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Redistribution of Employment in the United States, 1940-1972

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REDISTRIBUTION OF EMPLOYMENT IN
THE UNITED STATES, 1940-1972

By

Ernesto C. Lucas

August 1975

No. 75-14

NOTE: Industries referred to in the text, tables and figures are "short titles." They include: Agriculture, Forestry and Fisheries under the general heading "Agriculture" (Agr.); Mining of metals, fuels, and nonmetallic minerals under the general heading "Mining" (Min.); General Building and Special Trade Contractors under the general heading "Construction" (Const.); Durable and Nondurable goods manufacture under "Manufacturing" (Mfg.); Transportation, Communication, Electric, Gas, and Sanitary Services under "Transportation" (Trans.); "Wholesale Trade" (W.Tr.); "Retail Trade" (R.Tr.); Finance, Insurance, and Real Estate under the heading "Finance" (Fin.); Business, Personal and Professional Services under the heading "Services" (Serv.). For a complete listing of industries included in each of these major groups see U. S. Department of Commerce, Bureau of the Census, County Business Patterns, 1972, Appendix D [10].

REDISTRIBUTION OF EMPLOYMENT IN
THE UNITED STATES, 1940-1972

Ernesto C. Lucas*

Measured in terms of employment, substantial geographic re-distribution of economic activities has occurred in the decades of the nineteen-forties and the nineteen-fifties and in the eight year period 1965-1972.

From 1940 to 1950, the rate of employment growth in most of the states comprising the Western, Rocky Mountain, and Great Lakes regions was higher than the nation's 27 percent average. Employment growth below that of the nation's average has been concentrated in the Plains and New England states and the Southeast and Mideast regions. This pattern continued throughout the decade of the 1950's, except for the Great Lakes region which joined the ranks of slow growing regions. In the eight years from 1965 to 1972, all of the regions west of the Mississippi River and south of the Mason-Dixon Line experienced employment growth rates greater than the national average.

The objectives of this study are:

1. to explain the differences in regional employment growth in terms of the three broad categories of factors -- the national growth component, the industry mix growth component and the regional share growth component, within the periods 1940-1950, 1950-1960 and 1965-1972; and
2. to describe and explain the differences in employment growth patterns among industries and among states in each region for the period 1965-1972.

The data used in this study were obtained principally from employment statistics in the County Business Patterns, U.S. Summary, 1965 and 1972 (10, 11). Results of a similar study by Lowell D. Ashby (1) have been used for comparison. These data have several shortcomings. First, the industrial classification is highly aggregative; the employment statistics are based on a one digit SIC classification. Second, the data include only those employees covered by the Social Security Act, representing approximately seventy-six percent of the total civilian labor force in the United States. Third, employment of government employees and domestic workers have been excluded.

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Although there is a five year interval between Ashby's study and the present one, the factors affecting employment shifts within this interval probably exerted the same influence during the period covering Ashby's study and the present one.

This study is divided into three parts. The first outlines the mathematical and theoretical foundation of the shift and share analysis, the main analytical tool used in this study. The second part summarizes the historical changes in employment among the eight regions from 1940-1950, 1950-1960 and 1965-1972. The third deals with a detailed analysis of employment changes among industries and states in the eight regions in the 1965-1972 period.

Shift and Share Analysis

Shift and share analysis is a method which has been proven effective in identifying slow growth industries and depressed areas. It has also been demonstrated by Ashby (1), and Bretzfelder (2), as an effective device in identifying the changes in patterns of income and employment and the factors causing the change.

The procedure is conceptually simple, based on common sense logic rather than profound theory. It does not make impossible demands on the data, and the computational procedures can be programmed easily in a computer or worked out in a desk calculator.

Despite its simplicity, shift and share analysis is a powerful tool which enables the investigator to look through the mass of statistical data and acquaint himself with the basic facts regarding the multiplicity of relationships among areas and industries. It helps the investigator untangle complex relationships among industries and regions and discover the basic problems confronting the industry and/or the region.

The Model

Let there be n industries ($i = 1, 2, 3, \dots, n$) and m states ($j = 1, 2, 3, \dots, m$). Also, let E_{ij} and E'_{ij} be the employment of the i th industry in the j th state for the base year and the terminal year respectively. From these basic variables we establish the following computational relationships.

$$E_{i.} = \sum_{j=1}^m E_{ij} = \text{the national employment for the } i\text{th industry in the base year,}$$

$$E'_{i.} = \sum_{j=1}^m E'_{ij} = \text{the national employment for the } i\text{th industry in the terminal year,}$$

$$E_{..} = \sum_{i=1}^n \sum_{j=1}^m E_{ij} = \text{aggregate national employment in the base year,}$$

$E'_{..} = \sum_{i=1}^n \sum_{j=1}^m E'_{ij}$ = aggregate national employment in the terminal year,

$r_i = E'_{ij}/E_{ij}$ = terminal to base year employment ratio for the i th industry in the j th state,

$R_i = E'_{i.}/E_{i.}$ = terminal to base year employment ratio for the i th industry in the nation, and

$R_a = E'_{..}/E_{..}$ = the terminal to base year aggregate employment ratio.

The shift and share analysis assumes that the change in employment between the base and terminal years can be factored into three component parts - the national growth component (NG), the industrial mix growth component (IMG), and the regional share growth component (RSG). This is shown algebraically as

$$(1) E'_{ij} - E_{ij} = \Delta E_{ij} = E_{ij}(R_a - 1) + E_{ij}(R_i - R_a) + E_{ij}(r_i - R_i),$$

where:

ΔE_{ij} = change in employment for the i th industry in the j th state,

$E_{ij}(R_a - 1)$ = change in employment due to national growth effect,

$E_{ij}(R_i - R_a)$ = change in employment due to industrial mix effect, and

$E_{ij}(r_i - R_i)$ = change in employment due to regional share effect.

Dividing equation (1) by E_{ij} and multiplying the quotient term by term by 100 yields the percent change ^{ij} in employment as

$$(2) r_i - 1 = (R_a - 1) + (R_i - R_a) + (r_i - R_i),$$

where:

$r_i - 1$ = percent change in employment in the i th industry for the j th state,

$R_a - 1$ = percent change in employment accounted for by the national growth effect,

$R_i - R_a$ = percent change in employment accounted for by industry mix effect, and

$r_i - R_i$ = percent change in employment accounted for by regional share effect.

The industrial summation of employment (summation all over the i th index) for each state yields the change in state employment.

$$(3) \quad E_{.j}^i - E_{.j} = \Delta E_{.j} = E_{.j} (R_a - 1) + E_{.j} (R_i - R_a) + E_{.j} (r_i - R_i).$$

Equation (3) shows that the change in employment in the j th state is the difference in the sum of all industry employment in the state between the base and the terminal year. This difference is attributable to the national, industrial mix and regional share components of growth as shown in the first, second and third terms of equation (3) respectively.

Interpretation of the Model

Due to their close interrelationships, expansions among state, regional and national economies roughly parallel each other. However, this parallelism is approximate only. Geographic differences do occur because of inherent differences in factor endowments, institutional arrangements, and product markets within which regions and states operate. These differences are reflected in their differential rate of growth measured in terms of employment.

Shift and share analysis recognizes these differences and similarities. Accordingly, it assumes that the growth of a state or region can be factored into three components, namely, the national growth component, the industrial mix growth component and the regional share growth component.

A state's growth in employment attributable to the general employment growth in the nation is known as the national growth component. Assuming no differences in economic characteristics, each state would grow at a rate equal to that of the nation, and so maintain its share of the nation's total. This component is computed by applying to the industry's employment in the initial year (E_{ij}) the nation's percentage increase in employment ($R_a - 1$); the product obtained indicates the change in employment due to the national growth effect.

The industrial mix growth component arises from the differential growth rates between a particular industry in the nation ($R_i - 1$) and the aggregate employment growth rate ($R_a - 1$). The industrial mix growth component is computed by applying to each industry employment in the base year (E_{ij}) the difference between the national employment growth rate for the i th industry and the national aggregate employment growth rate ($R_i - R_a$)^{1/}; the product obtained indicates the change in employment due to industry mix effect.

If for a particular industry ($R_i - R_a$) < 0, that industry is said to be a slow growth industry and its impact on the state's employment is negative. An ($R_i - R_a$) > 0, indicates a fast growing industry that exerts a positive influence on the state's employment. To the extent that a major portion of the state's employment consists of slow growing industries, employment will expand at less than the national rate. Conversely, a state with many fast growing industries will increase its share of the nation's total, other things being equal.

^{1/} $R_i - R_a = (R_i - 1) - (R_a - 1).$

The regional share growth component arises from the fact that a state's or region's employment is expanding or declining more rapidly vis-a-vis other states or regions engaged in the same activity because of its advantageous access to basic inputs and to product markets. Thus, it measures the extent to which a state's or region's growth exceeds or falls short of the national norm for that industry. It reflects the competitive position of a state or region relative to other states or regions in the nation. It is measured by applying to each industry employment in the base year (E_{ij}) the difference between the growth rate of a specific industry in the state and the growth rate of its counterpart in the nation ($r_i - R_i$).^{2/}

If $(r_i - R_i) < 0$, the state has an unfavorable competitive position for that industry, relative to other states in the nation. Conversely, if $(r_i - R_i) > 0$, the state has a favorable competitive advantage for that industry over other states in the nation.

An Illustration: New York State, 1965-1972

For computational illustration, we apply the technique to employment changes of New York State and the nation for the 1965 to 1972 period. The basic data are given in Table 1; the computational steps are outlined as follows:

1. Estimate the New York employment ratio (r_i) and the U.S. employment ratio (R_i) for the ten industry groups. This is shown in columns 6 & 7, Table 1.
2. Estimate the aggregate employment ratio for U.S. (R_a) by dividing the 1972 aggregate employment by the 1965 aggregate employment.
3. Having computed the New York State employment ratio for each industry group, the U.S. employment ratio for each industry group, and the aggregate employment ratio for the United States, equation (1) can be used to estimate the change in employment for each industry group in New York. Consider the change in agricultural employment between 1965 and 1972.
4. The change in agricultural employment in New York is 1,900 or the difference between the 1972 employment of 9,300 and the 1965 employment of 7,400. The 1,900 difference can be factored into three components as in equation (1) as follows:

$$\Delta E_{ij} = E_{ij}(R_a - 1) + E_{ij}(R_i - R_a) + E_{ij}(r_i - R_i).$$

Substituting values obtained in Table 1, we have:

$$\begin{aligned} 1,900 &= 7,400(1.2152 - 1.0000) + 7,400(1.3399 - 1.2152) \\ &\quad + 7,400(1.2568 - 1.3399) \\ &= 1,590 + 920 - 610 \\ &= 1900 \end{aligned}$$

^{2/} $r_i - R_i = (r_i - 1) - (R_i - 1).$

Table 1. Employment and Employment Ratios
for U.S. and New York State, by
Industries, 1965 & 1972

Industries	New York Employment (E _{1j})		U.S. Employment (E _{1j})		New York Ratio (r _{1j})	U.S. Ratio (R _{1j})	Aggregate Employment Ratio
	1965	1972	1965	1972			
---thousands---							
Agriculture	7.4	9.3	152.1	204.2	1.2568	1.3399	
Mining	9.7	8.3	599.3	597.2	.8557	.9965	
Contract Construction	225.0	240.2	2824.0	3398.2	1.0676	1.2033	
Manufacturing	1847.0	1659.3	17595.1	18096.4	.8984	1.0626	$R_a = \frac{E_{..}}{E_{..}}$
Transportation	437.9	495.7	3218.7	3895.4	1.1320	1.2102	= $\frac{58015.9}{47743.2}$
Wholesale Trade	460.5	471.7	3434.9	4074.8	1.0243	1.1863	
Retail Trade	885.1	994.4	8963.7	11647.9	1.1235	1.2995	= 1.2152
Finance	508.8	592.9	3014.2	3924.1	1.1653	1.3019	
Services	1042.6	1293.1	7709.2	11102.1	1.2403	1.4401	
Unc. Industries	21.2	45.8	231.7	475.6	2.1604	2.0527	
TOTAL	5445.2	5810.7	47743.2	58015.9			

Source: U. S. Department of Commerce, County Business Patterns, 1965 and 1972.

The above computation shows that the increase in agricultural employment of 1,900 can be distributed among three components: 1,590 due to the national growth component, 920 due to the industry growth component, and -610 due to the regional share growth component. Dividing the result by the base employment figure and multiplying the quotient obtained by 100 yields the percentage increase in agricultural employment.

$$25.68\% = 21.52\% + 12.47\% - 8.31\%$$

This analysis implies that in New York, the 25.68% increase in agricultural employment is accounted for by a 21.52% national growth effect, 12.47% industry growth effect, and -8.31% regional share growth effect.

The fact that the industry growth component is positive indicates that agriculture is a fast growth industry and consequently exerts a positive effect on New York's employment. Conversely, the negative regional share growth component indicates that New York has a weak competitive position for agriculture, and therefore exerts a negative influence on employment. The sum of the industry growth effect and the regional share effect, known as the net effect ($4.16\% = 12.47\% - 8.31\%$), indicates the extent to which agriculture in New York State exceeds or falls short of the national norm of 21.52%. If the national growth effect of 21.52% is added to the net effect of 4.16%, the actual percent increase in agricultural employment of 25.68% is obtained.

If procedures 1 through 4 are repeated for the other nine industries, and the results are summed, the total change in New York's employment is obtained. See Table 2.

Interpretation of Results for New York State

New York State employment increased by 6.71% from 1965 to 1972 representing 365,500 employment increase. Had the state's employment growth rate been equal to that of the nation, 21.52%, there would have been an increase of 1,171,800 jobs over the eight year period from 1965-1972. The State's employment growth has fallen approximately 15 percent below the national average. Let us examine why this is so.

The industry mix component of New York State is slightly favorable in that the sum of the employment changes due to industry mix effect is positive--gains in employment attributable to the fast growing industries has more than offset the employment losses in the slow growth industries. Thus the favorable industrial composition of the state has contributed 69,700 employment over the eight year period.

On the other hand, the employment changes due to the regional share effect, reflecting the competitive position of the state is negative, indicating inability of New York, in competition with other states, to attract industries that would otherwise provide additional employment for New Yorkers. This is true for practically all of the industries except for unclassified industries. Because of its weak competitive position, the state has lost 875,000 jobs over the eight year period.

Table 2. Components of Employment Change
in New York State, 1965 & 1972

Industries	New York Employment		Change in Employment ΔE_{1j}	Components of Change			Net Shift (IMG + RSG)
	1965 (E_{1j})	1972 (E'_{1j})		MG $E_{1j}(R_{1j}-1)$	IMG $E_{1j}(R_{1j}-R_{1j})$	RSG $E_{1j}(r_{1j}-R_{1j})$	
Agriculture	7.4	9.3	1.9	1.59	.92	-.61	.31
Mining	9.7	8.3	-1.4	2.09	-2.12	-1.37	-3.49
Contract Construction	225.0	240.2	15.2	48.42	-2.68	-30.53	-33.21
Manufacturing	1847.0	1659.3	-187.7	397.47	-281.85	-303.28	-585.13
Transportation	437.9	495.7	57.8	94.24	-2.20	-34.24	-36.44
Wholesale Trade	460.5	471.7	11.2	99.10	-13.31	-74.60	-87.91
Retail Trade	885.1	994.4	109.3	190.47	74.61	-155.78	-81.17
Finance	508.8	592.9	84.1	109.49	44.11	-69.50	-25.39
Services	1042.6	1293.1	250.5	224.37	234.48	-208.31	26.17
Unc. Industries	21.2	45.8	24.6	4.56	17.76	2.28	20.04
TOTAL	5445.2	5810.7	365.5	1171.80	69.72	-875.98	-806.26

Source: U. S. Department of Commerce, County Business Patterns, 1965 and 1972.

