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The Business Climate in Michigan: Wage & Tax Cost Considerations

Timothy L. Hunt

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The Business Climate in MICHIGAN

Wage and Tax Cost Considerations

Timothy L. Hunt

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Wage and Tax Cost Considerations

Timothy L. Hunt

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THE INSTITUTE, a nonprofit research organization, was established on July 1, 1945. It is an activity of the W. E. Upjohn Unemployment Trustee Corporation, which was formed in 1932 to administer a fund set aside by the late Dr. W. E. Upjohn for the purpose of carrying on "research into the causes and effects of unemployment and measures for the alleviation of unemployment."

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Foreword

Considerable research and discussion have centered on the economy of Michigan in the past ten years. There are undeniable problems, and everyone desires improved economic performance. Unfortunately, discussions of the state's business climate sometimes appear to be complicated because of the difficulties inherent in separating real and perceived problems.

One of the reasons is that there is no universally accepted definition of the term "business climate." Sometimes it is used as a synonym for labor's attitude; other times it appears to refer only to state and local business taxes. By judicious selection of variables and methods of comparison, "proof" can thus be shown of almost anything.

A broader approach is to relate the business climate to the many factors which are deemed to affect the competitive attractiveness of a community or state as a location for industry. Using this approach, Dr. Hunt highlights the complexity of the plant location decision and discusses some of the difficulties in making comparisons across regions. He argues that the measures utilized in making comparisons must be carefully selected and standardized in order to be meaningful. Even then, the measures must be used cautiously.

This paper is an introduction for the W. E. Upjohn Institute to the subject of the business climate. The purpose of this research area is threefold: (1) to develop a base of data from which to make meaningful interstate comparisons, (2) to intelligently discuss and interpret the mean-

ing of that data, and (3) to evaluate various policy alternatives. This particular paper is focused on the wage and tax elements of Michigan's business climate. Studies addressing other factors that relate to the costs of doing business in Michigan are planned under the Institute's regional economics series.

Facts and observations presented in this paper are the sole responsibility of the author. His viewpoints do not necessarily represent positions of the W. E. Upjohn Institute for Employment Research.

E. Earl Wright
Director

Kalamazoo, Michigan
December 1981

Preface

The notion of a “business climate” is necessarily vague, since any plant location decision is a complex one. Several recent studies of the business climates in each state have based their comparisons on wage and tax costs. These studies have concluded that Michigan is a relatively unattractive place in which to do business. However, there are inherent limitations in estimating the business climate strictly on the basis of costs alone. That approach neglects other important factors such as productivity, quality of life, proximity to markets, and the supply of skilled and unskilled labor. Moreover, comparisons of wage and tax costs must ensure that the measures utilized are selected and standardized so as to be comparable.

Direct interview studies of business executives highlight the complexity of the plant location decision; it is not a simple enumeration of the direct costs of doing business. One study that directly interviewed business executives about factors important in locating a firm found that labor costs were ranked sixth, and state and local business taxes were hardly mentioned at all. The critical factors were the supply of skilled labor, mentioned almost twice as often as other factors, followed by proximity to markets, productivity of the labor force, supply of unskilled labor, and the level of the state personal income tax. In another study, business executives stressed the increasing importance of the quality of life.

Recent business climate studies and many other studies have utilized the published data for average weekly manufacturing wages to assess relative wage costs across the states.

However, relying on average wages does not account for differences such as the length of workweek, overtime earnings at premium rates of pay, and the specific structure of industry. In the case of Michigan, the neglect of these factors may overstate true relative wage costs. For example, Michigan had the longest average manufacturing workweek in the nation in 1977, so the published data for average weekly wages overstate Michigan's true relative wage costs *vis-a-vis* the national average due to this longer average workweek.

It is possible to account for all three of these differences and calculate an adjusted average wage. The net results of standardizing the data show that Michigan's wages in 1977 were 17.8 percent above the national average instead of the published figure of 43.8 percent. For the Kalamazoo-Portage SMSA, this adjustment reveals that wages were only 8.7 percent above the national average instead of the published figure of 23.0 percent.

State and local taxes are another aspect of the cost of doing business. The approach taken here is to examine broad aggregates such as total state and local taxes and state and local taxes with an initial incidence on business because of the difficulties inherent in analyzing individual taxes. For example, a state may not impose a corporate income tax, but instead levy yearly franchise fees and/or require licenses. States may also substitute income taxes for sales taxes. A further complication is that any study of tax costs completely ignores the benefits of taxation. Citizens of a state may choose higher taxes to finance a quality public service such as the education system. In general, it appears that the total burden of taxation in Michigan is average.

While it is not possible to draw conclusions about the total relative cost of doing business in Michigan or the Kalamazoo-Portage SMSA based on an examination of

wage costs and tax costs alone, the limited analysis of this paper does indicate that the popular perception of Michigan as a high cost state is exaggerated. Any comparison of wage costs, tax costs, or any other factors must ensure that the measures utilized are carefully selected and standardized in order to be meaningful.

Timothy L. Hunt

Acknowledgments

Many individuals contributed significantly to this study. Special appreciation is due E. Earl Wright for his counsel, guidance, and considerable encouragement. His advice enhanced the study in many ways. Appreciation is also extended to my colleagues at the Upjohn Institute, Saul Blaustein, Phyllis Buskirk, Allan Hunt, and Wayne Wendling, who commented extensively on earlier drafts. Their ideas and suggestions clarified a number of key points. Thanks must also be given to Denise Duquette who collected much of the data and ably assisted me and to Joann Nunn who patiently typed and retyped the manuscript. Of course, all remaining errors in the paper are entirely my responsibility.

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I. Introduction

This paper examines the general approaches taken in evaluating the business climate, particularly as they relate to the present situation in Michigan and the Kalamazoo-Portage Standard Metropolitan Statistical Area (SMSA).¹ Business climate here is defined in a very broad sense to include the many locational and other factors that may contribute to the decision of a firm to expand or relocate.

Several studies have concluded that Michigan's business climate is relatively unattractive. The most recent of these gained wide distribution in the news media and among business executives across the entire nation. These recent efforts, which evaluate the business climate largely in terms of business costs, are discussed first. Several other studies are discussed in which business executives have been interviewed directly about factors important to them in selecting a location. Then, three studies are described which assess the quality of life in an area, a factor thought to be of growing importance in business location decisions. Finally, some comments are offered on present measures of the business climate in Michigan and the Kalamazoo-Portage SMSA, emphasizing the role of wage costs and tax costs.

