear	.86	.79	.85
Fabricated Textiles	--	.80	.76
Household Furniture	.85	.83	.78
Newspapers	.47	.54	.62
Commercial Printing	.80	.76	.77
Printing Trades Services	.78	.77	.71
Paints and Allied Products	.56	.58	.61
Stone, Clay, Glass	.88	.79	.51
Primary Metals	.83	.75	.82
Plumbing and Heating	.82	.78	.71
Structural Metal Products	.83	.64	.64
Fabricated Metal Products	--	.73	.70
Nonelectrical Machinery	.74	.69	.72
Electrical Machinery	.79	.65	.68
Ship and Boat Building	.92	.90	.82
Other Transportation Equipment	.54	.81	.75

* 1954 data are not published in comparable detail.

** 1947 data are not strictly comparable with data for 1958 and 1963.

Source: Bureau of the Census, U. S. Census of Manufactures, Vol. III, Area Statistics, 1947, 1958, 1963.

and household furniture) and increasing markedly in others (e.g. newspaper publishing, primary metals, and women's outerwear). On balance, the available data indicate that the relative employment of production workers fell in the majority of the industries cited, suggesting that the adoption of technological innovations or the use of larger proportions of capital equipment in production was a contributing force behind the employment trends cited at the beginning of this paper.

However, these same data also indicate that changes in production methods were not the sole reason for the decline in the aggregate proportion of blue-collar workers employed-- from 67 percent in 1947 to 58 percent in 1963--in San Francisco manufacturing firms. A part of the change in aggregate factor proportions must be attributed to the changing composition of manufacturing industries in the city--particularly the fact that the employment declines have been largest in industries such as ship building, in which the share of production workers in total employment has been highest, while the few manufacturing industries with increasing employment utilize small proportions of blue-collar workers. In general, this shift in the composition of manufacturing industry has increased the proportion of lighter industries, while the proportion of heavier industries (the largest employers of blue-collar workers) has decreased. The study of this phenomenon leads us to an examination of the forces behind industrial relocation.

C. Industrial Relocation

For several decades economists have studied industrial location with a view toward developing a theory from which one could predict the optimal location of a given industry. It was clear that any theory which was developed would not be all inclusive, since surveys of management in various areas

of the country indicated that to some extent historical accidents, such as the residence of business founders and the prevalence of useful business connections or sources of finance, ~~have~~ been significant in the location of some smaller firms. Nevertheless, the fact that the survival and growth of most business organizations are affected by demand and cost considerations and that these economic considerations vary between alternative locations suggested that a theory of optimal industrial location could be specified. The theory would have two uses: (1) it would indicate to a firm the best location in view of existing markets and cost conditions; (2) it would indicate to city, state, and regional policymakers the critical location-determining economic factors which might be varied by policy to encourage or discourage the location of industry within a specific area.

In general, the study of industrial location has failed in the first effort. A firm which desires to maximize profits will choose its location on the basis of the relative input costs at alternative locations. Since transportation expenditures are relevant, the location of the industries supplying production materials to the firm and the location of the markets for the firm's products influence the cost incurred in a particular location. Thus the optimal location of each firm from a standpoint of cost minimization depends on the location of every other firm that it buys from or sells to. However, the location of both input sources and markets are not stable, but changing. To put the point differently, the locational decision of each firm depends critically on the locational decision of every other firm. Theoretically, this problem could only be circumvented if every firm met and simultaneously decided where they would locate, and even this unlikely solution would not be optimal over time, since population movements and growth would tend to change the location of many markets. For these reasons a precise, rigorous analysis of the optimal location of a firm is not possible.

Nevertheless, locational decisions, however imperfect, are still made and the study of industrial location has achieved some success in the identification of the economic forces underlying locational decision-making.

The problem of plant relocation may be approached as a problem in investment decision-making. The average firm faces two general types of costs: (1) fixed costs which are incurred whether or not the plant is actually operating, and (2) costs which vary with the amount of product produced per hour or per day. At any moment in time the industries and firms which are observed in a particular area such as San Francisco are tied to the area by the fixed costs of investment in (1) plant, (2) equipment, and (3) training of a skilled labor force. As long as the variable costs of production and at least some of these fixed costs are covered by the firm's operations, the firm will not in the short run shut down or move to an area where the variable costs of production are lower. However, the first two locational ties mentioned above will dissipate with time. Both plant and equipment either wear out with use or become obsolete as technological innovations appear. The strength of the third tie will depend upon the size of the firm's training investment, the number of employees trained by the firm, their mobility, and the availability of labor with similar skills in alternative locations. As these locational ties dissipate, the firm faces a new investment decision. Because all costs are variable at the moment of the investment decision, the firm is relatively unconstrained in its choices of location and in general will weigh the relative cost advantages and disadvantages of alternative locations.

The implications of this view of plant relocation are important. For instance, an abnormally large movement of firms from the city within a short period of time does not necessarily imply the sudden incidence of some new economic pressure. It may indicate that several firms, facing an investment

decision around the same time, responded to a set of economic pressures which had been present for some time. Also, viewing the location decision as one part of an overall investment decision stresses the importance of inputs (e.g. land) which are normally regarded as fixed costs in a locational decision.

In the remainder of the paper we shall trace the movement of manufacturing establishments in San Francisco County and discuss the influence of several input costs.

The data on manufacturing establishments in San Francisco support two conclusions: (1) over the postwar period there has been a decline to the number of establishments, and (2) the average number of employees per manufacturing establishment has also decreased since the decline in employment has been proportionately greater than the movement or dissolution of firms.

The data in Table 15 indicate that the total number of manufacturing establishments declined sharply between 1947 and 1958 but increased slightly since that time. However, these aggregate movements conceal a gradual change in the type of industry found in the city from heavy durable goods manufacturing to lighter nondurable goods manufacturing. For instance, the increase in the number of manufacturing establishments during the 1958-1963 period was not widespread but concentrated in a few industries including commercial printing, paint products, women's outerwear, and fabricated textiles. Although there was a substantial drop in the number of establishments in some of the food products industries during the same period, the greatest decline in establishments occurred in such heavy industries as fabricated metals, machinery, and stone, clay, and glass.

That the decline in manufacturing establishments is not typical for the Bay Area generally or other urban areas is indicated by the data in Table 16. In most other urban areas manufacturing firms have increased in number

TABLE 15
 NUMBER OF MANUFACTURING ESTABLISHMENTS IN
 SAN FRANCISCO COUNTY BY INDUSTRY

	<u>1947</u>	<u>1954</u>	<u>1958</u>	<u>1963</u>
TOTAL	1,990	1,901	1,850	1,877
Food	310	281	269	226
Meat	49	NA	38	31
Dairies	10	NA	17	18
Bakery	67	NA	56	40
Candy	37	NA	NA	13
Beverages	37	NA	31	30
Miscellaneous Food	73	NA	75	66
Apparel	308	332	309	301
Women's Outerwear	135	NA	152	159
Fabrics and Textiles	NA	NA	65	70
Lumber and Wood	58	46	28	48
Furniture and Fixtures	73	95	81	84
Household Furniture	43	NA	50	45
Paper	36	31	28	27
Printing & Publishing	415	395	407	433
Newspapers	28	NA	29	28
Commercial Printing	185	NA	225	245
Printing Trades	50	NA	49	46
Chemicals	113	95	79	83
Paints	26	NA	20	25
Rubber	2	7	13	22
Leather	31	23	23	18
Stone, Clay, Glass	41	35	38	31
Primary Metals	26	27	26	24

TABLE 15 (Continued)

	<u>1947</u>	<u>1954</u>	<u>1958</u>	<u>1963</u>
Fabricated Metals	194	158	140	127
Plumbing	23	NA	8	8
Structural	75	NA	52	43
Miscellaneous	NA	NA	15	15
Machinery	137	136	141	136
Electrical Machinery	35	32	56	51
Transportation Equipment	32	NA	34	32
Ship and Boat Building	13	NA	14	14
Instruments	21	20	15	23
Miscellaneous Mfg.	120	135	122	109

Source: Bureau of the Census, Census of Manufactures, Vol. III
Area Statistics, 1947, 1954, 1958, 1963.

TABLE 16
 NUMBER OF MANUFACTURING ESTABLISHMENTS,
 SELECTED METROPOLITAN AREAS, 1947-1963

	<u>1947</u>	<u>1954</u>	<u>1958</u>	<u>1963</u>	<u>Percent Change</u>	
					<u>1947-63</u>	<u>1954-63</u>
San Francisco County	1,990	1,901	1,850	1,877	- 5.7	- 1.3
Bay Area (Excluding San Francisco)*	1,681	2,205	2,583	2,872	70.9	30.2
Santa Clara County	424	567	773	1,095	158.3	93.1
Average of 17 Metropolitan Areas	6,139	6,951	NA	7,295	18.8	4.9

* Includes Alameda, Contra Costa, Marin, San Mateo, and Solano Counties.

Source: Bureau of the Census, U.S. Census of Manufactures, Vol. III, Area Statistics, 1947, 1954, 1958, 1963.

although not as rapidly as in areas (such as the five Bay Area counties) which are peripheral to the central cities.

This observation is further substantiated by a recent study by the US Department of Labor of census data on the value of permits issued for non-residential building construction.* The study concluded that between 1954-65 most new industrial buildings were built outside the central city of major metropolitan areas in the United States. For the country as a whole, 62 percent of the valuation of permits authorized for new industrial building in metropolitan areas were for the suburbs. For western urban areas in general and Los Angeles in particular, 69 percent and 85 percent respectively of the value of new permits for industrial construction were for the suburbs. Contrary to San Francisco, however, in other urban areas the general tendency to locate in suburban areas has not been accompanied by an actual decline in manufacturing establishments in the central city.

