Michigan's Economic Competitiveness and Public Policy

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Executive Summary

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Michigan has faced serious economic problems since the last business cycle peak in 2000. As shown in Figure ES-1, from 2000–2005, Michigan on average has declined by 1.3 percent in employment each year.

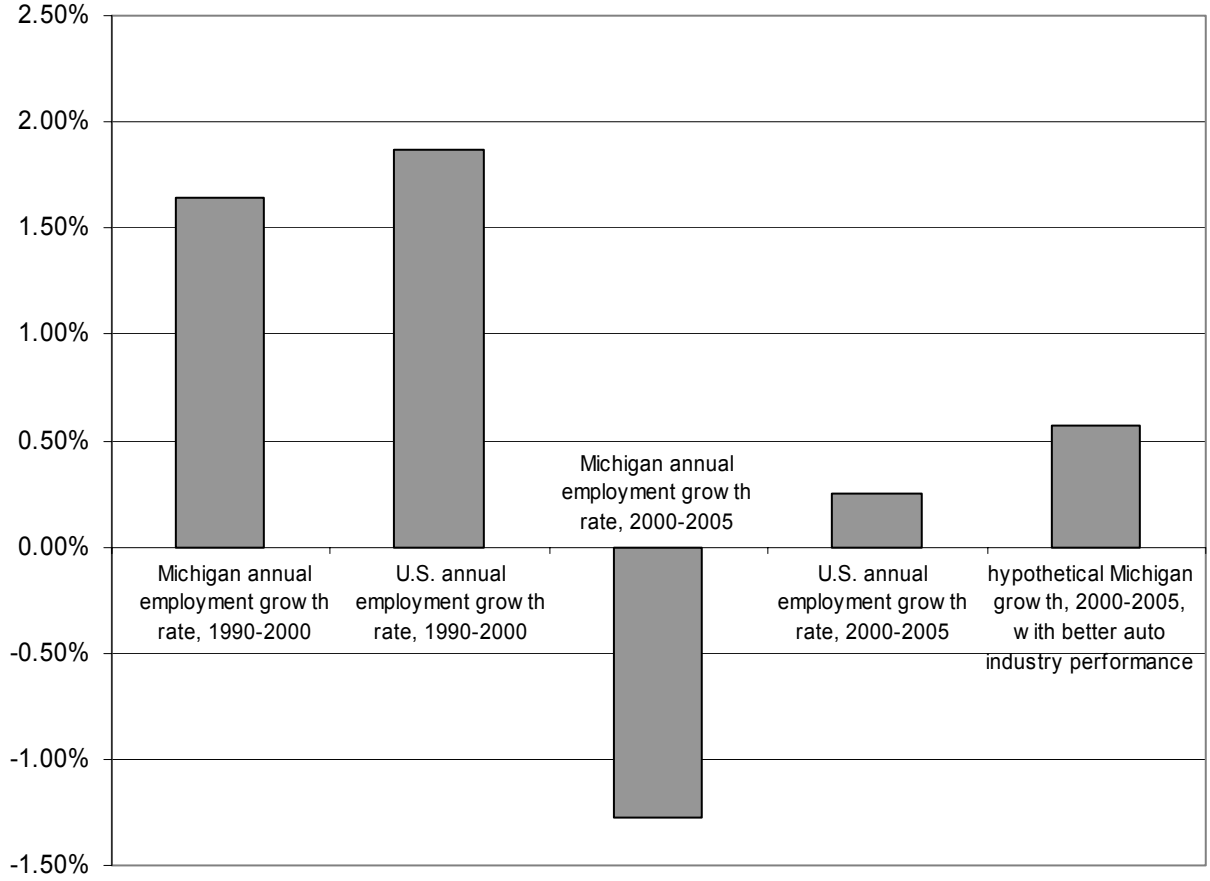

Figure ES-1. Michigan vs U.S. Employment Growth, Annual Percentage Rate

Part of Michigan's employment declines are attributable to slow national growth. From the business cycle peak of 1990 to the next business cycle peak of 2000, national employment growth was a robust 1.9 percent in additional employment per year. But from 2000 to 2005, national employment growth has slowed to only 0.3 percent per year.

But Michigan has also suffered from an additional "growth gap" vs. the U.S. since 2000. During the 1990s, Michigan's employment growth, at 1.7 percent per year, was only 0.2 percent per year behind the U.S. average. Since 2000, Michigan's average annual employment growth has been over 1.5 percent behind the U.S. average.

This report considers the following types of questions:

1) What has caused Michigan's increased growth gap compared to the growth of the U.S.? Is this due to problems in Michigan's public policies, such as allegedly excessive Michigan taxes or an allegedly inadequate Michigan education system?

2) Regardless of the causes of Michigan's increased growth gap, what is the potential for Michigan to improve its employment growth with better business tax policies or education policies?

THE CAUSES OF MICHIGAN'S SLOW GROWTH VS. THE U.S.'S

Our report's analysis suggests that Michigan's slow growth in recent years vs. the U.S.'s can be explained by Michigan's overspecialization in the Big Three auto companies. The share of Michigan's employment in motor vehicles is over seven times the national average. Furthermore, each job lost in the Michigan motor vehicle industry causes a loss of more than four other jobs in other industries in the short run, and more than five other jobs in other industries in the long run. Many Michigan businesses are dependent on the spending either of the Big Three in purchasing supplies, or of the Big Three's workers in purchasing consumer goods and services.

Since 2000, the overall automobile industry has fared poorly throughout the nation. In addition, the share of Michigan's auto industry in the national market has sagged.

To put this in quantitative terms, our analysis suggests that the overall slow growth of the auto industry has depressed Michigan's employment growth since 2000 by perhaps 1.8 percent. As shown in Figure ES-1, if the auto industry had done better, Michigan's employment growth from 2000 to 2005 would probably have been close to the U.S. average.

This finding makes it unlikely that Michigan's recent slow growth is primarily due to allegedly excessive business taxes or inadequate job skills. The slow growth of autos in Michigan is probably due to national and international trends and to trends in the auto industry, not to the state of Michigan's policy choices.

ARE MICHIGAN'S BUSINESS TAXES UNCOMPETITIVE?

Even though Michigan's business taxes are unlikely to be a major factor in explaining the state's recent slow growth, the question remains as to whether our taxes are out of line with those of the U.S. and our competitor states.

As shown in Table ES-1, using three different tax measures, the most recent measures of Michigan's taxes suggest that Michigan's taxes and business taxes are actually slightly below the U.S. average. Depending on the tax measure one uses, Michigan's taxes appear to be from 5 to 19 percent below the U.S. average.

Similar results occur when comparing Michigan's taxes to such nearby competitors as Indiana, Illinois, and Ohio. In addition, Michigan's taxes appear to have trended downwards relative to the U.S. average for all states and relative to our nearby competitor states.

Table ES-1. Michigan's Taxes vs. the U.S. Average, Three Different Tax Measures

Overall state and local taxes per dollar of personal income	Average state and local business taxes per dollar of private gross state product	State and local business taxes on investment in a new business facility
5% below U.S. average	12% below U.S. average	19% below U.S. average

NOTE: Based on Table 5 of full report. For each type of tax, we are using the most recent data available.

WHAT COULD BUSINESS TAX CUTS DO FOR THE MICHIGAN ECONOMY?

Even if Michigan's business taxes are competitive, further cuts in Michigan's business taxes might be able to boost the economy. For this report, we use the best available regional econometric model of Michigan's economy to simulate the possible effects of abolishing Michigan's Single Business Tax on Michigan's annual employment growth rate. We find that the economic effects of this policy depend crucially on how this policy change is financed. In particular, we reach the following conclusions:

1) If the abolition of Michigan's Single Business Tax is financed by a reduction in public spending and public services, the estimated effects in boosting growth range from a positive 0.09 percent per year to a negative 0.01 percent per year (i.e., this policy change might reduce Michigan's growth rate), depending upon assumptions about how public services affect business productivity and costs.

2) If the abolition of Michigan's Single Business Tax is financed by broadening the sales tax to include services, this policy change would boost Michigan's annual employment growth rate by 0.13 percent per year.

3) If the abolition of Michigan's current Single Business Tax leads to its replacement with a business tax that raises similar revenue but imposes zero additional costs on new business investment by giving investment tax credits or deductions, then this policy change would boost Michigan's annual employment growth rate by 0.16 percent per year.

Therefore, under a wide variety of assumptions, a major business tax change such as abolishing Michigan's Single Business Tax, while it may boost growth, is unlikely to solve more than a small proportion of Michigan's recent growth gap behind the U.S. Recall that Michigan's growth gap in annual employment growth vs. the U.S.'s is over 1.5 percent per year. These business tax changes would make up no more than one-ninth of this growth gap at best.

How a business tax cut is financed matters because a state's economy is affected by public spending as well as by tax policy. Cuts in public spending have two potential types of negative effects on a state's economy. First, reduced public spending reduces jobs and wages for public employees, as well as for employees in private organizations that contract with the government. The reduction in jobs and wages in publicly financed organizations in turn leads to reduced consumer spending, which reduces jobs in many private firms. Second, reduced public spending, if it reduces the quality of public services, may reduce the attractiveness of a state to

both businesses and households. The quality of roads and other infrastructure, as well as of education and job training programs and other services, may directly and immediately affect some businesses' productivity and costs, which will affect their interest in locating and expanding in the state. In addition, if cuts in public services lead to households not choosing to locate in the state, this may adversely affect the cost and availability of labor to businesses, which will eventually also affect business location and expansion decisions.

WHAT COULD BOOSTS IN EDUCATIONAL ATTAINMENT DO FOR MICHIGAN'S ECONOMY?

Recent research on regional economies suggests that regional economies with a greater proportion of college graduates are more successful. These regional economies are more successful in two dimensions. First, regional economies with more college graduates appear to be able to sustain higher wages for all workers, including workers who don't go to college. Second, regional economies with more college graduates appear to have greater long-run growth.

These social benefits of more education for regional economic growth probably occur because of effects of greater overall education on productivity. When the local workforce is more educated, firms find it easier to obtain workers who can readily use more productive technologies. Furthermore, more-educated workers find it easier to use new technologies that firms may wish to introduce.

Improvements in the education of Michigan's workers could make a significant contribution to closing Michigan's growth gap, but only under certain conditions.

1) The increase in Michigan's educational attainment has to be quite large to have large effects upon the growth gap. For example, to completely close the 1.5 percent annual growth gap with the U.S. would require an increase of about 25 points in the percentage of Michigan residents with a college degree. This is about double Michigan's current percentage of residents with a college degree.

2) To achieve such large increases in educational attainment would require long-term sustained efforts, which would only fully pay off for Michigan's economic development in the long run. For example, suppose we increase the proportion of current K–12 students who successfully complete college by 25 percentage points. Even if this does not lead to an increase in out-migration of Michigan college graduates, this policy would take about 50 years to increase the proportion of Michigan's workforce having a college degree by 25 percentage points. A little less than a quarter of this effect would be achieved within about 15 years of initiating the policy.

3) Increases in educational attainment would be expected to not only attract more and better-paying businesses, but also to lead to more net out-migration of college residents from Michigan. Estimates suggest that without some policy to make Michigan more attractive to college-educated migrants, for every 100 additional Michigan residents who become college graduates, in the long run the number of college graduates in Michigan will only go up by about 30 more college graduates. This occurs because the increased

supply of college graduates makes it harder for college graduates in Michigan to find appropriate jobs at good pay. A consequence is increased net out-migration of college graduates from Michigan.

4) Therefore, to fully realize the economic benefits of greater educational attainment of Michigan's K–12 students, educational reforms must be accompanied by policies to increase the attractiveness of Michigan to college graduates. These policies could include measures to improve amenities that are attractive to college graduates, and economic development policies that encourage the location or expansion of businesses that will employ college graduates.

CONCLUSION

Michigan's recent slow growth is largely due to our overdependence on the fortunes of the auto industry, not to excessive Michigan business taxes.

In the short run, it is difficult for any Michigan policy to fully offset the large negative effects of the competitive challenges facing the Big Three auto companies.

In the medium run and long run, business tax reforms that lowered the taxes on new investment, without cutting public spending and public services, could make some contribution to partially reducing Michigan's growth gap with the U.S. Such policies would require increasing taxes on some businesses and households to make up for the loss of revenue from reduced taxes on businesses making new investments.

In the long run, educational policies that increased the percentage of more skilled workers in Michigan's economy could also make a significant contribution to reducing the gap between Michigan's growth and that of the U.S. economy. To be most effective, such policies would have to increase educational attainment among Michigan's students, while also making Michigan a more attractive place for college graduates to live and work.

1. INTRODUCTION

This report considers Michigan's competitiveness. The "competitiveness" of a state is here defined as features of the state that can be altered by public policy and that affect the state's attractiveness for economic growth, which can raise both wages and employment rates.

A state's economic growth is arguably affected by all the state's features, including many that cannot be changed by public policy, such as climate, and others that are quite difficult to change through policy, such as market wages. Our focus in this report is on features of Michigan that affect growth and can be readily influenced by public policy, such as taxes, public spending, educational attainment of the state's population, and skills of the state's population.

We choose to focus on ways in which Michigan's employment growth might be improved without lowering wages. There are several reasons for this choice. First, the state cannot easily lower wages, although some state policies may influence wages, such as minimum wage policy, labor regulation, and policy towards unions. Second, the issue of how wages affect growth is complicated and controversial. This issue is theoretically complicated because higher wages may not only increase business costs, but may also increase worker productivity by increasing incentives to work hard and by attracting higher productivity workers. This issue is empirically complicated because there is significant controversy over the effects of government policies to regulate wages. For example, in the empirical research on the impact of minimum wage regulation, most economists conclude that the effect of higher state minimum wages on employment is modestly negative, but some economists conclude that the effect of higher state minimum wages on employment is zero or even positive (Card and Krueger 1995; Neumark and Wascher 1997; Neumark 1999). Third, increasing a state's employment growth by lowering

wages is obviously not the most desirable way to increase growth; we would prefer growth that raises both employment rates and wage rates.

Therefore, the plan for this paper is to address the following selective aspects of Michigan's competitiveness:

First, we briefly review how the state has fared from 1990 to 2000 (the previous business cycle), and from 2000 to 2005 (the current business cycle). As is well-known, these trends show the state has done quite poorly in the current business cycle relative to the United States.

Second, we present empirical evidence on which industry trends have contributed to the state's recent economic performance. To the extent that the state's performance is due to national industry trends, or trends in particular firms, bad public policy is unlikely to have caused the current poor performance of the state's economy. As we will show, the state's current poor performance is mainly due to the state's over reliance on the Big Three auto companies. However, this does not mean that public policy could not have effects on Michigan's economic performance.

Third, we review the empirical evidence on Michigan's competitiveness on taxes. We will show that Michigan is quite competitive on taxes today compared to the average state, and compared to our nearby competitor states. Our tax competitiveness seems to have improved over time. However, it would be desirable for the state to have more updated and detailed information on the best measure of business tax competitiveness, which is the marginal tax rate on new business investment.