A number of key findings are presented here. First, 43.5 percent of the difference between Michigan's apparent higher average manufacturing wage compared to the United States as a whole can be explained by Michigan's unique mix

1. The Kalamazoo-Portage SMSA consists of Kalamazoo and Van Buren Counties, Michigan.

of industries. The comparison is even more striking for the Kalamazoo-Portage SMSA where 51.9 percent of Kalamazoo-Portage's higher than national average wage rate can be explained by its mix of industries. Second, the total tax climate in Michigan appears to be no worse than the national average. Third, the quality and productivity of Michigan's workers is at least average and perhaps slightly above the United States average. While it is not possible in this review to draw conclusions about the total relative costs of doing business in Michigan, the limited analysis of this paper does indicate that the popular perception of Michigan as a high-cost state is at least exaggerated if not unwarranted.

Another key finding of this study is that it may be inappropriate to evaluate the business climate strictly on the basis of costs in any event. One study that directly interviewed business executives about factors important in locating a firm found that labor costs were ranked sixth, and state and local business taxes were hardly mentioned at all. The critical factors were the supply of skilled labor, mentioned almost twice as often as other factors, followed by proximity to markets, productivity of the labor force, supply of unskilled labor, and the level of the state personal income tax. In another study, business executives stressed the increasing importance of the quality of life. It is interesting to note that Michigan fares more favorably in these other critical factors, which, of course, are ignored in cost studies of the business climate.

The final noteworthy finding is that, regardless of the facts of Michigan's business climate, the popular perception remains that Michigan is "anti-business." Fantus Factory Locating Service reported as long ago as 1959 that "of fifty mid-western industrial site searches conducted . . . thirty-four firms categorically rejected Michigan as a location before the search began . . . and only two firms of the

original fifty selected Michigan . . . in spite of the fact that economics would have permitted the selection of Michigan in the case of at least eight of the companies.’’² Unfortunately, there is very little reason to think that the situation has changed today.

2. Fantus Factory Locating Service, *Business Climate*, unpublished report to the W. E. Upjohn Institute for Employment Research, May 11, 1959, p. 4.

II. The Business Climate: Costs Approach

The notion of a business climate is necessarily vague since any decision to locate or expand a plant is a complex one. One approach has been the development of a ranking technique based on the estimated costs of doing business in each state. Two studies which have used this cost-centered approach are reviewed in this section, after which a number of limitations are noted.

In both 1979 and 1980, Alexander Grant and Company, a Chicago based accounting firm, developed a manufacturing business climate ranking for the 48 states of the continental U.S. in cooperation with the Conference of State Manufacturers Associations (COSMA).³ Michigan was ranked last in the composite business climate rankings of both of the Grant studies.

The most recent Grant study based its ranking on 18 factors. These factors were chosen by the member associations of COSMA as those most significant to manufacturing firms when measuring the relative attractiveness of different states. Most of the factors are cost centered, with low values considered to be favorable except for the net worth of the state unemployment compensation fund per covered worker, state disbursements for highways per highway mile, and

3. *A Study of Manufacturing Business Climates of the Forty-eight Contiguous States of America, 1979* (Chicago: Alexander Grant and Company, 1980); and *A Study of Manufacturing Business Climates of the Forty-eight Contiguous States of America, 1980* (Chicago: Alexander Grant and Company, 1981).

vocational educational expenditures per capita. The latter two criteria are clearly exceptions to the cost orientation of the study and were included to measure a state's commitment to improving the training of the workforce and to measure the quality of the state's transportation system which in turn, according to the Grant study, affect the quality of life.⁴

All states were ranked in each of the 18 categories relative to one another. Since the factors are not directly comparable, the values for each factor were adjusted or standardized on a scale of 0 to 100, with 100 being the best, using the range of each factor as the standardizing criteria. The composite business climate score for each state was arrived at by summing the 18 standardized factor values for that state after they were weighted by the estimated importance of each factor in the business climate. The weights were determined by a survey of the 38 COSMA state associations in which they were asked to rank eight of the most important factors. Each factor was assigned one point each time it was mentioned and additional points depending on its rank order position. The weight for 16 of the factors was arrived at by dividing the total points for each factor by the total points for all factors. Two factors were assigned weights arbitrarily.

Earlier, the Fantus Company, a business location consulting firm, had undertaken a 1975 business climate analysis for all 48 states of the continental U.S. on behalf of the Illinois Manufacturers Association.⁵ Michigan was ranked 45th of the 48 states evaluated in the Fantus study.

The Fantus study based its ranking on 15 factors deemed important to firms locating a business. As in the Grant study, the 15 factors evaluated are cost centered, but they are

4. *A Study of Manufacturing Business Climates*, 1980, p. 5.

5. Fantus Company, *Comparative Business Climate Study* (Chicago: Illinois Manufacturers Association, 1975).

largely limited to state and local tax or legislative factors. In the Fantus study, the composite business climate scores were sums of the individual factor rankings, 1 through 48, for the states. Thus, if a state were lucky enough to be first in all 15 categories, then its composite business climate score would be 15. Notice that in contrast to the Grant study, this procedure of summing the ranks gives equal importance to each factor in arriving at the composite business climate score.

Both of the Grant studies and the Fantus study recognize clearly that there are other factors besides costs which affect the location decisions of manufacturers such as proximity to markets and the quality of life. However, there remain a number of other limitations to both of these cost-centered studies.

First, there is the problem of duplication in the individual factor criteria leading to redundancy in the data. In the Fantus study, even though per capita state debt was already included as one of the factor variables important in determining a state's business climate, a measure for per capita state *and* local debt is included as well. Also, in that same study, personal income taxes, per capita total state taxes, and per capita total state and local taxes, are measured as three separate and important influences in determining a state's business climate. But notice that personal income taxes are one component of both of the other two variables, and clearly per capita state taxes are measured once again as part of per capita state and local taxes. Such duplication of measurement is difficult to accept because it puts undue weight on individual variables.

A second limitation involves the actual data selected to measure the variables. For instance, the average weekly manufacturing wage and the percentage change in that wage are two of the variables important in determining the business climate in both of the Grant studies. The actual data

selected to measure this variable in the 1980 Grant study was the average weekly wage as of December 1979, a monthly average, while the 1979 study measures the same variable but uses data for August 1978, another monthly average.⁶ The utilization of monthly estimates of the average weekly wage instead of yearly estimates of the average weekly wage is unfortunate because the monthly wage data are particularly susceptible to seasonal variations peculiar to each region. There are also other regional-specific factors such as strikes, natural catastrophe, etc., which have completely unpredictable effects on short term measures of wages. Such regional seasonality and other regional “shocks” are much less pronounced in the yearly estimates.