Combining the national growth effect of 1,171,800; the positive industrial mix effect of 69,720; and the negative regional share effect of -875,980; the actual increase in employment of 365,540 is obtained. This 6.71% increase over the base employment is 15 percent below the national average (Table 2).

Perhaps the result of the above analysis can be seen more clearly by expressing the component changes as percent of the base employment and plotting these percentages in an IMG-RSG coordinate system (Tables 3 and Figure 1). As in algebra, the IMG-RSG coordinate system has four quadrants. The first quadrant shows the positive effects of both the industrial mix growth and the regional share growth components, the second quadrant shows the negative effect of the industry mix component and positive effect of the regional share growth component, the third quadrant shows the negative effects of both the industry mix and regional share growth components and the fourth quadrant shows the positive effect of the industry mix component and the negative effect of regional share growth component. The algebraic sum of the IMG-RSG coordinate, known as the net effect, indicates the extent to which the two components of growth exceed or fall short of the national norm. The national norm is indicated by the dashed diagonal line running from the upper left hand, passing through the origin, to the lower right hand corner of the diagram. All points to the left of the diagonal line are negative net effects, i.e., the growth rate is less than that of the national norm. All points to the right of the diagonal line indicate positive net effects implying that the growth rate is greater than the national norm. The magnitude of the difference between the national norm and the growth rate is given by the vertical distance between the diagonal line and the point in the diagram.

Inspection of Figure 1 indicates that all of the points lie below the IMG axis suggesting a negative regional share growth components for all industries, except for unclassified industries which is not shown in the diagram. The industries on the right hand side of the RSG axis are the fast growth industries, namely, agriculture, finance, retail trade and services; while those on the left hand side are the slow growth industries, including mining, manufacturing, transportation, construction, and wholesale trade. To find the specific change in agricultural employment, we see that agriculture is plotted in the IMG-RSG coordinate at (12,-8) representing 12 percent increase in employment due to industry growth effect (or agriculture's growth rate for the nation is 12 percent above the national norm) and -8 percent representing employment loss due to the weak competitive position of New York in agriculture. The sum of the coordinates, known as the net shift (4 percent), shows the extent to which agricultural employment has exceeded the national growth rate of 21.52%. This is shown in the diagram as the vertical distance between the point representing agriculture and the diagonal line. The sum of the net shift (4.16%) and the national growth rate (21.52%) when added yields 25.68%, or the rate of employment increase in agriculture from 7,400 in 1965 to 9,300 in 1972.

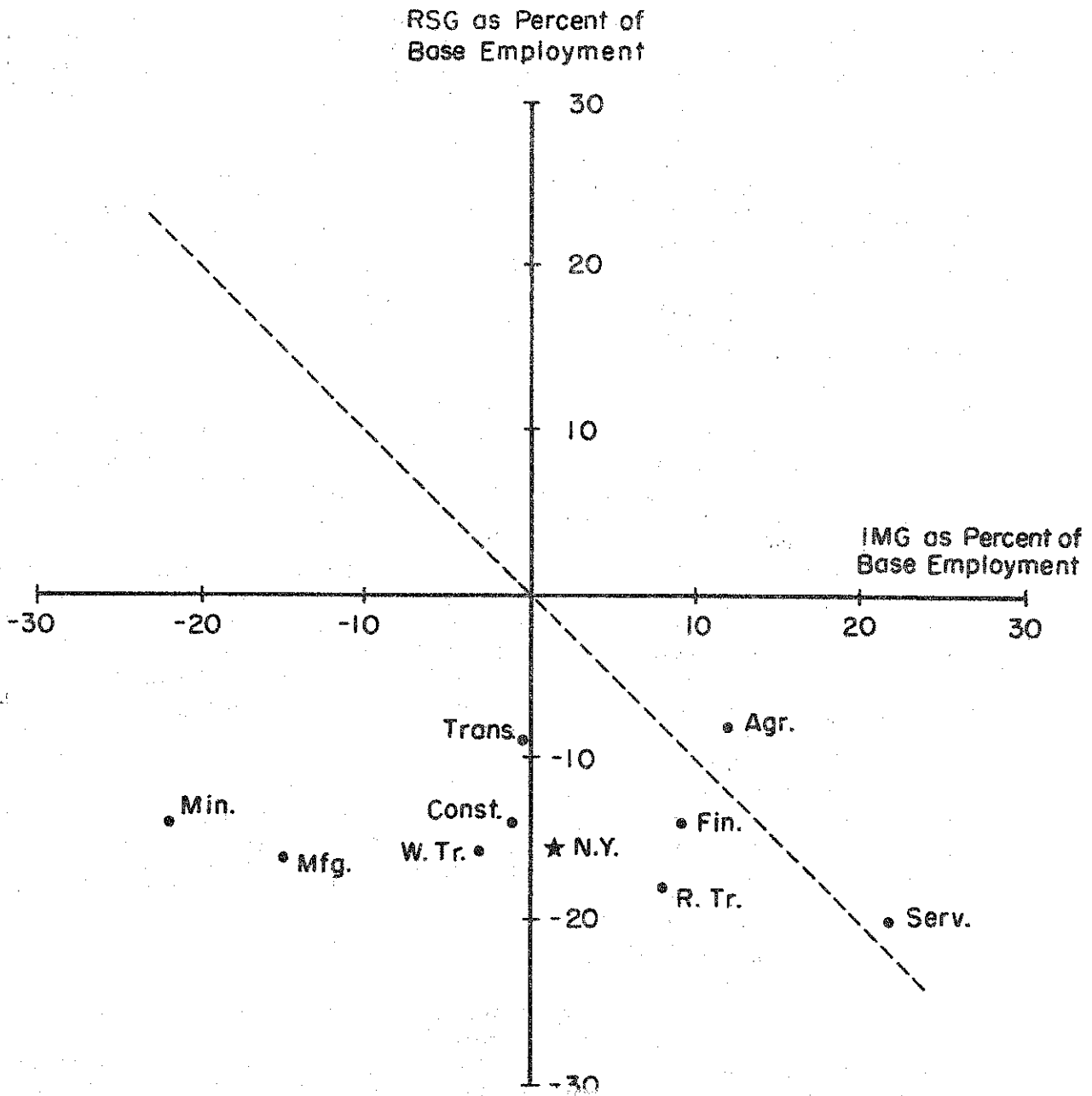
Similar procedures may be used to interpret changes in employment for the other industries, or for changes in total employment for New York State. Examination of Figure 1 shows that percentagewise, mining and manufacturing are the two greatest employment losers, with negative industry mix and regional share growth components of 36 and 31 percent below the nation's average, respectively. On a statewide basis, New York's employment growth was about 15 percent below the national average of 22 percent. When these two figures are added, the actual increase of approximately 7 percent is obtained.

Table 3. Components of Employment Changes
in New York as Percent of Base
Employment, 1965 & 1972

Industries	New York Employment		Change in Employment		Components of Change		
	1965 thousands	1972	Thousands	Percent	MG	IMG	RSG
Agriculture	7.4	9.3	1.9	25.68	21.49	12.43	-8.24
Mining	9.7	8.3	-1.4	-14.43	21.55	-21.86	-14.12
Contract Construction	225.0	240.2	15.2	6.76	21.52	-1.19	-13.57
Manufacturing	1847.0	1659.3	-187.7	-10.16	21.52	-15.26	-16.42
Transportation	437.9	495.7	57.8	13.20	21.52	-.50	-7.82
Wholesale Trade	460.5	471.7	11.2	2.43	21.52	-2.89	-16.20
Retail Trade	885.1	994.4	109.3	12.35	21.52	8.43	-17.60
Finance	508.8	592.9	84.1	16.53	21.52	8.67	-13.66
Services	1042.6	1293.1	250.5	24.03	21.52	22.49	-19.98
Unc. Industries	21.2	45.8	24.6	116.04	21.52	83.77	10.17
TOTAL	5445.2	5810.7	365.5	6.71	21.52	1.28	-16.09

Source: Tables 1 and 2.

FIGURE 1. PROFILE OF EMPLOYMENT CHANGES IN NEW YORK STATE BY INDUSTRIES, 1965-1972



It is interesting to note that the state has not been able to increase employment opportunities in the fast growth industries, much less maintain its employment share of the slow growth industries (Figure 1).

Historical Changes in United States Employment Since 1940

From 1940 to the present time growth in the United States has not followed a linear trend. The Second World War and the disarmament that followed, the Korean War, several years of slow economic growth interrupted by mini-recessions and a period of strong and substantial economic growth stimulated by the Vietnam War, followed by inflation and recession occurring at the same time, have contributed to economic cycles that have occurred since 1940.

The purpose of this section is to analyze, in terms of the three components of growth discussed earlier, the trends in the redistribution of employment as the country moved from one phase of the cycle to another. These changes in the employment pattern among regions as they are influenced by the economic and political climate of the time are discussed.

Regional Patterns of Growth

The nation's employment grew by about 27 percent during the decade of the 1940s. This growth was not uniform throughout the eight regions. Employment growth was larger in the Far West, Rockies, Southwest and the Great Lakes states than it was in the Plains, Southeast, Mideast and New England states (Figure 2).

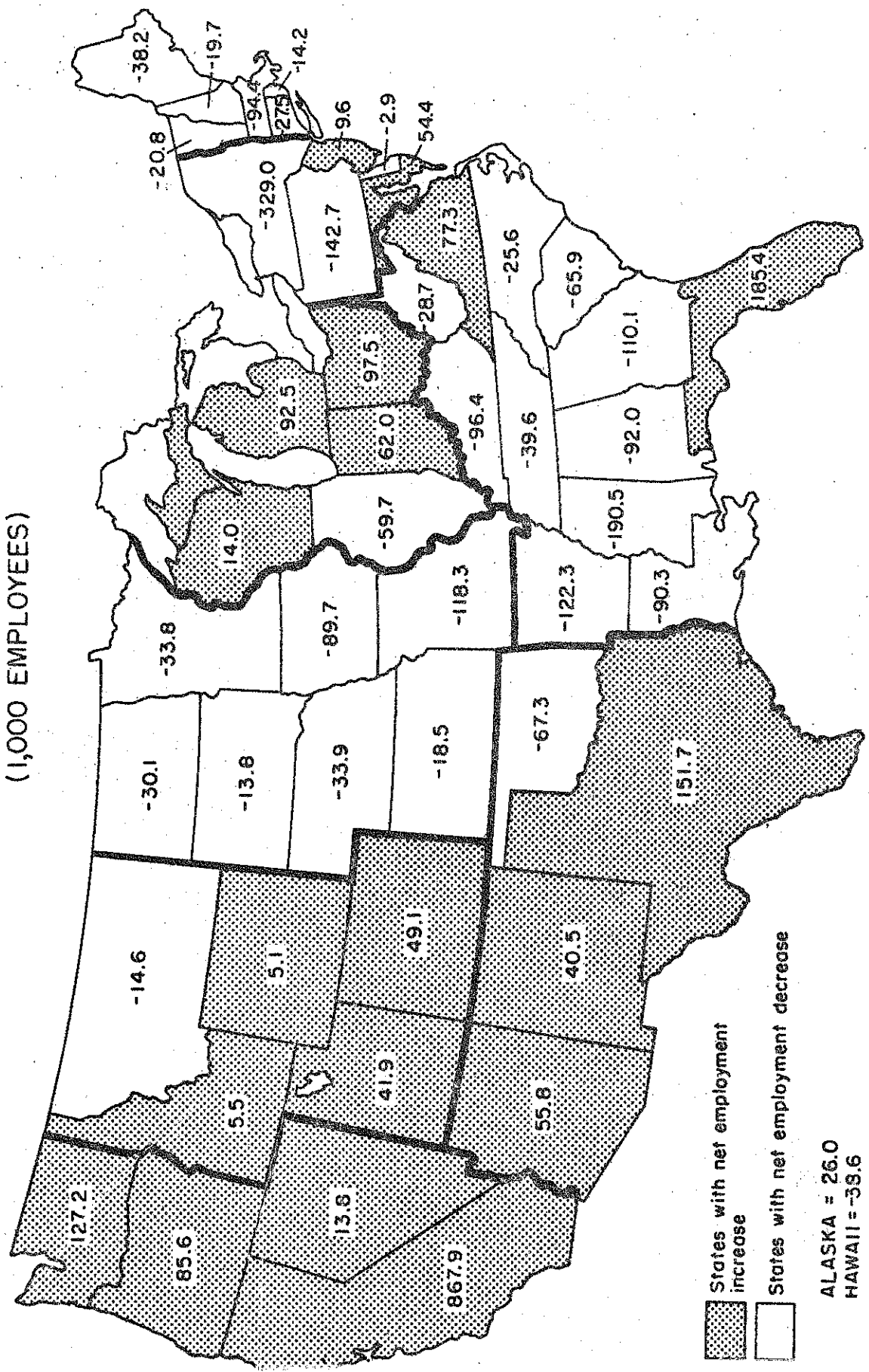
In the decade of the 1950s, the national growth rate declined to 15 percent. The employment trends among regions remained much the same, except that three of the five states in the Rockies, one state in the Far West registered employment growth rates below that of the national average at the same time that three of the twelve states in the Southeast had employment growth above the national average. Actual changes in employment are given in Figure 3.

The eight year period from 1965 to 1972 showed a more distinct regional pattern of growth. With few exceptions, employment growth in the states west of the Mississippi River and south of the Mason-Dixon Line were higher than the rest of the nation (New England, the Mideast and the Great Lakes regions) (Figure 4).

Analysis of Changes in Employment

An effective way of evaluating regional employment growth over time is to express the components of growth as percent of the base employment, and plot the percentages in an IMG-RSG coordinate system. This device provides an instant and visual interpretation of the extent and direction to which a region's employment shifts over time. The region's specific position in the coordinate system, known as the net shift, shows the magnitude to which the growth has exceeded or fallen short of the national norm, while the direction

FIGURE 2. PROFILE OF NET EMPLOYMENT CHANGE, BY STATE, 1940-1950
 (1,000 EMPLOYEES)



States with net employment increase
 States with net employment decrease

ALASKA = 26.0
 HAWAII = -39.6

FIGURE 3. PROFILE OF NET EMPLOYMENT CHANGE, BY STATE, 1950-1960
 (1,000 EMPLOYEES)