Fourth, we examine how the Michigan economy would be affected by current proposals to eliminate the Single Business Tax (SBT). As this analysis will show, the estimated effects vary depending upon what one assumes about the sensitivity of business location to taxes, and on

how the SBT elimination is financed. However, under the most plausible assumptions, the effects of SBT elimination on Michigan growth are modest. SBT elimination, or any other way of lowering marginal tax rates on business investment, has more positive effects on Michigan's employment growth if such a tax change is financed without reducing public spending or public services.

Fifth, we briefly review the evidence on how Michigan's growth is affected by the educational attainment of Michigan's workforce. As is well known, the state is below average in its percentage of college-educated workers. Significantly increasing the state's economic performance by improving the educational attainment of Michigan workers is a strategy that takes a long time to accomplish and requires addressing both the educational attainment of Michigan's youth and the attractiveness of Michigan to well-educated migrants.

Sixth, we examine Michigan's competitiveness on specific occupational skills with strong national demand. We do this by looking at occupations in which Michigan has an above-average share and in which national wage trends appear strong. We briefly review what kinds of industries most intensively use these occupational skills; the types suggest some industrial targets that may deserve consideration.

Finally, we summarize the policy lessons of these findings.

A technical appendix presents results from another recent Upjohn Institute study of the competitiveness of different metropolitan areas. From an economic standpoint, a state is not one regional economy but rather a collection of different regional economies, most of which are metropolitan areas. As this appendix shows, the competitiveness of Michigan's metropolitan areas varies widely across different metropolitan areas and different indicators of competitiveness.

2. MICHIGAN'S RECENT ECONOMIC PERFORMANCE

As shown in Figures 1 and 2, since the business cycle peak of 2000, Michigan on average has declined in employment by about 1.3 percent per year. This is considerably worse economic performance than that of the U.S., which has had mediocre but positive employment growth averaging about 0.3 percent per year.

Michigan's recent economic performance is also in contrast with its absolute and relative performance, compared to the U.S., during the period from the business cycle peak of 1990 to the business cycle peak of 2000. During that business cycle, Michigan's average annual employment growth was about 1.7 percent, only slightly behind the U.S.'s employment growth of 1.9 percent annually.

Are these recent trends attributable to bad Michigan public policies, or do they have other causes? And regardless of the causes of Michigan's recent poor performance, what is the potential for changes in Michigan's public policies to increase the state's employment growth?

3. INDUSTRY TRENDS AND MICHIGAN'S RECENT ECONOMIC PERFORMANCE

A common method in regional economics of analyzing a region's growth, and how a region's growth is affected by its industries, is shift-share analysis. This approach divides a region's differential from overall national growth into two components: 1) the "share component," which depends on whether the region has above-average or below-average shares of industries that happen to be fast-growing or slow-growing nationally, and 2) the "shift component," which depends on whether industries in the region grow faster or slower than their national counterparts (whether these industries are "shifting" to the region).

In addition to calculating the overall "share" and "shift" components, it is useful to look at the industry components that are summed to generate these components. The individual industry data allow us to see to what degree a region's specialization in a particular industry is hurting or helping its growth, and to see to what degree the industry is underperforming or outperforming its national counterpart. It should be understood that these industry shift effects, which represent an industry's growth advantage or disadvantage over the industry's national counterpart, will be interrelated across different industries in the same region. For nonexport-base industries—that is, industries that mostly sell to buyers within the region—most of the difference of the industry's growth in a region from the industry's national growth will depend on what happens to other industries in the region. Even for export-base industries, which are defined as industries that sell most of their output to buyers outside the region, the portion of the output sold within the region may influence an industry's measured shift effect.

This shift-share analysis was done on 92 industry categories in Michigan for two time periods, 1990–2000 and 2000–20005, using the same data that we've been using on Michigan and U.S. nonfarm employment. Table 1 summarizes this information by aggregating these 92 industry categories into four industrial categories: 1) motor vehicles and other transportation equipment, 2) federal employment, 3) other export-base industries, and 4) other nonexport-base industries.

Rather than reporting the data as annual percentage growth rates, Table 1 reports data as annual job gains or losses, which allows the data to add up properly and facilitates discussion of multiplier effects of one industry on other industries. As the table shows, after gaining about 70,000 jobs per year during the 1990s, Michigan lost about 58,000 jobs per year during the current decade, a decline in performance of 128,000 jobs per year. A little over half of this

declining job performance is due to slower national job growth. Even if Michigan had grown at the national average in both time periods, annual job gains in Michigan would have declined by about 69,000 jobs.

The shift-share analysis suggests that the remaining half of Michigan's poorer job performance in the current decade, compared to the 1990s, is attributable to Michigan's strong dependence on the Big Three auto companies and to the challenges these companies have faced in the current decade. To understand why this is so, we need to remember that for many industries, their performance in Michigan depends on other Michigan industries, because these other industries or their workers buy their goods and services. What this chart shows is that the share effect for transportation equipment declined from a positive 1,000 jobs per year in the 1990s to a negative 10,000 jobs per year in the current decade. In other words, the generally slow national employment growth of the auto industry, even if Michigan automakers had kept their share of the national market, would have directly caused an annual swing in Michigan job growth of 11,000 jobs per year. In addition, Michigan automakers have lost more national market share in the U.S. auto industry in the current decade than they did in the 1990s. In the 1990s, the loss of national market share for Michigan auto producers cost about 3,000 lost jobs per year; in the current decade, this escalated to a loss of 9,000 jobs per year, for a total swing of an additional 6,000 jobs lost per year.

Thus, the slow national growth of the auto industry caused Michigan's annual job growth to deteriorate by about 11,000 jobs per year, and the declining share of Michigan automakers in the national auto market caused Michigan's annual job growth to deteriorate by 6,000 lost jobs per year. We would expect this total swing in auto job creation, a negative swing of about 17,000 jobs per year, to have multiplier effects on many other Michigan industries, both export-base and

nonexport-base. For example, less auto job creation, or outright job declines, would hurt the plastics industry, which supplies many parts to the auto industry, as well as hurting many wholesale and retail industries that sell goods and services to the auto industry's workers. Our work with the well-regarded REMI regional econometric model for Michigan suggests that the employment multiplier for motor vehicles in Michigan is about 5. With a multiplier of 5, a swing of 17,000 jobs in autos in a negative direction would be sufficient to cause a negative swing in total Michigan employment of about 85,000. This actually exceeds the deterioration in Michigan's employment, relative to the nation's, of 60,000 jobs per year. That is, poor trends nationally in autos, and in Michigan's share of the auto industry, more than explain why Michigan's job growth has deteriorated relative to the nation's in this decade.

To translate this back into annual growth terms, this swing of 85,000 jobs per year, if restored, would be equivalent to additional growth of 1.84 percent per year during the 2000–2005 time period. This more than makes up for Michigan's lag of 1.52 percent behind the nation during this period. Michigan's total employment growth would have improved by 1.19 percent per year if national trends in autos have been similar to the average industry. Michigan's total employment growth would have improved by 0.65 percent per year if Michigan had maintained its market share in autos.

An additional, minor factor is that Michigan has had some modestly unfavorable trends in federal employment. Michigan has a below average share in federal employment, which generally has been a declining sector, but less so in 2000–2005 than in 1990–2000. In addition, Michigan has had larger percentage losses in federal employment than is true for the nation as a whole. Given a modest multiplier of 1.5 or so, it seems plausible that trends in national and

Michigan federal employment have probably caused Michigan's annual job growth in the current decade to deteriorate by perhaps 3,000 jobs per year compared to the 1990s.

It is unlikely that national trends in motor vehicles are due to Michigan's economic policies. Trends in Michigan's share of the total national market in motor vehicles have more to do with the fortunes of the Big Three auto companies than with Michigan's economic policies. Therefore, these results suggest that Michigan's poor employment performance in the current decade is unlikely to be primarily due to poor policy choices by the state. At the least, it can be said that there is no need for a hypothesis that blames it on policy, as we can explain all or almost all of the state's poor economic performance by trends in the Big Three auto companies.

However, this does not mean that better Michigan economic policies could not improve the state's economic performance. How competitive is the state in its tax policies and its human capital policies? What could the state plausibly achieve by changes in these policies?

4. MICHIGAN'S TAX COMPETITIVENESS

Few economists believe that state and local business taxes have large effects on a state's economic development. The majority view among economists is that higher state business taxes, other things being equal, have modestly negative effects on a state's economic development. This consensus is based on a significant research literature examining how state and local growth responds to changes in state and local business taxes. As summarized by Wasylenko (1997), building on an earlier review of the research literature by Bartik (1991), the majority view among economists is that the long-run effect of a 10 percent cut in state and local business taxes, holding other effects on business location constant, is to raise business activity in a state by about 2 percent.

A significant minority of economists disagrees with the majority view and believes that the effects of state and local business taxes are so small as to be negligible (McGuire 2003; Lynch 2004). This minority points to some well-done studies that find no effects of state and local business taxes on state economic development. In addition, this minority points out that state and local business taxes are quite small compared to other business costs. For example, state and local business taxes in Michigan are estimated to be about $3,946 per employee, which is equivalent to a little less than $2 per hour (Bartik 2006a, updating figures from Ernst and Young 2004). Average hourly wages in the U.S. are about $18 per hour, so straight labor costs, even excluding employee benefits, are over nine times state and local business taxes. Furthermore, research has found modest effects of business costs such as labor costs on business location decisions. This suggests that the likely effects of state and local business taxes are even smaller.

The majority view among economists, that there are modestly negative effects of business taxes on state economic development, is based on considering the effects of business taxes, holding other location factors constant. But often business tax cuts are financed in ways that may alter local economic growth. If business tax cuts are financed by cutting public services, the public service cuts may negatively affect a state's economic development in two ways. First, the cut in public spending reduces public sector jobs and reduces private sector activity and jobs that depend on purchases from the government or government workers. Second, businesses may value public services. There is at least some research that suggests that business tax cuts, financed by cutting productive public services such as investment in roads or public education, may harm a state's economic development (e.g., see review by Fisher (1997) and studies by Bartik (1999, 1989), Munnell (1990), and Helms (1985)).

In this report, we consider three sources of data on Michigan's tax competitiveness. Each source has its advantages and disadvantages. The first source is Census data on state and local taxes, divided by Bureau of Economic Analysis estimates of state personal income. The second source is Ernst and Young estimates of total state and local business taxes, divided by private-sector gross state product data from the U.S. Bureau of Economic Analysis. The third source is estimates by Peter Fisher and Alan Peters of the University of Iowa of marginal business taxes on business investment, as measured by the additional tax liability due to building a new business facility in the state divided by the profits from the new facility.

The Census data on total state and local taxes is high-quality data that have been calculated in a consistent way for more than 30 years. The big disadvantage of these data is that over half of state and local taxes are household taxes, not business taxes (Ernst and Young 2006). Household taxes have no direct, immediate effect on business location decisions. The effects of household taxes on business location would occur indirectly to the extent that household taxes altered household migration patterns or labor supply decisions, which in turn would affect worker wages and availability, which in turn would affect business location decisions. Any such effects would take some time to occur. Furthermore, household migration decisions depend on the whole package offered by the state: public services and amenities as well as taxes, for example. It is generally believed that households directly receive more in state and local public services than they pay in taxes, whereas the reverse is true for businesses (Oakland and Testa 1996). Therefore, it is not obvious that higher household taxes, when their effect on public services is considered, have a long-run negative effect on business location decisions.

The Ernst and Young (2004, 2005, 2006) estimates of state and local business taxes are only publicly available for individual states for recent years. However, these data do use the best available methodology for calculating average state and local business tax rates. The Ernst and Young researchers, who are well-respected public finance economists, use the best methodology available to allocate all major state and local taxes to businesses or households. Private-sector gross state product is probably the best indicator of private-sector business activity in a state.

One significant limitation of Ernst and Young's estimates is that they only reflect average business taxes. What should be most relevant to business location decisions is the marginal tax rate on business investment—for example, how much a business's taxes go up if it builds a new plant or invests in an existing plant. In the long run, it is these investment decisions that determine the magnitude of business activity in a state.

Average business taxes on existing business activity may not be similar to marginal business taxes on new business investment. For example, a state's average tax rates on existing business activity could be quite high, but investment tax credits, tax deductions, or economic development incentives could mean that new business investment will result in little additional tax liability.

The best and most recent data on marginal business tax rates is from Peters and Fisher (2002). Their research takes full account of all of the complex ways in which new investment decisions by business affects business tax liability. They construct hypothetical balance sheets for typical firms and then consider how the business's tax liability would be altered by a business investment decision, for example a new plant. Such calculations must consider factors such as the state's formula for allocating the business tax base of multistate businesses across different states, as well as economic development incentives.

The main limitation of Peters and Fisher's research is that the most recent year for which these data are available is 1998. We know that states continue to modify their tax system and economic development incentives to try to increase their attractiveness to business, so it would be desirable to have more recent information.

In examining Michigan's competitiveness by these three measures of taxes, we consider data on Michigan, the U.S. as a whole, and Michigan's nearby competitor states of Indiana, Illinois, and Ohio. Research on business location decisions suggests that factors such as taxes probably have greater scope once the location decision has been narrowed down to relatively fewer states, which frequently are nearby states that offer similar access to markets and suppliers. Therefore, Michigan should be more concerned with its competitiveness with Indiana, Illinois, and Ohio than with its competitiveness with more distant states.

Figure 3 and Table 2 present the Census data on overall state and local taxes in Michigan as a percentage of state personal income, compared to the U.S. average, for all years from 1970 to 2004. The table also considers Michigan's nearby competitors. As can be seen in the figure and table, Michigan, after being somewhat above the U.S. average and its nearby competitors in the 1970s and 1980s, has generally had declining taxes relative to the U.S. and nearby states. By 2004, overall state and local taxes in Michigan as a percentage of income were below similarly calculated tax rates in the U.S as a whole, were significantly below Ohio's rates, and were virtually identical to those in Illinois and Indiana. Because state and local business taxes as a percentage of personal income fluctuate up and down with the economy, it is difficult to precisely date the decline of Michigan's overall state and local tax rates, but there appear to have been significant declines in the mid-1980s, again in the mid-1990s, and again in the current decade.

Figure 4 and Table 3 present the Ernst and Young data on average state and local business taxes in Michigan as a percentage of private gross state product, compared to the U.S. average. The table also considers Michigan's neighboring states. As can be seen in the figure and table, Michigan has generally been quite close to the national average for state and local business taxes, and has been quite similar to its neighboring states in business taxes, for most of the period from 2000 on. In the last two years, Michigan's average business tax rates have dipped below the U.S. average and the averages for its neighboring states. In part, this reflects some reductions in average business tax rates in Michigan, which may reflect some recent state policy changes affecting business taxes. But Michigan's gain relative to the United States and its neighbors also reflects some increases in business tax rates in other states. These increases may be in part due to the pro-cyclical nature of business corporate income taxes in many states, as business profits tend to increase faster than gross state product during the upswing stage of a business cycle (and decline faster than gross state product when the economy declines). In contrast, Michigan has a business tax system that includes the Single Business Tax, a tax designed to depend more on business activity than on profits. Therefore, Michigan's business taxes would be expected to increase less with economic recovery. In addition, Michigan has not shared much in the recovery.