A third limitation can be found in the manner in which the individual factor scores are standardized. As stated earlier, that adjustment or standardization is necessary to facilitate the summation of unlike factors across the states. The Fantus study uses the rankings of the states, 1 to 48, directly, while the Grant study uses the range of the variables to create a ratio scale of 0 to 100. Unfortunately, the Fantus approach fails to utilize any information at all about the distribution of the individual factor values except the rankings themselves, when more information is available, while the utilization of the range in the Grant methodology attaches maximum importance to extreme values in the distribution rather than to typical values of the distribution. The preferred procedure is to construct index numbers using the mean or average value of each variable and then possibly to restate the index numbers as standardized Z values.⁷

6. U.S. Department of Labor, Bureau of Labor Statistics, *Employment and Earnings* (Washington: Government Printing Office, March 1980), p. 115; and U.S. Department of Labor, Bureau of Labor Statistics, *Employment and Earnings* (Washington: Government Printing Office, November 1978), p. 109.

7. For an explanation of standardized Z values, see B. W. Lindgren, G. W. McElrath, and D. A. Berry, *Probability and Statistics* (New York: Macmillan, 1978), p. 122.

Finally, it is interesting to note that there is considerable variability in the composite business climate rankings in the 1980 and 1979 Grant studies. Four states "improved" their business climate ranking by nine or more ranking positions, while the business climate in five other states "deteriorated" by nine or more ranking positions. This variability in the rankings is disturbing because presumably the business climate in a state is a long run phenomena and not subject to dramatic short run fluctuations. No doubt some of this variability is due to the problems already discussed.

In summary, the Fantus study and both of the Grant studies are valuable attempts to estimate the business climate for manufacturing industries. Both utilize primarily a cost-centered approach. The limitations of the studies are due to redundancy of the selected variables, procedures of data selection, and the manner of standardization of the data.

III. The Business Climate: Direct Interview Approach

A large number of studies have interviewed business executives directly to determine those factors which the businessmen themselves judged were important in locating a firm. Only three of the most recent studies are reviewed here. The important point is that costs appear to be considered as only one element in the business climate of a state.

In 1980, Roger W. Schmenner, formerly a research associate at the Harvard-MIT Joint Center for Urban Studies and now an Associate Professor of Business at Duke University, published a summary of the results of his study of plant location, primarily of Fortune 500 firms.⁸ Schmenner's work, funded through a grant from the U.S. Department of Housing and Urban Development, was rather extensive; it involved the creation of three independent but complementary sources of data and information. These included 60 open-ended direct interviews with high-level business executives, a mail-in plant survey, and a direct plant "census" of 410 of the largest firms in the U.S. which have opened, closed, expanded or relocated a business since about 1970.

Schmenner found that large corporations systematically consider costs and benefits in choosing a plant location. They quantify as many variables as possible, but nonquantifiable variables are important and considered, i.e., selec-

8. Roger W. Schmenner, *Summary of Findings: The Location Decisions of Large, Multi-Plant Companies*, unpublished manuscript, 1980.

tion is not a “by the numbers” choice only. The primary controlling concerns for these large corporations were proximity to markets, proximity to supplies/resources, proximity to other company facilities, the quality of life, labor costs, and labor attitudes.

Concerning state and local government policy toward the location of firms, Schmenner draws a number of interesting conclusions. First, the influence of state and local tax rates appears to him to be a weak and secondary variable. In fact, Schmenner found that firms do not tend to exploit all of the government programs available to them in locating a new plant site. Second, Schmenner states that it is important and influential for state and local governments to provide firms with speedy and accurate information about new plant sites. Response to such routine requests for information about environmental requirements, zoning laws, roads, sewers, etc., apparently may reveal government’s attitude toward business. Finally, Schmenner suggests that state and local governments avoid “tax incentives” as carrots for a plant location, but he also recommends that state and local governments avoid needless notoriety by being “fiscally conspicuous.”⁹ In other words, state and local policies should blend well with existing policies prevailing within the region.

In 1976, the New York State School of Industrial and Labor Relations (NYSSILR) at Cornell University completed a survey of 318 large employers in New York State concerning their perceptions of the business climate.¹⁰ Approximately three-fifths of the sample were goods-producing firms and the remainder were service-producing firms. One of the questions asked respondents to choose the five most important factors in selecting a plant location from a total

9. Schmenner, p. 18.

10. Felician F. Foltman, *Business Climate in New York State: Perceptions of Labor and Management Officials* (Ithaca, NY: New York State School of Labor and Industrial Relations, March 1976).

list of 58 factors developed by NYSSILR. The results of this survey question are summarized in table 1. The six factors selected most often by the respondents were the supply of skilled labor, proximity to markets, productivity of the labor force, supply of unskilled labor, level of state personal income tax, and the level of wages/benefits. The supply of skilled labor was mentioned almost twice as often as the other factors, and some of the cost factors, so important in the Grant and Fantus studies, were hardly important here. It is also interesting that of the tax factors, the most important one was the personal income tax, ranked 5th; and some would argue that the personal income tax is not directly a part of the costs of doing business at all. The NYSSILR study concludes that businessmen see the aggregate of all taxes, i.e., the total tax burden, as the villain, rather than any individual tax per se.¹¹ In that light, the personal income tax may simply be a very visible irritant to business executives in their other important economic role—that of consumer. In general, the NYSSILR study provides some strong evidence that the direct costs of operating a business are only a part of assessing the business climate in a state.

The Industrial Development Research Council (IDRC) is an Atlanta-based organization whose members are top business executives responsible for locating a plant. In 1975, the IDRC surveyed its members concerning their views on environmental and land use controls,¹² including a question in which these executives were asked to rate the states in terms of their general attitude toward business. Since the remainder of the survey dealt with environmental and land use controls, it is unclear whether responses to that one question can be judged as an estimate of the overall business climate or strictly as an estimate of each state's responsiveness to

11. Foltman, p. 6.

12. "IDRC Airs Views on Environmental, Land Use Controls," *Industrial Development*, May/June 1975, pp. 7-10.