In absolute numbers, the decline in average establishment size, measured by total employment, has been commensurate with the decline in the Bay Area and other urban centers. (See Table 17.) This general trend is the result of various forces including shifts in consumer tastes (and consequently, production) to products requiring a relatively small labor input.

*U. S. Department of Labor, Press Release #7359, "Greater Concentration of Business in Suburbs Hits Big City Poor," (August 15, 1966).

TABLE 17
 AVERAGE NUMBER OF EMPLOYEES PER MANUFACTURING ESTABLISHMENT,
 SELECTED METROPOLITAN AREAS, 1947, 1954, 1963

	<u>1947</u>	<u>1954</u>	<u>1963</u>
United States	59	55	53
17 Urban SMSA'S	64	62	60
Bay Area (Excluding San Francisco)*	61	53	44
Santa Clara County	44	49	87
San Francisco County	31	34	32

* Includes Alameda, Contra Costa, Marin, San Mateo, and Solano Counties.

Source: Bureau of the Census, Census of Manufactures, Vol. III, Area Statistics, 1947, 1954, 1963

It is of interest to note that average establishment size in San Francisco is smaller than the rest of the Bay Area and other urban areas for each postwar observation. This fact suggests the presence of economic factors, unique to the City of San Francisco, which place a constraint on the economic operating size of manufacturing firms. Of particular relevance to this problem is the availability of industrial land in the city--a topic that will be explored in the following section.

1. Land. The influence of land values on industry is most pertinent at the time of a locational decision when all costs to the firm are variable. Once a company has purchased or decided to rent the land and a plant is established, the cost of the land cannot be varied by the firm, and therefore, does not enter into day-to-day production decisions. However, land values are of major importance when a firm faces a locational decision because of changing markets or obsolete plant. We shall consider evidence relating to: (1) trends in the supply of industrial land within San Francisco County, (2) the relative supply of industrial land in San Francisco and other major urban areas (which may be of relevance to the locational decisions of firms facing a national market), and (3) the relative supply of land in San Francisco and other Bay Area counties (which may be relevant to the locational decisions of firms facing a local or regional market).

During the postwar period industrial land use in San Francisco has increased by 210 acres. This represented a slight increase in the share of total city land devoted to industry. In general, as the data in Table 18 indicate, the share of land in almost every major use increased at the expense of vacant land, which accounted for almost one-fifth of total city land in 1947-48. Only the share of land used by heavy structural industry and utilities declined during the period, thus confirming the conclusions reached

TABLE 18
 PERCENT DISTRIBUTION OF LAND USE,
 SAN FRANCISCO COUNTY*

	<u>1961-1964</u>	<u>1947-1948</u>
Net Area (acres)	22,601.49	22,284.99
	<u>100.00%</u>	<u>100.00%</u>
Residence	40.0	37.0
Commerce	6.5	5.5
Industry	6.5	5.6
Structural: Light	2.4	2.0
Intermediate	1.4	1.1
Heavy	.7	1.2
Open Air * Light	.4	.2
Intermediate	1.0	.7
Heavy	.6	.4
Utility	4.2	4.8
Institutional	1.9	1.6
Public	29.2	24.2
Private Recreation	1.6	1.3
Vacant	10.0	19.9

* Acreage figures are provided in Appendix C.

Note: This classification is based on the predominant ground floor use of property which does not necessarily conform with the zoning classification.

Source: San Francisco Department of City Planning, The Use of Land in San Francisco, October, 1964.

in the preceding discussion of manufacturing establishments.

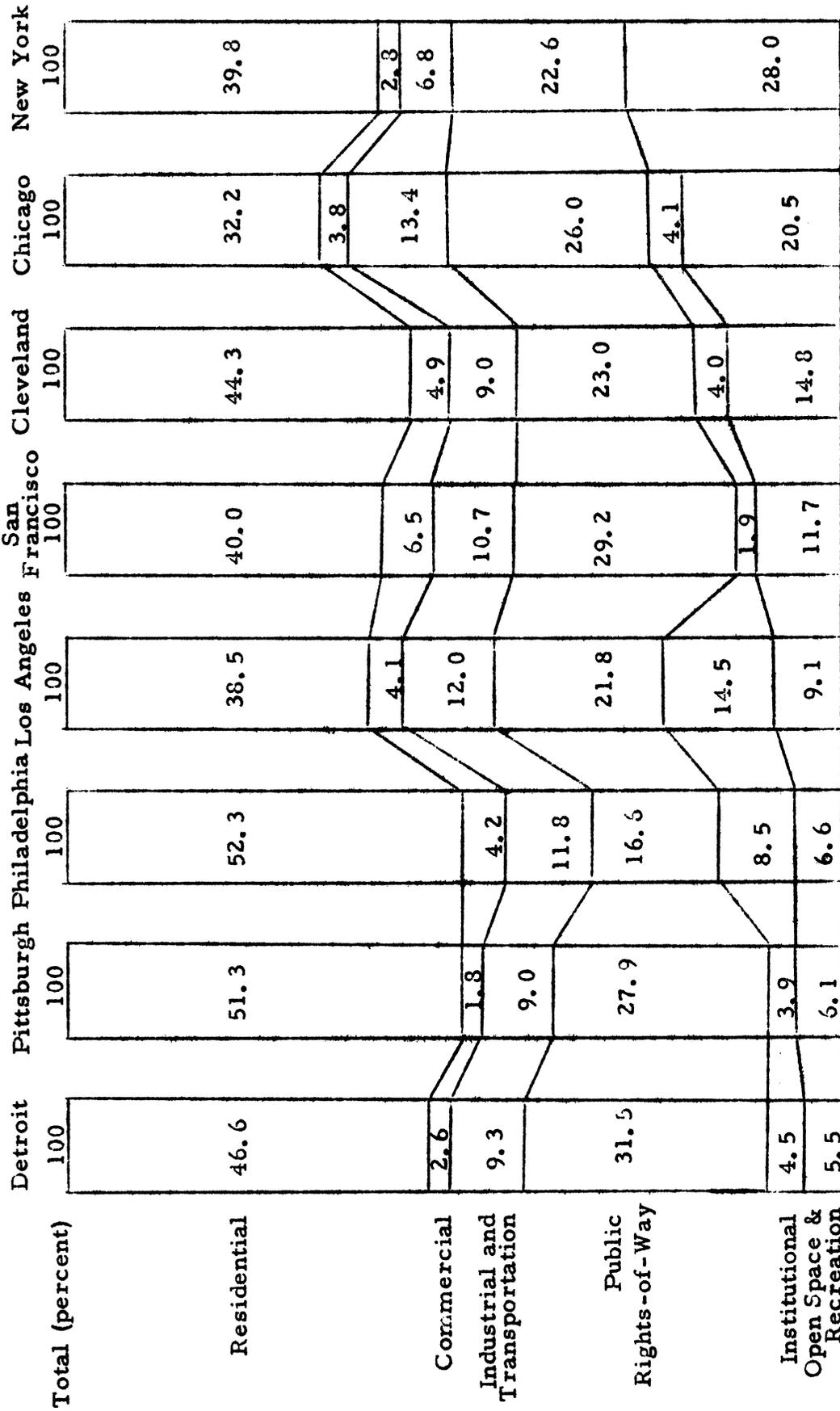
Although the proportion of land for industrial use did not decline during the postwar period, there was a considerable shift in the location of manufacturing activity within San Francisco. In particular, there was a substantial reduction in industrial land use in the central business districts along with increased industrial activity along the San Francisco Bay shore, south of the central business districts. It is evident that the locational shift of manufacturing activity within the city coincided with a change in the industrial composition of the city, for while land in the central business districts was vacated by heavy industry, the new industrial land was occupied by light and intermediate industries.

It should be noted that the data refer to land use rather than to zoning classifications and therefore do not indicate changes in industrial zoning or conformance of land use with zoning.

How does the distribution of land use in San Francisco compare with other metropolitan areas? As Chart 4 indicates, the distribution for San Francisco is not atypical. However, the total acreage data for each city give a more accurate notion of the land constraint. It is a geographical fact that San Francisco is many times over the smallest major U.S. city in terms of total acreage. As a consequence, the amount of land available for industrial use is smaller by a similar proportion than the amount available in other urban areas, despite the fact that the share of total acreage available for industrial use is comparable to other cities. Therefore, from a standpoint of industrial location, San Francisco has an interregional disadvantage with respect to land availability.

How does San Francisco compare with other Bay Area counties? The comparison of land availability in San Francisco to the surrounding Bay Area

CHART 4
Land Use in Major Metropolitan Areas



Central City:

Population(1960) 1, 670, 100 604, 300 2, 002, 500 2, 479, 000 740, 300 876, 000 3, 550, 400 7, 782, 000
 Acres 184, 960 342, 100 322, 050 958, 430 22, 601 155, 530 360, 190 1, 536, 000

Source: Charles Abrams, "The Use of Land in Cities," p. 154 in Scientific American, Cities (New York, 1965).
 San Francisco Department of City Planning, The Use of Land in San Francisco, October, 1964.

counties provides some indication of the factors behind the earlier observation that in the aggregate industry appears to have a locational preference for suburban areas.