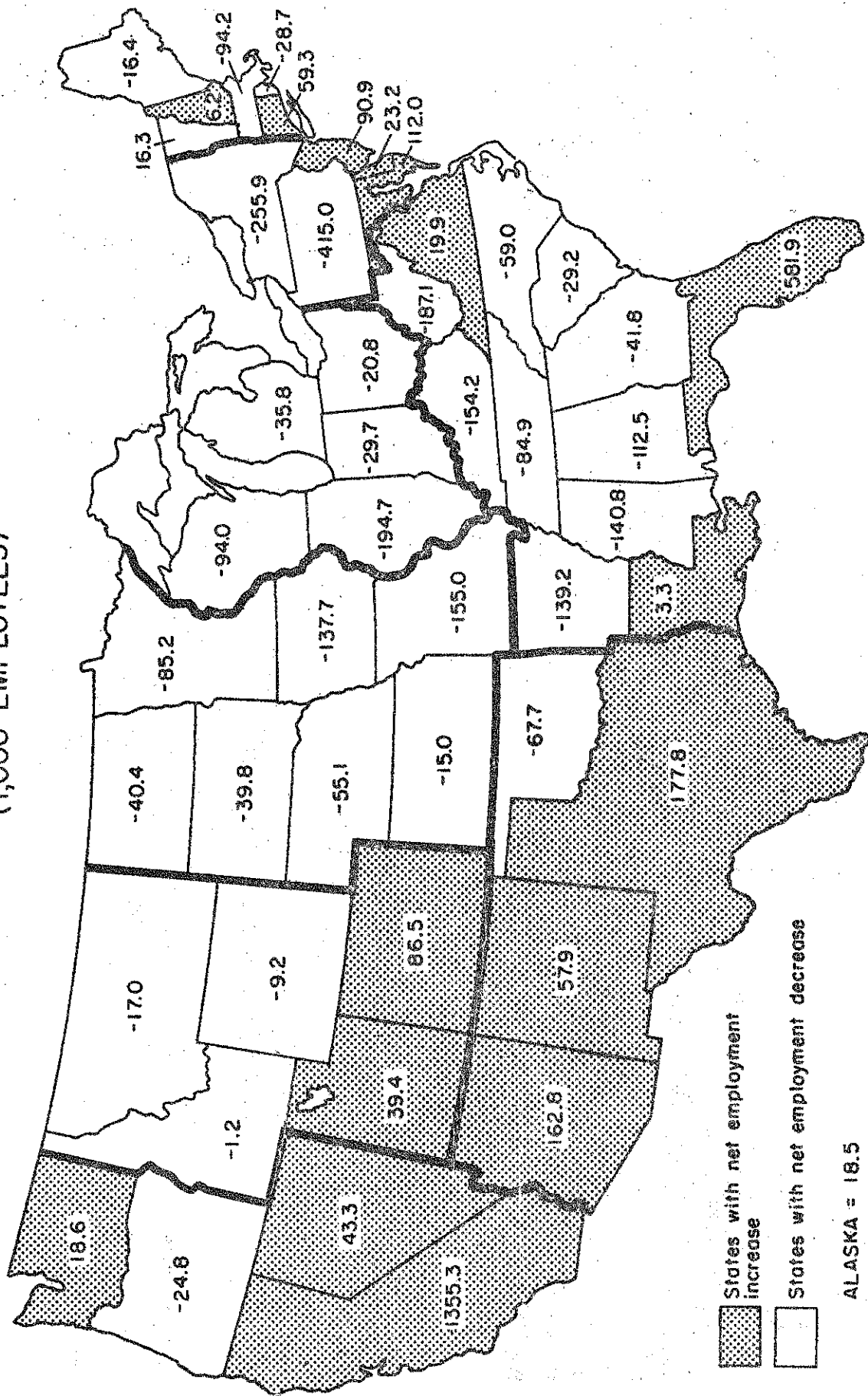
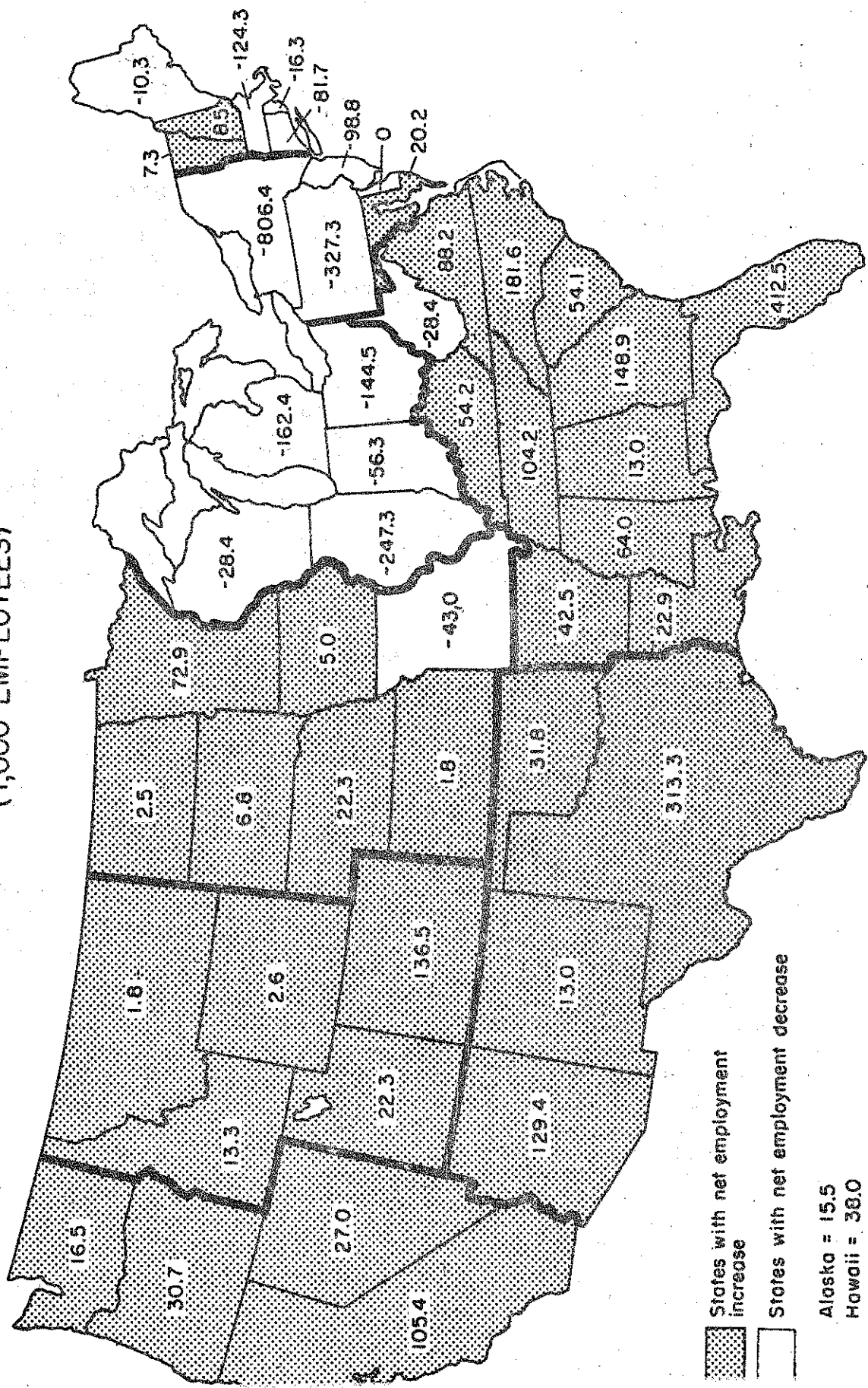


FIGURE 4. PROFILE OF NET EMPLOYMENT CHANGE, BY STATE, 1965-1972
(1,000 EMPLOYEES)



States with net employment increase
States with net employment decrease
Alaska = 15.5
Hawaii = 38.0

of the arrow joining the three different points in time (1940-1950, 1950-1960, and 1965-1972) provides an indication of the factors causing the change in employment. See Tables 4 and 5, and Figure 5.

Let us analyze the Far West in terms of the diagram. Within the period 1940-1950, employment grew from 3,773,900 to 5,871,300, representing a 56 percent increase; 27 percent was due to national growth, 8 percent to industry mix growth, and 21 percent to regional share growth. This information is plotted as (8,21) and defines the 1940-1950 point for the Far West in the IMG-RSG coordinate system. Employment changes for the periods 1950-1960 and 1965-1972 are analyzed and plotted similarly and the points joined defining an arrow labeled "Far West" in Figure 5.

The arrow provides a vivid picture of the trends in employment. For example, in 1940-1950, the Far West was the fastest growing region of the country with a growth rate of 29 percent above the national average. This is the vertical distance between the initial point of the arrow and the dashed diagonal line. This new distance (29 percent) represents the net shift and can be apportioned among its component parts: 8 percent due to the industry mix growth component, shown in the diagram as the horizontal distance between the point and the RSG axis, and 21 percent due to the regional share growth component, shown in the diagram as the vertical distance between the point and the IMG axis.

The rapid growth rate in the decade of the 1940s declined slightly to 24 percent above the national growth rate in the decade of the 1950s and abruptly to 4 percent above the national average in the period from 1965-1972.

Most of the decline during the 32 year period was due to a weakening competitive position and, to a lesser extent, deterioration of favorable industry mix. As the Far West, particularly California, matured and developed the growth rate declined and became similar to that of the more developed Mideast and Great Lakes regions (Figure 5).

Similar interpretations can be made for the other regions. Immediately obvious is the continuing shift of employment from the northeast to the south and west. Initially, the northeast showed a favorable industry mix, reflecting a higher proportion of employment in the fast growth industries than in the slow growth industries. In the 1965-1972 period not only did regional share growth effects become negative, the industry mix deteriorated to a point where it too became negative. The arrows representing the Great Lakes, New England and the Mideast regions indicate a deterioration in the industry mix as they move from the fourth to the third quadrant.

The opposite has been the case for the Rocky Mountain, Southeast and Southwest regions. They have strengthened their competitive position as well as improved their industrial mix, indicated by the direction of the arrows as they move from the second towards the first quadrant.

In the Plains region the industrial mix and regional share were negative in both the 1940-1950 and 1950-1960 periods. Net employment loss was over 7 percent in the early period, principally due to an unfavorable industry mix.

Table 4. Historical Changes in Net Employment
by Regions, 1940-1950, 1950-1960
and 1965-1972

Regions and Periods	Changes in Employment	Components of Change			Net Shift
		NG	IMG	RSG	
-----Thousands-----					
I. New England					
1940-1950	601.0	816.0	225.2	-440.1	-214.9
1950-1960	476.8	566.8	198.2	-288.2	-90.0
1965-1972	489.3	705.9	-32.6	-184.0	-216.6
II. Mideast					
1940-1950	2487.0	2900.0	821.6	-1234.6	-413.0
1950-1960	1528.9	2068.8	758.4	-1298.3	-539.9
1965-1972	1261.9	2532.9	8.9	-1279.9	-1271.0
III. Great Lakes					
1940-1950	2674.5	2468.3	507.1	-300.8	206.3
1950-1960	1472.1	1847.1	277.1	-652.1	-375.0
1965-1972	1669.8	2247.7	-216.6	-365.3	-577.9
IV. Plains					
1940-1950	865.4	1203.5	-316.6	-21.5	-338.1
1950-1960	304.4	832.7	-320.9	-207.4	-528.3
1965-1972	808.3	739.0	50.8	18.5	69.3
V. Southeast					
1940-1950	2035.1	2634.0	-1299.7	700.8	-598.9
1950-1960	1500.7	1844.3	-1062.4	718.8	-343.6
1965-1972	3032.9	1874.8	-28.5	1186.6	1158.1
VI. Southwest					
1940-1950	103.9	823.3	-220.7	401.4	180.7
1950-1960	964.1	633.4	-100.8	431.5	330.7
1965-1972	1130.8	703.2	61.9	365.7	427.6
VII. Rocky Mountain					
1940-1950	334.7	247.8	-33.1	120.0	86.9
1950-1960	294.2	195.7	-64.6	163.1	98.5
1965-1972	374.2	197.8	26.4	150.0	176.4
VIII. Far West					
1940-1950	2097.4	1006.3	316.2	774.9	1091.1
1950-1960	2356.6	908.9	315.0	1132.6	1447.6
1965-1972	1504.9	1272.5	123.5	108.9	232.4
United States ^{a/}					
1940-1950	12099.1	12099.1	0	0	0
1950-1960	8897.7	8897.7	0	0	0
1965-1972	10272.1	10272.1	0	0	0

a/ Details may not add to total due to rounding.

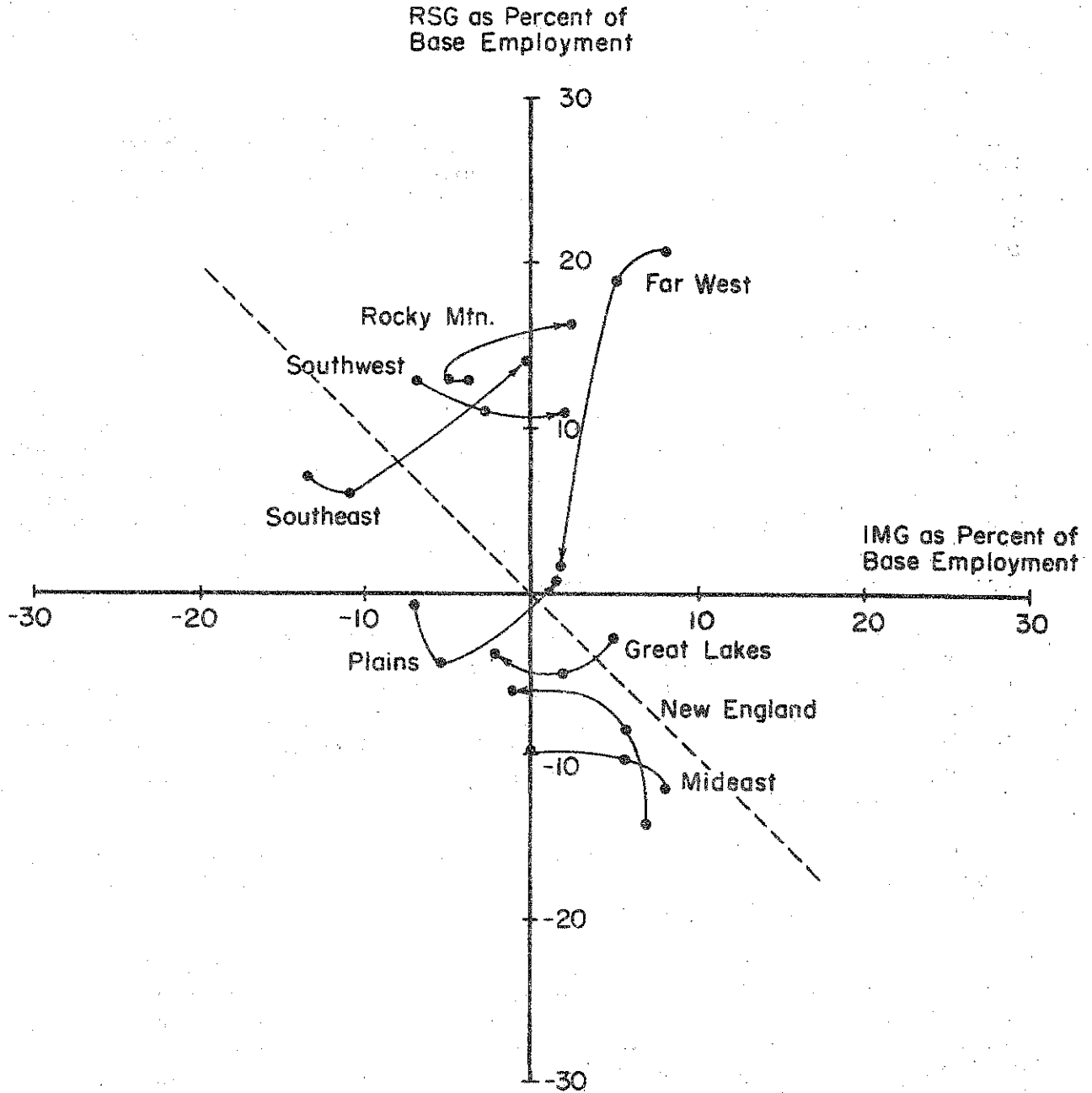
Source: Ashby, Survey of Current Business, V. 44, Oct. 1964.

Table 5. Components of Change in Employment
as a Percent of Base Employment,
by Regions, 1940-1950, 1950-1960 and
1965-1972

Regions and Periods	Components of Change As Percent of Base Employment			
	NG	IMG	RSG	NS
I. New England				
1940-1950	26.67	7.36	-14.38	-7.02
1950-1960	15.48	5.41	-7.87	-2.46
1965-1972	21.52	-0.99	-5.61	-6.60
II. Mideast				
1940-1950	26.67	7.55	-11.35	-3.80
1950-1960	15.48	5.68	-9.72	-4.04
1965-1972	21.52	.08	-10.87	-10.80
III. Great Lakes				
1940-1950	26.67	5.48	-3.25	2.23
1950-1960	15.48	2.32	-5.47	-3.14
1965-1972	21.52	-2.04	-3.50	-5.54
IV. Plains				
1940-1950	26.67	-7.01	-.48	-7.49
1950-1960	15.48	-5.97	-3.96	-9.82
1965-1972	21.52	1.48	.54	2.02
V. Southeast				
1940-1950	26.67	-13.16	7.09	-6.06
1950-1960	15.48	-8.92	6.03	-2.88
1965-1972	21.52	-.33	13.62	13.29
VI. Southwest				
1940-1950	26.67	-7.15	13.00	5.85
1950-1960	15.48	-2.46	10.55	8.08
1965-1972	21.52	1.89	11.19	13.09
VII. Rocky Mountain				
1940-1950	26.67	-3.56	12.91	9.35
1950-1960	15.48	-5.11	12.90	7.79
1965-1972	21.52	2.87	16.32	19.19
VIII. Far West				
1940-1950	26.67	8.38	20.53	28.91
1950-1960	15.48	5.37	19.29	24.66
1965-1972	21.52	2.09	1.84	3.93

Source: Table 4.