Table 1
The 18 Factors Most Often Selected by Businessmen as Most Important
in Locating a Firm (each of 318 respondents listed up to 5 factors)

Factors	Number of times listed and order of listing						Weighted total ^a
	Total	1st	2nd	3rd	4th	5th	
Supply of skilled labor	120	82	14	7	10	7	514
Proximity to markets	80	25	13	14	16	12	263
Productivity of labor force	77	11	29	24	6	7	262
Supply of unskilled labor	68	20	32	4	9	3	261
Level of state individual income tax	62	13	10	13	15	11	185
Level of wages/benefits	61	11	16	21	11	2	206 ^b
Level of state corporate income tax	52	5	7	9	15	16	126
Attitude of organized labor	48	4	15	12	11	6	144 ^b
Attitude of state government leaders	48	11	8	4	9	16	133 ^b
Access to truck transportation	40	4	5	12	8	11	103
Proximity to raw materials or supplies	38	7	7	11	8	5	117 ^b
Attitude of state legislators	29	10	4	4	3	8	92
Level of local property tax	29	3	3	4	12	7	70
Level of state corporate franchise tax	27	4	6	7	7	3	82

Availability of state financial incentives	27	3	5	5	5	9	69
Attitude of local government leaders	27	2	6	2	6	11	63
State unemployment insurance laws	26	7	8	5	5	1	93 ^b
Level of county or city sales tax	26	3	1	6	5	11	69

SOURCE: F.F. Foltman, *Business Climate in New York State: Perceptions of Labor and Management Officials* (Ithaca, NY: New York State School of Industrial and Labor Relations, March 1976), p. 11.

a. In weighted total, extra weight is given to item depending on order listed by the respondent. If listed first, each mention is given a value of 5; for second, 4; for third, 3; for fourth, 2; for fifth, 1.

b. If weighted total is used for ranking, these items move up in rating.

land use controls and environmental regulations. In any event, there is a general correspondence between the ranking of states in the IDRC study with the ranking in the Grant and Fantus studies. Michigan is one of the low ranked or "anti-growth" states.

Recent direct interview studies of business executives and surveys of businesses highlight the fact that the decision to locate a plant remains a complex one; it is not a simple enumeration of the direct costs of doing business. Some of the other factors besides costs which are important are proximity to markets, supply of skilled and unskilled labor, and the quality of life.

How does Michigan fare with these other criteria? Since Michigan is near the mid-point of the great Kansas City-Chicago-New York-Washington manufacturing axis and within 500 miles of almost 50 percent of the nation's business establishments as well as almost 50 percent of the nation's spendable income, not to mention the huge and easily accessible Canadian markets, proximity to markets is not viewed as a major problem. Also, finding skilled and unskilled workers willing and able to work is not an obstacle to locating a plant in Michigan since at present there are over 466,000 unemployed workers in the state. A separate discussion of the quality of life criterion follows.

IV. The Business Climate: Quality of Life

The quality of life in a state or area is thought to be a factor which is growing in importance as a criterion for the location of industry, especially high technology industry. Unfortunately, no two individuals evaluate "quality of life" in the same way, so establishing an objective criterion is difficult. Nonetheless, there have been attempts to provide such measures. Even the Grant study, a cost-centered approach to estimating the business climate, included one variable as a "proxy" for the quality of life.

The Midwest Research Institute (MRI) is an independent, not-for-profit contract research organization located in Kansas City. In 1973, MRI, supported in part by a grant from the Kerr Foundation of Oklahoma, developed a quality of life rating for each of the 50 states and the District of Columbia.¹³ Nine separate aspects of the quality of life were evaluated. The nine aspects were: individual status, individual equality, living conditions, agriculture, technology, economic status, education, health and welfare, and state and local governments. Over 100 individual factors or variables were utilized in developing these ratings; an overall composite rating for each state was developed also. Michigan ranked 26th overall among the states in this quality of life study.

13. Ben-Chieh Liu, *Quality of Life in the United States* (Kansas City: Midwest Research Institute, 1973).

Given the complexity of the MRI study, no attempt is made here to list the more than 100 variables utilized. However, the nine aspects evaluated were presumed to be indices of the quality of life; therefore, they deserve further comment.

Individual status was interpreted as describing existing opportunities for self-support through various employment measures, promoting maximum development of individual capabilities through various education measures, and widening the opportunity for individual choice through measures of mobility and information availability. Individual equality focused on various measures where race and sex were a factor. Living conditions evaluated various social factors such as the accident death rate and the marriage-divorce rate, facilities for living such as parks and libraries, and a general area which included such factors as crime rates, housing units with plumbing facilities, and the cost of living. The assessment of agriculture presumed that large operations enhance efficiency and minimize the "under-employment of rural labor,"¹⁴ and so concentrated on various capital equipment and size measures. Technology measured the promotion and encouragement of scientific manpower as well as the level of existing scientific manpower, thus presuming that properly trained manpower is one of the dominant factors in technological change and improvement. The purpose and interpretation of the remaining four aspects of the quality of life—economic status, education, health and welfare, and state and local governments—are more self-evident and not discussed here.

The raw data for each of the variables were converted to index form using the mean of the individual data series for all the states as the index base; the indexes were then summed as deemed appropriate in the study and restated once again

14. Liu, *Quality of Life in the United States*, p. 9.

in index form to obtain the composite ratings for each of the nine aspects of the quality of life. The individual indexes for each variable were weighted equally in this summing procedure. The overall composite index of all nine aspects of the quality of life was obtained by summing the nine individual indexes and restating the result once again in index form.

In 1975, MRI, funded by a grant from the U.S. Environmental Protection Agency, followed up its study of the quality of life for the states with a similar study for the 243 SMSAs.¹⁵ Over 123 variables were used to develop ratings in five separate areas of the quality of life as well as a composite rating. The five areas were: economics, politics, environment, health and education, and social. These five areas were similar to the nine areas studied in the MRI study of the quality of life in the states with the following exceptions: individual status, individual equality and living conditions were included in the social component, consideration of agriculture and technology were dropped, and the environment was added as a separate new factor. This new environmental factor focused on measures for air, visual, noise, and water pollution and various climatological data.

The SMSAs were divided into three groups based upon population—large (over 500,000), medium (200,000 to 500,000), and small (less than 200,000). Comparisons were made only within the same group. In other words, a large SMSA was compared only to other large SMSAs, etc. No justification for the population groupings was given in the study, except that less data were available to study the small SMSAs. The Kalamazoo—Portage SMSA was ranked 8th among 83 medium sized SMSAs in the overall quality of life. In fact, the MRI study concluded that the quality of life in

15. Ben-Chieh Liu, *Quality of Life in the U.S. Metropolitan Areas* (Kansas City: Midwest Research Institute, 1975).

health and education tended to be outstanding in many of Michigan's SMSAs.¹⁶

In May 1979, the U.S. Department of Agriculture developed a quality of life rating for 3,097 counties of the United States.¹⁷ Out of an initial list of 35 variables thought to be important in determining the quality of life, principal components analysis¹⁸ was used to determine if it was possible to reduce that list to a smaller number of measures or indexes which would still adequately or generally describe the quality of life. The resulting 12 variables as part of four composite indexes of the quality of life were:

1. *Socioeconomic*: median family income, families with male heads not in poverty, school attainment, and dwelling units with plumbing.
2. *Health*: mortality from all causes, infant mortality and mortality from influenza and pneumonia.
3. *Family*: proportion of children living with both parents, difference in percent of males and females in the labor force, and percent of families with female heads.
4. *Alienation*: mortality from suicides and cirrhosis of the liver.