The data in Table 19 indicate that San Francisco faces the same relative locational disadvantage in terms of land supply locally that it faces nationally with respect to other metropolitan areas. (San Francisco is also the smallest county in the state, with the next largest, Santa Cruz, being almost ten times as large.) Additional evidence on the cost disadvantages of locating in San Francisco is provided by the data on industrial land values in several Bay Area cities in Table 20. The data do not show rental values of available space, but normally this also varies with supply and demand conditions. It is evident that the supply of industrial land in surrounding counties is greater, and hence cheaper, for a given state of demand, than in San Francisco.

In general, manufacturing industries prefer locations where they can conduct a land-intensive operation and still remain competitive.

This importance of land availability has been noted in two recent surveys. In a survey of 2800 East Bay firms, of which 60 percent were manufacturers, the ability to expand facilities was given as one of the four most important locational factors.* A survey conducted by Arthur D. Little of firms that had moved from San Francisco to other Bay Area counties between 1953 and 1962 indicated that these migrant firms increased their lot sizes substantially.** Further, the building size total and production space were larger at the new location than had been the case in San Francisco.

* The other three factors were: (1) nearness to freeway, (2) nearness to established labor supply, (3) nearness to market. See Development Research Associates, "Land Utilization-Marketability Study, West Berkeley Industrial Park Project" (Los Angeles, California, 1966), pp. 7 and 8

**Arthur D. Little, Inc., Studies on the San Francisco Economic Environment, Technical Paper Number 5 (no date) p. 7.

TABLE 19
LAND AREA OF BAY AREA COUNTIES

<u>Counties</u>	<u>Land (Sq. Mi.)</u>
Alameda	733
Contra Costa	734
Marin	520
Napa	758
San Francisco	45
San Mateo	454
Santa Clara	1,302
Solano	827
Sonoma	1,579

Source: State of California, Department of Finance, California Population--1965, Table 17.

TABLE 20
INDUSTRIAL LAND VALUES, BAY AREA CITIES, 1963

	<u>Price Per Square Foot</u>	
	<u>Low</u>	<u>High</u>
San Francisco	\$1.70	\$8.00
Berkeley	1.20	2.25
Emeryville	1.65	2.75
Oakland	.90	2.00
Palo Alto	1.00	1.50
San Jose	.55	2.25

Source: Bay Area Council, Guide to Industrial Locations in the San Francisco Bay Area, 1964, p. 34.

These locational factors appear to be particularly true for heavy industries which, as was noted earlier, have been moving out of the central city. A recent study of Alameda County noted that in recent years new manufacturing firms requiring a large initial investment tend "to locate in more rural areas usually adjacent to railroad tracks or major highways and away from the central metropolitan area."* Many suburban communities encourage this movement by providing blocks of developed land for industrial use.

These observations also help to explain the observed differences in the average size of manufacturing establishments. (See Table 17.) San Francisco with its severe land constraint does not provide a competitive location for industries that require a large, single-story plant for production at minimum cost. As a result, the industries, which do remain, operate on the average a small plant which is presumably geared to a local market. The larger, average establishment size observed for the entire Bay Area and urban areas in other regions is a reflection of the location of heavier (and larger) plants where land is relatively abundant.

2. Wages

a. The role of wages in location.

An assessment of the role of wages in the locational decisions of manufacturing firms is important because labor costs comprise a large share of total costs in most manufacturing industries, and at the same time, difficult because of the variety of other cost, market, and competitive considerations.

*Craft, James A., Recent Trends in Industrial Growth and Factors Affecting that Growth in Alameda County (Unpublished manuscript, 1963).

Production worker wage rates are of particular interest because they are usually the major variable costs of production. In theory, an increase in production worker wage rates relative to the costs of other inputs (particularly capital equipment) encourages substitution of capital equipment for labor in production. Alternatively, if the prices of labor-intensive goods are raised (because of increased labor costs) relative to the prices of capital-intensive goods, consumers may substitute capital-intensive purchases for labor-intensive products in the market. Either effect will reduce the employment of production workers.

In practice, firms may be unable to make adjustments in the combination of capital and labor used in production each time the relative prices change. Moreover, competitive firms which employ large proportions of blue-collar labor may decide to incur reduced profits or temporary losses if wages rise in excess of productivity gains, in order to maintain sales and production.

At the time of an investment decision, however, firms in high-wage areas which (1) produce for a national market and (2) do not face other cost disadvantages in alternative locations have the option of moving to a lower wage area or remaining in the same location but changing the technology of production to use less of the relatively high-priced factor (e.g. labor). As we shall see, blue-collar wage pressures in the San Francisco area may have influenced the relocation of industry of this type which were facing an investment decision. However, blue-collar wage rates will not be a decisive determinant of location if inter-regional wage differentials are matched by differences in the skill of workers. If, for example, both the wage rate for a particular occupation and labor productivity due to education and training is ten percent higher in San Francisco than in Seattle, the labor cost per unit of output will be matched by a compensating difference in output per

manhour. The emphasis is important, for differences in labor productivity may be due either to inter-regional variations in labor quality or to differences in the amount or type of capital equipment used in production. The latter require additional investment where wages are high in order to maintain a competitive unit labor cost and are thus a negative factor in location.

There is also a group of industries which are relatively insensitive to inter-area wage differentials because of ties to their local markets. In some cases the firms must locate close to the market because of the perishable quality of the product. Newspapers are an example of a product which is perishable and which in many cases has a decidedly local orientation. Other industries including bakeries, breweries, and bottling works must remain close to the areas they serve in order to avoid prohibitive transport costs. Whenever there is a large increase in weight or size during the production process so that the final product is more expensive to transport than the materials used in production, a firm will minimize costs by locating close to the market in which it sells. The same forces which tie certain industries to a local market also insulate them from the competition of firms in lower wage areas for up until a point differences in wage rates are more than offset by differences in transportation expenses between plant and market.

However, the fact that some firms do not make a locational response to a moderate wage differential does not imply that they will remain insensitive to wage pressures if the differential should increase. Even firms with a local orientation may adopt labor saving solutions such as mergers or technological change if wage differences become so large that competition from other areas is introduced.

Finally, the locational pressures produced by inter-regional wage differentials will also depend upon the types of skills and the proportion of skilled to unskilled labor utilized in production. These factors differ considerably between individual manufacturing industries, and as we shall see, the inter-regional pattern of variation of the wages for skilled workers differs from the variation for unskilled occupations.

b. Wages within the San Francisco-Oakland Metropolitan Area.

From both casual and empirical evidence it appears that the difference between blue-collar wage rates in San Francisco and other Bay Area counties and cities is negligible.

Several representatives of management and labor mentioned during our interviews that collective agreements in their industries covered the entire Bay Area or Northern California. The limited data available for blue-collar union wage scales (see Table 21) tend to support this view.

In general it appears that wages do not provide major locational pressures between Bay Area counties and cities. A firm which prefers a location within the region will presumably consider the alternatives in terms of the location of its primary markets in the Bay Area, industrial-land availability, transportation facilities, and perhaps taxes.

c. Inter-regional wage differences.

The industrial location problem is not restricted to the choices of firms which are tied to the Bay Area. We pointed out in a previous section that there are other firms which serve a national market, and consequently, have considerable latitude in their choice of location if nearness to sources of raw materials' supplies and transportation costs are not a restriction. Several labor and management officials noted in our interviews that several manufacturing firms which left San Francisco during the past decade moved

TABLE 21
 BAY AREA UNION WAGE SCALES
 July, 1966

<u>City</u>	<u>Occupation</u>	
	<u>Machinist</u>	<u>Shirt Presser</u>
San Francisco	\$3.64	\$1.975
<u>Alameda County</u>		
Alameda	3.64	1.98
Berkeley	3.64	1.98
Hayward	3.64	1.98
Oakland	3.64	1.98
<u>Contra Costa County</u>		
Richmond	3.64	1.98
<u>San Mateo County</u>		
San Mateo	3.64	1.87
<u>Santa Clara County</u>		
San Jose	3.59	1.76
Palo Alto	3.59	1.76
<u>Solano County</u>		
Vallejo	3.63	1.68

Source: California Department of Employment, Research and Statistics, California Community Labor Market Surveys, 1965-1966.

to other states. Where plant removals are from the San Francisco Area to other states, it then becomes relevant to ask about the relative wage position of the San Francisco Area* with respect to other major urban areas in the United States.

The interpretation of available statistical evidence on inter-regional wage differentials is, however, not an easy task for several reasons. As pointed out above, the quality of the labor force is an important criterion in the determination of the price of labor. Further, data available for inter-regional comparisons are averages drawn from a sample of firms in each area. These averages indicate the general level of wages for the occupation and/or industry but mask a considerable dispersion of the wage rates within each urban area.

Three basic sources of inter-regional wage information are therefore examined in the following pages in order to familiarize readers with the type of information available. In each case the reader is informed of the problems of interpretation that arise when the various data series are used.

Data on average hourly earnings (including overtime payments) by manufacturing industry are presented for 17 metropolitan areas in Table 22. In order to illustrate the relative wage position of the San Francisco-Oakland Area, the hourly earnings average for each area is expressed as a percentage of the average for the San Francisco Area. Thus, in 1965, average earnings of production workers in the food products industry in Pittsburg were 89.2 percent of the average for that industry in the San Francisco Metropolitan Area. With three major exceptions the San Francisco Area appears to have the

* Most wage rate data are averages for six counties--Alameda, Contra Costa, Marin, San Francisco, San Mateo, and Solano.