Table 4 presents the Fisher and Peters data on marginal state and local business taxes for Michigan, nearby states, and for the typical U.S. state. These data represent the average across 16 industries of the marginal tax rate on a new plant located in the state. This marginal tax rate is calculated as the present value of the additional state and local taxes the business will pay over a 20-year period because of the new plant, divided by the present value of the profits generated by the new plant. These data are only available for two years, 1990 and 1998. We report both the

tax rate considering only regular state and local business taxes, and the tax rate also considering general economic development incentives.

As these data show, state and local marginal business tax rates on new investment declined in the 1990s. The decline of marginal business tax rates is greater when economic development incentives are considered. Michigan had an even faster decline in marginal tax rates on new business investment than these nearby states and the typical state. By 1998, Michigan's net marginal tax rates on new investments were below the typical state and all its neighboring states except Illinois, whether or not we include economic development incentives. When incentives are included, Michigan's net business tax rates on new investment are about the same as Illinois's as of 1998. One hypothesis about Michigan's decline in marginal business tax rates is that it was during this period that Michigan changed its formula apportionment to give a greater weight to sales when allocating the business tax base of multistate firms. A greater sales weight significantly reduces marginal business tax rates on new investment on export-base firms with multistate operations.

Figure 5 and Table 5 summarize the tax information from all three types of tax rates. The data are summarized as the ratio of Michigan's tax rate to the analogous U.S. tax rate for the same year. As is consistent with the previous discussion, these data show a Michigan tax rate that has declined from the 1980s on. By the latest data available on all three types of tax rates, Michigan is somewhat below the average U.S. state and local tax rate. Therefore, Michigan's poor economic performance in recent years cannot be attributed to unusually high tax rates, as Michigan's tax rates are no longer high compared to the nation's, and have declined in recent years. The impression that Michigan is a high tax state is based on historical patterns rather than current reality.

However, this does not necessarily mean that still lower business tax rates would not help spur Michigan's economy. We will explore this possibility next.

5. THE EFFECTS OF CUTTING BUSINESS TAXES ON IMPROVING MICHIGAN'S ECONOMIC COMPETITIVENESS

We now consider the effects of cutting business taxes on improving Michigan's economic performance. As we will see, the effects depend on estimates of business tax effects on state economic development, and on how the tax cut is financed. However, under plausible assumptions, feasible business tax cuts seem unlikely to come close to solving the problem of Michigan's slow growth relative to the U.S.'s growth

Given the current debate over the Michigan Single Business Tax (SBT), we consider the likely effects of complete elimination of the Single Business Tax. We first consider effects using the REMI model and its default parameters and estimated behavioral elasticities—in particular its estimates of how state business activity responds to changes in business costs. We examine effects on Michigan's economy over the 10-year period of 2006–2016 from abolishing the Single Business Tax in 2006. The cut in the Single Business Tax is modeled as reducing business production costs, with this business production cost reduction allocated across industries based on estimates of the share of the Single Business Tax paid by each industry. These lower production costs have positive supply-side effects on the Michigan economy by attracting new business activity to Michigan and allowing Michigan businesses to gain a greater share of national and international markets. In addition, the cut in the Single Business Tax also increases the dividend income of some Michigan residents by increasing business profits, which has demand-side effects on Michigan's economy as these residents increase their spending, including

spending on Michigan goods. However, most of the increase in profits will go to out-of-state residents who own stock in Michigan businesses.

The elimination of the Single Business Tax eliminates about $1.9 billion annually in state revenue. For the initial simulation, we assume that this tax cut is financed by an equal-sized cut in public spending to meet the requirement of keeping the state budget balanced. This cut in public spending is allowed to have demand-side effects on the economy by reducing state and local government employment, and employment in private sector organizations financed by government spending, as well as having multiplier effects in reducing employment in businesses that supply the state government or sell goods and services to state workers. However, in this initial simulation we do not allow cuts in government spending to have any supply-side effects on the state's economy by affecting the quality of public services to businesses and households in Michigan. Such supply-side effects, which seem plausible, would include the effects of such services as education and roads on business productivity and costs, and the effects of education, roads, and amenities such as parks on the quality of life of households and hence on household migration decisions. The financing of the Single Business Tax elimination by cuts in these services would be expected to have negative effects on business and household location decisions and hence the state economy, which we do not allow for in this initial simulation.

As shown in Table 6, the resulting simulation suggests that elimination of the Single Business Tax, financed by cuts in public spending, will actually have a negative effect on the state's employment growth over a 10-year time horizon. Rather than helping close the gap between state and national employment growth, elimination of the SBT would exacerbate the state's growth problems. These negative effects of SBT elimination occur because the negative effects of public spending reduction on publicly financed jobs, and the multiplier effects of this

reduction on other jobs, outweigh the incentives for business location provided by lower business tax rates.

The REMI model's parameters for how Michigan's businesses will respond to business tax cuts are derived from empirical estimation in which a state's share of the national market depends upon overall business costs, with tax costs a relatively minor portion of business costs compared to other factors such as labor costs. As we mentioned, this is consistent with the view of a significant minority within economics that believes that business tax effects on business location decisions are so minor as to be negligible. However, empirical estimation that directly looks at the effects of business taxes on a state's economic activity tends to find larger effects. The majority view among economists is that business tax effects on economic activity are somewhat larger than the estimates that underlie the REMI model.

In the second simulation, we impose the larger business tax cost elasticities which reflect the view of most economists on the effects of business tax cuts. This is a long-run elasticity of about −0.2. To do this, we have to multiply the production cost reductions due to SBT elimination by about 2.55. We continue to assume that this tax cut is financed by cuts in public spending, which have demand-side effects on employment but are not allowed to have any supply-side effects on the attractiveness of Michigan to businesses and households.

Under these assumptions, over a 10-year period, SBT elimination would boost the Michigan economy by an increase in annual growth of 0.09 percent. While this is a positive effect, it is less than one-fifteenth of the gap of over 1.52 percent in annual growth between Michigan and the U.S. average.

One issue is whether the positive effects of SBT elimination in this simulation might improve the state's fiscal situation sufficiently to reduce the required cuts in public services,

which would further boost the state's economy. This simulation does not allow for such dynamic feedback effects of state tax policy. However, the results of the simulation suggest that any positive effects of this greater employment growth on the state's fiscal situation are likely to be quite small. After 10 years, this simulation estimates that the SBT elimination and $1.9 billion annual public spending cut have increased real income of persons residing in Michigan by $4.770 billion, a 1.3 percent increase in Michigan real income. This real income increase is partly due to a 0.8 percent increase in total Michigan nominal personal income, and partly due to a −0.5 percent reduction in Michigan prices due to lower production costs brought about by the SBT cut. This real income increase is likely to boost state and local revenue by a similar percentage. If 10.52 percent of this revenue goes to state and local taxes, as was true for Michigan in 2004, state and local tax revenue in Michigan will go up by $502 million. However, the simulation also estimates that the SBT cut and the public spending cut will increase Michigan's population by 0.95 percent. If total public spending needs increase proportionately with the population, required public spending will increase by $365 million. Under this assumption that public spending needs are proportionate with population, the net fiscal dividend from the SBT elimination is only $137 million, a small proportion of the $1.9 billion cut in the SBT. The exact increase in public spending needs would depend on many factors. Public spending needs could increase more than population if the population increase is accommodated by sprawl that requires expensive new public infrastructure.

This second simulation, while it may increase the effects of state business taxes to a point that is closer to the majority view among economists, does not allow for any positive effects of public services in increasing business productivity or reducing business costs, or attracting households. However, we would think there would be some such effects. If such effects of public

services on business costs are even at a level of just 60 percent of the effects of taxes, then we would be back to the estimates of the first simulation. The second simulation multiplies the REMI effects of business taxes on production costs by 2.55 to get higher elasticities. If the cut in public services of $1.9 billion has an effect in raising business costs of just 61 percent (1.55 / 2.55) of the effect of business taxes in reducing costs, then the first simulation will still be correct. But, as we mentioned, there are many studies that suggest that businesses do place some value on public services in making business location decisions. In some simulations, balanced budget cuts in business taxes and public services have negative effects on a state's business activity. This looks quite plausible here. It is reasonable to assume that the true effects of SBT elimination financed by cuts in public spending and public services would be somewhere between a 0.09 percent boost in annual employment growth and a 0.01 percent reduction in annual employment growth. Our estimate is that the effects would be closer to the 0.01 percent reduction unless the public spending cut somehow avoided any major cuts in public services.

We also consider a third simulation in which we continue these higher effects of taxes on business location of a −0.2 elasticity, but assume that the positive effects of an SBT elimination can somehow be achieved without cutting public spending or raising household taxes. One plausible way to do this would be to replace the current SBT with a new business tax system that raises the same revenue but lowers marginal tax rates from the SBT on business investment to zero. It is reasonable to assume that it is marginal tax rates on business investment that really drive any business tax effects on business location and investment. Zero marginal tax rates under the SBT for new business investment could be achieved by going back to the original SBT design of a 100 percent tax deduction for new investment or, alternatively, by an investment tax credit rate equal to the SBT rate. The revenue loss from this tax credit could be offset by

eliminating many special tax provisions of the SBT that have accumulated over the years. We estimate that lowering the marginal tax rate on new investment in the SBT to zero would cost less than $270 million annually, and we can easily identify revenue offsets in the SBT of over $500 million.[1] It should be understood that this policy option would raise the business tax liability of many Michigan businesses. Specifically it would raise the tax liability of Michigan businesses that are not making significant investments. However, the tax liability of businesses that are making significant investments would be lowered, so that their marginal tax rate on new investment would be zero.

Under this simulation, SBT elimination would increase annual employment growth rates in Michigan by 0.16 percent. This is about one-tenth of Michigan's current annual growth gap that separates it from national growth.

Finally, we consider a simulation in which SBT elimination is financed by extending the sales tax to services. Under this scenario, SBT elimination would increase average annual growth by 0.13 percent. This is less than would be achieved by equal-revenue reform of the SBT, but is greater than if SBT elimination is financed by cuts in public spending. Increasing the sales tax on services reduces somewhat the positive effects of the elimination of the SBT by lowering consumer spending. However, cuts in public spending directly eliminate both public sector jobs

[1]Given that the current investment tax credit under the SBT already reduces the marginal tax rate on investment by at least one-third, and that this provision cost $132 million in FY 2006 (Executive Budget Appendix on Tax Credits, Deductions, and Exemptions for Fiscal Year 2006), the total cost of lowering this marginal tax rate on investment to zero probably is less than an additional $264 million per year. The excess compensation reduction provision costs $218 million per year, and the gross receipts reduction provision costs $161 million per year. In addition, the exemption for unemployment insurance, workers' compensation, and social security payments costs $151 million per year. If we ignore interaction between these SBT provisions and other SBT provisions, eliminating just these three provisions of the SBT would raise $530 million per year. In addition, Michigan Senate Fiscal Agency memos from December 14, 2005, and September 14, 2005, suggest that rolling back the sales factor weight raises about $24 million per 5 percent rollback—i.e., the state would collect $24 million more in revenue if the sales factor was reduced from 95 percent to 90 percent—and by much more with a more extensive rollback of the sales

and jobs financed by the public sector, while also lowering consumer spending because of this elimination of publicly financed jobs. Financing an SBT elimination by cutting government spending, as opposed to by increasing the sales tax on services, therefore has less of a positive effect on growth because of this extra negative effect of the direct elimination of government jobs.

These results show that business tax reforms of the magnitude of SBT elimination will only have, at best, modestly positive effects on the state economy. And even these modestly positive effects only occur if policies are adopted to minimize the negative effects of these tax cuts on public spending and the quality of public services.

6. EDUCATION AND MICHIGAN'S COMPETITIVENESS

Another option to improve Michigan's competitiveness is to increase the average level of education of Michigan's residents, in the process raising the percentage of Michigan residents that have a college degree. As is well known from the work of the Cherry Commission (2004), as well as that of various scholars (e.g., Blank and Sallee 2006), Michigan is below average in its share of residents with a college degree but above average in its share of residents with a high school degree. According to the Digest of Education Statistics, in 2004, 24.4 percent of Michigan residents ages 25 and over had a college degree, compared to 27.7 percent in the U.S. Also in 2004, 87.9 percent of Michigan residents ages 25 and over had a high school degree, compared to 85.2 percent for the U.S.

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factor. Therefore, it appears likely that changes in all these SBT provisions could fully finance both lowering the marginal tax rate on investment in the SBT to zero and allowing for a lower SBT rate.

There is considerable evidence that there is a social return to increasing the percentage of a local economy's residents with a college degree. For example, research by Moretti (2003, 2004) suggests that a 1.0 point increase in the percentage of college residents in a local economy increases the average level of local wages by 0.6 to 1.2 percent. This is an increase over and above the increase that occurs for the individuals who get more education; an individual's wages appear to depend both on his or her own education level, and on the average educational level of his or her fellow residents of the metropolitan area. In addition, research by Glaeser and Saiz suggests that a local economy that has a 1.0 point higher percentage of residents with a college education will have growth that is about 0.6 percent higher over a 10-year period (Bartik 2006b, interpretation of Glaiser and Saiz 2003).

Why do these social returns occur? One possibility is that employers are able to use more productive technologies, and introduce new technologies more rapidly, if they know they can count on an ample supply of more educated workers.

In the current economy, these extra social returns to education appear to be primarily associated with the attainment of a college degree. A higher percentage of workers in a local economy with a high school degree does not appear to be associated with any extra social returns to wages or any extra effect on local growth. It is the college-educated worker percentage that yields the social returns, a phenomenon that presumably reflects what types of skills are currently most valuable to employers and in relatively short supply.

These social returns to education are proportionally large, in that they substantially increase the total returns on investment in education. However, they are also modest enough that it would take quite a large increase in the percentage of Michigan residents with a college degree to close the growth gap between Michigan and the U.S. For example, to close the 1.52 percent

gap in annual employment growth between Michigan and the U.S. that occurred over 2000–2005, the percentage of Michigan residents 25 and over with a college degree would have to increase by 25.3 points, that is from the current level of 24.4 percent to 49.7 percent.[2] Based on population figures by age for Michigan as of July 1, 2004, this would mean the state population would currently have to have 1.6 million more college graduates. Thus, to completely close the Michigan vs. U.S. gap in annual employment growth through college education alone would require doubling the percentage of college graduates in the Michigan economy.