Although the final selection of variables and indexes may somewhat reflect the value judgments or rural interests of the Department of Agriculture, the methodology and results of the study are interesting. In this study of the quality of life, Kalamazoo County is ranked average in family status and alienation, and well-above average in health and socioeconomic status.

16. Liu, *Quality of Life in the U.S. Metropolitan Areas*, p. 50.

17. Peggy J. Ross, Herman Bluestone, and Fred K. Hines, *Indicators of Social Well-Being for U.S. Counties*, Rural Development Research Report No. 10 (Washington: U.S. Department of Agriculture, May 1979).

18. For a short explanation of this statistical technique, see G.S. Maddala, *Econometrics* (New York: McGraw-Hill, 1977), pp. 193-194. A more complete mathematical explanation can be found in any standard statistics text in multivariate analysis.

The primary limitation of quality of life studies, regardless of who the investigators may be, is that it is difficult, if not impossible, to develop objective criteria for "quality." The MRI study of the states presumes that the larger the farm and the more capital equipment used on that farm, the higher the agricultural component of the quality of life in that state, while the U.S. Department of Agriculture study presumes that as females increase their participation rate in the labor force, the family component of the quality of life decreases. Not only might some disagree with both of these criteria, they might even wish to exactly reverse the standards. In other words, there is no "consensus" list of quality of life factors, and in some cases there might even be disagreement over the direction of influence of the factors which are chosen. In any event, based on the available evidence, it is clear that the quality of life in Michigan and the Kalamazoo area both show many positive features.

V. Evaluating the Business Climate in Michigan and the Kalamazoo-Portage SMSA: Wage Costs and Tax Costs

What is the business climate in Michigan and the Kalamazoo-Portage SMSA? According to both the Grant studies and the Fantus study, all of which used a cost-centered approach in estimating the business climate, Michigan's business climate is relatively unattractive. The IDRC study appears to confirm that conclusion in that the state was judged to be anti-growth by business executives. The situation does not appear so bleak, however, if one examines factors other than costs. The surveys of business executives in the NYSSILR and the Schmenner study indicated the importance of other factors such as proximity to markets, supply of skilled and unskilled labor, and the quality of life, all of which are likely more favorable to the State of Michigan. However, despite the positive attributes about Michigan's business climate, the criticism of Michigan as being a high cost state remains.

The purpose of this section is to explore two of the important components of costs, wage costs and tax costs, to determine if Michigan is truly such a high cost state. The details of any data manipulations are relegated for the most part to the appendix to preserve the readability of the paper.

Wage Costs

The business climate studies reviewed earlier and many other studies as well utilize the published data for the average weekly wages of production workers in all manufacturing industries in order to assess relative labor costs across the states. In 1977, Michigan's average weekly manufacturing wage was 43.8 percent above the national average, while the average weekly manufacturing wage in the Kalamazoo-Portage SMSA was 23.0 percent above the national average.¹⁹ Unfortunately, these simple comparisons using the published data, though statistically correct, are not economically meaningful in judging relative wage costs. Michigan's length of the workweek, overtime earnings at premium rates of pay, mix of industry, possible productivity differences, and other factors must also be investigated.

The length of the workweek in Michigan was the longest in the nation in 1977.²⁰ Thus, published data on average weekly wage costs tend to overstate relative wage costs in Michigan. In other words, some proportion or percentage of the difference between the average weekly wage in Michigan and the national average weekly wage is due simply to Michigan's longer than average workweek. A large measure of this distortion can be eliminated by dividing the average weekly wage by the average number of hours worked per week. The net result of these calculations is that 21.7 percent of the difference between Michigan's average weekly wage and the national average weekly wage can be accounted for by Michigan's longer workweek. Since Kalamazoo-Portage's average workweek is slightly less than the statewide average workweek but still longer than the national average workweek, only 15.2 percent of Kalamazoo-Portage's higher

19. U.S. Department of Labor, Bureau of Labor Statistics, *Employment and Earnings, States and Areas, 1938-78* (Washington: Government Printing Office, 1979).

20. *Ibid.*

than national average weekly wage can be accounted for by the longer workweek.

Closely related to the question of the length of the workweek is that of overtime earnings at premium rates of pay. The published data for average weekly wages do not distinguish between regular and overtime pay; yet, one might logically expect that Michigan had a higher than average number of hours worked at premium or overtime rates of pay since it also had the longest average workweek. To the extent that the foregoing is true, the published data for average weekly wages tend to overstate relative average wage costs in Michigan.

Although exact figures for overtime earnings at premium rates of pay are not available, it is possible to make some very conservative assumptions about overtime work and thereby calculate at least a lower bound for the influence of overtime earnings at premium rates of pay on average weekly wages in Michigan. The assumptions are that overtime pay is received only to the extent that the average workweek in Michigan exceeds the national average workweek and that the premium rate paid for this overtime work is 50 percent higher than the regular rate of pay. Utilizing these assumptions, it was found that a minimum of 11.3 percent of the difference between Michigan's average weekly wage and the national average weekly wage can be accounted for by overtime earnings at premium rates of pay. The same calculations for the Kalamazoo-Portage SMSA reveal that a minimum of 7.7 percent of Kalamazoo-Portage's higher than average weekly wage is due to overtime earnings at premium rates of pay.

Since the effects of the length of the workweek and overtime earnings at premium rates of pay are so closely related, it may be helpful to combine these two aspects of the presentation and restate the conclusions before proceeding further.

The published data for average weekly wages in Michigan and the Kalamazoo-Portage SMSA are distorted upward or overstated vis-a-vis the national average due to a longer than average workweek and overtime earnings at premium rates of pay. Specifically, after accounting for both Michigan's longer average workweek and a minimum estimate of overtime earnings at premium rates of pay, Michigan's average weekly wage in 1977 was 30.4 percent above the national average instead of the published figure of 43.8 percent. Likewise, Kalamazoo-Portage's average weekly wage in 1977 was 18.0 percent above the national average instead of the published figure of 23.9 percent.

Another reason that the published data for average weekly wages appear to be so high in Michigan is the structure of manufacturing in the state, often referred to as the mix of industry. Michigan has specialized in those industries which tend to be the highest paying industries in the nation, e.g., transportation equipment, primary and fabricated metals, machinery, and chemicals. Specifically, 80.0 percent of all production workers in Michigan in 1977 were employed in industries that were high wage paying industries for the entire nation, as illustrated in table 2. This unusual concentration of high paying industries results in disproportionate weight in the published data for average weekly wages in Michigan, and the state's wage costs relative to the national average are thereby overstated.²¹

The extent to which the unique mix of high paying industries accounts for the higher overall wages for all manufacturing industries in Michigan can be estimated. If we assume that Michigan and the Kalamazoo-Portage SMSA

21. There is also evidence of an occupational mix problem as well as an industrial mix problem. As noted by one researcher, the older industrial regions have tended to maintain their research and development centers. Thus, some workers in Michigan may be technically classified as production workers when, in fact, they "produce" mock-ups, experimental designs, etc. Of course, such workers receive much higher pay than ordinary production workers. See Schmenner, *Summary of Findings*, p. 14.