TABLE 22

GROSS AVERAGE HOURLY EARNINGS OF PRODUCTION WORKERS IN
SELECTED MANUFACTURING INDUSTRIES IN MAJOR URBAN AREAS, 1965

Metropolitan Area	Industry (continued on next page)							
	Average hourly earnings	Food	Bakeries	Beverages	Apparel	Women's Outerwear	Printing & Publishing	Chemicals
San Francisco-Oakland *	Percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Pittsburgh		89.2	n. a.	n. a.	77.3	n. a.	76.0	87.6
Seattle		96.2	n. a.	n. a.	89.6	n. a.	97.3	93.4
Los Angeles-Long Beach		100.3	101.5	103.5	94.8	98.6	93.0	89.7
St. Louis		103.5	n. a.	n. a.	n. a.	n. a.	85.0	95.8
Chicago		89.8	82.4	79.7	93.8	n. a.	83.8	87.9
Minneapolis-St. Paul		97.1	n. a.	n. a.	n. a.	n. a.	79.9	n. a.
Philadelphia		83.8	n. a.	n. a.	97.2	n. a.	78.2	87.0
New Orleans		80.0	n. a.	n. a.	67.3	n. a.	73.6	n. a.
New York		96.0	90.3	105.1	113.3	121.9	92.0	85.2
New Haven		83.2	n. a.	n. a.	n. a.	n. a.	30.4	91.5
Boston		77.1	n. a.	n. a.	101.9	n. a.	79.9	90.0
Atlanta		73.0	n. a.	n. a.	79.1	n. a.	n. a.	63.7
Dallas		67.3	n. a.	n. a.	74.9	n. a.	n. a.	n. a.

(Table 22 continued on next page)

TABLE 22 (continued)

Metropolitan Area	Average hourly earnings	Industry					
		Primary Metals	Fabricated Metals	Machinery	Electrical Machinery	Transportation Equipment	Motor Vehicles
San Francisco-Oakland *	Percent	100.0	100.0	100.0	100.0	100.0	100.0
Pittsburgh		96.7	98.8	95.7	99.0	92.8	n. a.
Seattle		91.8	85.4	106.1	n. a.	93.1	n. a.
Los Angeles-Long Beach		88.3	82.2	92.0	98.7	94.0	96.1
St. Louis		91.0	37.5	92.6	83.3	92.0	96.4
Chicago		94.5	83.7	95.1	83.1	90.5	88.4
Minneapolis-St. Paul		84.3	85.7	85.9	93.3	92.2	n. a.
Philadelphia		93.9	87.5	89.9	83.9	96.3	n. a.
New Orleans		n. a.	77.3	n. a.	n. a.	n. a.	n. a.
New York		86.3	72.0	89.6	76.8	82.8	74.2
New Haven		80.8	78.1	82.8	77.1	85.6	n. a.
Boston		77.8	80.5	92.3	80.9	91.1	n. a.
Atlanta		87.5	61.8	69.6	n. a.	95.1	n. a.
Dallas		n. a.	n. a.	74.2	77.1	88.8	n. a.

n. a. - not available

* Data are available only for San Francisco-Oakland Metropolitan Statistical Area.

Source: U. S. Bureau of Labor Statistics, Employment and Earnings Statistics for States and Areas, 1939-65.

highest average hourly earnings for the sample of urban areas. Wages in the food industries are higher in the Los Angeles Area, but many of these industries, such as bakeries and beverage firms, are tied to a local market and relatively insensitive to moderate inter-area wage differences. In Seattle the average wage for the nonelectrical machinery industry is 6.1 percent an hour higher than in San Francisco. The final exception is in the beverage and apparel industries in the New York Area.

These data provide only a general notion of the inter-regional contours of industrial wages and cannot be accepted as a precise index of the relative wage pressures which would face a firm in various urban locations for at least two reasons. In the first place, the gross average hourly earnings data in Table 22 will not adequately reflect the basic wage rates if the amount of overtime varies between areas. More serious, however, is the fact that each of the wage rates on which Table 22 is based is an average of the rates observed in several small industries which are grouped by government statistical bureaus into the broad classifications used in the table. Thus, the relatively high average wage for the printing and publishing industry in San Francisco may mean that the city has relatively more of the higher wage industries in that classification rather than that wages are relatively high in every San Francisco firm classified in the printing and publishing industry. Furthermore, the earnings are averages of a plant's entire production work force so that they are affected by differences in labor force structure.

Some of the data problems arising from inter-regional differences in labor force structure and overtime hours can be avoided by comparing the wage rates for a particular occupation in various urban areas. Tables 23 and 24 present data gathered by the U. S. Bureau of Labor Statistics on

TABLE 23

AVERAGE HOURLY EARNINGS (EXCLUDING OVERTIME)

OF SELECTED BLUE-COLLAR OCCUPATIONS IN MANUFACTURING, 1965-1966

		Occupation							
		Maintenance Carpenter	Maintenance Electrician	Toolroom Machine Tool Operator	Maintenance Machinist	Automotive Mechanic	Tool and Die Maker	Material Handling Labor	Shipping Packer
Metropolitan Area	Average Hourly Earnings	\$ 3.74	\$3.88	3.77	3.86	3.82	4.16	2.91	3.10
San Francisco- Oakland	Percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Detroit		95.5	96.6	99.2	96.9	92.1	93.7	97.3	91.0
Pittsburgh		88.5	88.7	91.8	97.9	90.1	86.1	92.8	75.2
Seattle		91.4	---	---	88.6	87.7	87.3	99.7	84.2
Los Angeles-Long Beach		90.9	94.6	93.4	90.4	94.5	87.0	87.6	74.8
St. Louis		89.8	92.8	90.7	93.0	85.3	91.8	84.2	80.3
Houston		94.7	93.0	83.3	95.6	82.2	81.5	67.7	64.5
Chicago		88.5	92.8	93.1	94.6	91.4	92.1	81.4	78.7
Minneapolis-St. Paul		87.2	94.8	82.5	93.3	90.3	87.5	89.3	80.9
Phoenix		92.0	88.1	87.3	96.1	76.4	87.3	80.1	81.3
Philadelphia		88.8	86.1	85.4	88.1	84.8	83.9	83.8	72.6
New Orleans		84.8	86.6	---	85.5	68.8	---	67.4	57.7
New York		90.1	91.8	82.8	96.4	94.8	84.3	87.6	68.1
New Haven		73.5	78.4	---	75.6	82.7	74.8	76.6	68.4
Boston		81.8	83.2	84.9	82.9	82.7	82.0	72.8	74.5
Atlanta		79.9	89.4	---	82.9	73.0	86.5	62.9	64.2

TABLE 24
 AVERAGE HOURLY EARNINGS (EXCLUDING OVERTIME)
 OF SELECTED BLUE-COLLAR OCCUPATIONS IN MANUFACTURING, 1958-1959

Metropolitan Area	Occupation								
	Maintenance Carpenter	Maintenance Electrician	Toolroom Machine Tool Operator	Maintenance Machinist	Automotive Mechanic	Tool and Die Maker	Material Handling Laborer	Shipping Packer	
	Average Hourly Earnings \$	2.92	3.07	2.98	3.03	2.96	3.38	2.30	2.28
San Francisco- Oakland	Percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Detroit		100.7	100.0	102.7	101.3	95.9	93.8	100.0	100.0
Seattle		88.0	88.9	-	91.7	86.8	89.7	91.7	93.0
Los Angeles-Long Beach		93.8	95.8	94.6	96.7	94.6	88.5	93.5	90.8
St. Louis		93.8	94.1	91.6	96.7	89.9	89.7	85.7	86.0
Chicago		94.9	97.4	94.6	99.7	94.6	93.5	86.5	87.7
Minneapolis-St. Paul		92.8	91.9	81.9	92.7	87.2	87.3	90.0	89.0
Philadelphia		89.7	87.9	88.3	88.4	85.5	84.9	84.3	78.9
New Orleans		80.1	89.9	-	88.1	72.6	-	63.0	59.2
New York		90.1	91.5	89.3	93.7	88.9	84.9	90.9	73.7
Boston		82.9	85.3	83.2	85.8	81.8	81.4	77.8	73.7
Atlanta		75.3	89.3	-	81.5	71.3	-	66.5	69.7
Dallas		80.8	78.8	-	81.5	69.3	80.5	66.1	67.1

Source: U. S. Bureau of Labor Statistics, Occupational Wage Surveys, 1958-59.

average hourly earnings excluding overtime in selected blue-collar, manufacturing occupations. Data for several metropolitan areas are presented for two recent time periods, 1958-59 and 1965-66, to indicate any changes in the inter-city wage differences. The data illuminate several aspects of the relative wage position of the Bay Area:

1. The wage differences among metropolitan areas are greater for unskilled than for skilled workers. In Table 23, for example, the lowest urban wage for material handling labor in 1966 was not quite 63 percent (in Atlanta, Georgia) of the prevailing San Francisco area wage for the occupation, and the wage rates of shipping packers in some areas (Dallas and New Orleans) were just under 58 percent of the local rates. At the same time the lowest straight-time average hourly earnings in the more skilled occupations (carpenters, electricians, machinists, etc.) were generally 75 to 80 percent of those for comparable occupations in the Bay Area.
2. Since 1958-59 the difference between average hourly earnings in the San Francisco-Oakland Area and other urban areas appears to have increased, with a relatively greater gap developing in the unskilled than in the skilled occupations. In general, a comparison of Tables 23 and 24 indicates that average hourly earnings for most of the cited occupations in most of the sample metropolitan areas were a smaller percent of the San Francisco Area level in 1965-66 than in 1958-59. In the latter period, for example, wages in Detroit for most of the occupations were either the same or slightly higher than in the San Francisco Area, but in the more recent period, average earnings in each of the occupations were much less in relation to San Francisco. On the one hand, the differential between the Los Angeles and San Francisco Areas increased over

the period. On the other, the earnings differential between San Francisco and Seattle decreased for several occupations (e.g. maintenance carpenter and material handling laborer). The results in southern cities were also mixed. In Atlanta, for example, earnings for skilled occupations increased while those for unskilled decreased relative to San Francisco.