We can also approach this issue from the other direction: what increases in college-educated population in Michigan might be feasible over different time periods? Suppose we somewhat arbitrarily consider what might be feasible in increasing the college-educated population in Michigan over a 15-year period. Suppose, further, we imagined that we increased the percentage of each cohort of 18-year-olds that achieved a bachelor's degree or higher by 20 points. This is a large increase, but there is room to make it. According to the Cherry Commission, only 41 percent of Michigan's 9th graders start college within four years of 9th grade—in other words, go straight into college from high school—and only 55 percent of those who start college get a bachelor's degree within six years of starting college. Michigan typically has about 150,000 18-year-olds, so 20 percent more completing college is 30,000 extra college graduates in each single age cohort (30,000 is 20 percent of the 150,000 18-year-olds). After 15 years, this increase in educational attainment would have affected the 25-and-over graduate percentage by affecting those ages 25 to 33; multiplying 30,000 by these nine years yields an increase in college graduates of 270,000. In order for this influx to fully affect the number of

[2]Based on Glaeser and Saiz, the annual growth rate effect of 1.0 point more college education is about 0.06 percent; 1.52 percent divided by 0.06 percent yields the required increase in percentage college graduates of 25.3

college graduates living in Michigan, we would have to assume an end to the net out-migration of younger Michigan graduates. From 1995 to 2000, Michigan lost about 77,000 college graduates ages 25–34 (as of April 2000) to other states, and gained 58,000 from other states, for a net "brain drain" of 19,000 college graduates. (See Table 7; as this table shows, there is no net brain drain from ages 35–54, but there is some brain drain at older ages.) Assume that we eliminated this brain drain and that, even with a higher production of college graduates, Michigan's net migration rate in college graduates stays at zero. The elimination of the 25–34 year old brain drain would increase college graduates in Michigan by about 19,000 every 5 years, or by 57,000 after 15 years. Adding the increased production of college graduates to the elimination of the 25–34 year old brain drain would yield an increase of 327,000 college graduates. This increase is about 5 percent of the Michigan population 25 and over. Such an increase would be estimated to increase Michigan's average annual employment growth rate by about 0.3 percent, or roughly one-fifth of the gap separating Michigan from the nation.

Therefore, it takes large changes in educational policy to significantly improve Michigan's growth prospects, and these changes would take some time to have economic growth effects. In the long run, this increase of 20 percentage points would work its way through the entire labor force. This would take 40 years or more from the time the policy was started, enough time for the initial group whose K–16 educational attainment was improved to reach retirement age. Assuming that in-migration and out-migration of college graduates remain balanced, the resulting long-run increase in the percentage of college graduates in the Michigan labor force

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percent.

would be 20 points. This would go four-fifths of the way toward doubling Michigan's number of college graduates and matching the U.S. employment growth rate.

What happens if we do a better job of increasing the proportion of Michigan residents who obtain a college education, but we make no special effort to increase the attractiveness of Michigan to potential migrants with a college education? Under these assumptions, the best empirical evidence suggests that, in the long run, the increase in college graduates residing in Michigan will be about 30 percent of Michigan's increased production of college graduates. Data on the residential choices of Michigan's college graduates suggest that with current migration patterns, probably 50 to 60 percent of them end up spending most of their working careers in Michigan. Table 8, taken from the 2000 Census, shows that of college graduates who were born in Michigan, around 50 percent have remained in Michigan for much if not all of their prime working ages. Many of these college graduates in fact left Michigan well before college; information from other sources suggests that about one-sixth of those who had left Michigan did so before age 18 (Bartik 2006b), so it is probably the case that of former 17-year-old Michigan residents who have gone to college, the percentage that currently spend most of their working careers in Michigan is closer to 60 percent.

But this is under current migration patterns. A large increase in the percentage of college graduates in Michigan will result in labor market changes that may affect both household migration patterns and business location decisions. An increase in college graduates in Michigan may lower wage rates and increase unemployment rates among college-educated workers in Michigan. This change in labor market conditions has two effects: on the one hand, it encourages household out-migration and discourages household in-migration to Michigan; on the other hand, the greater availability of college-educated labor at lower wages encourages additional

businesses that need college-educated labor to locate and expand in Michigan. A new equilibrium in the labor market will be established, with both greater net out-migration of college-educated workers, and a greater proportion of college-educated workers in the Michigan economy, resulting in more businesses operating in Michigan that use college-educated workers.

Two lines of reasoning suggest that in this new equilibrium the net increase in college-educated workers will be about 30 percent of Michigan's increased production of college graduates. First, evidence from Bartik (2001) suggests that, in general, the equilibrium response to a labor supply shock of a particular type of labor to a local economy is an increase in employment of that type of labor of from one-third to two-thirds of the initial labor supply boost. As the initial labor supply boost, under current migration patterns, is about 60 percent of the increased production of local graduates, the equilibrium increase in employment of college graduates will be from one-third to two-thirds of that 60 percent, or 20 to 40 percent. Second, evidence from Bound et al. (2004) directly estimates that an increase in the flow of new college graduates in a state increases the stock of college graduates in the state, 5–24 years later, by 30 percent of the initial flow increase. This 30 percent boost is less than the initial 60 percent boost to labor supply because of increased net household out-migration of college-educated workers. It is greater than zero because the increased availability of college-educated labor will attract some new business activity to Michigan.

With an eventual increase in the stock equal to about 30 percent of the increased flow, a 20 point increase in the percentage of Michigan residents getting a college degree, if sustained for 15 years, would be expected to increase the stock of college graduates 25 years and older by $0.30 \times 270{,}000 = 81{,}000$ additional college graduates, or about a 1.2 point increase in Michigan's percentage of college graduates. Based on the results of Glaser and Saiz, this

increase in the college-educated portion of Michigan's labor force would be sufficient to increase Michigan's annual employment growth rate by 0.06 percent, a quite modest improvement compared to the annual growth gap of 1.52 percent between Michigan and the nation. The long-run effects on Michigan's growth would be about five times stronger; the long-run increase in the percentage of college graduates in the Michigan labor force would be 6 percent (20% $\times$ 0.3), which would increase Michigan's annual employment growth rate by 0.30 percent.

This suggests that to fully exploit the potential economic growth effects of increasing the supply of college-educated workers, Michigan would have to not only increase the proportion of residents who receive a college degree, but also adopt policies that can affect migration patterns of college-educated workers. These could include measures to improve the amenities and quality of life in Michigan as viewed by college-educated workers. They could also include economic development measures to increase the labor demand for college-educated workers. In general, public policies that boost both labor supply and labor demand at the same time are more effective in increasing a state's economic growth than either labor supply policy or labor demand policy is separately.

A full analysis of the economic development effects of this increase in educational attainment would have to also consider the cost of this policy. Presumably, higher K–16 educational attainment would require some increased public spending and hence some tax increases. These increased taxes would have negative economic development effects, and the increased public spending would both stimulate the demand side of the economy and make Michigan more attractive for household migration and business location decisions. The exact magnitude of the effects would depend on the size of the assumed need for public spending

increases and on what types of taxes were increased. This report's results suggest that the net effect of such public spending increases, if financed by household tax increases, is likely to be positive, whereas the effect of financing these public spending increases by business tax increases is likely to be negative.[3]

7. OCCUPATIONAL JOB SKILLS AND MICHIGAN'S ECONOMY

A college education is not the only measure of job skills. Other dimensions of skills might also have a considerable social return. For example, one would think that there might be some occupational skills that, if amply available, would allow firms in particular industries to more readily use advanced technologies or introduce new technologies. Even though Michigan is relatively weak in the percentage of its population with a college degree, perhaps the state is stronger with respect to some of these key occupational skills.

Unfortunately, there is no economics literature that has examined how a local economy's availability of specific types of skills, as opposed to college education in general, affects wages or growth in particular industries. Therefore, we have to guess about what particular skills might be in short supply. Our goal is to identify some occupational skills that might be in short supply relative to demand in the U.S., but for which Michigan has a relatively ample supply, and to identify the industries to which these occupations might be relevant.

We approach this task from two perspectives, one focusing on occupational skills that are in short supply, and the other on occupational skills that Michigan has a high specialization in.

[3]Effects in the REMI model are usually roughly additive across scenarios. If we compare the effects of the two simulations that show the effects of SBT elimination when financed by spending cuts or service tax increases, these suggest that spending increases financed by service tax increases will positively affect the Michigan economy. However, the results of these simulations suggest that business tax increases to boost public services may negatively affect Michigan's economy.

Table 9 uses the Occupational Employment Statistics database of the U.S. Bureau of Labor Statistics to list 43 occupations (out of 808 for which there are data) that meet the following two criteria: 1) from 1999 to 2005, the annual salary of that occupation increased by over 20 percent, and 2) the share of Michigan's employment in the occupation exceeds the national share of employment in that occupation by at least 20 percent. Table 10 uses the same database to list occupations that meet the following two criteria: 1) from 1999 to 2005, the annual salary of that occupation increased by over 15.5 percent (the inflation rate over this time period), and 2) the share of Michigan's employment in the occupation is more than double the national average. For each occupation listed in either table, I also list the industries in which the share of that occupation in total industry employment is over eight times the average share of that occupation in all employment; that is, these are industries that tend to intensively use those particular occupations.

As these tables reveal, Michigan is strong in a number of highly skilled occupations with at least decent wage growth that are intensively used by a wide variety of manufacturing industries. In addition, Michigan has some occupational strength in occupations with decent wage growth that are in health-related industries. This table does not prove that Michigan's occupational strengths necessarily are a strong lure to all of the detailed industries within these industrial categories. Nor is it necessarily the case that all the industries within these industrial categories would be good targets for economic development strategies; other factors, such as general trends in these industries and the multiplier effects of these industries, would also have to be considered. However, this table does offer a list of occupations and industries with which it might be fruitful to explore with industry experts the importance of Michigan's strengths in

particular occupations, to see if these strengths can be promoted to attract additional business activity.

8. CONCLUSION

Michigan's economy is in a difficult competitive situation. The state is experiencing slow employment growth that is largely due to its economic specialization in the Big Three auto companies. It is difficult in the short run for any Michigan policy to overcome the negative economic effects of the Michigan auto industry's problems.

Over the medium run and long run, the state can take actions that will help improve its economic performance. Cuts in marginal taxes on business investment may help somewhat if they are financed without decreasing public spending and the quality of public services. However, such a tax policy requires that taxes be increased on some firms or households to finance lower marginal taxes on businesses making investments. Increases in educational attainment and attraction of more educated workers may also help the state's economy, particularly in the long run. These policies probably require more public spending to improve education and provide amenities for more educated workers, as well as requiring efforts to attract employers that use more educated workers. Finally, the state may explore some targeted efforts to exploit its already considerable occupational strengths in areas related to design and research and development in various manufacturing industries, as well as in areas related to highly skilled precision production in these industries.

Table 1. Shift-share Analysis of Michigan's Employment Growth, 1990–2000 and 2000–2005

	Annual job growth, 1990–2000	Annual job growth, 2000–2005	2000-05 minus 1990–2000
Michigan growth if grew at U.S. average	80.8	11.9	−68.9
Actual Michigan annual job growth	70.4	−58.0	−128.4
Difference of Michigan from U.S. annual job growth	−10.4	−69.9	−59.5
Share effect, by type of industry			
Transportation equipment	1.1	−10.4	−11.6
Federal government	1.7	0.5	−1.2
Other export base	1.8	−0.4	−2.2
Nonexport base	−0.4	2.5	2.9
Total share effect	4.2	−7.9	−12.1
Shift effect, by type of industry			
Transportation equipment	−2.6	−8.8	−6.2
Federal government	0.6	−0.5	−1.1
Other export base	1.5	−5.9	−7.4
Non export base	−14.4	−46.9	−32.5
Total shift effect	−14.9	−62.1	−47.2
Sum of share plus shift effect = Michigan growth differential	−10.7	−69.9	−59.2

NOTE: Annual job growth numbers are in thousands of jobs per year. Share effect for each industry represents additional job growth (or less job growth) attributable to that industry having a different share of employment in Michigan than the national average share, and that industry's differential growth, or Share effect for industry *i* during time period *t* is Share(*it*) = (*Eimb* − *Eimb**)(*Git* − *Gt*), where *Eimb* is actual base year employment in industry in Michigan during base period, *Eimb** is what employment in the base year in Michigan in that industry would be if that industry's employment share in Michigan was at the national average, *Git* is the national employment growth rate of that industry during time period *t*, and *Gt* is average national employment growth rate during that time period for all industries. Shift effect for industry *i* during time period *t* is Shift (*it*) = *Eimb*(*Gimt* − *Git*), where *Gimt* is employment growth of that industry during time period. The sum of share effect and shift effects across all industries mathematically must equal the differential of Michigan's overall job growth from national job growth.

Table 2. State and Local Taxes as a Percentage of Personal Income in Michigan and Its Neighbors and the U.S., 1970–2004

	United States	Michigan	Illinois	Indiana	Ohio
1970	11.24	11.07	11.29	9.78	8.83
1971	11.41	11.84	11.31	10.77	9.00
1972	12.21	13.00	11.97	11.37	9.84
1973	12.27	12.82	11.63	10.65	10.13
1974	11.82	12.27	11.72	10.78	9.51
1975	11.62	11.57	11.19	10.63	9.32
1976	11.79	11.87	10.90	9.99	9.53
1977	11.97	12.34	11.13	9.89	9.34
1978	11.90	12.10	10.80	9.81	9.33
1979	11.22	11.93	10.63	9.35	9.22
1980	10.88	11.17	10.67	8.55	8.83
1981	10.64	11.19	10.57	8.82	8.69
1982	10.32	11.18	9.80	8.55	8.86
1983	10.29	11.81	9.77	8.49	9.56
1984	10.85	12.83	10.53	9.83	10.23
1985	10.70	12.21	10.02	9.55	9.87
1986	10.62	11.62	10.01	9.40	9.87
1987	10.92	11.44	10.09	9.60	9.90
1988	11.07	11.80	10.47	10.03	10.14
1989	11.07	11.76	10.28	10.43	10.28
1990	10.97	11.40	10.65	9.79	10.22
1991	10.81	11.20	10.32	10.04	9.95
1992	11.13	11.11	10.46	10.63	10.29
1993	11.11	11.62	10.38	10.17	10.20
1994	11.27	12.02	10.72	10.75	10.68
1995	11.32	10.76	10.85	10.62	11.08
1996	11.21	10.91	10.83	10.36	11.10
1997	11.18	11.22	10.60	11.15	11.10
1998	11.20	11.34	10.55	10.63	11.09
1999	10.99	11.28	10.54	10.43	10.98
2000	11.19	11.32	10.78	10.57	11.25
2001	10.85	10.87	10.55	10.38	11.19
2002	10.38	10.25	10.23	10.12	11.11
2003	10.58	10.33	10.34	10.22	11.21
2004	11.03	10.52	10.58	10.44	11.43

NOTE: Data on state and local taxes were obtained directly from the Census Bureau and correct some errors in published data. State and local taxes are data for that fiscal year; as is done by most researchers (e.g., Slemrod 2006; Ballard 2006), tax rates are calculated by dividing state and local tax collections for a given fiscal year by personal income data for the previous year. This is more sensible than dividing by the current year's personal income as more of the tax liability for a given fiscal year is probably based on the previous calendar year's income. Data for 2001 and 2003 for individual states were estimated by us. This estimation was done in two steps. First, the tax rates for the states and for the U.S. as a whole were interpolated using adjacent years. Then all states and the U.S. were adjusted by the ratio of the actual U.S. tax rate for 2001 and 2003 to the interpolated U.S. tax rates for these years. This second state adjustment reconciles the U.S. to actual observed data and assumes that the interpolation procedure has similar biases for all states. This estimation does not change the relative position of Michigan vs. other states and the U.S., and only affects the absolute levels of these tax rates.