Table 2
Concentration of High Wage Employment by Industry
in the United States and Michigan

United States high wage industry	United States wage index ^a	Percent of workers employed	
		United States ^b	Michigan ^c
Tobacco	1.05	.4	—
Paper	1.09	3.6	2.2
Printing & publishing	1.08	4.6	2.5
Chemicals	1.16	4.0	2.6
Petroleum & coal	1.44	0.7	0.2
Stone, clay & glass	1.02	3.5	1.9
Primary metal	1.37	6.5	8.6
Fabricated metal	1.03	8.7	14.7
Machinery except electrical	1.11	10.3	13.0
Transportation equipment	1.32	9.4	34.0
Total		51.7%	80.0%

SOURCE: Based on data from the U.S. Department of Commerce, Bureau of Census, *Census of Manufactures, 1977* (Washington: Government Printing Office, 1977).

a. Each industry's average wage rate for production workers is divided by the U.S. average wage rate for production workers in all manufacturing industries.

b. Each industry's production employment is divided by total U.S. production employment for all manufacturing industries.

c. Each industry's production employment in Michigan is divided by total Michigan production employment for all manufacturing industries.

had the same concentration or mix of industry as the nation as a whole, then it is possible to compute a "national composition" average wage for Michigan by multiplying the average wage for each industry in Michigan by the degree of concentration of that industry in the nation as a whole and summing the results.²² These calculations show that 43.5 per-

22. Much of the data on wage costs is from 1977 because of the availability in that year of the Census of Manufactures, the most comprehensive recent statistical report available about U.S. industry, from which it is possible to calculate the composition constant wage rates. See U.S. Department of Commerce, Bureau of the Census, *Census of Manufactures, 1977* (Washington: Government Printing Office, 1977).

cent of the difference between Michigan's higher average wage and the national average wage can be explained by Michigan's mix of industries. The comparison is even more striking for the Kalamazoo-Portage SMSA, where 51.9 percent of Kalamazoo-Portage's higher average wage can be explained by the unique mix of industries.²³

Other factors that may explain Michigan's higher average wages are productivity or quality differences. If Michigan's workers are of higher quality and therefore more productive, then those higher wages may simply reflect the fact that business obtains more output on average from each of its labor inputs in Michigan. Unfortunately, productivity differences across the states are difficult to measure, largely because the factors of production—labor inputs, capital inputs, material inputs, etc.—can be combined in varying proportions in the making of output. Thus, direct comparisons across the states are difficult to make.

One crude measure that has been utilized to obtain at least an "idea" of the productivity of labor is the computation of value added per production employee, where value added is the difference between total sales and all material costs. In 1977, value added per production employee in Michigan was 11.3 percent higher than the national average, while value added per production employee in the Kalamazoo-Portage SMSA was 21.6 percent higher than the national average. These results are not surprising since the state is composed largely of industries in which value added per worker tends to be high nationally. Therefore, just as average wages in Michigan were adjusted for the mix of industry, it is also appropriate to adjust value added per employee for each in-

23. Michigan's industrial mix does affect economic development in the state. It may be difficult to attract low wage industries which must then compete in the same labor market as the dominant high wage industries. One exception, is the possibility that the skills of the low wage workers are not amenable to the needs of the high wage industries. Another exception might occur if the low wage industry can locate in a relatively low wage area within the state.

dustry in Michigan to determine (crudely) if the higher than average productivity in the state is due simply to a concentration of high value added industries. The net results of these calculations were to reduce both Michigan's and Kalamazoo-Portage's value added per employee, but they remain 9.1 percent and 19.8 percent above the national average respectively.

While the foregoing results do not necessarily prove that Michigan's workers are more productive, there is other fragmentary evidence to consider. First, as already noted in the previous section of this paper, several quality of life studies indicate that many of Michigan's SMSAs are outstanding in terms of health and education, important factors in improving the quality of workers. Second, in 1973, Michigan was ranked 12th best in the nation for the low proportion of selective service exam rejections due to physical and mental reasons, a rough measure of quality of the citizens. Third, the relative stability of the state's labor force is amply demonstrated by the fact that Michigan ranks first in the proportion of its citizens who are homeowners. And finally, the average quit rate in manufacturing in Michigan in 1977-78, relatively good years for the state, was 50 percent below the national average. In fact, throughout the 1960s and 1970s, Michigan's average quit rate tended to be substantially below the national average.

In short, it appears reasonable to conclude that the productivity of Michigan's workers is equal to or conceivably above average. To the extent that Michigan's higher average wage rates represent true productivity differences, then, those higher average wage rates should not discourage businesses from locating in Michigan.

After accounting for Michigan's length of workweek, overtime pay, and the mix of industry, average weekly wages in Michigan and the Kalamazoo-Portage SMSA remain 17.2

percent and 8.7 percent higher than the national average respectively, as illustrated in table 3.²⁴ Of course, none of the comparisons in table 3 account for any possible productivity differences, and there may be other reasons too numerous to discuss that may further account for Michigan's higher average wages. For instance, the stability of the Michigan workforce may result in a higher than average experience level, while the below average quit rate may lower training costs. To some extent, both factors may be reflected through higher average wages. However, disregarding these other differences as well as possible productivity differences, the limited analysis of average wage costs in this review has illustrated that superficially attractive and widely published statistical data may be very misleading in assessing relative wage costs.²⁵ At the very least, the published data significantly overstate or exaggerate Michigan's true relative wages, largely due to Michigan's mix of industry but also due to a longer average workweek and overtime earnings at premium rates of pay.

Tax Costs

Wage costs are only one important element in total costs. State and local taxes are another aspect of the cost of doing business. Despite the fact that the true importance of state and local taxes in the determination of the location of business may be secondary, these taxes are controlled by

24. These statistical results are not meant to imply that any existing wage differences are so small that they are unimportant, for even small decreases or increases in wage costs, one of the important costs of doing business, can change profits dramatically, all other things equal. Perhaps the reason that interviews with businessmen do not indicate that wage costs are the overriding consideration in location decisions is that so many other things are *not* equal.

25. Note that the data used in this study and most other studies ignore fringe benefits which include such things as vacations, holiday pay, insurance and pensions. The reason is that only scanty information is available about fringe benefits, and the information which is available is not truly comparable across the states for some of the same reasons that the published data on average wages are not comparable and many other reasons as well.

legislative bodies and those same bodies can alter tax rates. In short, state and local taxes are important to the government because they are the policy variables through which the costs of doing business within a state can be influenced. One would also expect business leaders to be vocal supporters of lower business taxes in order to lower production costs.