3. The above facts suggest that wage differences between the San Francisco Area and other urban areas would be a more important locational force for firms employing large proportions of unskilled and semi-skilled workers.

There is one general objection to assessing the relative wage position of an area by inter-regional differences in occupational average hourly earnings. Wages for a given occupation may be influenced by the types of industry providing jobs in a given area. For instance, the wage rate for a carpenter or machinist in an industry which is isolated by virtue of size from severe competitive pressures is normally higher than the wage offered the same occupation in a highly competitive industry. To the extent that the composition of manufacturing in a given area is dominated by high-wage or low-wage firms, occupational wages will vary accordingly.

By comparing average hourly earnings for specific occupations in a given industry among various metropolitan areas, the problem of industrial composition is avoided, and perhaps the purest estimate of a region's relative wage position is obtained. In Table 25 there are data on average hourly earnings excluding overtime in recent years for various skilled and unskilled blue-collar occupations in four industries for which data were available for several major metropolitan areas. The data confirm the conclusions drawn from the other inter-area wage data presented in the study. Only the

Average Hourly Earnings (Excluding Overtime) of Blue-Collar
Occupations in Selected Manufacturing Industries and Metropolitan Areas

		Nonelectrical Machinery(1965)				Gray Iron(1962)		
		tool and die makers	class A machine tool operators	Class B assemblers	material handling laborers	squeeze machine molder	hand core - maker	chippers and grinders
	Average Hourly Earnings	\$3.97	\$3.58	\$3.06	\$2.90	\$3.29	\$3.15	\$2.58
San Francisco- Oakland	Percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Detroit		93.7	97.2	95.8	95.9	-	-	-
St. Louis		94.7	100.8	92.8	80.3	89.1	86.7	84.9
Chicago		90.9	90.2	90.2	80.3	85.7	90.2	95.0
Los Angeles		87.2	89.4	83.0	86.9	85.7	89.5	87.6
Pittsburgh		83.4	88.5	99.0	84.5	83.9	88.6	101.2
New York		84.9	84.9	81.0	73.1	-	-	-
Philadelphia		86.4	83.2	80.4	78.1	80.5	79.7	78.3
Minneapolis		84.1	82.4	80.7	83.1	-	-	-
Boston		81.9	80.2	81.7	75.2	-	-	-
Houston		83.9	82.7	81.0	70.7	-	-	-
Dallas		74.1	74.3	69.6	59.7	-	-	-
United States		-	-	-	-	87.2	82.9	89.9
Pacific Region		-	-	-	-	97.6	94.0	92.6

(Table 25 continued on next page)

TABLE 25 (continued)

Paints and Varnishes(1961)					Corrugated and Solid Fiber Boxes (1964)			
Average Hourly Earnings	tinters	mixers	fillers	material handling laborers	printing slotter machine operators	folding & glueing machine operators	off- bearers	bundlers- packers
San Francisco-	\$3.06	\$2.75	\$2.65	\$2.60	\$3.04	\$2.85	\$2.50	\$2.45
Oakland	Percent 100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Detroit	88.9	89.5	90.2	95.4	93.4	97.9	98.4	93.5
St. Louis	83.7	82.5	83.4	83.8	91.4	89.8	98.8	95.5
Chicago	85.9	83.6	81.1	83.5	90.8	88.8	100.8	93.9
Los Angeles	89.5	89.1	86.4	86.2	102.6	102.8	104.8	101.2
Pittsburgh	80.4	86.2	79.2	86.9	-	-	-	-
New York	85.3	78.5	73.2	75.4	93.1	86.7	93.6	93.1
Philadelphia	85.9	87.3	80.3	86.2	85.5	86.3	88.0	87.3
Minneapolis	-	-	-	-	-	-	-	-
Boston	74.2	80.4	77.4	76.5	-	-	-	-
Houston	73.9	76.0	67.2	59.6	-	-	-	-
Dallas	78.1	76.0	75.8	72.7	-	-	-	-
United States	83.7	81.5	78.1	80.8	86.8	86.0	96.4	87.8
Pacific Region	94.1	93.8	92.8	95.8	100.7	100.0	102.0	100.4

Source: U.S. Bureau of Labor Statistics, Industry Wage Surveys, Bulletin Nos. 1476, 1386, 1318, 1478.

relative wage positions of Pittsburgh and Minneapolis appear to be substantially changed when the data are thus corrected for industrial composition.

In summary, the San Francisco-Oakland Area appears to have the highest blue-collar average hourly earnings in the country. For industries which are not tied to a location in the San Francisco Area, the relatively high blue-collar average hourly earnings may be one factor encouraging location or relocation in other areas. The extent to which this is a factor will vary between industries, depending on their occupational mix and the differences in the productivity (due to skill, education, and training) of labor at alternative locations.

3. Transportation. For most manufacturing firms the problem of distribution begins where production ends. Once a plant is constructed and operating, management must live with the existing transportation apparatus. However, at the time of a locational decision the costs of distribution associated with a particular location are of comparable importance to the production costs which the firm would incur in the area. If, for instance, management had a choice between two alternative locations where all relevant production costs were virtually the same, it would choose rationally the site where congestion and transportation rates were lowest.

We have only indirect evidence of the increased transportation time required to deliver or obtain cargo within San Francisco during the postwar period.*

*The lack of empirical evidence on transportation costs necessarily restricts the discussion in this section. The brevity of this section, however, should not be construed as minimizing the importance of transportation costs in the location decision.

In Table 26 the traffic survey data indicate that in 12 years the number of vehicles entering San Francisco on a typical weekday increased by 87,000. While overall congestion increased, however, the number of commercial vehicles declined. In particular, the number of trucks declined by over 16,000. These data support the conclusion drawn from other evidence that the manufacturing firms which remain in San Francisco are tied to markets in the central city, for the truck traffic associated with the distribution of local manufacturers would generally remain within the city and thus would not be enumerated in the traffic surveys.

TABLE 26

NUMBER OF VEHICLES ENTERING SAN FRANCISCO ON A "TYPICAL" DAY

	1959		1947	
	<u>Vehicles</u>	<u>Percent</u>	<u>Vehicles</u>	<u>Percent</u>
Autos	275,355	87.2	171,027	75.0
Taxis	8,085	2.5	9,332	4.0
Trucks	26,068	8.3	42,148	18.4
Local Bus	4,936	1.6	5,668	2.4
Out of Town Bus	<u>1,556</u>	<u>0.4</u>	<u>570</u>	<u>.2</u>
Total	316,000	100.0	228,745	100.0

Source: Transportation Technical Committee of the Mayor's Transportation Council, City and County of San Francisco, Cordon Count Data, Metropolitan Traffic District, July, 1959.

4. Taxes and Public Services

a. The role of taxes and public services in location.

In the study of industrial location, the role of taxes must be evaluated jointly with the quantity and quality of the public services financed by taxes. On the one hand, taxes represent a fixed cost to the firm so that at the time of a locational decision alternative sites must be evaluated in terms of the costs to be incurred from state and local taxes. On the other hand, taxes finance public services which are an important source of cost reductions to the firm.

There are two major ways in which tax-financed public services affect the cost structure of an industry. The first is the direct effect in which state or local governments use taxes to provide services which the firm otherwise would have to provide for itself at increased operating costs. Police and fire protection provide examples of the direct trade-off between taxes and operating costs. The "use of industrial tax revenues to support efficient fire and police departments may reduce the taxed firms' expenditures for watchmen and fire insurance."* A similar analysis may be extended to the water supply, sewer systems, transportation facilities, and other public services which are critical to the productive activity of a firm.

*J.S. Floyd, Jr., Effects of Taxation on Industrial Location (Chapel Hill: University of North Carolina, 1952), p. 20. For other examples see: Committee for Economic Development, Guiding Metropolitan Growth, August 1960; Tomlinson Fort, "What Industry Looks for in a Community," Louisiana Industrial Development Conference, Louisiana State University, Baton Rouge, Louisiana, December 15, 1953; John D. Garwood, "Taxes and Industrial Location," National Tax Journal, December 1952; Ralph Gray, "Case Study of a Plant Location," The Arkansas Economist, Spring 1962; Walter A. Morton, Housing Taxation (Madison: University of Wisconsin Press, 1955).