Table 3. Michigan's Average State and Local Business Tax Rates, Compared to the U.S. and Nearby States, 2000–2005

	2000	2001	2002	2003	2004	2005
United States	4.72%	4.48%	4.47%	4.49%	4.66%	4.84%
Illinois	4.72%	4.50%	4.53%	4.92%	4.82%	5.28%
Indiana	4.42%	4.23%	4.25%	3.61%	4.36%	4.52%
Michigan	4.43%	4.25%	4.29%	4.58%	4.35%	4.26%
Ohio	4.20%	4.07%	4.16%	4.33%	4.51%	4.71%

NOTE: Data on business tax collections come from Ernst and Young (2006, 2005, and 2004). We start with the latest data available from Ernst and Young for a given fiscal year for individual states. The 2006 Ernst and Young report gives U.S. totals for all these years; these totals are used to adjust proportionally all the states in 2000 and 2003 up or down because the reported U.S. total for these years from the 2006 report slightly differs from the U.S. totals reported in previous years. The fiscal year data are divided by data obtained by us from the U.S. Bureau of Economic Analysis on private sector gross state product to yield percentage tax rate figures. The fiscal year data are divided by the previous calendar year's private GSP figure. The 2001 figures are estimated by us, in two stages. First, the adjacent years are interpolated to give an initial estimate of the state and U.S. tax rate for 2001. Then, all of these tax rates are adjusted by the same proportion, with this proportion chosen so that the U.S. tax rate actually generates the total state and local business tax revenue that is given by Ernst and Young in their 2006 report.

Table 4. Marginal Tax Rates on Business Investment in a New Plant in a State, Michigan, Nearby States, and U.S., 1990 and 1998

Marginal tax rates on new plant investment, general state and local business taxes

	1990	1998
United States	8.5	7.9
Illinois	5.9	5.5
Indiana	13.8	13.6
Michigan	10.0	7.5
Ohio	10.6	10.0

Marginal tax rates on new plant investment, general state and local business taxes plus general economic development incentives

	1990	1998
United States	7.6	6.7
Illinois	5.5	5.1
Indiana	13.8	10.8
Michigan	8.0	5.4
Ohio	10.5	7.8

NOTE: Data are taken from Table 3.3, pp. 62–63 in Peters and Fisher (2002). The U.S. marginal tax rates given are the median over the 20 leading industrial states considered. This U.S. average is not quite the same concept as the mean U.S. figure considered in previous tables. The tax rate is the present value of net additional state and local taxes that occur because of a new plant investment, divided by the present value of pretax profits from the new plant. This calculation considers effects of state and local taxes on federal tax liability. The tax rates reported are weighted averages over 16 "2-digit SIC" industries, with weights based on each industry's share of U.S. manufacturing employment in 1995.

Table 5. Ratio of Michigan to U.S. Tax Rates for Three Types of Measures of Tax Rates, Various Years

	Average overall state and local taxes	Average state and local business taxes	Marginal state and local business taxes
1970	0.985		
1971	1.037		
1972	1.065		
1973	1.045		
1974	1.038		
1975	0.996		
1976	1.007		
1977	1.031		
1978	1.017		
1979	1.063		
1980	1.027		
1981	1.052		
1982	1.083		
1983	1.148		
1984	1.182		
1985	1.141		
1986	1.093		
1987	1.048		
1988	1.066		
1989	1.063		
1990	1.039		1.053
1991	1.036		
1992	0.999		
1993	1.046		
1994	1.066		
1995	0.950		
1996	0.973		
1997	1.003		
1998	1.012		0.806
1999	1.026		
2000	1.012	0.939	
2001	1.002	0.948	
2002	0.987	0.958	
2003	0.976	1.020	
2004	0.953	0.933	
2005		0.880	

NOTE: These data are taken from the previous tables. Average overall state and local taxes are based on Census data, average state and local business taxes are taken from Ernst and Young, and marginal state and local business taxes are taken from Peters and Fisher. Blank = no information available.

Table 6. Alternative Estimates of the Effects of Eliminating Michigan's Single Business Tax

	Default REMI estimates, financed by cuts in government spending	REMI estimates adjusted to majority view in literature, financed by cuts in government spending	Adjusted REMI estimates, pure effects of SBT equivalent cuts in marginal taxes, no loss in government revenue	Adjusted REMI estimates, financed by extension of sales taxes to services
Effects on annual average Michigan employment growth rate, 2006–2016	-0.01%	0.09%	0.16%	0.13%

NOTE: All these estimates use various versions of the REMI model to estimate effects over the 2006–2016 period of eliminating business location effects of SBT. First estimates use REMI model estimates of effects of business taxes on business location, with a $1.9 billion cut in public spending used to finance elimination of SBT. The second column of results forces the REMI model to conform to business location research literature that suggests a long-run elasticity of regional business activity with respect to state and local taxes of −0.2. The third column of results assumes that we can somehow achieve location effects of eliminating SBT without any sacrifice of revenue, which might be feasible through tax reform that made the marginal business tax under SBT equal to zero but modified SBT to raise more revenue from existing businesses. The last column of results assumes that SBT elimination is financed by extension of sales tax to services.

Table 7. U.S. Census Data on Migration to and from Michigan of College-Educated Persons, 1995–2000

Age group	Michigan residents in 2000	Domestic in-migrant, not living in Michigan in 1995, but in Michigan in 2000	International in-migrant, not in Michigan in 1995, in Michigan in 2000	Domestic out-migrant: Michigan resident in 95, living in other state in 2000	Net migration to and from Michigan but within U.S, 1995–2000 (Domestic in-migrants minus out-migrants to other states)
25 to 34	352,280	57,999	23,597	76,772	-18,773
35 to 44	366,559	37,591	11,561	37,633	-42
45 to 54	345,481	19,302	4,507	18,907	395
55 to 64	176,788	6,909	1,838	14,156	-7,247
65 to 74	91,108	2,753	461	6,740	-3,987
75 and older	65,424	2,178	233	3,798	-1,620

NOTE: All these data pertain only to Michigan residents or migrants *with a college degree*. These data are calculated from the PUMS files of the 2000 U.S. Census. We do not have data on the number of Michigan residents with a college degree who left the state for another country between 1995 and 2000. However, we suspect that it is less than the number of international in-migrants, as Michigan has net immigration from other countries of 100,000 from 1990 to 2000, and 123,000 from 2000 to 2005.

Table 8. U.S. Census Data on Percentage of College-Educated Persons Born in Michigan Who Still Lived in Michigan in 2000, Different Ages

Age	% still living in Michigan in 2000	Age	% still living in Michigan in 2000
22	65.9	56	51.6
23	62.4	57	49.6
24	62.2	58	47.4
25	58.9	59	45.2
26	58.4	60	47.0
27	58.5	61	47.6
28	55.6	62	47.6
29	55.5	63	48.5
30	57.4	64	44.7
31	54.9	65	47.2
32	56.9	66	49.6
33	56.3	67	46.3
34	58.5	68	43.8
35	56.8	69	47.2
36	57.4	70	47.9
37	54.5	71	45.0
38	55.6	72	44.4
39	53.1	73	45.7
40	50.4	74	46.0
41	51.1	75	45.3
42	51.3	76	44.0
43	52.3	77	51.0
44	50.2	78	46.5
45	54.0	79	46.2
46	53.9	80	47.0
47	54.5	81	47.9
48	56.5	82	43.8
49	53.7	83	47.8
50	55.1	84	44.3
51	54.7	85	46.9
52	55.1	86	41.0
53	52.5	87	56.3
54	50.2	88	58.5
55	50.1	89	66.3

NOTE: These data are calculated from the PUMS files of the 2000 U.S. Census.

Table 9. Occupations with High Wage Growth in Which Michigan Has a Moderately High Share

Occupation	Percentage change in annual earnings, 1999–2005	Michigan's "Location quotient" (share of Michigan employment in occupation divided by share of national employment in occupation)	Industries that heavily use that occupation
First-line supervisors/managers of correctional officers	24.9	3.79	Federal, state, and local government (OES designation)
Patternmakers, metal and plastic	23.2	3.38	Primary metal manufacturing Fabricated metal products manufacturing Machinery manufacturing Electrical equipment, appliance, and component manufacturing
Mechanical drafters	20.0	2.79	Fabricated metal products manufacturing Machinery manufacturing Transportation equipment manufacturing
Mechanical engineers	21.0	2.70	Machinery manufacturing Computer and electronic product manufacturing Transportation equipment manufacturing
Molding, coremaking, and casting machine setters, operators, and tenders, metal	22.8	2.57	Plastics and rubber products manufacturing Primary metal manufacturing Machinery manufacturing Electrical equipment, appliance, and component manufacturing Transportation equipment manufacturing Miscellaneous manufacturing
Heat treating equipment setters, operators, and tenders, metal and plastic	20.1	2.54	Plastics and rubber products manufacturing Primary metal manufacturing Fabricated metal products manufacturing Transportation equipment manufacturing
Radio operators	55.5	2.27	Air transportation Transit and ground passenger transportation Broadcasting (except Internet) Telecommunications
Refractory materials repairers, except brick masons	29.1	2.13	Nonmetallic mineral product manufacturing Primary metal manufacturing

Table 9. (Continued)

Occupation	Percentage change in annual earnings, 1999–2005	Michigan's "Location quotient" (share of Michigan employment in occupation divided by share of national employment in occupation)	Industries that heavily use that occupation
Directors, religious activities and education	22.5	2.03	Religious, grant-making, civic, professional, and similar organizations
Audiologists	25.4	2.01	Health and personal care stores Ambulatory health care services
Power distributors and dispatchers	25.8	2.00	Utilities
Sales engineers	36.5	1.79	Machinery manufacturing Computer and electronic product manufacturing Merchant wholesalers, durable goods Wholesale electronic markets and agents and brokers Telecommunications
Inspectors, testers, sorters, samplers, and weighers	20.2	1.76	Textile product mills Apparel manufacturing Plastics and rubber products manufacturing Primary metal manufacturing
Bicycle repairers	30.2	1.66	Sporting goods, hobby, book, and music stores
Radiation therapists	49.6	1.64	Hospitals
Chief executives	31.5	1.64	
Architecture and engineering occupations	22.3	1.62	Computer and electronic product manufacturing
Industrial production managers	26.9	1.62	Paper manufacturing Petroleum and coal products manufacturing Chemical manufacturing Plastics and rubber products manufacturing Primary metal manufacturing Fabricated metal product manufacturing Machinery manufacturing
Orthotists and prosthetists	44.1	1.62	Miscellaneous manufacturing Health and personal care stores
Nuclear medicine technologists	45.9	1.58	Hospitals
Metal-refining furnace operators and tenders	22.3	1.57	Primary metal manufacturing

Table 9. (Continued)

Occupation	Percentage change in annual earnings, 1999–2005	Michigan's "Location quotient" (share of Michigan employment in occupation divided by share of national employment in occupation)	Industries that heavily use that occupation
Opticians, dispensing	25.5	1.52	Health and personal care stores Ambulatory health care services
Dental hygienists	29.0	1.46	Ambulatory health care services
Funeral attendants	23.1	1.45	Personal and laundry services
Instructional coordinators	20.8	1.44	Educational services Museums, historical sites, and similar institutions
Production occupations	20.1	1.43	Textile product mills Apparel manufacturing Leather and allied product manufacturing Furniture and related product manufacturing
Engineering managers	25.8	1.41	Computer and electronic product manufacturing
Statisticians	32.6	1.41	Chemical manufacturing Funds, trusts, and other financial vehicles
Electromechanical equipment assemblers	21.4	1.40	Machinery manufacturing Computer and electronic product manufacturing Electrical equipment, appliance, and component manufacturing Transportation equipment manufacturing
Power plant operators	20.0	1.36	Utilities
Environmental engineers	24.0	1.35	Professional, scientific, and technical services Waste management and remediation services
Boilermakers	27.7	1.35	Construction of buildings Heavy and civil engineering construction Specialty trade contractors Petroleum and coal products manufacturing Rail transportation
Purchasing agents, except wholesale, retail, and farm products	24.0	1.34	
Cardiovascular technologists and technicians	25.7	1.34	Hospitals

Table 9. (Continued)

Occupation	Percentage change in annual earnings, 1999–2005	Michigan's "Location quotient" (share of Michigan employment in occupation divided by share of national employment in occupation)	Industries that heavily use that occupation
Motorboat mechanics	21.1	1.34	Motor vehicle and parts dealers Water transportation Scenic and sightseeing transportation Amusement, gambling, and recreation industries Repair and maintenance
Electrical engineers	21.2	1.29	Utilities Computer and electronic product manufacturing Electrical equipment, appliance, and component manufacturing
Insurance appraisers, auto damage	20.3	1.26	Insurance carriers and related activities
Interior designers	24.0	1.24	Furniture and home furnishings stores Professional, scientific, and technical services
Refuse and recyclable material collectors	22.3	1.23	Waste management and remediation services
Veterinary assistants and laboratory animal caretakers	24.0	1.22	Professional, scientific, and technical services
Recreation workers	22.4	1.22	Nursing and residential care facilities Religious, grantmaking, civic, professional, and similar organizations
Dietetic technicians	20.2	1.21	Hospitals Nursing and residential care facilities
Occupational therapist assistants	21.0	1.21	Nursing and residential care facilities

NOTE: Source for data is Occupational Employment Statistics of the U.S. Bureau of Labor Statistics, data files for 1999 and 2005. Occupations listed here must have growth in annual earnings in the nation of over 20% from 1999 to 2005, and their share of Michigan's total employment must be 20% greater than the national average share in that occupation. Industries that heavily use that occupation are those in which the share of employment in that occupation is over eight times the share of overall employment in that occupation.