Table 3
Relative Index of Average Weekly Wages
for all Manufacturing Industries in Michigan
and the Kalamazoo-Portage SMSA, 1977
(United States base = 100.0)

Average weekly earnings as percentage of U.S. average of 100, adjusted for:	Michigan	Kalamazoo- Portage SMSA
Length of workweek, overtime earnings at premium rates of pay, and mix of industries	117.2	108.7
Length of workweek and overtime earnings at premium rates of pay only	130.4	118.0
Length of workweek only	134.3	119.5
Published data	143.8	123.0

SOURCES: Published data are from U.S. Department of Labor, Bureau of Labor Statistics, *Employment and Earnings, States and Areas, 1938-78* (Washington: Government Printing Office, 1979). The relative adjustment for mix of industry was based on data from U.S. Department of Commerce, Bureau of the Census, *Census of Manufactures, 1977* (Washington: Government Printing Office, 1977).

Any analysis of state and local taxes is complicated by many factors, only two of which are mentioned here. First, taxes are often viewed as a nonproductive cost when, in fact, government provides services in return for those taxes. Thus, high taxes in a state may simply reflect the fact that the citizens of that state, including at least some of its businessmen, desire more government services. Second, data

on tax receipts, especially business taxes, do not necessarily reflect the true incidence of the tax, where incidence refers to who really pays the tax as contrasted to who collects and forwards the taxes to the government. For instance, no one would conclude that the severance taxes on coal and oil in such states as Wyoming and Alaska are really paid by the residents of those states, yet data on tax receipts appear to indicate exactly that. To the maximum extent possible, businesses pass taxes forward to both in-state and out-of-state consumers of their products. However, some business taxes may be passed backward to the factors of production which make the product through lower profits, wages, rents, and interest. Unfortunately, the direction and extent of such shifting of taxes is difficult to estimate in most cases.

With these caveats in mind, let us examine the question of state and local taxes from the standpoint of costs. Many studies consider the myriad details of state and local taxes, much like the Fantus study. However, it appears reasonable that the aggregate of all taxes is the villain rather than any individual tax per se. A state may choose to finance its educational system with predominantly local taxes, predominantly state taxes or some combination thereof. Therefore, little meaningful information is gleaned by examining the components of taxes in great detail. Likewise, a state may advertise that it has no corporate income tax, but then that same state may have very high yearly franchise fees, licenses, and possibly even high personal income tax rates.

Three broad approaches to determine the influence of state and local taxation appear plausible and consistent with the foregoing discussion. One is to examine total state and local taxes. A second is to examine state and local taxes in which the initial incidence is on business (remembering that the ultimate burden may be shifted elsewhere). And the third possible approach is to determine the total tax burden on highly paid technical and professional workers. Although

this third approach may be much more narrow than the other two, remember that businessmen are also consumers and may, therefore, base location decisions in part on their own personal tax burden. Also, the total tax burden on highly paid technicians and professional workers in a state may influence the degree to which that state can attract and develop the high technology industries which employ such workers.

Recently, the Advisory Commission on Intergovernmental Relations (ACIR) has compiled the necessary data for the first two approaches.²⁶ The part that has been lacking for many years is a reliable estimate of state and local business property taxes and sales taxes on business purchases for their own use and consumption. Aside from the development of the referenced business tax data, ACIR used the standard Census Bureau definitions of state and local taxes. The additional business taxes not already mentioned are business income taxes, insurance taxes, severance taxes, public utilities gross receipts taxes, various license taxes, and miscellaneous business taxes. Personal taxes include the personal income tax, residence property taxes, sales taxes on personal purchases, personal excise taxes such as those on cigarettes, liquor, parimutuels, etc., and motor fuel and vehicle taxes. The Census Bureau definition of state and local taxes does not include employer contributions to social security, unemployment compensation, and workers' compensation.

Utilizing the ACIR data and presuming that businesses desire lower taxes, it was found that Michigan ranked 40th in total state and local taxes per capita in 1977. Michigan's total state and local taxes per capita were 8.4 percent above the national average.

26. Advisory Commission on Intergovernmental Relations, *Regional Growth: Interstate Tax Competition* (Washington: Government Printing Office, March 1981).

It is not at all clear, however, whether state and local taxes should be evaluated on a per capita basis. Perhaps a more meaningful comparison can be gained by examining state and local taxes as a proportion of personal income earned in the state, generally referred to as the burden of taxation.²⁷ In other words, is state and local government taking an above average share of personal income in one state vis-a-vis other states? Using this approach ACIR found that in 1978 Michigan ranked 32nd in total state and local taxes as a proportion of personal income. Specifically, 12.67 percent of personal income in Michigan was paid in state and local taxes, and that rate was slightly under the national average.

Turning to the second approach of examining taxes which have an initial impact on business, it was found that Michigan was ranked 36th in state and local taxes with an initial incidence on business per employee, and that business tax rate was 1.0 percent above the national average. ACIR reported that the proportion of taxes in Michigan with an initial incidence on business in 1977 was 28.5 percent of total state and local taxes collected in the state. Perhaps surprisingly, Michigan ranked 16th lowest among all states in the nation in their reliance on business taxes to raise revenue. Also, ACIR pointed out that from 1957 to 1977 Michigan had the fifth greatest percentage decrease in reliance on business taxes of any state in the nation.

As previously mentioned, it is necessary to be very cautious in interpreting any tax data, and several comments are warranted concerning the decline in the importance of business taxes to raise state and local revenue. First, business tax collections are rising absolutely in Michigan as well as nationwide; it is only in their relative importance that business taxes are decreasing both in Michigan and nationwide. Second, this relative decline can be accounted for in part by the

27. The economics literature prefers the concept of burden because all taxes must ultimately be paid from income.

rising importance of two taxes which respond more readily to growth in the economy; namely, state personal income taxes and sales taxes. Third, the relative decline in the importance of business taxes most likely reflects deliberate tax policy to improve the business climate. ACIR points out that 8 of the 10 states with the greatest percentage reduction in their reliance on business taxes are located in the slow growth regions of the Northeast and Midwest.²⁸ And finally, the decline in the relative importance of business taxes also reflects the simple fact that manufacturing industries as a whole are becoming less important in the economy.

The third approach to evaluate the influence of taxes on the business climate is to determine the relative tax burdens on highly paid workers. In 1979, Ecker and Syron published a study of the relative tax burdens of an individual making \$25,000 and \$50,000 income per year for 1977 with homes valued at twice their income for 22 selected localities in the United States.²⁹ The selected locality in Michigan was Farmington Hills. For a person with \$25,000 of income, Michigan had the 12th lowest total tax burden and was slightly below the average tax burden for the 22 selected localities. For a person with \$50,000 of income, Michigan had the 9th lowest total tax burden and once again was slightly below the average tax burden. This limited study of the tax burden of highly paid workers seems to imply that Michigan may be average or slightly below average.