FIGURE 5. HISTORICAL TRENDS IN NET EMPLOYMENT CHANGES BY PERIODS AND REGIONS, 1940-1950, 1950-1960, & 1965-1972



Between 1950-1960 a slight improvement in the industry mix was more than offset by a decline in the regional share and the employment loss reached 10 percent. In 1965-1972 a 2 percent increase in net employment was the result of positive industry mix and regional share effects.

If the trends continue, the Rocky Mountain, Southeast, Southwest and the Plains regions will continue to experience employment growth rates above the national average as a result of their favorable industry mix and strong competitive position. On the other hand, the Great Lakes, New England and Mideast regions will have below average employment growth due to a combination of an unfavorable industry mix and a weak competitive position. Employment growth in the Far West will probably stabilize at a level equivalent to that of the national average.

Generally the shift in employment from the north and east to the south and west which characterized the 1940s and 1950s came about because the industrial mix composition in these states continually improved while the north and east have more or less specialized in manufacturing, which had become a slow growth industry by the 1970s. Population growth generally followed similar patterns.

Effects of Demographic and Economic Influences

Demographic shifts among regions have both economic and social dimensions. Non-white migration has contributed to employment redistribution essentially from the south to the north and west. A handful of states accounted for the bulk of the movement. More than half of the black migrants came from North Carolina, South Carolina, Georgia, Alabama and Mississippi with destinations generally in Illinois, New York and California. The impact of the black migration has been felt in increased unemployment in the northern states, it has not adversely affected unemployment problems in California.

The migration of the white population has been in accord with changes in economic activities. The flow of white population has been generally opposite to that of the blacks, usually from the northern and central states to the southern and western states. White migration was more dispersed, reflecting the continuing search for better economic opportunity as well as improved quality of life. The states affected are generally in the northeast quarter of the nation.

In a number of cases, white migration has also reflected dissatisfaction of urban living. This is primarily true for migration from Washington, D. C. and New York City areas to the suburbs.

The above average growth in employment in the Far West, Southeast and Southwest regions reflects the rapid expansion of many industries, particularly the export industries. In line with the export base theory, the shift in the food, apparel, textile, non-automotive transportation equipment and electrical machinery manufacturing from the Mideast, New England and Great Lakes to the Southeastern states, has induced increased employment in industries such as trade and construction.

Also, the changing structure of defense procurement as the country shifts from "conventional" to electronic and atomic warfare has caused employment shifts of major proportion from the northeastern regions to the Southwest, Southeast, and Far West.

During the decade of the 1940s the high employment growth rate of the Great Lakes region reflected the role it played in the Second World War and its aftermath as the country adjusted its production from war materiel to civilian durable goods. Since then, the Great Lakes, along with the neighboring regions, experienced employment losses particularly in fabricated metals, machinery and non-automotive transportation equipment. Also, since the population growth lagged, industries providing goods and services for consumption, such as trade, finance and service industries, declined in employment.

The migration of the textile industry to the South contributed to New England's decline in employment; the shift of federal activities and losses of apparel and chemical manufacturing operations have caused lag in the Mideast, while the shift of automotive manufacturing to other parts of the country had adversely affected employment in the Great Lakes.

The decline in employment in the Plains from the 1940s to the early 1960s can be attributed to reduced farm income, a development that extended throughout the nation, but which had its greatest impact on the Plains. Reduced prices of farm products during this period caused farmers to move out of agriculture. The movement from the farm within these two decades appears to have become permanent as the agri-business farm operations replaced many of the traditional family type farms. Fortunately, the Plains has been able to improve its industry mix by not relying completely on agriculture. In the period 1965-1972, employment increased in retail trade and services.

Regional Employment Shifts in the United States, 1965-1972

In relative terms, regions in the northeastern part of the United States have been losing employment to the southern and western regions of the country. This section contains a detailed analysis of this trend, determining the causes of the shifts in employment and identifying the industries within which they occur. This discussion will proceed from the fastest to the slowest growing region of the country.

The Rocky Mountains

Colorado, Utah, Idaho, Wyoming and Montana, named in the order of their rate of employment growth, are the states comprising the Rocky Mountain region. This is the fastest growing region in the country, with an employment increase from 919,300 in 1965 to 1,293,500 in 1972, approximately 19 percent above the 22 percent national average. Of this 19 percent, 16 percent is due to regional share effect and 3 percent to industry mix effect.

The region's growth in employment has not been uniform throughout the region. Colorado's 33 percent above the national growth rate is followed by Utah and Idaho at 11 percent, Wyoming at 5 percent, and Montana, at 2 percent. All of the states have favorable industry mixes, ranging from 2 percent in Idaho and Utah to 4 percent in Colorado. The variability of their growth rates has been due to regional share growth effect, reflecting differences in their competitive positions.

Except for mining, all industry groups have exhibited positive net effects, contributing to the tremendous increase in aggregate employment. Agriculture showed the highest rate of increase, followed by services, construction, finance, transportation, and wholesale trade. It appears that the region has a strong competitive advantage vis-a-vis other regions and has exploited employment opportunities even in the slow growth industries (Figures 6 and 7).

Among all regions, Rocky Mountain region employment growth ranks first in agriculture, construction, manufacturing, retail trade, services and unclassified industries; second in finance, wholesale trade and transportation; and third in mining.

The Southeast

The Southeast region consists of twelve states, Virginia, West Virginia, Kentucky, Tennessee, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana and Arkansas. It was the second fastest growing region in the United States in the eight year period ending in 1972 with an employment growth from 8,712,200 in 1965 to 11,745,100 in 1972. Growth was more than 13 percent above the national average. Practically all of the increase is due to a strong regional share growth effect.

Growth rates among the twelve states varied, with Florida leading the region at about 32 percent above the national rate of growth, and West Virginia at the bottom, 8 percent below the national rate. Total employment in the region appears to be split equally between fast and slow growth industries. However, only Florida and Louisiana of the 12 states have positive industry mix components. As in the Rocky Mountain region, growth in the Southeast appears to be largely a function of regional share growth effect, reflecting the competitive position of the states rather than their industrial composition (Figure 8).

Finance is the fastest growing industry, followed by services, retail trade, transportation, construction, wholesale trade, agriculture, manufacturing and mining (Figure 9).

All industries except mining have contributed positively to the increase in aggregate employment, and all except agriculture showed positive regional share growth effect.

In comparison with other regions, the Southeast is first in mining, finance, wholesale trade and transportation; second in services and retail trade; third in construction and manufacturing; fourth in agriculture, and last in unclassified industries.