There is also an important indirect consideration for firms which must attract a labor force (usually skilled workers) to a new location. Typically, the transfer can be accomplished by offering wages and salaries which are sufficiently high to overcome the inconvenience of leaving existing jobs and moving to a new location. However, the amount of inducement required will depend on the quality of the environment to which the workers are being attracted. In general, the magnitude of the wage inducement will be less in areas providing the highest quality of public education, health, and protection services to residents. Thus, industry also has an interest in the quality of those public services which do not directly effect operating costs. On this subject one expert has noted that:

...industry may be getting its money's worth out of local taxes even if the money value of taxes exceeds the estimated direct benefit to industry in terms of measurable cost of such services as police and fire protection. The company's employees are essential to the company's operation. If they receive a tax bargain as home-owner-taxpayers because of the taxes paid by industry that tax bargain is one of the factors attracting the employees to work for that company and live in that community; hence, the benefit shows up indirectly, but no less significantly, through the better quality of personnel at any given salary scale.*

It now becomes clear that when evaluating the influence of taxes alone, a simple comparison of tax rates in alternative locations does not by itself indicate the location with the lowest cost for the firm may lose the savings of a low tax rate in the additional costs incurred in providing its own services. Therefore, in making a locational

*H. Somers, "Taxes and Services as Factors in Industrial Location" in Governor's Conference on Employment (Berkeley: Institute of Industrial Relations, 1965), p. 4-15.

decision, the firm must evaluate tax rates in alternative locations in terms of the level of public services provided.

In analyzing taxes from this benefit-cost viewpoint, the firm would clearly list a location with low taxes and a high level of public services as first choice. Since services are financed by taxes, this ideal combination is rarely found in communities with a residential section. Areas with high taxes and low level or quality of public services are at the other ~~extreme~~ and offer the poorest alternative from a cost standpoint.

In the more general situation, the level and quality of services vary with the tax burden. In this instance each firm must decide whether it is more advantageous to buy its services through taxes or to locate in a low tax area and provide the services directly through higher overhead costs.

b. Property taxes in San Francisco and the Bay Area

Bearing the above considerations in mind, we can now consider real property tax rates in San Francisco and other Bay Area municipalities. However, it is not possible to render a definitive statement regarding the "best" location in the area (on the basis of taxes and public services alone) because of the difficulties in measuring the quality of public services and because different firms and industries require different types of services. A study of prevailing tax rates does indicate where firms would normally expect high quality services to compensate for the additional cost of a relatively high tax rate.

The data in Table 27 show the "true" tax rates per \$100 of full market value in several Bay Area cities. This rate is the basic tax rate multiplied by the ratio of assessed value to full market value of the property. Thus, by correcting for the intercity differences in assessment ratios, the "true" or composite tax rate provides the most accurate indicator of comparative tax costs in Bay Area locations. Where rates vary between districts within cities, the highest and lowest rate in the range is shown.

The "true" or composite tax rate for San Francisco is higher than the lowest rates prevailing in those cities and towns in San Mateo, Santa Clara and Alameda counties which are most cited as the locations for major new industries in the Bay Area. In general, the data suggest that those areas which offer the greatest advantage in terms of land availability also offer the lowest tax rates. But again, it must be stressed that from a viewpoint of a firm's cost structure, taxes must be interpreted in terms of the quantity and quality of public services available in each location -- a regrettably difficult item to assess.

A specific property tax that has been cited as offering locational advantages and disadvantages within the Bay Area is the business inventory tax. This tax has been of importance to industries or operations (such as warehousing) which typically must carry a substantial amount of merchandise in stock. Within the area differences have existed because of the lack of uniform assessment practices. In particular, San Francisco followed a high assessment policy. With the passage of Assembly Bill 80 by the California Legislature, however, inter-county differences in assessment practices within the Bay Area should be removed by fiscal 1971-72. On this point, A.B. 80 reads:

TABLE 27

"TRUE" TAX RATES IN BAY AREA CITIES, 1966-67*

85.

<u>County and City</u>	<u>Range of "True" Rates</u>	
	<u>Low</u>	<u>High</u>
<u>San Francisco County</u>		
San Francisco	\$2.04	\$2.04
<u>Alameda County</u>		
Berkeley	2.72	2.74
Emeryville	1.40	1.40
Fremont	2.09	2.38
Livermore	2.30	2.30
Oakland	2.17	2.72
Pleasanton	1.98	2.37
San Leandro	1.73	2.51
Union City	1.92	2.31
<u>Contra Costa County</u>		
Concord	2.54	2.98
Martinez	2.00	2.99
Richmond	2.52	2.97
Walnut Creek	2.59	2.91
<u>San Mateo County</u>		
Brisbane	1.94	2.28
Menlo Park	1.85	2.41
Redwood City	1.96	2.33
San Carlos	1.78	2.08
South San Francisco	1.88	2.39
<u>Santa Clara County</u>		
Milpitas	1.80	2.25
Palo Alto	1.01	2.46
San Jose	1.74	2.48
Santa Clara	2.14	2.29
Sunnyvale	2.09	2.47
<u>Solano County</u>		
Fairfield	1.67	2.12
Vallejo	1.92	2.24

*Real property tax rates per \$100 of full market value. "True" tax rates apply to property theoretically assessed at full market value to permit comparison of cities with different assessment practices. The table does not include special taxes levied in some areas on land and land improvements.

Source: Auditor-Controller Offices, Bay Area counties and various cities; as published by the Bay Area Council in Bay Area Facts, December 1966.

Every assessor shall assess all property subject to general property taxation from the lien date for the 1967-68 fiscal year through the 1970-71 fiscal year at a publicly announced ratio of his own choosing which shall be between 20 percent and 25 percent of full cash value. Beginning with the lien date for the 1971-72 fiscal year he shall assess all property subject to general property taxation at 25 percent of its full cash value.

D. Conclusion

This report has covered the dimensions of the decline in manufacturing employment in San Francisco and presented an analysis of the major underlying economic forces. A review of the alternative explanations of the decline in manufacturing employment indicated that industrial relocation was the primary factor.

The major assumption underlying the analysis in the second section of the report is that firms attempt to maximize profits. Since profit is defined as revenue minus cost, maximizing profits is equivalent to minimizing the cost of producing a given output. In some instances minimizing costs may require the relocation of a plant.

Four cost factors have been stressed in this report -- land, wages, transportation, and taxes -- but these do not represent an exhaustive list of the costs incurred by manufacturing firms. They are, however, major sources of industrial cost. But, whereas each cost has been considered separately in the preceding analysis, the profit-maximizing firm must consider total costs when making a locational decision.

It should now be clear why no single general answer to the question, "Why is industry leaving San Francisco?" has emerged from this report. The relative importance of each type of cost incurred both varies considerably among industries and also differs with the size of

the market and the degree of competition encountered by a firm. Since no single force affects all industries equally, the cost factor(s) inspiring relocation will most likely differ among industries.

However, the specific answers to the question "Why is Industry X or Industry Y leaving San Francisco?" can be answered with the appropriate analysis. The preceding pages provide the framework for the application of such analysis to the individual industries.

APPENDIX A

SUPPLEMENTARY TABLES

TABLE 1

POPULATION INSIDE AND OUTSIDE CENTRAL CITY OR CITIES FOR
SELECTED LARGE METROPOLITAN AREAS, BY RACE, 1900 and 1960

Areas	Total Population (000)	All Classes						White			Negro		
		Total	Central City	Outside Central City	Total	Central City	Outside Central City	Total	Central City	Outside Central City	Total	Central City	Outside Central City
<u>New York</u>													
1960	10695	100.0	72.8	27.2	88.0	62.1	25.9	11.5	10.2	1.3			
1900	3813	100.0	90.1	9.9	97.4	88.4	9.0	1.9	1.6	0.3			
Change in percent points			-17.3	17.3	-9.4	-26.3	16.9	9.6	8.6	1.0			
<u>Philadelphia</u>													
1960	4343	100.0	46.1	53.9	84.3	33.8	50.5	15.5	12.2	3.3			
1900	1892	100.0	68.4	31.6	99.7	65.0	34.7	5.4	3.3	2.1			
Change in percent points			-22.3	22.3	-15.4	-31.2	15.8	10.1	8.9	1.2			
<u>Minneapolis-St. Paul</u>													
1960	1482	100.0	53.7	46.3	98.2	52.0	46.1	1.4	1.4	-			
1900	460	100.0	79.6	20.4	99.1	78.7	20.4	0.9	0.8	-			
Change in percent points			-25.9	25.9	-0.9	-26.7	25.7	0.5	0.6	-			
<u>Boston</u>													
1960	2589	100.0	26.9	73.1	96.6	24.3	72.4	3.0	2.4	0.6			
1900	1321	100.0	42.5	57.5	98.4	41.6	56.8	1.6	0.9	0.7			
Change in percent points			-15.6	15.6	-1.8	-17.3	15.6	1.4	1.5	-0.1			

TABLE 1 (Continued)

Areas	Total Population (000)	All Classes						White			Negro				
		Central City		Outside City		Total	Central City		Outside City		Total	Central City		Outside City	
		Total	Change in percent points	Total	Change in percent points		Total	Change in percent points	Total	Change in percent points		Total	Change in percent points		
<u>Houston</u>															
1960	1243	75.5	24.5	79.9	58.0	22.0	19.8	17.3	2.5	31.2	22.9	8.3			
1900	64	70.0	30.0	68.7	47.0	21.7	31.2	22.9	8.3						
Change in percent points		5.5	- 5.5	11.2	11.0	0.3	-11.4	- 5.6	-5.8						
<u>Los Angeles-Long Beach</u>															
1960	6743	41.9	58.1	91.2	35.5	55.7	6.9	5.1	1.8	96.5	43.8	0.4			
1900	190	55.1	44.9	96.5	52.8	43.8	1.5	1.2	0.4						
Change in percent points		-13.2	13.2	- 5.3	-17.3	11.9	5.4	3.9	1.4						
<u>Detroit</u>															
1960	3762	44.4	55.6	84.9	31.4	53.5	14.9	12.8	2.0	98.9	32.9	0.2			
1900	427	66.9	33.1	98.9	66.0	32.9	1.1	1.0	0.2						
Change in percent points		-22.5	22.5	-14.0	-34.6	20.6	13.8	11.8	1.8						
<u>St. Louis</u>															
1960	2060	36.4	63.6	85.5	25.9	59.6	14.3	10.4	3.9	94.0	28.8	1.6			
1900	827	69.6	30.4	94.0	65.2	28.8	5.9	4.3	1.6						
Change in percent points		-33.2	33.2	- 8.5	-39.3	30.8	8.4	6.1	2.3						
<u>Chicago</u>															
1960	6221	57.1	42.9	85.2	43.6	41.6	14.3	13.1	1.2	98.3	18.3	0.2			
1900	2085	81.5	18.5	98.3	80.0	18.3	1.6	1.4	0.2						
Change in percent points		-24.4	24.4	-13.1	-36.4	23.3	12.7	11.7	1.0						