In general, the statistical data presented in this section do not support the contention that Michigan is a high tax state. While total state and local taxes per capita in Michigan are 8 percent above the national average, the state is slightly below average when total state and local taxes are viewed as a pro-

28. Advisory Commission on Intergovernmental Relations, *Regional Growth*, p. 68.

29. Deborah S. Ecker and Richard F. Syron, "Personal Taxes and Interstate Competition for High Technology Industries," *New England Economic Review*, September/October 1979, pp. 25-32.

portion of personal income. Michigan's total business taxes per employee are average, and the proportion of the tax burden in the state with an initial incidence on business is 7.8 percent below the national average. Finally, the tax burden on highly paid professional and technical workers so critically needed in high technology industries appears to be average or below average.

Once again, the reader is reminded of the many difficulties in interpreting any tax data. Though such critical cataloging can be extended to great lengths, several further comments and cautions are warranted concerning Michigan's tax situation. First, even though total taxes in the state may be average, there may remain individual taxes in the state which are burdensome and perhaps even inefficient for business or consumers. Second, there is also some evidence that other so-called high tax states such as California, New York and Massachusetts are attempting to improve their competitive tax position. If they do so, Michigan's relative position may change.

VI. Concluding Remarks

The popular impression, buttressed by the Grant studies in 1979 and 1980 and the Fantus study of 1975, is that Michigan is a relatively unattractive place in which to do business. However, there are inherent limitations in estimating the business climate strictly on the basis of costs alone. It neglects other important factors such as the quality of life, proximity to markets and the supply of skilled and unskilled labor, all factors more favorable to Michigan. Also, there are limitations in the Grant and Fantus studies in terms of redundancy of the data, selection of data, and the standardization of the data. And third, any approach in which published average weekly wage rates are used directly can be particularly misleading for a state such as Michigan where the industrial structure consists predominantly of the highest paying industries in the U.S., where the average workweek tends to be one of the longest in the U.S., and where overtime earnings at premium rates of pay tend to be among the highest in the U.S.

What are the real facts about Michigan's business climate? First, after allowing for Michigan's mix of industry, length of workweek, and overtime pay, Michigan's average manufacturing wages in 1977 were found to be reduced to within 9 to 17 percent of the national average. These results may still overstate Michigan's true relative wages, however, because they do not account for such factors as the historic stability and experience level of Michigan's workers and the low quit rates of Michigan's workers. In addition, there is other fragmentary evidence that Michigan's workers may be

of a higher quality and more productive than the national average. Second, Michigan's relative burden of total state and local taxes is no more than average and perhaps slightly below average, the relative burden of business taxes is average, and the burden of taxation on highly paid technicians and professional workers appears to be average or below average. Third, the quality of life in Michigan has been measured to be at least average for most, and even better than that in many parts of the state. Fourth, Michigan's proximity to markets and supply of skilled and unskilled labor appear to remain favorable, though not formally evaluated in this review.

Perhaps the most troubling aspect of Michigan's business climate is that the state was and has been widely perceived to be anti-business. The point is that the facts of Michigan's business climate are far overshadowed by the popular perception of Michigan's business climate. In other words, that long-standing perception has probably had and will likely continue to have a more profound and lasting negative impact on the economic health of the state than the individual facts warrant.

Since the economic future of Michigan is directly related to the degree of success in expanding job opportunities in the state, and Michigan's "image" problem apparently is a long-standing one, an important policy goal of the 1980s should be to improve the reputation of the state as a desirable place to live and work. Measures utilized for making comparisons across regions have too often resulted in distortion of reality. While there are undeniable problems and a need for improved economic performance in Michigan, there is also a need for factual analysis which distinguishes real problems from popular myths and misconceptions.

Appendix

Appendix

The purpose of this appendix is to provide the technical details of the data manipulations and further information about the sources of data, as necessary.

The minimum effect of overtime earnings at premium rates of pay on average weekly wages was estimated. First, average weekly wages in a state are a function of regular and overtime earnings, or

$$E_i = w_i (X_i + a Z_i)$$

where

E_i = average weekly wages in state i

w_i = regular hourly rate of pay in state i

X_i = number of hours in the average workweek in state i

a = premium paid for overtime work, assumed to be 0.5 in this paper

Z_i = number of overtime hours worked in state i , assumed to be those hours worked in state i in excess of the national average workweek, zero otherwise

Since E_i , X_i , and Z_i are observed and a is assumed constant, we can solve for the regular hourly rate of pay in state i ,

$$w_i = \frac{E_i}{(X_i + a Z_i)},$$

and a $w_i Z_i$ is the influence of overtime earnings at premium rates of pay on average weekly earnings in state i .

The national composition constant average wage rate for a state is:

$$xc_j = \sum i w_{i.US} \frac{W_{ij}}{H_{ij}}$$

where

xc_j = national composition constant wage rate for production workers in state j

$w_{i.US}$ = concentration of industry i in the U.S., determined by dividing the number of production workers in industry i in the U.S. by the total number of production workers in the U.S.

W_{ij} = total production wages paid in industry i, state j

H_{ij} = total production hours worked in industry i, state j

Of course, the weighted average, xc_j , is not accurate unless

$$\sum i w_{i.US} = 1,$$

but some industries are either not represented in a state or the information is withheld for reasons of confidentiality. In such cases, the $w_{i.US}$ not specifically identified in a state can be multiplied either by the unadjusted or unweighted average wage in the state for all production workers or by the average wage for industries not specifically identified in the state. The latter approach was used since the identified industries in the state have already been accounted for in the weighted average.

The procedure to calculate the national composition constant value added per employee is analagous to that for the national composition constant average wage rates. In short,

$$VAC_j = \sum i w_{i.US} \frac{VA_{ij}}{Y_{ij}}$$

where the variables not already defined are:

VAC_j = national composition constant value added per
production employee in state j

VA_{ij} = value added in industry i , state j

Y_{ij} = number of production employees in industry i ,
state j

The source for the ACIR tax data has already been given, but note that the *revised* appendix tables were used for the computations in this paper. The population data necessary to calculate per capita taxes in 1977 were obtained from the *Statistical Abstract of the United States 1980*, U.S. Department of Commerce, Bureau of the Census, Washington. The employment data used to calculate business taxes per employee were the series for nonagricultural employment excluding government workers, as found in *County Business Patterns 1977: United States*, U.S. Department of Commerce, Bureau of the Census.

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