FIGURE 6. PROFILE OF EMPLOYMENT CHANGES IN THE
ROCKY MOUNTAINS, BY STATE, 1965-1972

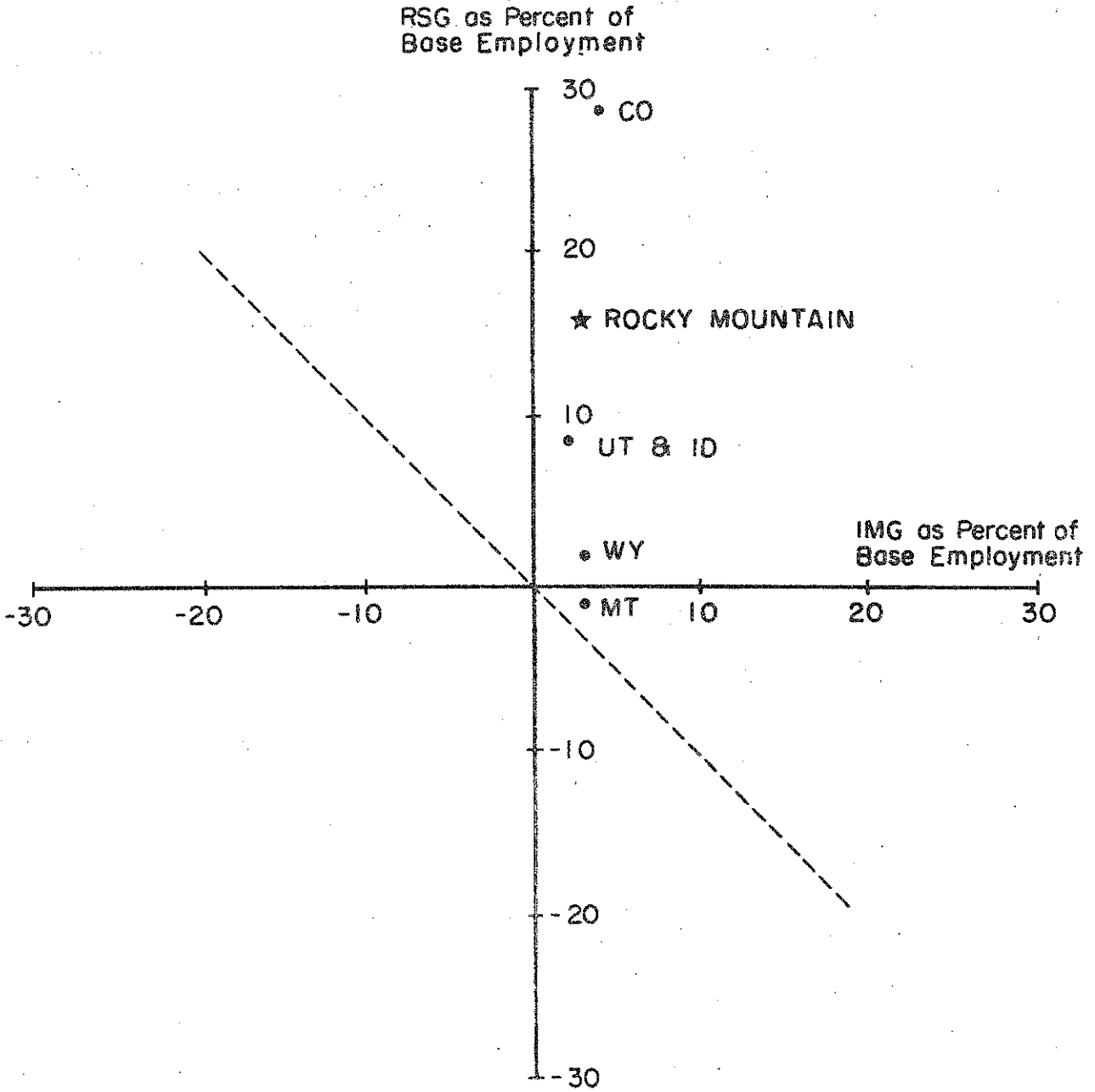


FIGURE 7. PROFILE OF EMPLOYMENT CHANGES IN THE ROCKY MOUNTAINS, BY INDUSTRY, 1965-1972

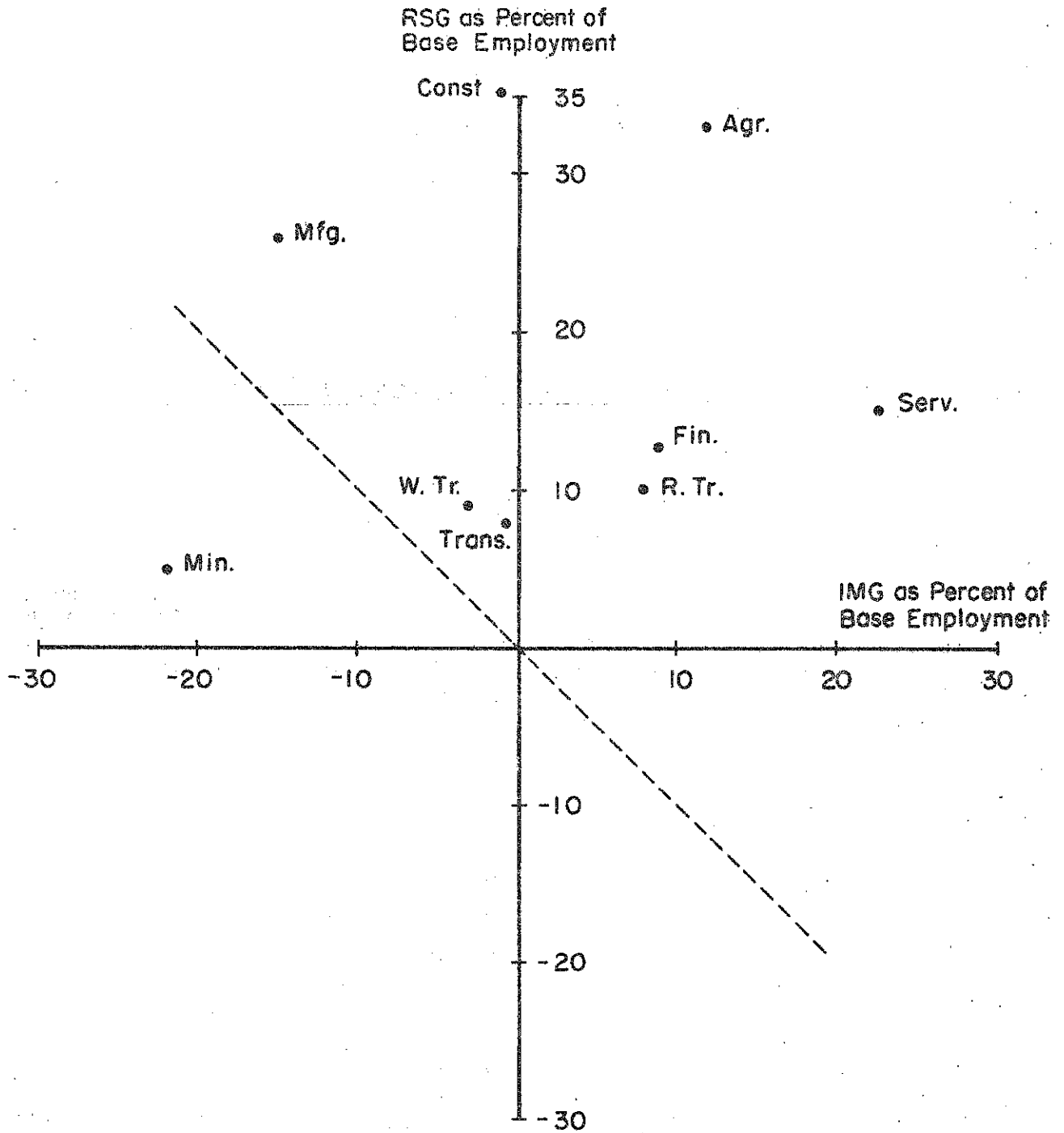


FIGURE 8. PROFILE OF EMPLOYMENT CHANGES IN THE SOUTHEAST, BY STATE, 1965-1972

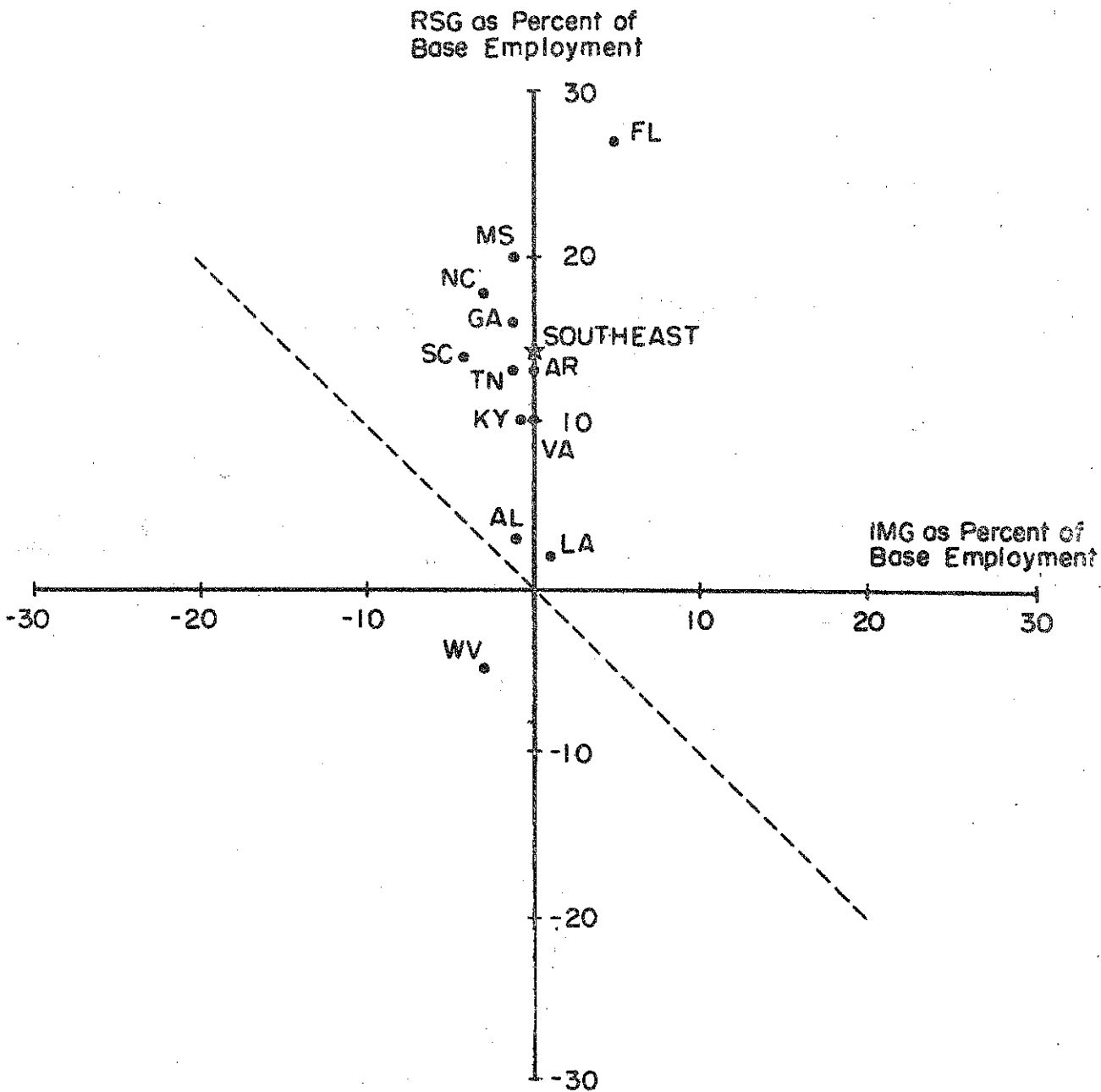
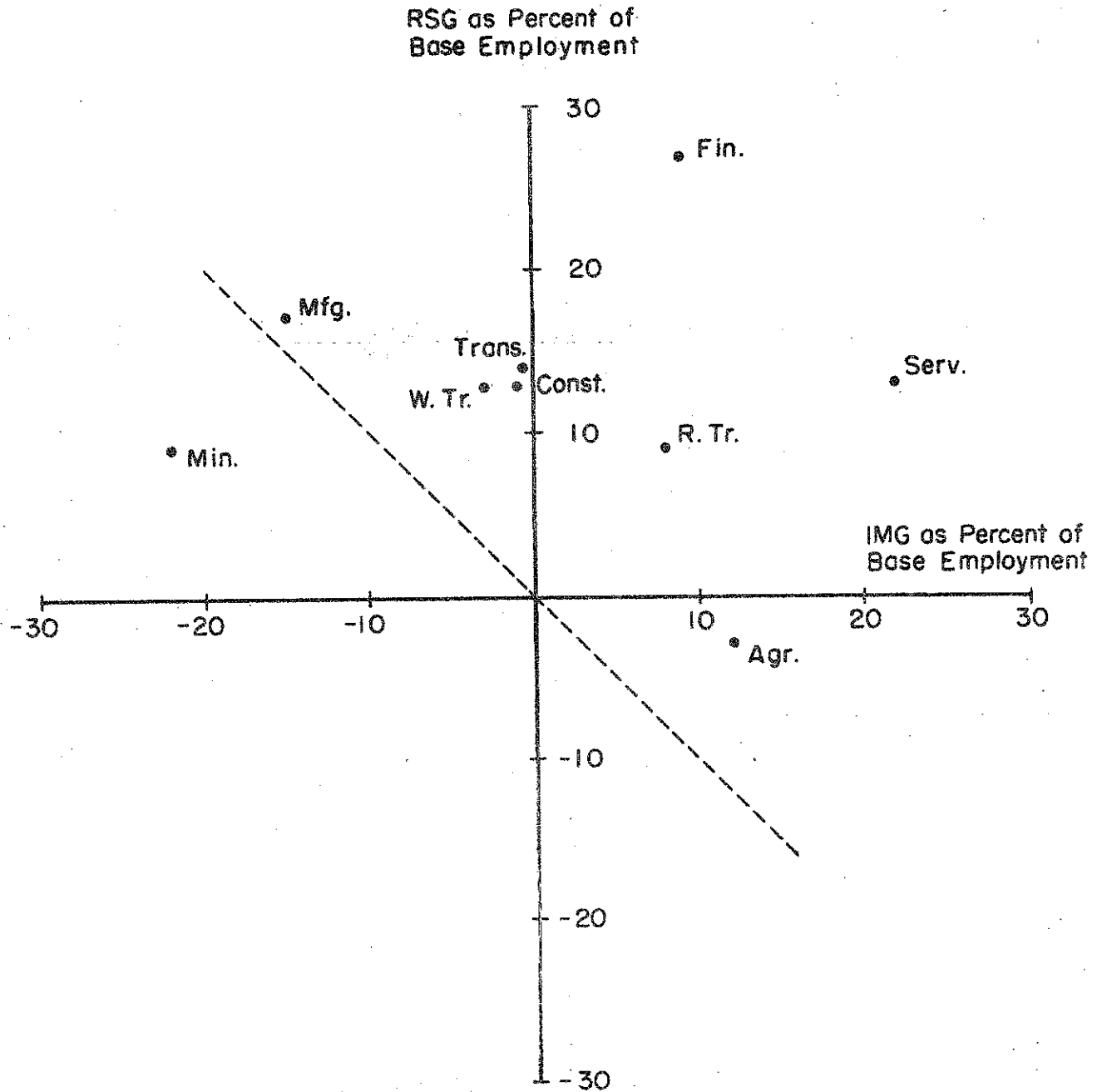


FIGURE 9. PROFILE OF EMPLOYMENT CHANGES IN THE SOUTHEAST BY INDUSTRY, 1965-1972



The Southwest

The Southwest region comprising the states of Arizona, Texas, Oklahoma and New Mexico is the third fastest growing region in the United States in terms of employment. Employment increased from 3,267,100 in 1965 to 4,397,900 in 1972, 13 percent above the national growth rate. Eleven percent was due to the regional share effect and 2 percent to industry mix effect.

Although the Southwest has an employment growth rate almost equal that of the Southeast, the causes and sources of much of its growth are quite different. For example, unlike the Rocky Mountain and the Southeast regions, all of the states have positive industry mix effect. These effects ranged from 2 percent in Texas to 5 percent in New Mexico. Positive regional share growth effects ranged from 3 percent in New Mexico to a high of 39 percent in Arizona. The regional share effect accounts for most of the net increases in aggregate employment, reflecting a strong competitive position rather than a favorable industry mix (Figure 10). It must be pointed out, however, that a high proportion of employment is engaged in the fast growth industries.

The growth rates of the different industries are varied. Agriculture is the fastest growing industry, followed by services, finance, retail trade, construction, manufacturing, transportation, wholesale trade and mining, in that order. All but two industries, mining and wholesale trade, have positive impacts on employment, due to the slow growth nature of the former and weak competitive position of the latter (Figure 11).

In comparison with other regions, the Southwest is second in agriculture, construction and manufacturing; third in finance, retail trade and services; fourth in mining and transportation; fifth in unclassified industries; and last in wholesale trade.

The Far West

The Far West comprising the states of Washington, Oregon, Nevada, California, Alaska and Hawaii, is the fourth fastest growing region of the country. Its 1965 employment of 5,913,600 had increased to 7,148,700 by 1972, representing an increase 4 percent above the national average. The industrial mix effect and regional share effect contributed to the growth in about the same proportion (Figure 12).

All of the states in the region have growth rates above that of the nation. Alaska led the region and the nation with a 52 percent growth rate, followed by Hawaii at 25 percent. California showed the lowest growth rate in the region, about 2 percent. All of the states exhibit favorable industry mix effects, reflecting a high proportion of the labor force engaged in fast growth industries. Except for California, the increase in employment is a function of strong competitive position rather than favorable industry mix. California's 2 percent increase above the nation's average is primarily due to its favorable industry mix.

The ten major industry groups exert diverse effects on the rate of employment growth in the Far West. For example, agriculture, services, finance, retail trade, in that order, have growth rates higher than the national average,