TABLE 1 (Continued)

Areas	Total Population (000)	All Classes						White			Negro		
		Total	Central City	Outside Central City	Total	Central City	Outside Central City	Total	Central City	Outside Central City	Total	Central City	Outside Central City
<u>Pittsburgh</u>													
1960	2405	100.0	25.1	74.9	93.2	20.9	72.3	6.7	4.2	2.5			
1900	1084	100.0	41.7	58.3	96.7	39.8	57.0	3.2	1.6	1.7			
Change in percent points			-16.6	16.6	- 3.5	-18.9	15.3	3.5	2.6	.8			
<u>Dallas</u>													
1960	1084	100.0	62.7	37.3	85.4	50.6	34.8	14.3	11.9	2.4			
1900	211	100.0	20.2	79.8	89.1	15.9	73.2	10.9	4.3	6.6			
Change in percent points			42.5	-42.5	- 3.7	34.7	-38.4	3.4	7.6	-4.2			

Source: U. S. Bureau of the Census. U. S. Census of Population: 1960. Selected Area Reports. Standard Metropolitan Statistical Areas. Final Report PC (3)-1D.

TABLE 2
 ADMINISTRATIVE AND AUXILIARY PERSONNEL AS A
 PERCENT OF TOTAL PRIVATE MANUFACTURING
 EMPLOYMENT, 1950 AND 1964

<u>Counties</u>	<u>Mid-March 1950 (Percent)</u>	<u>Mid-March 1964 (Percent)</u>
Alameda	2.3	5.4
Contra Costa	*	*
Marin	*	*
San Francisco	6.2	17.2
San Mateo	*	6.9
Santa Clara	2.5	2.5
Solano	*	*
California	2.5	4.1
<hr/>		
San Francisco County as a Percent of California	22.2	18.9

*Negligible number

Source: U.S. Bureau of the Census, County Business
 Patterns, 1950 and 1964.

TABLE 3
 LAND USE IN SAN FRANCISCO COUNTY (IN ACRES),
 1947-48 AND 1961-64

<u>Land Use</u>	<u>1961-64</u>	<u>1947-48</u>
Total Net Acreage	22,601	22,285
Residence	9,037	8,240
Commerce	1,478	1,233
Industry	1,464	1,254
Structural: Light	552	444
Intermediate	315	255
Heavy	162	262
Open Air: Light	84	35
Intermediate	219	159
Heavy	132	99
Utility	954	1,072
Institutional	440	352
Public	6,594	5,398
Private Recreation	364	298
Vacant	2,271	4,439

Source: San Francisco Department of City Planning,
The Use of Land in San Francisco, October,
 1964.

TABLE 4

PERCENT DISTRIBUTION OF INVESTMENT BY INDUSTRY

	United States	San Francisco County	San Francisco Oakland SMSA	Santa Clara County
TOTAL	100.0	100.0	100.0	100.0
Food	10.2	46.5	15.5	22.1
Tobacco	.4	-	-	-
Textiles	3.6	-	-	-
Apparel	.9	3.2	.5	-
Lumber	2.9	-	.6	.7
Furniture	.8	2.0	1.7	.5
Paper	7.0	2.3	7.3	4.2
Printing	3.7	13.8	4.3	3.4
Chemicals	12.3	4.0	10.7	4.4
Petroleum	5.9	-	21.7	.4
Rubber	2.3	-	.7	.8
Leather	.3	-	-	-
Stone, Clay, Glass	5.9	.5	3.5	10.9
Primary Metals	14.0	.6	7.8	.6
Fabricated Metals	5.1	14.1	7.6	6.0
Machinery	7.6	4.3	4.5	18.8
Electrical Machinery	5.6	1.9	4.8	25.7
Transportation Equipment	9.1	3.5	7.2	-
Instruments	1.5	-	.5	1.0
Miscellaneous	1.8	1.4	.6	.4

Source: Bureau of the Census, Census of Manufactures, Vol. III, and Annual Survey of Manufactures.

Note: Dates for which the data apply are given in Charts 1, 2, and 3.

APPENDIX B
DEFINITIONS AND DESCRIPTIONS OF INDUSTRIAL
AND OCCUPATIONAL GROUPS

1. DETAILED DESCRIPTION OF STANDARD INDUSTRIAL
CLASSIFICATIONS FOR THE MANUFACTURING INDUSTRIES

Food and Kindred Products: Establishments manufacturing foods and beverages for human consumption, and certain related products, such as manufactured ice, chewing gum, vegetable and animal fats and oils, and prepared feeds for animals and fowls.

Tobacco Manufactures: Establishments manufacturing cigarettes, cigars, smoking and chewing tobacco, and snuff, and in stemming and redrying tobacco.

Textile Mill Products: Establishments engaged in performing any of the following operations: (1) preparation of fiber and subsequent manufacturing of yarn, thread, braids, twine, and cordage; (2) manufacturing broad woven fabric, knit fabric, and carpets and rugs from yarn; (3) dyeing and finishing fiber, yarn, fabric, and knit apparel; (4) coating, waterproofing, or otherwise treating fabric; (5) the integrated manufacture of knit apparel and other finished articles of yarn; and (6) the manufacture of felt goods, lace goods, bonded-fiber fabrics, and miscellaneous textiles.

Apparel: Establishments producing clothing and fabricated products by cutting and sewing purchased woven or knit textile fabrics and related materials such as leather, rubberized fabrics, plastics and furs.

Lumber and Wood Products: Logging camps engaged in cutting timber and pulpwood; merchant sawmills, lath mills, shingle mills, cooperage stock mills, planing mills, and plywood mills and veneer mills engaged in producing lumber and wood basic materials; and establishments engaged in manufacturing finished articles made entirely or mainly of wood or wood substitutes.

Furniture and Fixtures: Establishments engaged in manufacturing household, office, public building, and restaurant furniture, and office and store fixtures.

Paper and Allied Products: Manufacture of pulps from wood and other cellulose fibers, and rags; the manufacture of paper and paperboard; and the manufacture of paper and paperboard into converted products such as paper coated off the paper machine, paper bags, paper boxes, and envelopes.

Printing, Publishing, and Allied Industries: Establishments engaged in printing by one or more of the common processes; those which perform services for the printing trade; and establishments engaged in publishing newspapers, books, and periodicals, regardless of whether or not they do their own printing.

Chemicals and Allied Products: Establishments producing basic chemicals, and establishments manufacturing products by predominantly chemical processes.

Petroleum Refining and Related Industries: Establishments primarily engaged in petroleum refining, manufacturing paving and roofing materials, and compounding lubricating oils and grease from purchased materials.

Rubber and Miscellaneous Plastics Products: Establishments manufacturing rubber products such as tires, rubber footwear, mechanical rubber goods, heels and soles, flooring, plastics products, and establishments engaged in molding primary plastics for the trade.

Leather and Leather Products: Establishments engaged in tanning, currying, and finishing hides and skins, and establishments manufacturing finished leather and artificial leather products.

Stone, Clay and Glass Products: Establishments engaged in manufacturing flat glass and other glass products, cement, structural clay products, pottery, concrete and gypsum products, cut stone products, abrasive and asbestos products.

Primary Metal Industries: Establishments engaged in the smelting and refining of ferrous and nonferrous metals from ore, pig, or scrap; in the rolling, drawing, and alloying of ferrous and nonferrous metals and in the manufacture of nails, spikes, and insulated wire and cable.

Fabricated Metal Products Industries: Establishments engaged in fabricating ferrous and nonferrous metal products such as metal cans, tinware, hand tools, cutlery, general hardware, nonelectric heating apparatus, fabricated structural metal products, metal stampings, and a variety of metal and wire products not elsewhere classified.

Machinery, Except Electrical: Establishments engaged in manufacturing machinery and equipment other than electrical equipment and transportation equipment.

Electrical Machinery: Establishments engaged in manufacturing machinery, apparatus, and supplies for the generation, storage, transmission, transformation, and utilization of electrical energy.

Transportation Equipment: Establishments engaged in manufacturing equipment for transportation of passengers and cargo by land, air, and water.

Professional, Scientific, and Controlling Instruments: Establishments engaged in manufacturing mechanical measuring, engineering, laboratory, and scientific research instruments; optical instruments and lenses; surgical, medical, and dental instruments, equipment, and supplies; ophthalmic goods; photographic equipment and supplies; and watches and clocks.