Table 10. Occupations with Decent Wage Growth in Which Michigan Has an Extremely High Share

Occupation	Percentage change in annual earnings, 1999–2005	Michigan's "Location quotient" (share of Michigan employment in occupation divided by share of national employment in occupation)	Industries that heavily use that occupation
Radio operators	55.5	2.27	Air transportation transit and ground passenger transportation Broadcasting (except Internet) Telecommunications
Refractory materials repairers, except brickmasons	29.1	2.13	Nonmetallic mineral product manufacturing Primary metal manufacturing
Audiologists	25.4	2.01	Health and personal care stores Ambulatory health care services
First-line supervisors/managers of correctional officers	24.9	3.79	Federal, state, and local government (OES designation)
Patternmakers, metal and plastic	23.2	3.38	Primary metal manufacturing Fabricated metal product manufacturing Machinery manufacturing Electrical equipment, appliance, and component manufacturing
Molding, core-making, and casting machine setters, operators, and tenders, metal	22.8	2.57	Plastics and rubber products manufacturing Primary metal manufacturing Machinery manufacturing Electrical equipment, appliance, and component manufacturing Transportation equipment manufacturing Miscellaneous manufacturing
Directors, religious activities and education	22.5	2.03	Religious, grant-making, civic, professional, and similar organizations
Mechanical engineers	21.0	2.70	Machinery manufacturing Computer and electronic product manufacturing Transportation equipment manufacturing
Heat treating equipment setters, operators, and tenders, metal and plastic	20.1	2.54	Plastics and rubber products manufacturing Primary metal manufacturing Fabricated metal product manufacturing

Table 10. (Continued)

Occupation	Percentage change in annual earnings, 1999–2005	Michigan's "Location quotient" (share of Michigan employment in occupation divided by share of national employment in occupation)	Industries that heavily use that occupation
			Transportation equipment manufacturing
Mechanical drafters	20.0	2.79	Fabricated metal product manufacturing Machinery manufacturing Transportation equipment manufacturing
Extruding and drawing machine setters, operators, and tenders, metal and plastic	19.7	2.20	Chemical manufacturing Plastics and rubber products manufacturing Primary metal manufacturing Fabricated metal product manufacturing Electrical equipment, appliance, and component manufacturing Miscellaneous manufacturing
Industrial engineers	19.5	3.01	Machinery manufacturing Computer and electronic product manufacturing Electrical equipment, appliance, and component manufacturing Transportation equipment manufacturing
Multiple machine tool setters, operators, and tenders, metal and plastic	19.4	2.89	Plastics and rubber products manufacturing Primary metal manufacturing Fabricated metal product manufacturing Machinery manufacturing Electrical equipment, appliance, and component manufacturing Transportation equipment manufacturing Furniture and related product manufacturing Miscellaneous manufacturing
Nuclear power reactor operators	19.1	2.10	Utilities
Welding, soldering, and brazing machine setters, operators, and tenders	19.0	3.52	Fabricated metal product manufacturing Machinery manufacturing Electrical equipment, appliance, and component manufacturing

Table 10. (Continued)

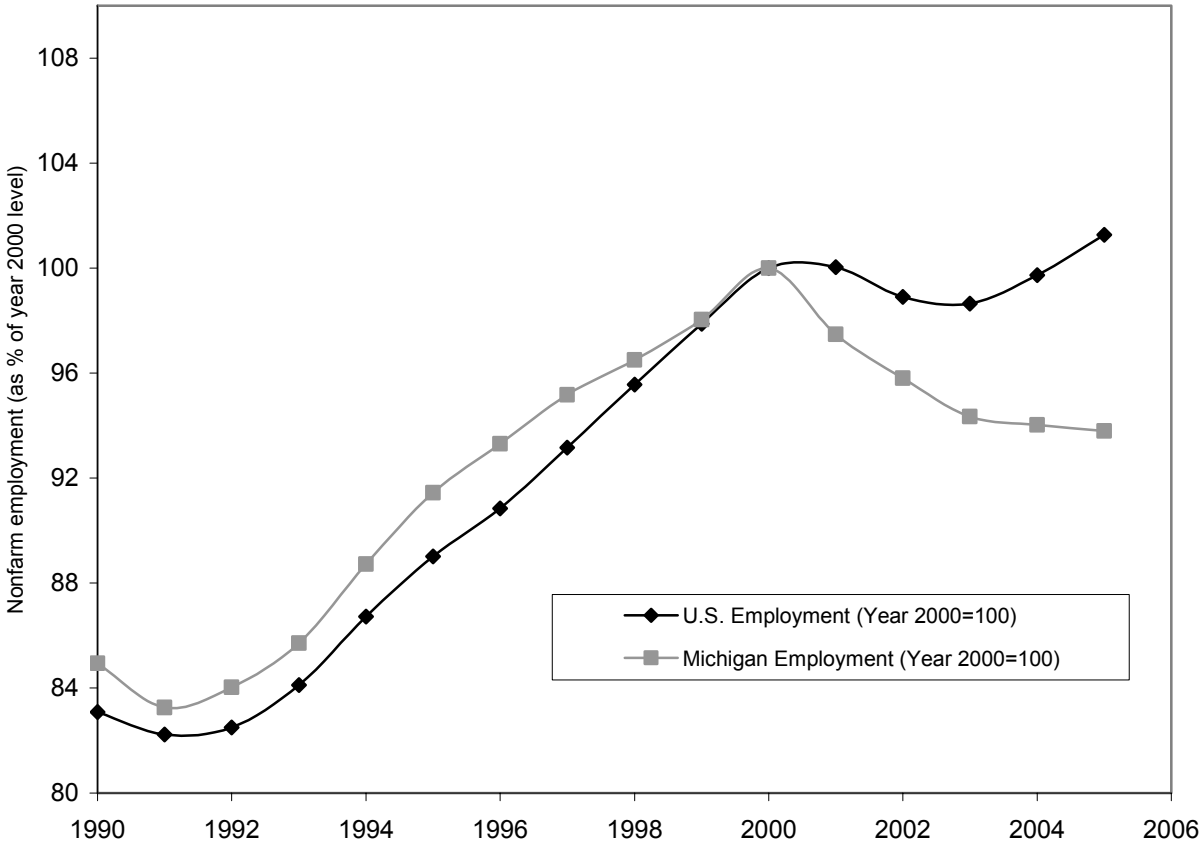
Occupation	Percentage change in annual earnings, 1999–2005	Michigan's "Location quotient" (share of Michigan employment in occupation divided by share of national employment in occupation)	Industries that heavily use that occupation
			Transportation equipment manufacturing
Cutting, punching, and press machine setters, operators, and tenders	17.1	2.48	Plastics and rubber products manufacturing Primary metal manufacturing Fabricated metal product manufacturing Machinery manufacturing Electrical equipment, appliance, and component manufacturing Transportation equipment manufacturing Furniture and related product manufacturing Miscellaneous manufacturing
Forging machine setters, operators, and tenders, metal and plastic	17.0	3.17	Petroleum and coal products manufacturing Plastics and rubber products manufacturing Primary metal manufacturing Fabricated metal product manufacturing Transportation equipment manufacturing
Numerical tool and process control programmers	16.4	2.15	Fabricated metal product manufacturing Machinery manufacturing
Drilling and boring machine tool setters, operators, and tenders, metal and plastic	16.4	2.92	Primary metal manufacturing Fabricated metal product manufacturing Machinery manufacturing Electrical equipment, appliance, and component manufacturing Transportation equipment manufacturing
Grinding, lapping, polishing, and buffing machine tool setters, operators, and tenders	15.6	2.23	Plastics and rubber products manufacturing Primary metal manufacturing Fabricated metal product manufacturing Machinery manufacturing Transportation equipment manufacturing Miscellaneous manufacturing
Machinists	15.5	2.22	Fabricated metal product manufacturing

Table 10. (Continued)

Occupation	Percentage change in annual earnings, 1999–2005	Michigan's "Location quotient" (share of Michigan employment in occupation divided by share of national employment in occupation)	Industries that heavily use that occupation
			Machinery manufacturing Transportation equipment manufacturing

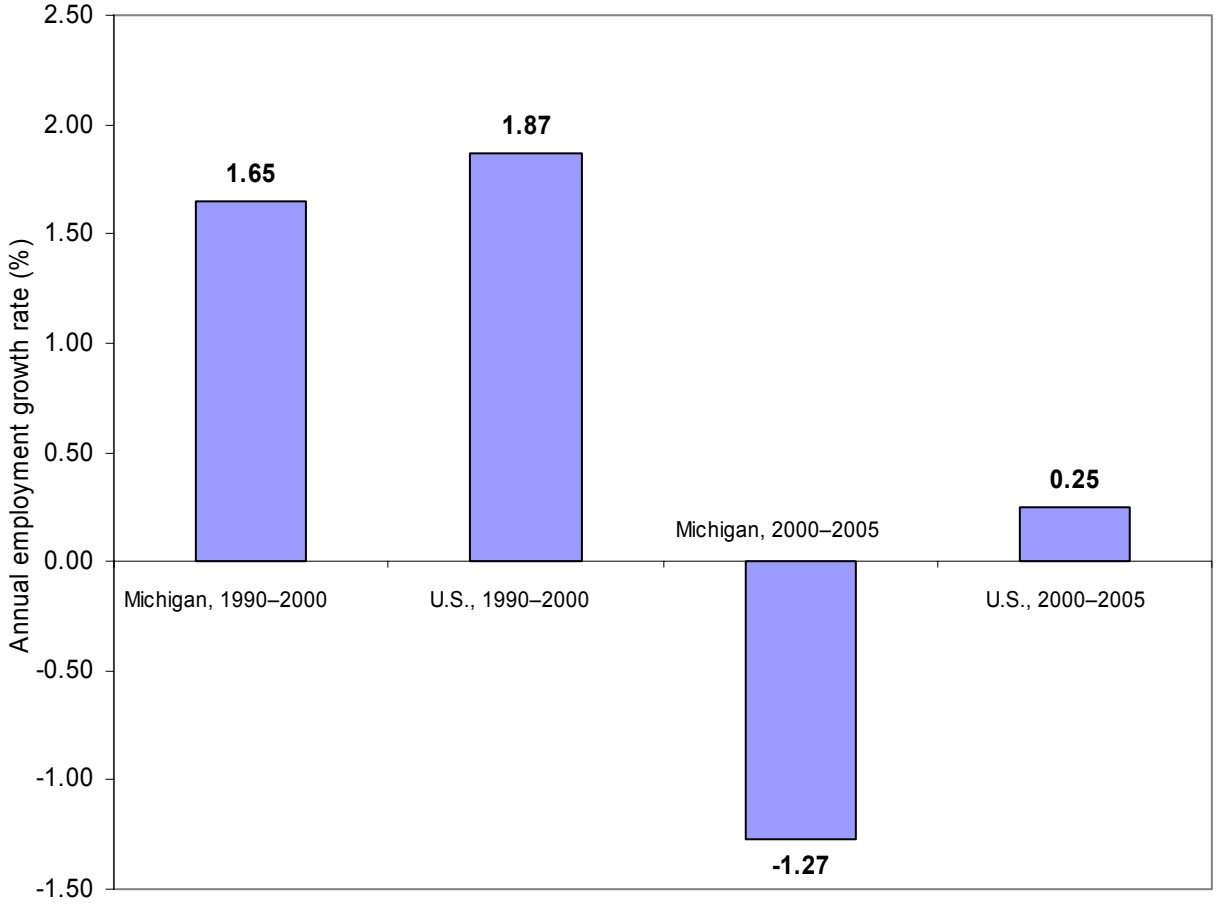
NOTE: Source for data is Occupational Employment Statistics of the U.S. Bureau of Labor Statistics, data files for 1999 and 2005. Occupations listed here must have growth in annual earnings in the nation of over 15.5% from 1999 to 2005, and their share of Michigan's total employment must be double the national average share in that occupation. Inflation from the median reference date of November 1999 for the 1999 data, to the May 2005 reference date for the 2005 data, was 15.5%, so these are occupations whose annual earnings growth exceeded the inflation rate over this time period. Industries that heavily use that occupation are those in which the share of employment in that occupation is over eight times the share of overall employment in that occupation.

Figure 1. Nonfarm Employment in Michigan and United States, 1990–2005



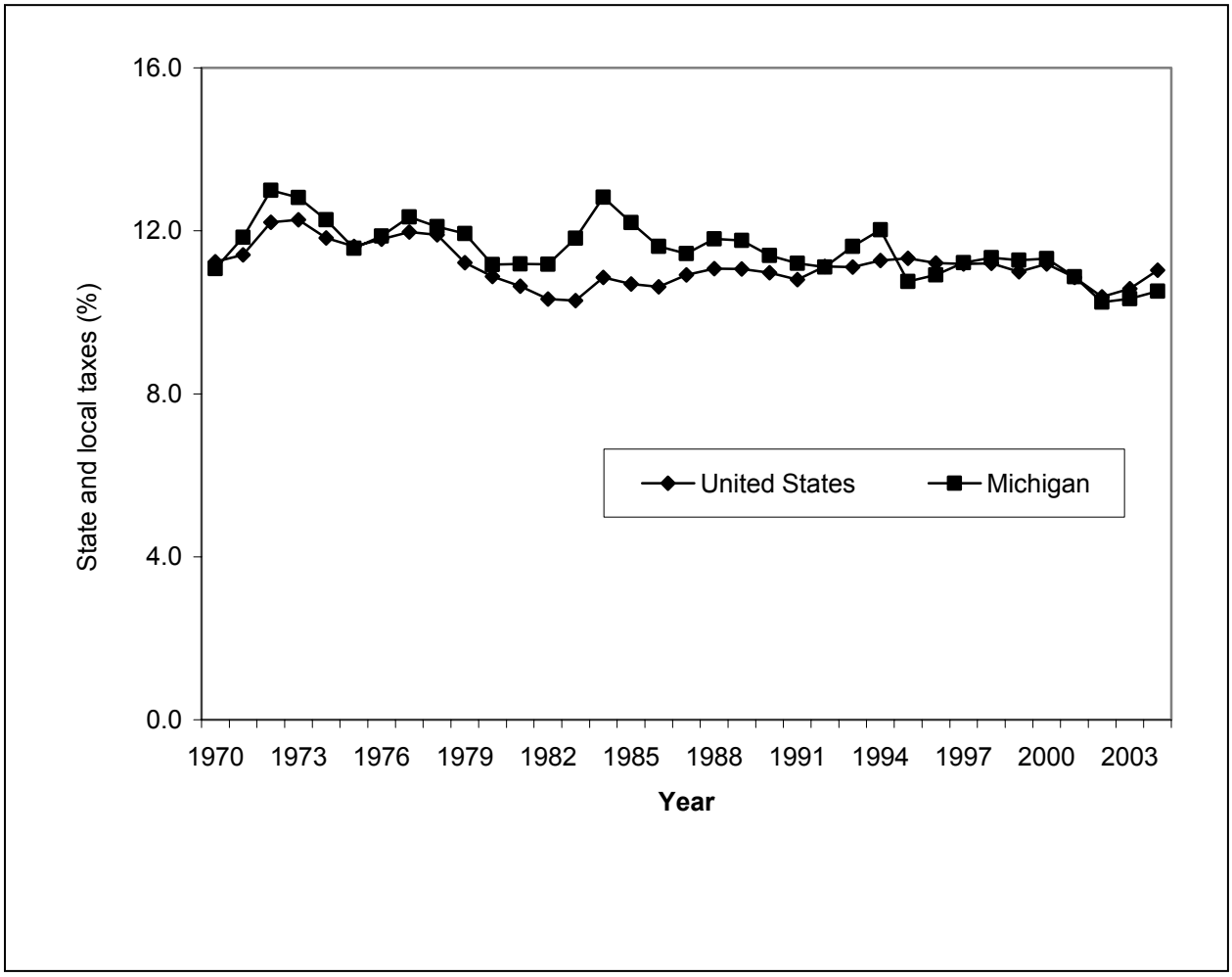
NOTE: Data on total nonfarm employment comes from the U.S. Bureau of Labor Statistics. Employment is rescaled so that employment in the year 2000 is set equal to 100 for both Michigan and the U.S.