FIGURE 10. PROFILE OF EMPLOYMENT CHANGES IN THE SOUTHWEST BY STATE, 1965-1972

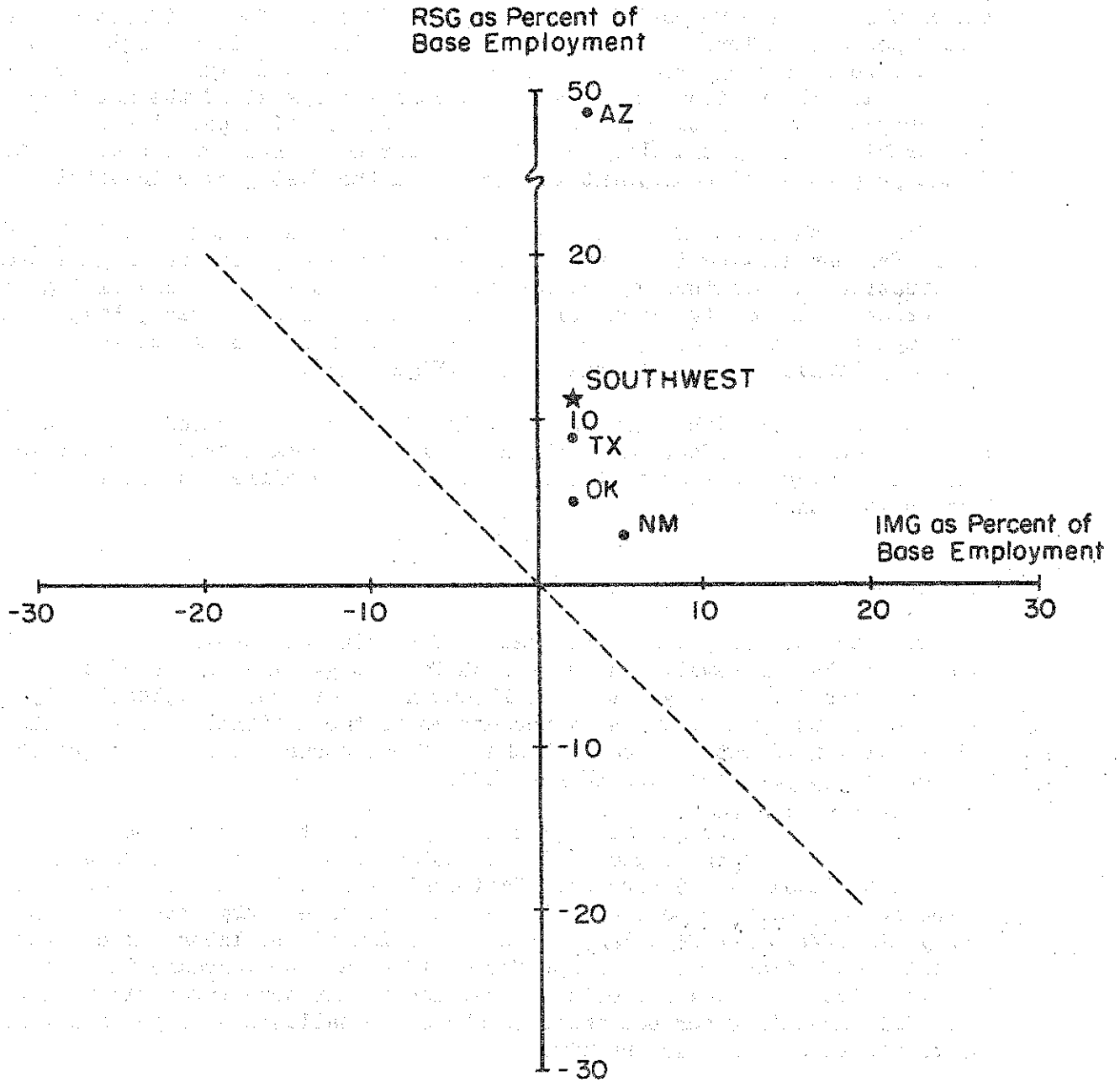


FIGURE II. PROFILE OF EMPLOYMENT CHANGES IN THE SOUTHWEST BY INDUSTRY, 1965-1972

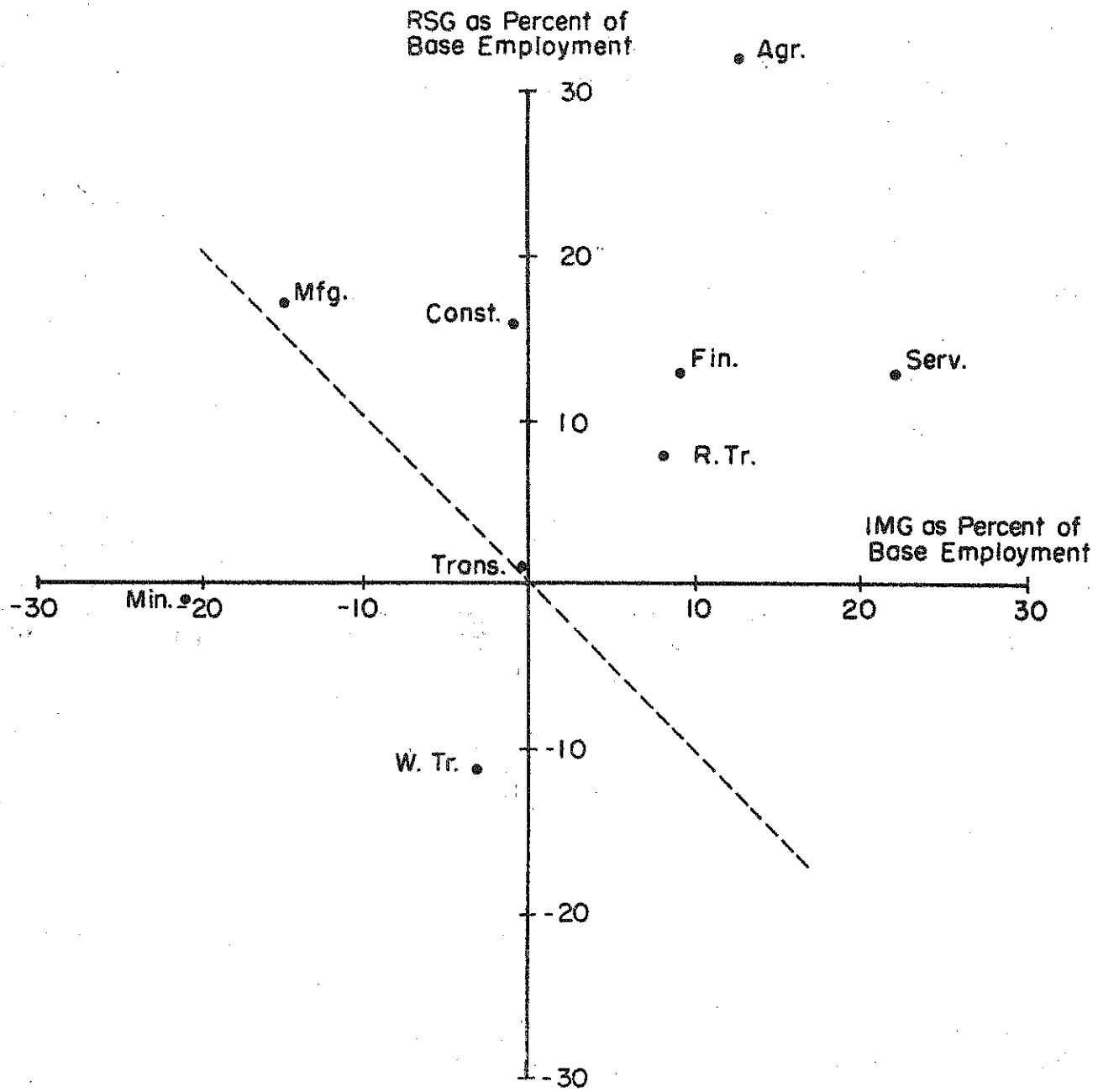
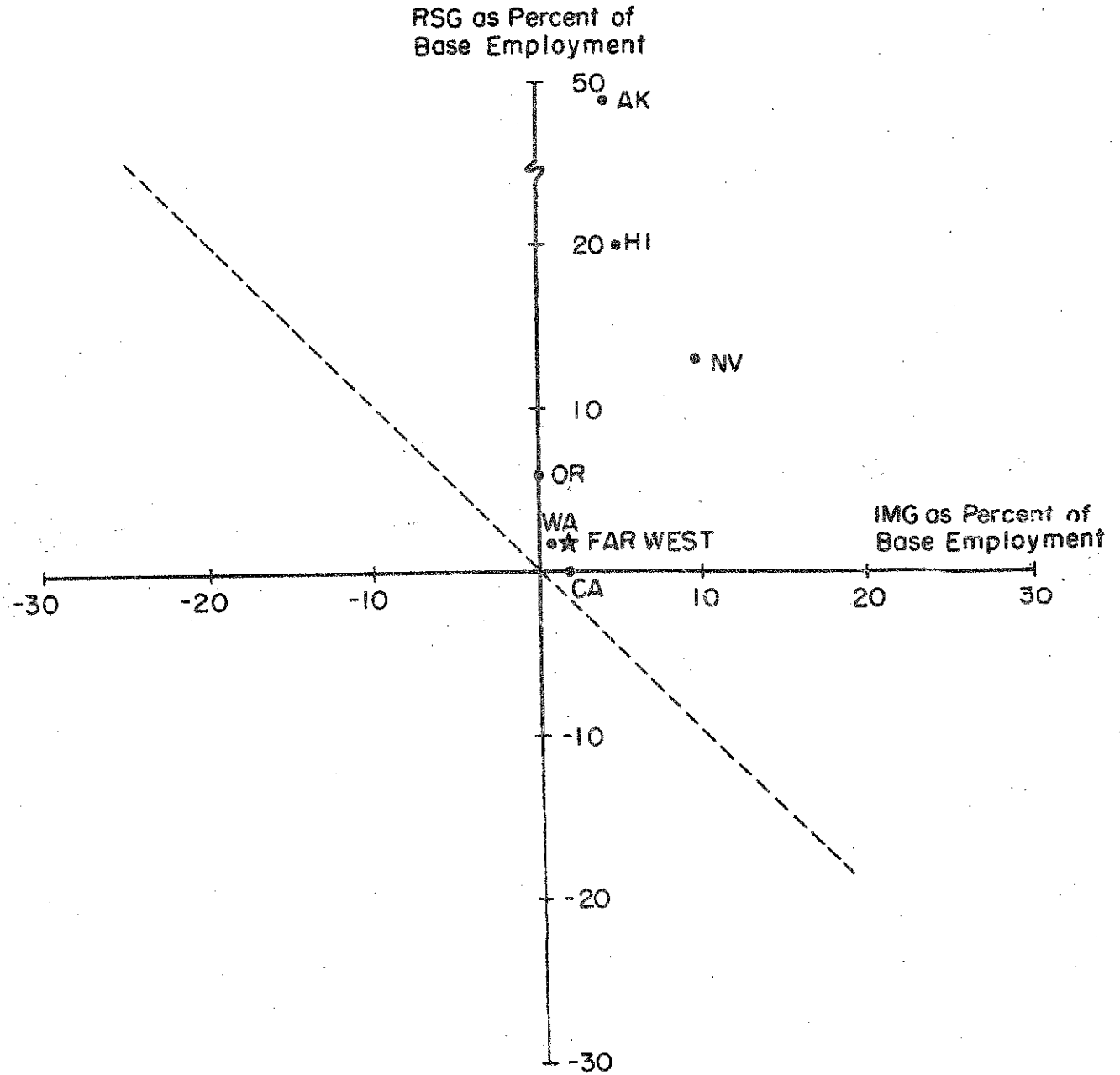


FIGURE 12. PROFILE OF EMPLOYMENT CHANGES IN THE FARWEST BY STATE, 1965-1972



with positive influences from both the industry mix and regional share effects. On the other hand, mining, construction, and wholesale trade had growth less than that of the national average, with negative influences from both the industry mix and regional share growth effects (Figure 13).

The Far West seems to have a strong competitive advantage in transportation and manufacturing, and although these are slow growth industries, they have added substantially to the increase in aggregate employment in the region.

In relation to other regions, the Far West is third in agriculture, wholesale trade, transportation, and unclassified industries; fourth in services, retail trade and finance; fifth in manufacturing, and last in mining and construction. The employment pattern of the region is dominated by the employment pattern prevailing in California.

The Plains

The Plains region, comprising the states of Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska and Kansas, is the fifth fastest growing region of the country. The growth rate is about 2 percent above the national average, one and one-half percent of which is due to a favorable industry mix effect and 0.5 percent is due to a regional share effect. The region had an employment of 3,394,300 in 1965, increasing to 4,200,600 by 1972.

All of the states in the region exhibit a favorable industry mix. This is particularly true for North and South Dakota and to a lesser extent for Nebraska. A favorable industry mix effect in all of the states except Missouri resulted in growth rates higher than the national average.

Much of the employment increase in Minnesota has been due to the regional share effect, indicating a strong competitive position, while most of the employment loss in Missouri has been due to the same factor. The employment growth accounted for by favorable industry mix in Kansas is partly negated by its weak competitive position (Figure 14).

In other than manufacturing and service industries, the region appears to have a weak competitive position. This has been particularly true for agriculture, mining, transportation, and wholesale trade. Its weak competitive position in agriculture and finance has been partially offset by the fast growth nature of these industries. The strong competitive position in manufacturing has been neutralized by its slow growth nature (Figure 15).

In comparison with other regions, the Plains is fourth in unclassified industries, and manufacturing; fifth in services; sixth in construction, wholesale trade and transportation; and seventh in mining and finance, and last in agriculture.

The Great Lakes

The Great Lakes region consists of the states of Michigan, Ohio, Indiana, Illinois and Wisconsin. It is the sixth fastest (or third from the slowest)

FIGURE 13. PROFILE OF EMPLOYMENT CHANGES IN THE FAR WEST, BY INDUSTRY, 1965-1972

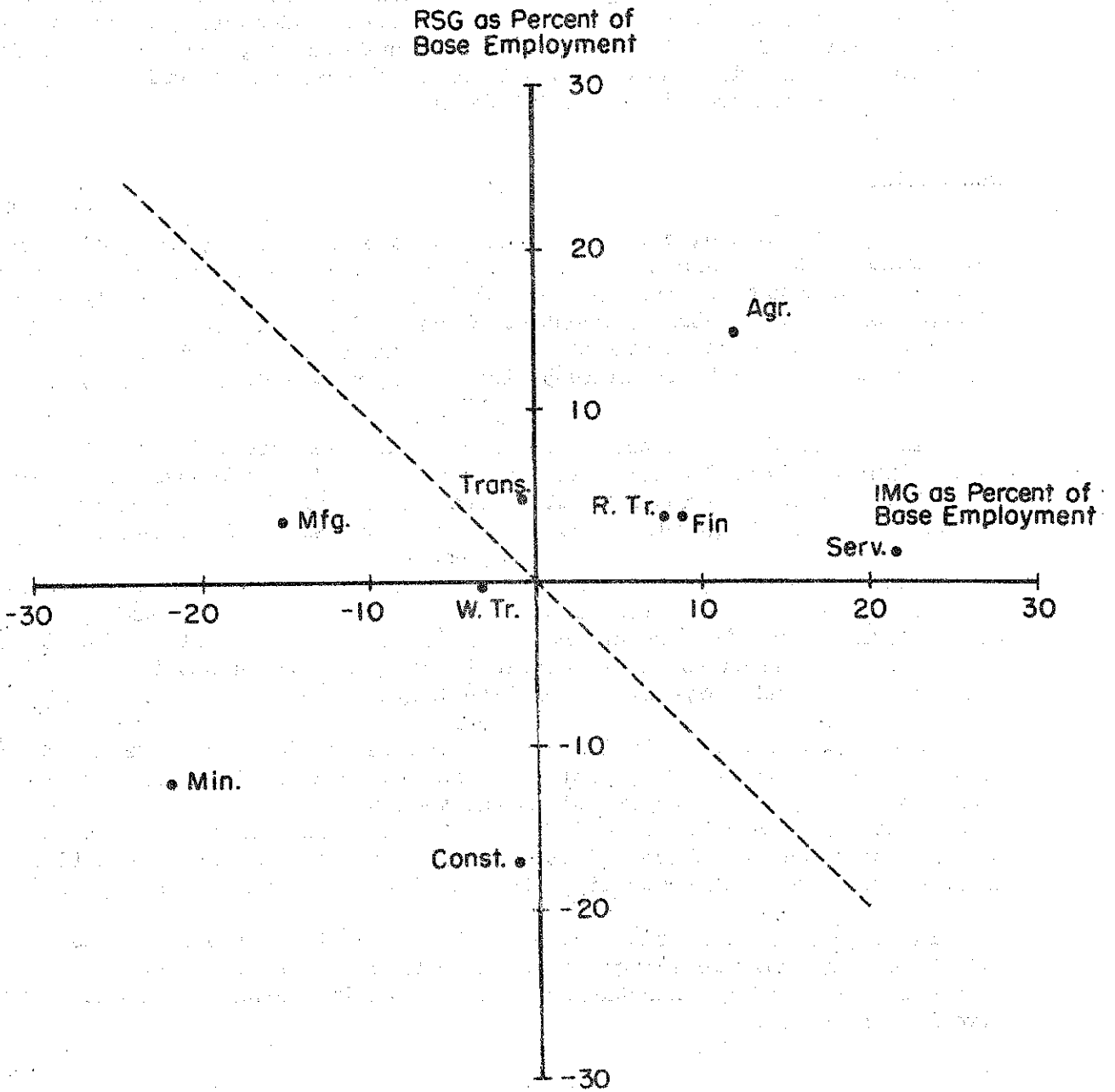


FIGURE 14. PROFILE OF EMPLOYMENT CHANGES IN THE PLAINS BY STATE, 1965-1972

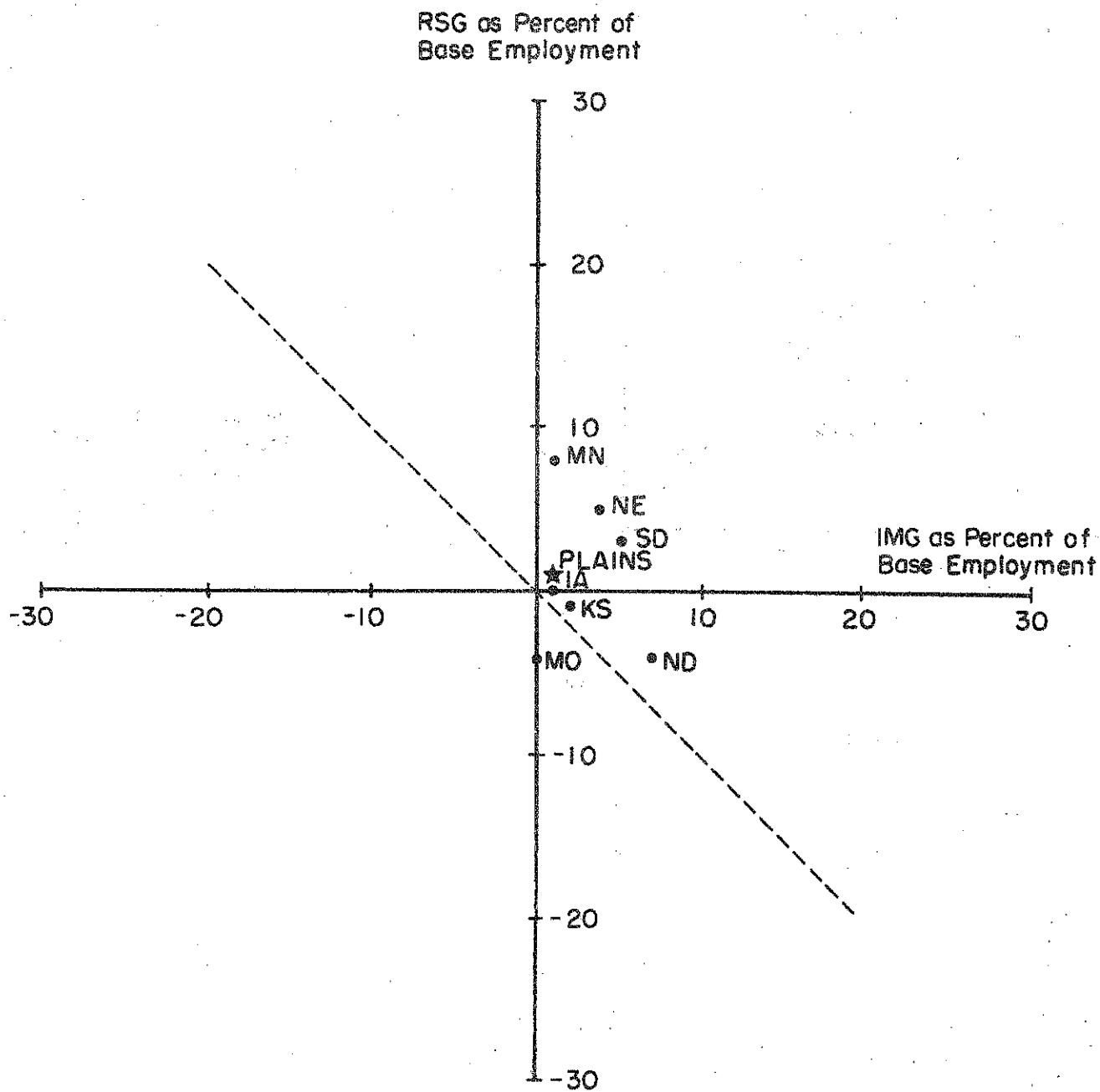
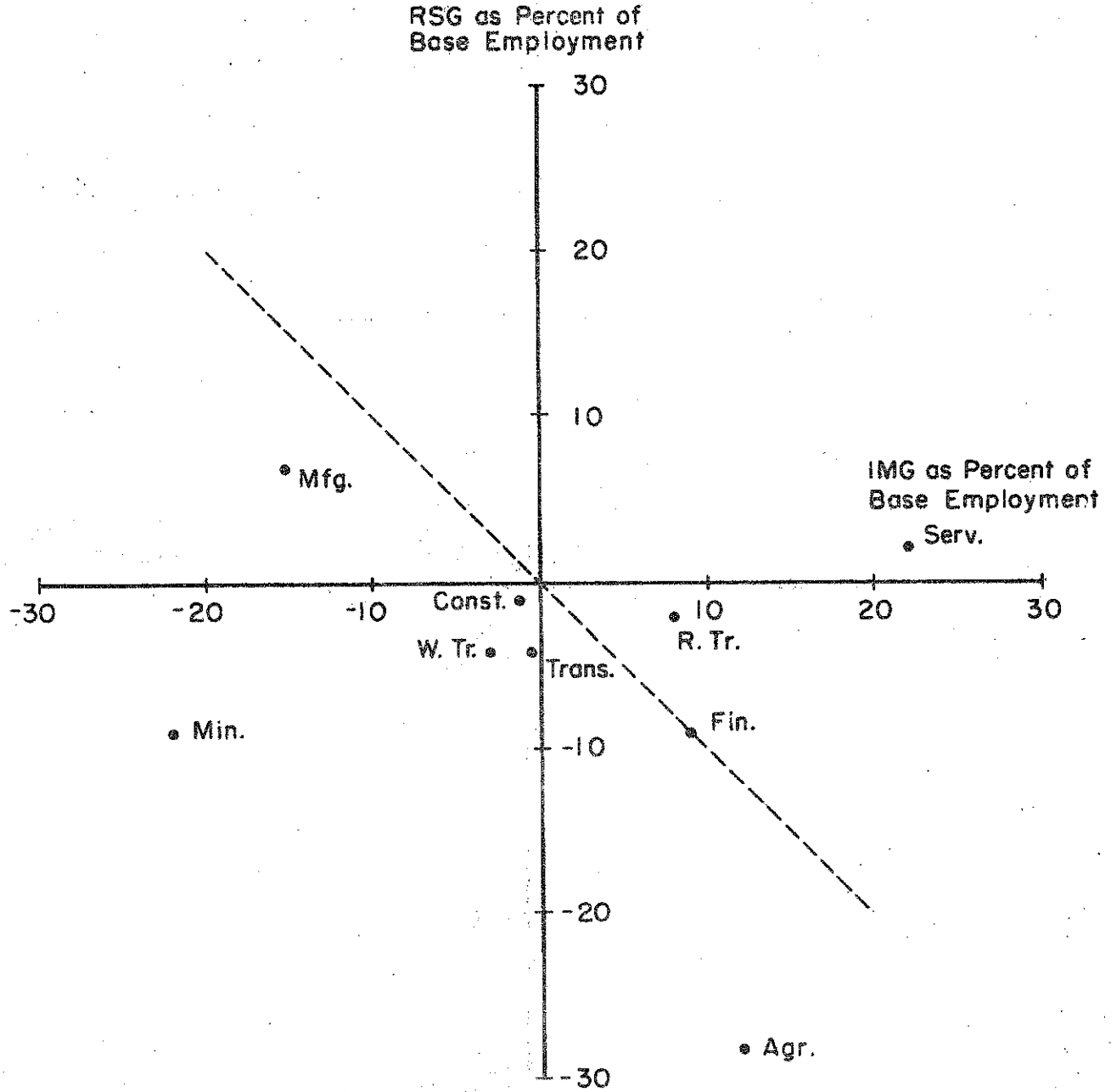