Miscellaneous Manufacturing Industries: Establishments engaged in manufacturing jewelry, silverware and plated ware; musical instruments; toys, sporting and athletic goods; pens, pencils, and other office and artists' materials; buttons, costume novelties, miscellaneous notions; brooms and brushes; morticians' goods; and other miscellaneous manufacturing industries.

Note: All descriptions are condensed from the U.S. Bureau of the Budget, Standard Industrial Classification Manual (Washington: U.S. Government Printing Office, 1958).

2. MAJOR SUBDIVISIONS OF BROAD GROUPS IN NONMANUFACTURING*

1. Transportation, communications, and utilities

Railroads and railway express service
 Street railways and bus lines
 Trucking service and warehousing
 Water transportation
 Air transportation
 All other transportation
 Communications
 Electric and gas utilities
 Water supply, sanitary services and other utilities

2. Retail trade

Food and dairy product stores
 General merchandise and variety stores
 Apparel and accessories stores
 Furniture, home furnishings and equipment stores
 Motor vehicle and accessory stores
 Gasoline service stations
 Drug stores
 Eating and drinking places
 Hardware, farm implements, building materials
 All other retail trade

3. Servicesa. Business and repair services

Business services
 Auto repair and garages
 Miscellaneous repair

b. Personal services

Private households
 Hotels and lodging
 Laundering, cleaning, and dyeing
 All other personal services

c. Professional and related services

Medical and other health
 Educational services, private and government
 Welfare, religious and membership organizations
 Legal, engineering and miscellaneous professional services

d. Entertainment and recreation services

*Detail is not provided for those industry groups whose content is clearly evident from the broad title; i.e., agriculture, forestry, fishing, construction, wholesale trade, finance, insurance, real estate, and public administration.

3. MOST NUMEROUS SPECIFIC OCCUPATIONS
INCLUDED UNDER THE MAJOR OCCUPATIONAL GROUPS

1. Professional, technical, and kindred

Accountants
Chemists
Engineers
Teachers (all levels)
Draftsmen
Lawyers and judges
Physicians, surgeons, and dentists
Medical and dental technicians
Electrical and electronic technicians

2. Managers, officials, and proprietors (excluding farm)

Salaried and self-employed persons in various industries
State and local administration officials and inspectors

3. Clerical

Bookkeepers
Mail carriers
Cashiers
Office machine operators
Stenographers, typists, and secretaries
Telephone operators

4. Sales Workers

Insurance and real estate brokers and agents
Sales workers in various lines

5. Craftsmen and foremen

Various construction crafts
Various metal crafts
Various printing crafts
Linemen and servicemen (telephone, telegraph, power)
Various railroad crafts
Mechanics and repairmen
Stationary engineers

6. Operatives

Apprentices
Auto service and parking attendants
Bus drivers
Laundry and dry cleaning operatives
Meat cutters
Sailors and deck hands

Taxicab drivers and chauffeurs
Truck drivers and deliverymen
Welders and flame-cutters
Semiskilled workers in manufacturing plants

7. Other service workers

Barbers
Janitors, porters, and charwomen
Cooks
Firemen
Guards and watchmen
Policemen
Waiters, bartenders, and counter workers
Hospital and other institutional attendants
Hairdressers
Practical nurses

8. Laborers (except farm and mine)

Fishermen
Longshoremen and stevedores
Unskilled laborers in various industries

APPENDIX C

COMPUTATIONAL METHODOLOGY OF OCCUPATIONAL
SPECIALIZATION RATIOS

OCCUPATIONAL SPECIALIZATION RATIOS*

A. Derivation of the Occupational Specialization Ratios by Residence of Workers

These ratios were derived from data in the U.S. Census of Population: 1960, General and Economic Characteristics, California. (Final Report PC(1) - 6C), Tables 74 and 84.

The methodology used to derive these ratios was as follows:

1. For each occupational category, the number of resident workers in each of the six Bay Area counties was expressed as a percentage of the total number for the Bay Area. For example, the entire Bay Area had 96,843 male resident workers in the professional and technical occupations. Of these workers, 23,352 males resided in San Francisco. Hence, San Francisco County's share for this occupation was 24.11 percent.
2. The total number of male resident workers in each county was expressed as a percentage of the total number of male resident workers in the entire Bay Area. For example, in 1960, San Francisco County had 197,636 male resident workers out of a Bay Area total of 699,777, or about 28.24 percent of the total.
3. In Table 11, the numbers in row b under each occupational category represent the ratio of the two percentages described above. For example, San Francisco's share of male resident professional workers was 24.11 percent while its share of all male resident workers was 28.24 percent. The quotient of these figures (.854) represents the residents' specialization ratio for male professional and technical workers in San

*The procedure detailed below follows in part that used by Edgar M. Hoover and Raymond Vernon. See Anatomy of a Metropolis (Cambridge, Mass.: Harvard University Press, 1959), Appendix L.

San Francisco. In this case, because the coefficient is less than one, San Francisco is under-represented in residents employed in the professional and technical occupations.

The above methodology was also followed to derive the residents' occupational specialization ratios for females.

The only occupational category excluded from the above analysis which appears in the Census was Farmers and Farm Managers. This group accounted for 0.6 percent of all male resident workers and 0.06 percent of all female resident workers in 1960.

Nonfarm managers were divided into the salaried and self-employed categories in order to discern any important differences that exist between these two categories.

Service workers include such occupations as waiters, bartenders, cooks, and protective service workers as well as private household workers.

Data for males treat deliverymen and drivers separately from operatives, the general semiskilled category, so that the differences between the two groups could be determined.

Nonfarm and farm laborers are treated as a group on the assumption that these groups, the unskilled, are interchangeable among industries. This assumption appears more realistic when studying labor supply inasmuch as there is considerable evidence regarding the flow of farm workers to urban areas when job opportunities are favorable.

B. Derivation of Occupational Specialization Ratios by Location of Jobs

The ratios of specialization by job location were obtained by a procedure that involved, as a first step, estimating employment in each county by industry. (As indicated above, Census data deal with the dis-

tribution of employed residents by industry and occupation. These data do not provide information on the location of the jobs by county.)

Basic data used to obtain the county employment estimates were those published in County Business Patterns, 1962 by the Bureau of the Census. These data include all employment subject to the Federal Insurance Contributions Act, i.e., (1) all covered wage and salary employment of private nonfarm employers and of nonprofit membership organizations under compulsory coverage and (2) all employment of religious, charitable, educational and other nonprofit organizations covered under the elective provisions of the Act. Excluded from the scope of County Business Patterns are farm workers, domestic workers reported separately, self-employed persons, employees of all levels of government, railroad workers, and unpaid family workers.

Total employment estimates were obtained by adding estimates for the latter excluded categories to those appearing in County Business Patterns. County estimates for farm workers, railroad workers, and several of the government employment categories were obtained from the California Department of Employment, Coastal Area. County estimates of Federal, State, and local government employment were obtained from the California Department of Industrial Relations, Division of Labor Statistics and Research. All government employment was allocated by industry group to conform to the allocation of employment in the private sector so that occupations could be studied. For example, employment in public schools is considered within the Service Industry sector along with private schools. Employment of domestic workers in private households was taken from the 1960 Census of Population. Implicit in this procedure is the assumption that residents of counties working in private households

do not cross county lines to get to their jobs. While some error is introduced by this assumption, the effect on the final ratios in Tables 11 and 12 is negligible. The number of self-employed workers in each county was estimated by applying the following factor. Self-employed workers (1960 Census data) divided by the number of reporting units (from County Business Patterns) for the six-county Bay Area to the number of reporting units in each county. These estimates were made separately for the following major groups: agriculture, forestry, and fishing; mining; construction; wholesale trade; retail trade; and finance, insurance, and real estate. For manufacturing, the transportation group, and service group, estimates were made for two-digit subgroups in order to reduce the amount of error introduced when only the broad groups are considered. Unpaid family workers were excluded from the estimates. These workers accounted for 0.6 percent of all Bay Area employment in 1960. To have distributed this small number of workers through the industrial structure of each county would have required several strong assumptions, and hence introduced errors of unknown magnitude. Further, inasmuch as the primary percentages were computed to the fourth decimal place, exclusion of these small numbers from the data yielded only a minor effect, if any, on the final ratios in Tables 11 and 12. County estimates were also adjusted to account for employment in private education that is excluded from the basic covered employment as described above.

The industry employment estimates for each county were allocated by sex according to ratios derived from the 1960 Census for total Bay Area employment. County industry employment data were then allocated by occupations for men and women separately. The occupation-by-industry coefficients were derived from the Census of Population: 1960, Detailed

Characteristics, California, Table 125. Occupational distributions

were derived for the following industry groups:

Agriculture, forestry, and fishing
 Mining
 Construction
 Manufacturing
 Railroads*
 Trucking*
 Other Transportation*
 Communications*
 Utilities*
 Wholesale Trade
 Retail Trade
 Finance, Insurance, and Real Estate
 Repair Services
 Business Services
 Hotels and Lodging
 Other Personal Services
 Entertainment
 Medical Services
 Education--Government
 Education--Private
 Other Professional Services
 Public Administration
 Industry Not Reported

For the female occupation-by-industry distribution, however, coefficients were derived for the one-digit group transportation, communications and utilities rather than for the detail shown above (starred items) because of the relative homogeneity in the occupation-by-industry distribution.

Application of these coefficients against industry employment data by county location yielded occupational employment estimates for men and women in each county. From these estimates, coefficients of occupational specialization by location of jobs were derived in the same way as described above for the residents' ratios.