Figure 2. Annual Employment Growth Rates, Michigan and U.S., 1990–2000 and 2000–2005



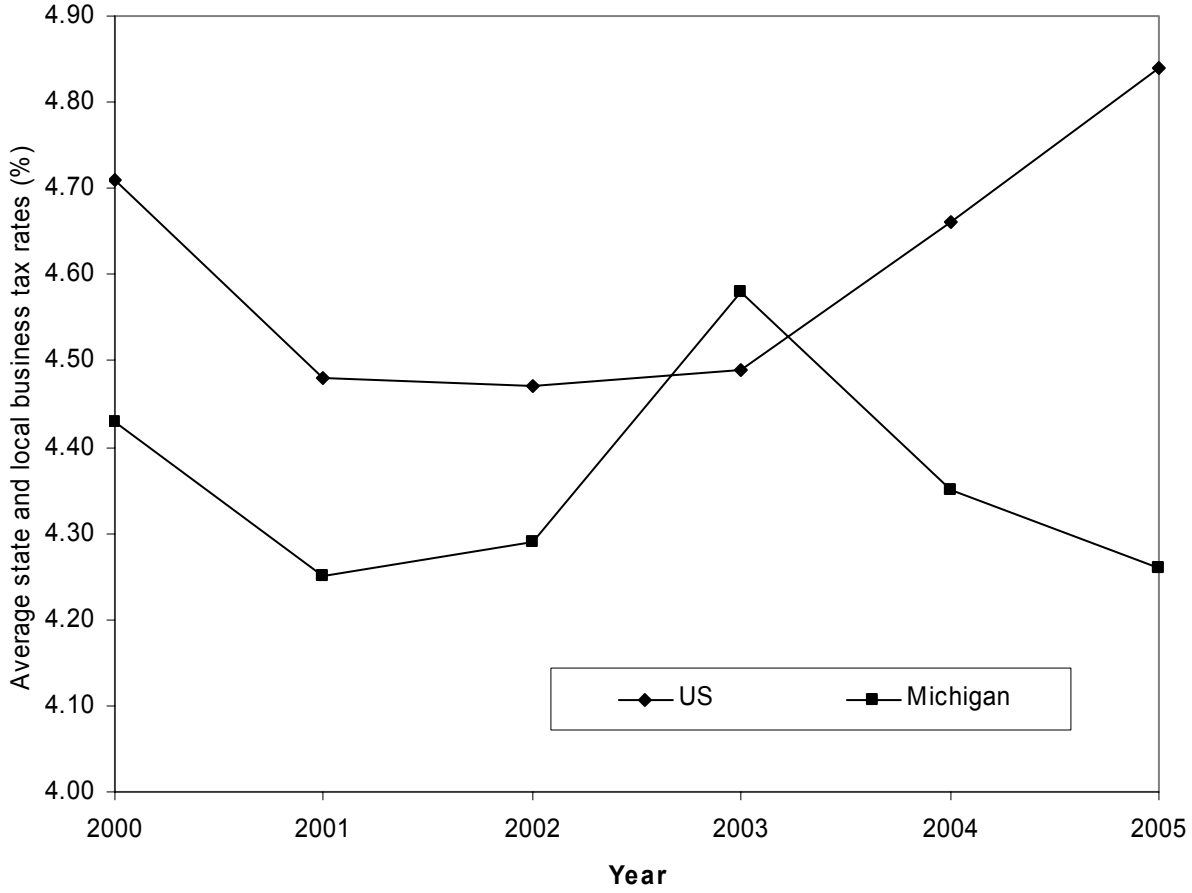
NOTE: Underlying data same as used in Figure 1.

Figure 3. Michigan's Overall State and Local Taxes Compared to the U.S., 1970–2004



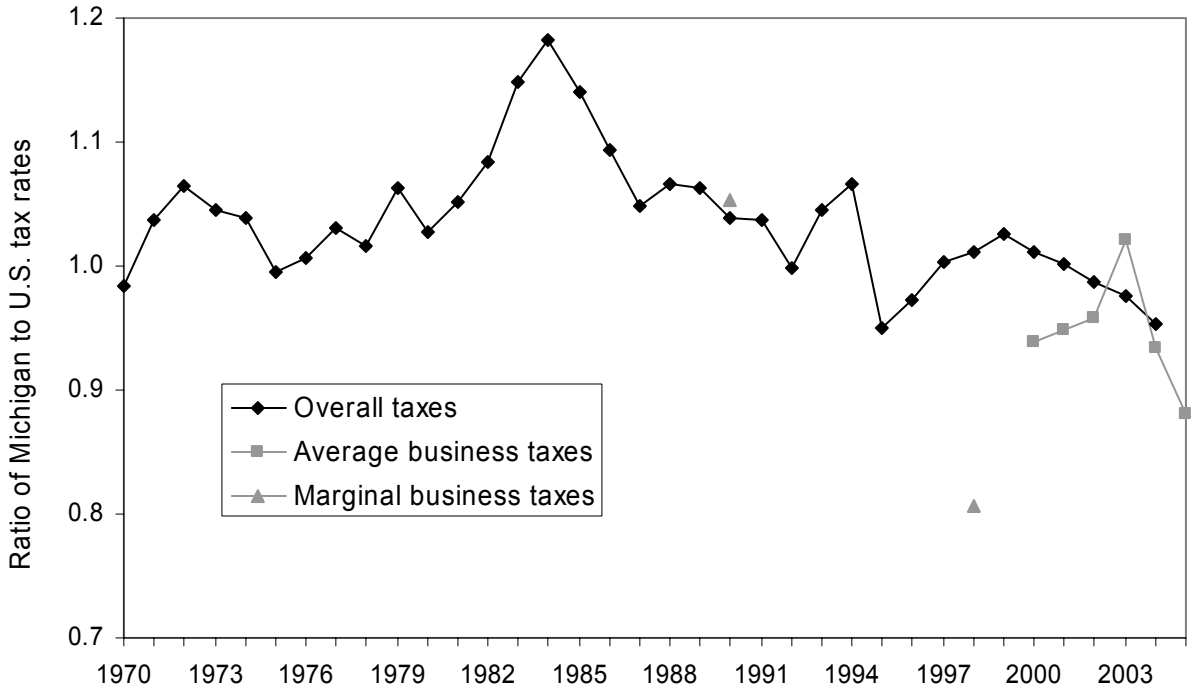
NOTE: Data on state and local taxes were obtained directly from the Census Bureau and correct some errors in published data. State and local taxes are data for that fiscal year; as is done by most researchers (e.g., Slemrod 2006; Ballard 2006), tax rates are calculated by dividing state and local tax collections for a given fiscal year by personal income data for the previous year. This is more sensible than dividing by the current year's personal income as more of the tax liability for a given fiscal year is probably based on the previous calendar year's income. Data for 2001 and 2003 for individual states were estimated by us. This estimation was done in two steps. First, the tax rates for the states and for the U.S. as a whole were interpolated using adjacent years. Then all states and the U.S. were adjusted by the ratio of the actual U.S. tax rate for 2001 and 2003 to the interpolated U.S. tax rates for these years. This second-state adjustment reconciles the U.S. to actual observed data and assumes that the interpolation procedure has similar biases for all states. This estimation does not change the relative position of Michigan vs. other states and the U.S. and only affects the absolute levels of these tax rates.

Figure 4. Michigan's Average State and Local Business Tax Rates, Compared to the U.S., 2000–2005



NOTE: Data on business tax collections come from Ernst and Young (2006, 2005, and 2004). We start with the latest data available from Ernst and Young for a given fiscal year for individual states. The 2006 Ernst and Young report gives U.S. totals for all of these years; these totals are used to adjust proportionally all the states in 2000 and 2003 up or down because the reported U.S. total for these years from the 2006 report slightly differs from the U.S. totals reported in previous years. The fiscal year data are divided by data obtained by us from the U.S. Bureau of Economic Analysis on private sector gross state product to yield percentage tax rate figures. The fiscal year data are divided by the previous calendar year's private GSP figure. The 2001 figures are estimated by us, in two stages. First, the adjacent years are interpolated to give an initial estimate of the state and U.S. tax rate for 2001. Then, all these tax rates are adjusted by the same proportion, with this proportion chosen so that the U.S. tax rate actually generates the total state and local business tax revenue that is given by Ernst and Young in its 2006 report.

Figure 5. Ratio of Michigan to U.S. Tax Rates for Three Types of Measures of Tax Rates, Various Years



NOTE: These data are taken from the previous tables. Average overall state and local taxes are based on Census data, average state and local business taxes are taken from Ernst and Young, and marginal state and local business taxes are taken from Peters and Fisher.

APPENDIX

The Competitiveness of Michigan Metropolitan Areas

This appendix briefly presents evidence on the economic competitiveness of different Michigan metropolitan areas with respect to different factors that are associated with employment growth, output growth, per capita income growth, or productivity growth.

From an economic perspective, a state is not a single economic unit. Rather, a state is a collection of different economic regions. Each economic region comprises a labor market, within which there is sufficiently mobility of labor that each particular type of labor has a uniform wage and availability that pervades the entire local labor market. As labor is the major component of business that is value-added, the cost and availability of different types of labor in the local labor market shape the attractiveness of the economic region for different types of businesses. The local labor market's wages and employment rates for different types of labor also shape the attractiveness of the economic region for migration of different types of households. The attractiveness of the area for different types of businesses and households heavily influences the economic future of the region.

The majority of economic production occurs in such local labor markets, or local economic regions, that are metropolitan areas. A metropolitan area is defined as a geographically contiguous group of counties (with counties being used purely as a convenient geographic unit) within which most commuting flows are contained—that is, the purpose of metropolitan area definition is to identify local labor markets.

The information presented here on the competitiveness of different Michigan metropolitan areas was originally collected as part of a project by Randall Eberts and George

Erickcek of the Upjohn Institute, along with independent consultant Jack Kleinhenz, on indicators of economic competitiveness for different metropolitan areas in northeast Ohio. Full details on this project, including more details on the underlying data, are provided in a working paper by Eberts, Erickcek, and Kleinhenz (2006). As part of the analysis of the competitiveness of northeast Ohio metropolitan areas, Eberts et al. collected data on 118 metropolitan areas throughout the U.S. For this appendix, we have added in data for the Detroit metropolitan area and seven other metropolitan areas.

These competitiveness data on metropolitan areas are summarized as standardized scores on eight factors that can be shown to affect some dimension of local economic development. These eight factors are derived from a factor analysis of 40 variables that are hypothesized to potentially affect some aspect of local economic development. Table A-1, reproduced from Table 4 of Eberts et al., shows the factor loadings on the 40 underlying variables that define the eight factors.

As is usual with factor analysis, there is some art to interpreting what the factors are actually measuring, and some factors are easier to interpret than others. The "Skilled Workforce" factor not only measures educational attainment, but also whether the local workforce is concentrated in professional occupations. "Urban Assimilation" can be interpreted as a measure of whether the local labor market has had a lot of foreign immigration. "Racial Inclusion" reflects the extent of racial integration. The "Legacy of Place" factor measures, among other things, whether the local area has a greater proportion of older housing. The "Income Equality" factor measures high neighborhood poverty for children as well as income disparities. The "Locational Amenities" factor includes a variety of standard "Places-Rated

Almanac" measures of a local area's attractiveness. The "Business Dynamics" factor measures not only whether the area has a lot of employment churning, with many jobs created and destroyed, but also whether the area has more small businesses and more nonmanufacturing businesses. Finally, the "Urban/Metro Structure" factor reflects both poverty concentration in the central city and metro population concentration in the central city.

These factors are defined so that for seven out of eight of them, all except "Legacy of Place," a higher score on the factor is expected to be positively associated with economic development. As is usual with factor analysis, the units of measure are defined so that each factor has a mean of zero across the different metropolitan areas, and a standard deviation of one across the different metropolitan areas.

Eberts et al. also empirically estimated how these eight factors were statistically related to four measures of local economic development. These relationships were estimated over the 118 metropolitan areas they included in their study. The measures of economic development that were considered were 1994–2004 percentage growth in the metropolitan area in employment, output, and productivity, and 1993–2003 percentage growth in the metropolitan area in per capita income. Productivity is defined as output per worker, so there is a close relationship between what affects the three variables of employment, output, and productivity. Thus, if a factor has large effects on employment growth and productivity growth, it must have large effects on output growth. In the long run, if one assumes that increases in productivity growth are divided similarly among owners of capital and workers, one would expect increases in productivity growth to be closely associated with increases in per capita income growth.

However, over the short run and medium run, not all increases in productivity growth need be broadly shared.

Table A-2 reports the results of how these factors affected these economic development measures and is reproduced from Table 9 of Eberts et al. As the eight factors all have the same standard deviation, the size of a factor's coefficient estimate roughly reflects the relative importance of that factor vs. other factors in influencing that particular measure of economic development. Only coefficients that are statistically significant at the 95 percent level are included.

It is no great surprise that the "Skilled Workforce" factor is strongly positively related to all four measures of local economic development. In particular, a metro area with a more positive "Skilled Workforce" factor is particularly likely to experience high productivity, output, and per capita income growth. The Skilled Workforce Factor is the most important variable in determining these three measures of economic development. What is perhaps more surprising is how important "Urban Assimilation" (or more immigrants) and "Racial Inclusion" (more racial integration) are in positively affecting employment, productivity, and output growth. In addition, areas with a high "Legacy of Place" factor (for example, older areas) tend to have weaker employment and output growth. Finally, areas with a more positive "Business Dynamics" factor (i.e., areas with more business churning, more small businesses, and more nonmanufacturing businesses) tend to have higher employment and hence output growth.

Tables A-3 through A-10 present the factor scores of 126 metropolitan areas on these eight factors, with the Michigan metropolitan areas highlighted in bold. We want to particularly focus on the Michigan metropolitan areas with factor scores of more than one or less than minus

one; these are areas that are more than one standard deviation away from the metropolitan area mean. We also focus on the factors that seem to have the strongest relationship to the most measures of local economic development.

First, the Ann Arbor area is, as one might expect, unusually high on the "Skilled Workforce" factor, ranking sixth among these 126 metropolitan areas. This emphasizes that the below-average college-educated proportion of Michigan, mentioned in the main text of the present report, does not characterize all Michigan metropolitan areas. Ann Arbor's strength on "Skilled Workforce" should help encourage continued economic growth in that area, particularly in productivity and per capita income.

Second, Saginaw, Flint, and Detroit all do quite poorly on the "Racial Inclusion" factor, which, among other things, measures the extent of racial integration in the metropolitan area. As Table A-2 showed, poor scores on this factor are associated with slower local growth in employment, productivity, and output.