FIGURE 15. PROFILE OF EMPLOYMENT CHANGES IN THE PLAINS BY INDUSTRY, 1965-1972



growing region of the country. Its employment growth of 1,670,000 over the eight year period, from 10,444,000 in 1965 to 12,144,000 in 1972, is about 6 percent below the national average. About 2 percent is due to the negative industry mix effect and 4 percent is accounted for by negative regional share effect.

All of the states showed negative industry mix indicating a high proportion of the employment is engaged in slow growth industries. The highest loss, 8 percent, was registered in Illinois and was accounted for primarily by weak competitive position. The smallest loss, 3 percent in Wisconsin, was accounted for primarily by unfavorable industry mix (Figure 16).

A large part of the employment loss in the region came from manufacturing, mining, transportation, and wholesale trade. The positive impact of the fast growth industries such as services, agriculture, finance and retail trade, had, to a large extent been negated by their weak competitive positions. It is only in construction, a slow growth industry, that this region seems to have a competitive advantage over other regions of the country (Figure 17).

In comparison with other regions, the Great Lakes is fifth in agriculture and mining; fourth in construction; sixth in manufacturing, finance, retail trade and unclassified industries and seventh in transportation and services.

New England

The New England region, Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut, is the second to the slowest growing region of the country. The growth rate was about 7 percent less than the national average. Of this, 6 percent is due to the negative effect of the regional share growth and 1 percent is due to the negative industry mix effect. Its employment over the eight year period grew by 365,400, from 5,445,300 in 1965 to 5,810,700 in 1972.

The growth rates among the states varied. On one hand, Vermont and New Hampshire have grown at rates higher than the national average, the former being the result of positive industry mix and regional share effects and the latter being the result of negative industry mix and positive regional share effects. The remaining states showed negative effects on both industry mix and regional share growth components (Figure 18).

As expected, the biggest employment losses are manufacturing, wholesale trade, mining and agriculture. Employment losses in mining are primarily due to its slow growth nature. However, losses in this industry seem to have been minimized by its strong competitive position. On the other hand, agriculture, a fast growth industry, suffered substantial net loss in employment due to the weak competitive position in this region (Figure 19).

In comparison with other regions, New England is second in mining and unclassified industries; fifth in construction, finance, wholesale trade, retail trade and transportation; sixth in services; and seventh in agriculture and manufacturing.

FIGURE 16. PROFILE OF EMPLOYMENT CHANGES IN THE GREAT LAKES, BY STATE, 1965-1972

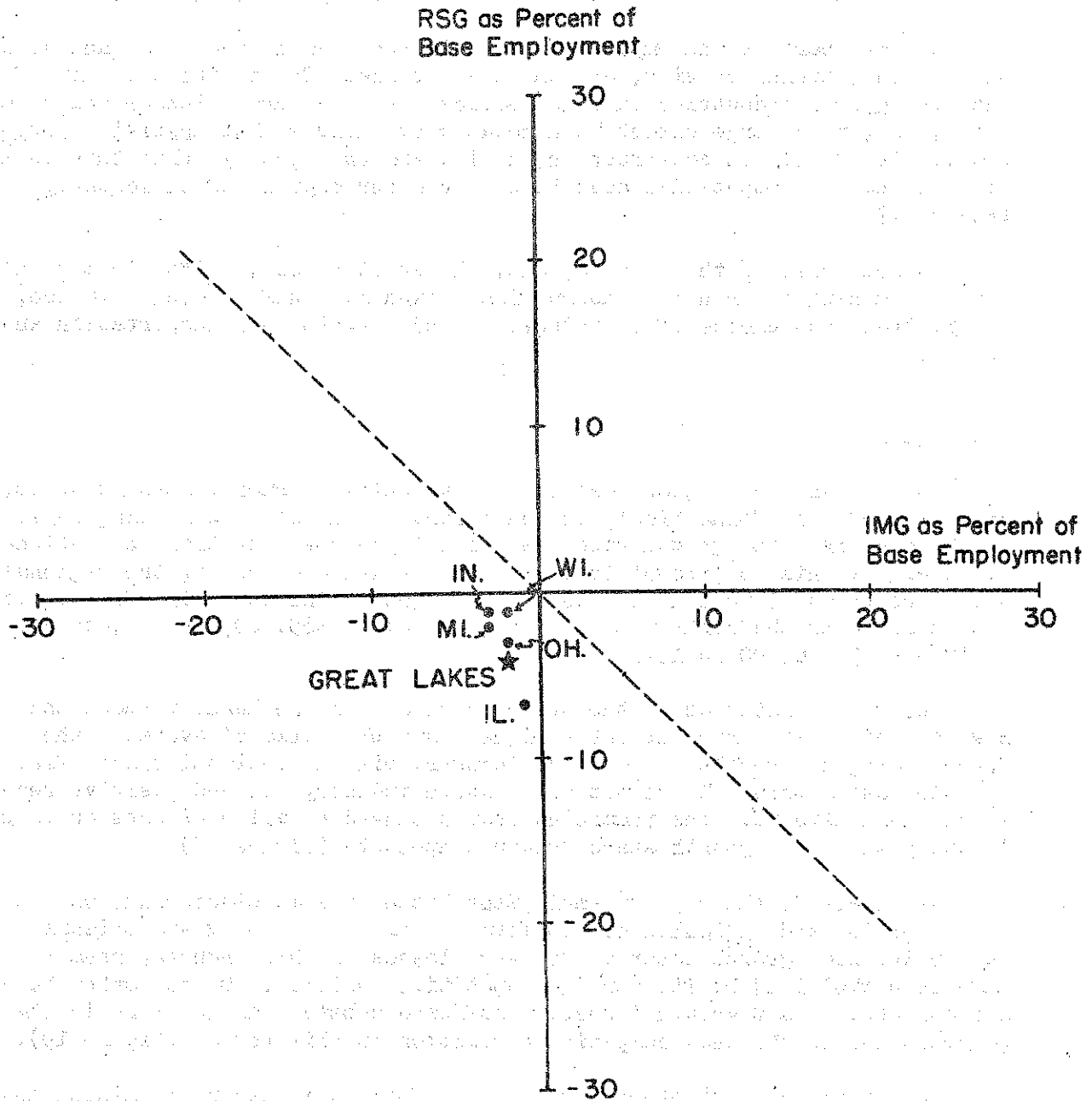


FIGURE 17. PROFILE OF EMPLOYMENT CHANGES IN THE GREAT LAKES BY INDUSTRY, 1965-1972

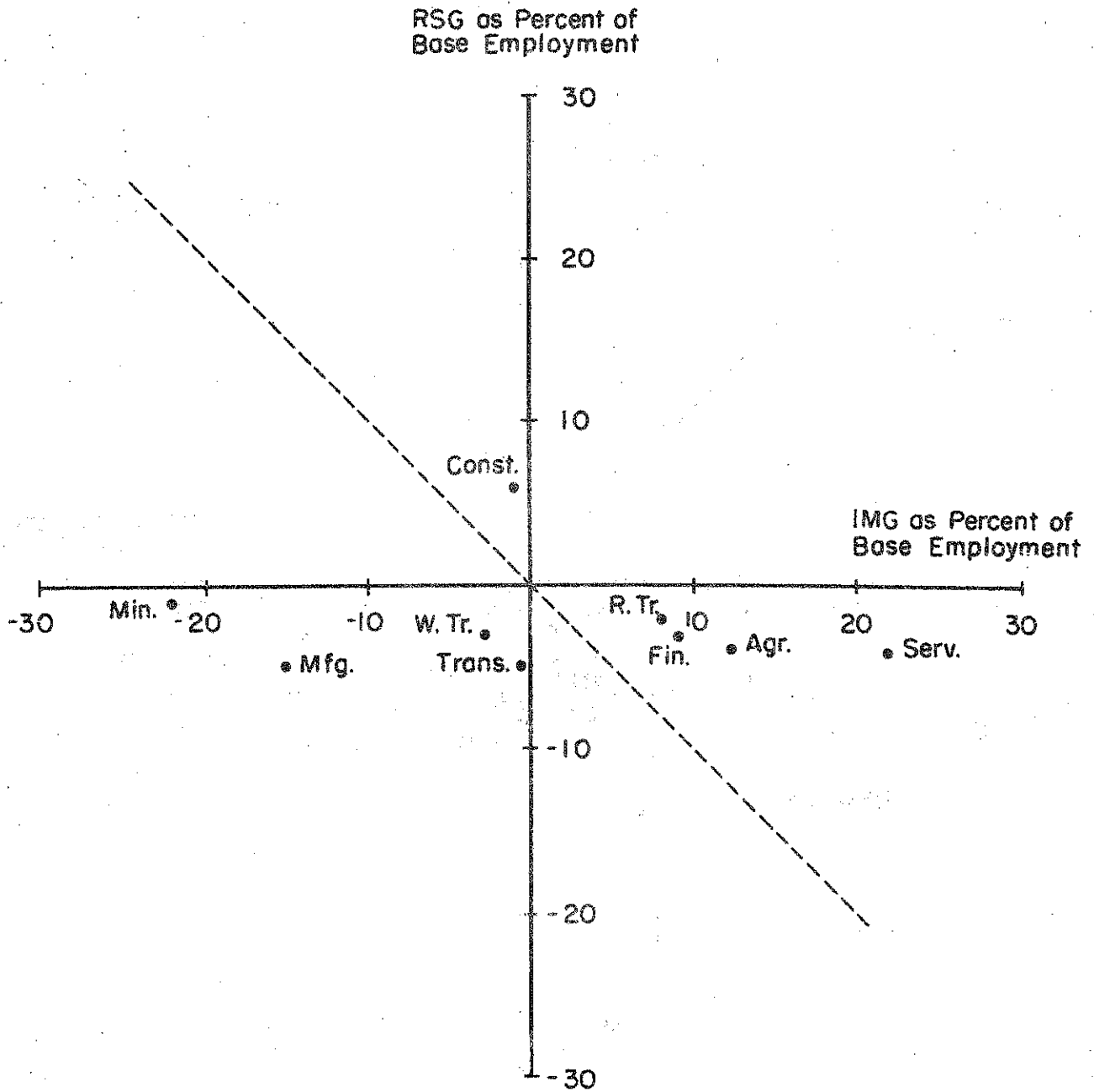


FIGURE 18. PROFILE OF EMPLOYMENT CHANGES IN
NEW ENGLAND, BY STATE, 1965-1972

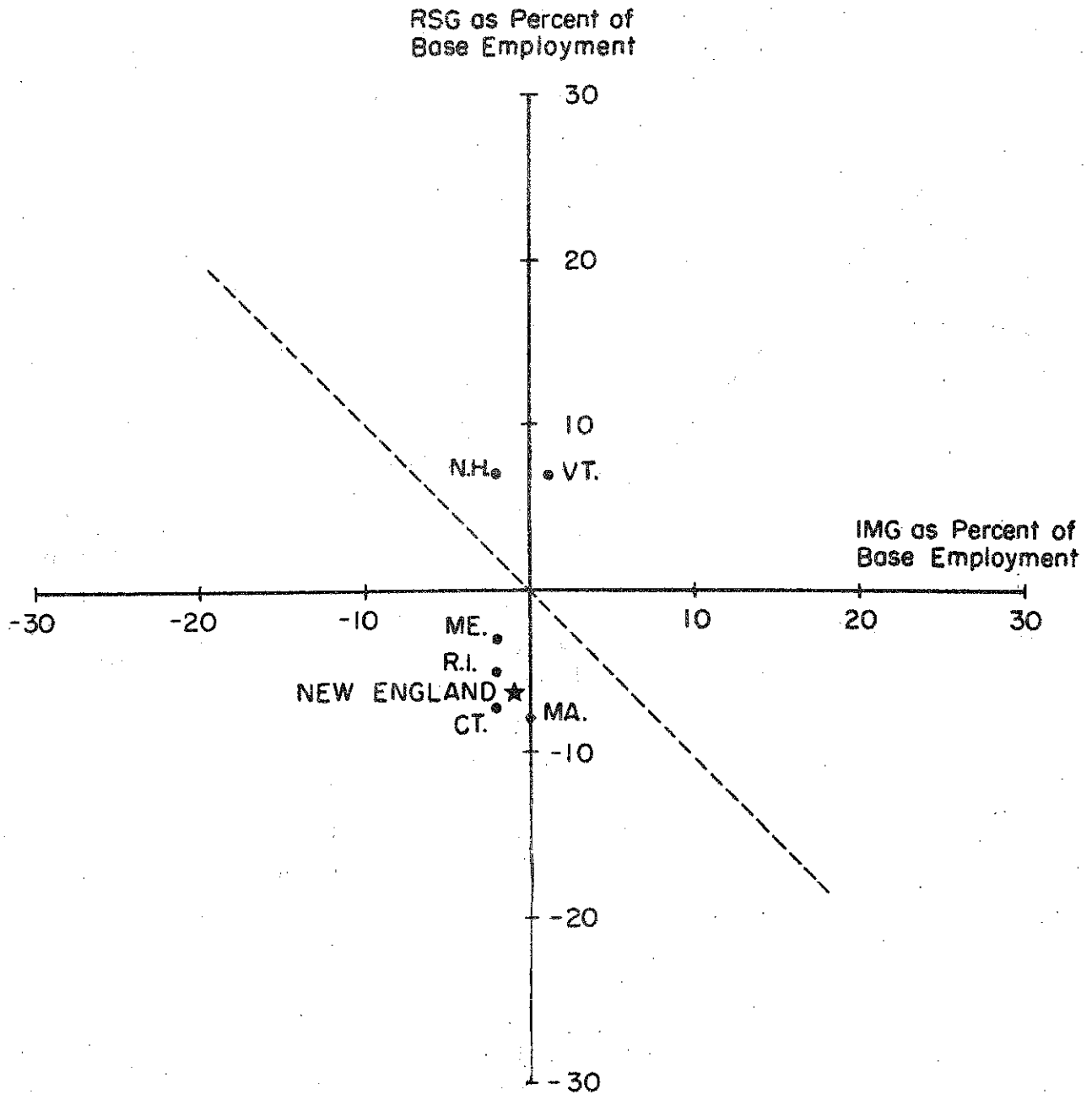
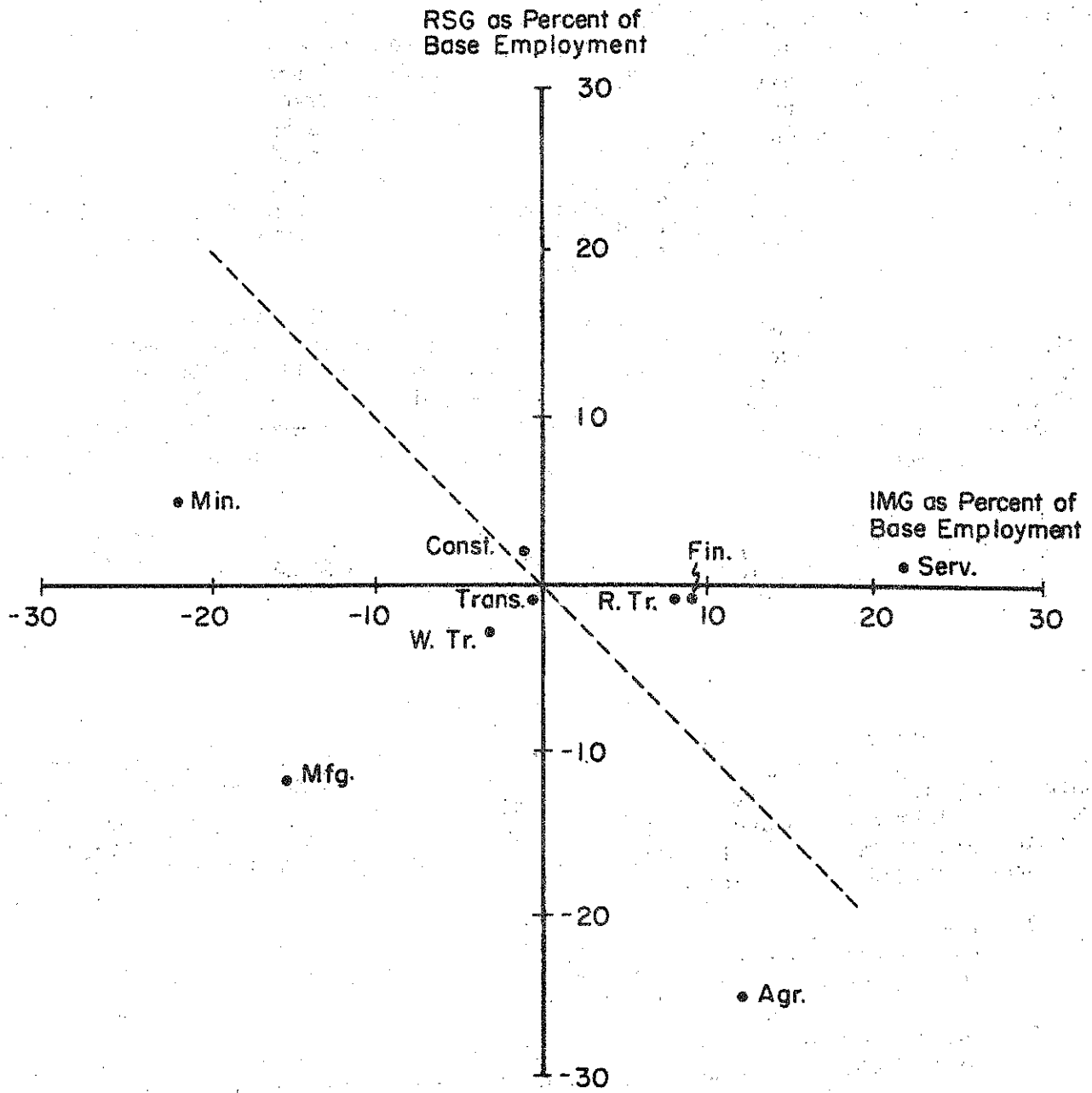


FIGURE 19. PROFILE OF EMPLOYMENT CHANGES IN NEW ENGLAND BY INDUSTRY, 1965-1972



The Mideast

The Mideast region, comprising the states of New York, New Jersey, Pennsylvania, Delaware, Maryland and the District of Columbia, is the slowest growing region of the country. Its employment increased by 1,261,900 over the eight year period, from 11,770,200 in 1965 to 13,032,100 in 1972. The growth rate approximately 11 percent below the national average is due in large part to a negative regional share effect.

The components of the region exhibit a highly variable growth pattern, but dominated by the two largest states in the region - New York and Pennsylvania. Maryland is the only state in the region with a positive net growth, about 2 percent higher than the nation's average, accounted for equally by favorable industry mix and regional share effects. Delaware's growth rate equals that of the nation, the positive industry mix effect is completely negated by negative regional share effect. Although Washington, D. C. and New York exhibit slightly favorable industry mix effects, their competitive positions are such that their employment increases over the eight year period were about 19 and 15 percent below that of the national average, respectively. Pennsylvania and New Jersey registered negative industry mix and regional share growth components (Figure 20).

Employment losses in the region, reflecting primarily weak competitive positions for all industries have been severe, particularly in manufacturing, mining, wholesale trade, construction and transportation. Employment losses in finance and retail trade have been minimized due to the fast growth nature of these industries. This is also true for agriculture and services, whose employment growth are 8 and 10 percent, respectively, higher than the national average (Figure 21).

In comparison with other regions, the Mideast is sixth in agriculture and mining; seventh in construction and wholesale trade; and last in most of the major industries including manufacturing, finance, retail trade, transportation and services.

Summary and Conclusions

A substantial redistribution of employment has occurred in the United States within the 33 year period from 1940-1972. With the use of shift and share analysis, the magnitude, causes and direction of employment changes among the eight regions and the ten major industry groups have been analyzed for the periods 1940-1950, 1950-1960 and 1965-1972. The major findings of the study are summarized below:

1. There have been substantial shifts in employment from the north and eastern part of the United States during the period covered in this study.
2. The New England, Mideast and Great Lakes regions appear to be losing employment as a result of the deterioration of their industry mix as well as their weakening competitive position. This has been brought about by their

FIGURE 20. PROFILE OF EMPLOYMENT CHANGES IN THE MIDEAST BY STATE, 1965-1972

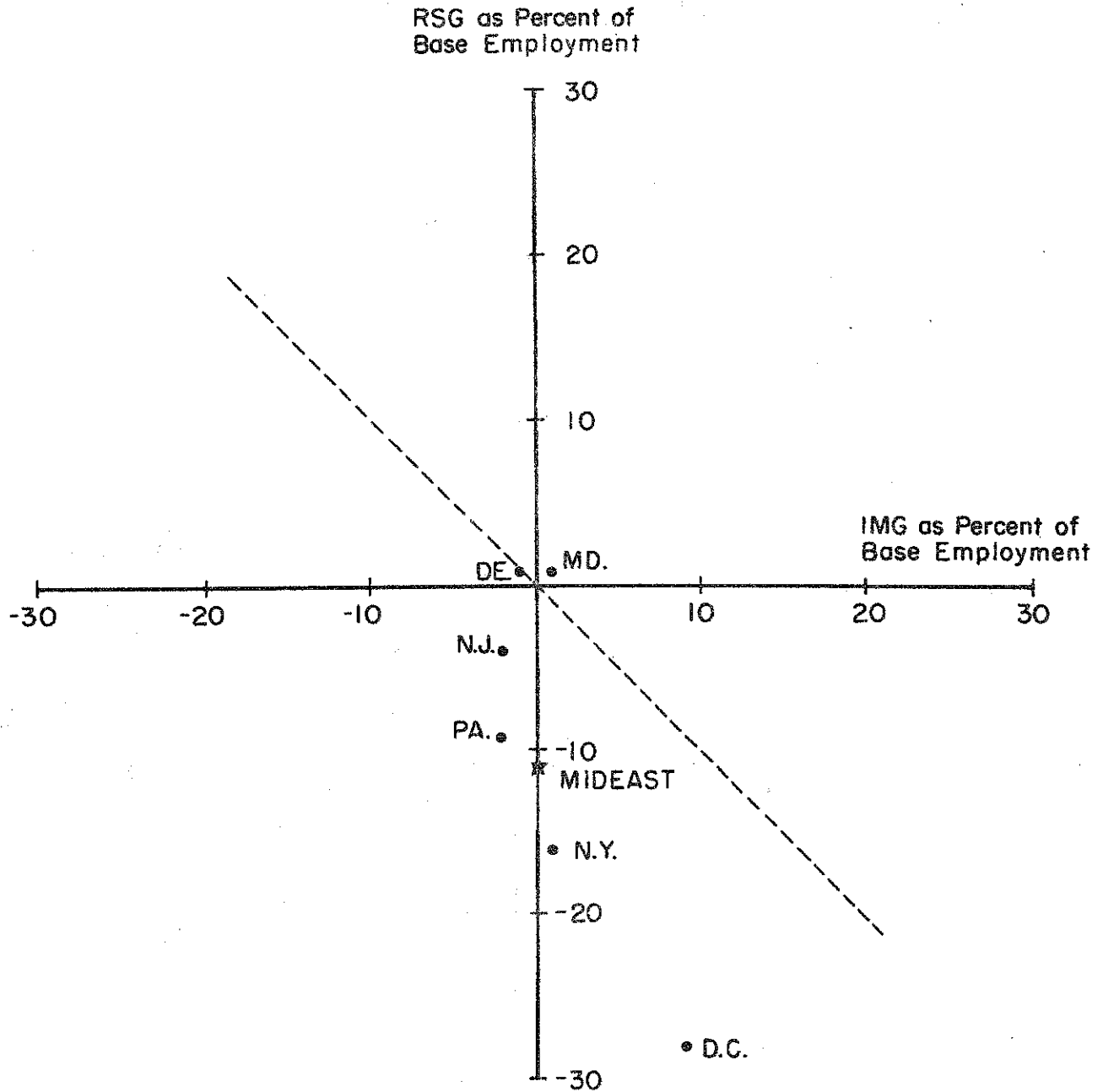
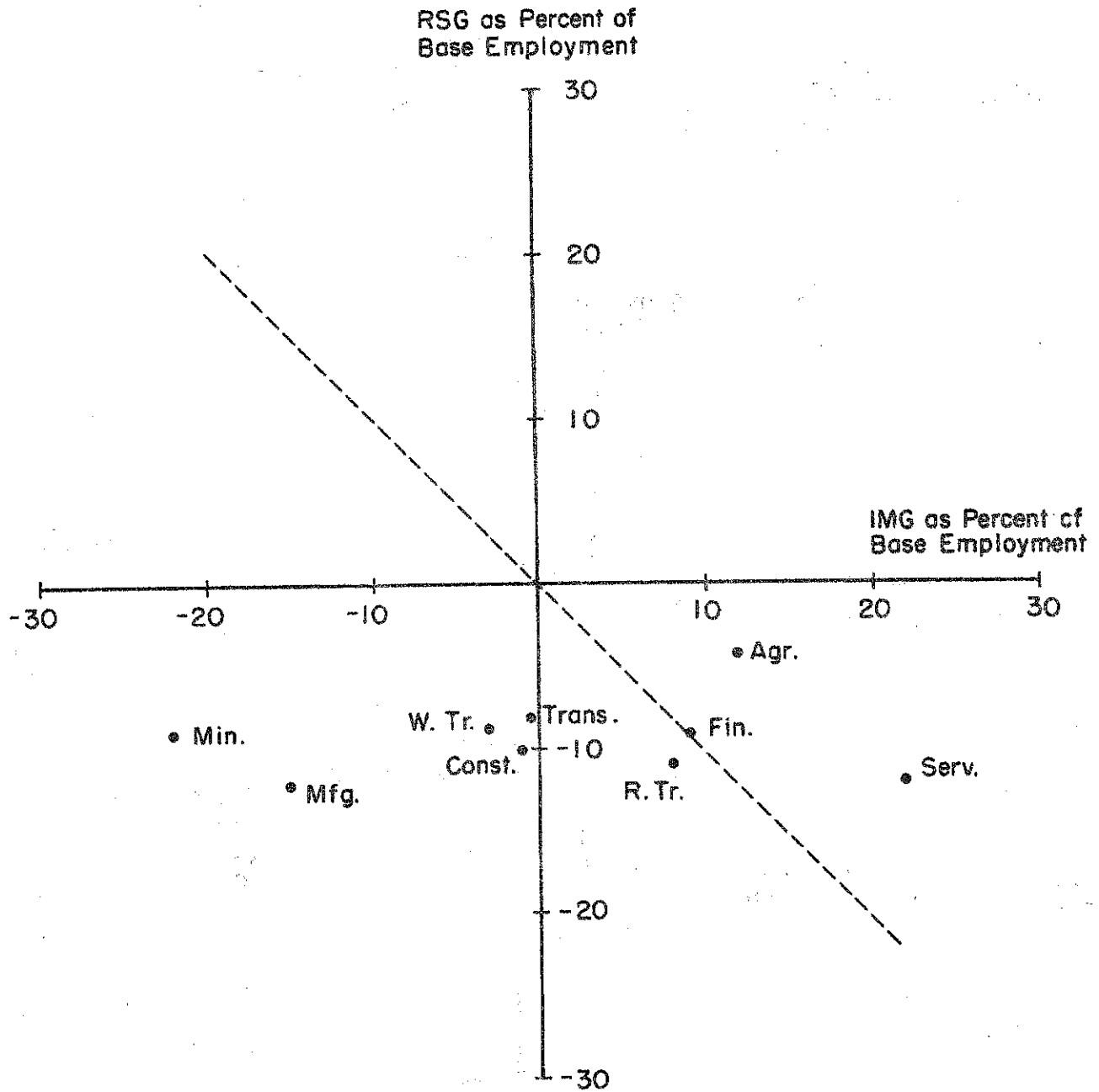


FIGURE 2I. PROFILE OF EMPLOYMENT CHANGES IN THE MIDEAST BY INDUSTRY, 1965-1972



specialized manufacturing and related industries which, for the last decade, have become less concentrated in this region and more widespread throughout the nation.

3. The opposite has been the case of the Rockies, Plains and the Southwest regions. Their employment rates have increased as a result of favorable industry mix as well as their strong competitive position, reflecting increased manufacturing and defense related employment which are primarily concentrated in the south and the west.
4. Population shifts from the north and northeast to the south and southwest also occurred as white population migrates in search of better economic opportunities and improved quality of life.
5. Although the employment rate in the Far West is still above the national average, it appears to be declining as California, the most populous state in the region, is becoming more developed, notwithstanding tremendous employment increases in the states of Alaska and Hawaii.
6. In terms of percentage increase, the Rocky Mountain, the Southeast, the Southwest, the Far West and the Plains, in that order, exceed the national employment growth rate of 21.52%. The regions with the smallest employment gains include the Mideast, New England and the Great Lakes.

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