Third, the Grand Rapids metropolitan area scores highly on the "Business Dynamics" factor, which reflects business churning, the importance of small businesses, and the importance of nonmanufacturing businesses. Higher scores on the "Business Dynamics" factor are associated with stronger employment growth.

Fourth, although no individual metropolitan area has a high negative score, all Michigan metropolitan areas are below the national average on the "Urban Assimilation" factor, which measures the extent of foreign immigration and is associated with faster output, productivity, and employment growth.

Much else can be gleaned by examining these tables showing how Michigan metropolitan areas rank on these various factors. We leave the remainder of this interpretation to the reader.

One policy implication of this analysis is that economic development policy might want to look beyond the state level. Michigan's economic development might be able to build on the particular strengths of individual metropolitan areas, for example Ann Arbor's strength in the "Skilled Workforce" factor. In addition, this analysis raises the issue of whether greater openness to racial integration and immigration might enhance Michigan's economic development.

Table A-1. Factor Loadings of 40 Variables and 8 Factors

Variable	Skilled workforce	Urban assimilation	Racial inclusion	Legacy of place	Income equality	Locational amenities	Business dynamics	Urban/ metro structure
Professional occupation	**0.955**	0.062	−0.042	0.053	−0.032	0.033	0.017	−0.010
Graduate degree	**0.906**	0.064	−0.077	0.006	0.010	0.039	0.075	0.058
Bachelor's degree	**0.881**	0.177	−0.049	0.063	−0.182	0.131	0.081	−0.089
Skill differences	**0.612**	−0.083	0.199	0.011	−0.188	0.152	−0.041	0.075
% population < 16 or > 64	**−0.660**	0.056	0.142	0.125	0.018	−0.081	0.280	0.142
Number of patents/employee	**0.480**	0.142	−0.181	−0.120	−0.176	−0.017	−0.087	0.073
Productivity information sector	**0.456**	0.271	−0.042	−0.013	−0.011	−0.049	0.152	−0.025
% foreign-born	0.097	**0.927**	−0.105	0.023	0.084	0.055	0.153	0.084
% minority business employee	0.031	**0.884**	0.056	0.125	0.223	−0.087	0.076	−0.012
% Hispanic	−0.138	**0.770**	−0.260	0.122	0.250	−0.030	0.142	−0.123
Cost-of-living index	0.342	**0.683**	−0.149	0.222	−0.132	−0.002	0.098	0.141
% Asian	0.341	**0.663**	−0.180	0.104	−0.056	−0.033	−0.192	0.032
Commuting time	0.144	**0.549**	0.256	0.167	−0.080	−0.149	0.168	0.303
% homeownership	−0.160	**−0.537**	0.223	0.068	−0.349	−0.124	−0.027	0.324
Isolation index	−0.034	−0.121	**0.928**	−0.025	0.182	0.167	−0.017	0.071
Dissimilarity index	−0.157	−0.167	**0.826**	−0.334	0.009	0.164	−0.031	0.141
% black	0.061	−0.121	**0.587**	0.299	0.394	−0.066	−0.058	−0.014
Climate index	−0.076	0.469	−0.247	**0.623**	0.187	−0.050	0.343	0.097
Gross change in employment due to business churning	0.163	0.356	−0.042	**0.618**	0.142	0.120	0.470	−0.075
Number government units	−0.164	−0.387	0.117	**−0.449**	−0.210	−0.070	−0.071	0.038
Crime index	0.150	−0.217	−0.359	**−0.530**	−0.352	−0.153	−0.125	0.192
% of houses built before 1940	−0.035	−0.050	0.137	**−0.878**	−0.030	0.027	−0.118	0.086
% children living in high poverty neighborhoods	−0.358	0.195	0.128	0.075	**0.814**	−0.029	0.039	−0.183
Income inequality	−0.005	0.387	0.285	0.206	**0.765**	−0.028	0.122	−0.054
Transportation index	0.126	−0.099	0.168	−0.026	0.043	**0.824**	−0.074	−0.155
Recreation index	0.083	−0.108	0.372	0.142	−0.265	**0.584**	0.214	0.184
Arts index	0.525	0.241	0.248	−0.087	−0.244	**0.535**	−0.067	0.053
Major university	0.487	0.026	0.074	0.107	0.104	**0.520**	−0.085	0.086
Health index	0.445	0.003	0.196	0.019	0.186	**0.451**	−0.037	0.045
% businesses employing less than 20 workers	−0.023	0.200	−0.032	0.177	−0.047	−0.109	**0.832**	0.226
Gross change in employment from business churning	0.163	0.356	−0.042	0.618	0.142	0.120	**0.470**	−0.075
Concentration in manufacturing employment	−0.096	−0.151	0.016	−0.261	−0.288	−0.077	**−0.693**	0.164
Concentration of poverty in core city	0.089	0.107	0.124	−0.141	−0.034	−0.071	0.037	**0.716**
% metro population in core city	0.128	−0.034	−0.154	0.098	0.262	−0.021	−0.109	**−0.762**

SOURCE: Reproduced from Table 4, Eberts et al. (2006).

Table A-2. Contribution of Factors to Growth Measures

Factors	Employment	Output	Per capita income	Productivity
Skilled workforce	0.019	0.119	0.039	0.081
Urban assimilation	0.019	0.083		0.056
Racial inclusion	0.033	0.081		0.034
Legacy of place	−0.065	−0.077	−0.017	
Income equality	0.025	0.049	0.013	
Locational amenities			0.011	
Business dynamics	0.054	0.041		−0.022
Urban/metro structure		0.041	0.015	
Adjusted R-squared	0.66	0.64	0.46	0.62

SOURCE: Reproduced from Table 9, Eberts et al. (2006).

NOTE: The growth measures are expressed as percentage changes between 1994 and 2004, except for per capita income, which spans the time period 1993–2003. All coefficients are statistically significant at the 95 percent level.

Table A-3. Rank of Metro Areas on Skilled Workforce Factor Score

Rank	Factor score	Metro area		Rank	Factor score	Metro area	
1	4.109	Boulder-Longmont	CO	63	-0.133	Syracuse	NY
2	2.695	Madison	WI	64	-0.141	Jacksonville	FL
3	2.321	Raleigh--Durham--Chapel Hill	NC	65	-0.167	Knoxville	TN
4	2.315	Middlesex--Somerset--Hunterdon	NJ	66	-0.170	Pensacola	FL
5	2.240	San Jose	CA	67	-0.181	Baton Rouge	LA
6	**2.179**	**Ann Arbor**	**MI**	68	-0.194	San Luis Obispo	CA
7	2.133	Tallahassee	FL	69	-0.212	Augusta-Aiken	GA--SC
8	1.700	Austin--San Marcos	TX	70	-0.227	Salt Lake City	UT
9	1.594	Seattle—Bellevue-Everett	WA	71	-0.242	Springfield	MO
10	1.513	Trenton	NJ	72	**-0.252**	**Kalamazoo--Battle Creek**	**MI**
11	1.392	Oakland	CA	73	-0.261	Fort Lauderdale	TX
12	1.368	Huntsville	AL	74	-0.261	Orlando	FL
13	1.297	Newark	NJ	75	**-0.296**	**Saginaw--Bay-Midland**	**MI**
14	1.217	Bergen-Passaic	NJ	76	-0.336	Mobile	AL
15	0.910	Atlanta	GA	77	-0.363	Tampa--St. Peterburg	FL
16	0.899	Denver	CO	78	-0.370	Greensboro-Winston-Salem-High Point	NC
17	0.806	Lincoln	NE	79	-0.381	Fayetteville--Springdale--Rogers	AR
18	0.784	Provo-Orem	UT	80	-0.382	Melbourne--Titusville--Palm Bay	FL
19	0.754	Lubbock	TX	81	-0.397	Macon	GA
20	0.730	Richmond--Petersburg	VA	82	-0.409	Reno	NV
21	0.705	Jackson	MS	83	-0.442	Toledo	OH
22	0.694	Colorado Springs	CO	84	-0.444	Tulsa	OK
23	0.636	Monmouth--Ocean	NJ	85	**-0.457**	**Grand Rapids-Muskegon-Holland**	**MI**
24	0.577	San Diego	CA	86	-0.562	Davenport--Moline--Rock Island	IA--IL
25	0.571	Charleston--North Charleston	SC	87	-0.585	Peoria--Pekin	IL
26	0.546	Santa Rosa	CA	88	-0.595	Reading	PA
27	0.502	Lexington	KY	89	-0.596	Tacoma	WA
28	0.501	Orange County	CA	90	-0.599	South Bend	IN
29	0.474	Birmingham	AL	91	**-0.601**	**Flint**	**MI**
30	0.472	Nashville	TN	92	-0.627	Sarasota-Bradenton	FL
31	0.395	Montgomery	AL	93	-0.650	Lancaster	PA
32	0.389	Dutchess County	NY	94	-0.695	Vallejo--Fairfield--Napa	CA
33	0.379	Rochester	NY	95	-0.704	Rockford	IL
34	0.373	Dallas	TX	96	-0.743	Fort Myers-Cape Coral	FL
35	0.365	Kansas City	MO--KS	97	-0.747	Utica-Rome	NY
36	0.354	Binghamton	NY	98	-0.774	York	PA
37	**0.312**	**Lansing--East Lansing**	**MI**	99	-0.780	Fort Wayne	IN
38	0.297	Indianapolis	IN	100	-0.808	Shreveport--Bossier City	LA
39	0.287	Pittsburgh	PA	101	-0.808	Salinas	CA
40	**0.278**	**Detroit**	**MI**	102	-0.809	Greenville-Spartanburg-Anderson	SC
41	0.276	Boise City	ID	103	-0.924	Corpus Christi	TX
42	0.274	Spokane	WA	104	-0.928	Miami	FL
43	0.217	Hamilton--Middletown	OH	105	-0.929	Appleton--Oshkosh--Neenah	WI
44	0.208	Des Moines	IA	106	-0.936	Atlantic--Cape May	NJ
45	0.207	Ventura	CA	107	-0.943	Erie	PA
46	0.202	Eugene-Springfield	OR	108	-0.967	Youngstown--Warren	OH
47	0.200	Milwaukee-Waukesha	WI	109	-1.035	Scranton--Wilkes-Barre--Hazleton	PA
48	0.167	Cleveland--Lorain—Elyria	OH	110	-1.045	Daytona Beach	FL
49	0.155	Santa Barbara	CA	111	-1.049	Beaumont--Port Arthur	TX
50	0.137	Dayton-Springfield	OH	112	-1.085	Fresno	CA
51	0.131	Houston	TX	113	-1.132	Johnson City	TN--VA
52	0.094	Galveston--Texas City	TX	114	-1.162	Stockton--Lodi	CA
53	0.085	Jersey City	NJ	115	-1.187	Canton--Massillon	OH
54	0.083	Buffalo--Niagara Falls	NY	116	-1.224	Fayetteville	NC
55	0.064	Tucson	AZ	117	-1.272	Fort Pierce	FL
56	0.063	Oklahoma City	OK	118	-1.335	Hickory--Morganton--Lenoir	NC
57	0.055	New Orleans	LA	119	-1.409	Riverside--San Bernardino	CA
58	0.043	Fort Worth Arlington	TX	120	-1.766	Modesto	CA
59	0.028	Little Rock - North Little Rock	AR	121	-1.829	Bakersfield	CA
60	-0.010	Akron	OH	122	-1.860	Lakeland--Winter Haven	FL
61	-0.074	West Palm Beach	FL	123	-1.881	Visalia--Tulare--Porterville	CA
62	-0.087	Allentown--Bethlehem—Easton	PA				

Table A-4. Rank of Metro Areas on Racial Inclusion Factor Score

Rank	Factor score	Metro Area		Rank	Factor score	Metro area	
1	-1.923	Eugene--Springfield	OR	63	0.081	Knoxville	TN
2	-1.857	Boise City	ID	64	0.090	Denver	CO
3	-1.788	Spokane	WA	66	0.161	York	PA
4	-1.745	Salt Lake City	UT	67	0.164	Orlando	FL
5	-1.658	Tucson	AZ	68	0.176	Rochester	NY
6	-1.546	Reno	NV	69	0.206	Fort Worth Arlington	TX
7	-1.454	Provo--Orem	UT	70	0.213	Vallejo--Fairfield--Napa	CA
8	-1.430	Visalia--Tulare--Porterville	CA	71	0.259	Greensboro--Winston-Salem--High Point	NC
9	-1.420	Boulder--Longmont	CO	72	0.288	Daytona Beach	FL
10	-1.403	Modesto	CA	73	0.291	Oakland	CA
11	-1.369	Orange County	CA	**74**	**0.310**	**Ann Arbor**	**MI**
12	-1.291	Santa Barbara	CA	75	0.334	Macon	GA
13	-1.284	Binghamton	NY	76	0.367	Tampa--St. Peterburg	FL
14	-1.250	Johnson City	TN--VA	77	0.412	Dallas	TX
15	-1.228	Lincoln	NE	78	0.413	Rockford	IL
16	-1.186	Riverside--San Bernardino	CA	79	0.418	Syracuse	NY
17	-1.182	Bakersfield	CA	80	0.442	Huntsville	AL
18	-1.148	Allentown--Bethlehem--Easton	PA	81	0.445	Nashville	TN
19	-1.124	Scranton--Wilkes-Barre--Hazleton	PA	82	0.453	Sarasota--Bradenton	FL
20	-1.087	Fresno	CA	83	0.527	Pittsburgh	PA
21	-1.078	Appleton--Oshkosh--Neenah	WI	84	0.535	Houston	TX
22	-1.062	Springfield	MO	85	0.549	Richmond--Petersburg	VA
23	-1.006	Santa Rosa	CA	86	0.631	Little Rock - North Little Rock	AR
24	-0.983	Corpus Christi	TX	87	0.680	Tulsa	OK
25	-0.935	Madison	WI	88	0.696	West Palm Beach	FL
26	-0.934	Hickory--Morganton--Lenoir	NC	89	0.780	Shreveport--Bossier City	LA
27	-0.929	Tacoma	WA	90	0.781	Galveston--Texas City	TX
28	-0.928	San Jose	CA	91	0.787	Jacksonville	FL
29	-0.876	Colorado Springs	CO	92	0.809	Atlantic--Cape May	NJ
30	-0.849	Reading	PA	93	0.812	Fort Lauderdale	TX
31	-0.815	Fayetteville--Springdale--Rogers	AR	94	0.831	Peoria--Pekin	IL
32	-0.803	Ventura	CA	95	0.843	Bergen--Passaic	NJ
33	-0.767	Stockton--Lodi	CA	96	0.847	Akron	OH
34	-0.765	Seattle--Bellevue--Everett	WA	97	0.852	Monmouth--Ocean	NJ
35	-0.752	San Diego	CA	**98**	**0.854**	**Grand Rapids-Muskegon-Holland**	**MI**
36	-0.708	San Luis Obispo	CA	99	0.859	Fort Myers-Cape Coral	FL
37	-0.676	Greenville--Spartanburg--Anderson	SC	100	0.882	Fort Pierce	FL
38	-0.666	Lexington	KY	101	0.884	Jersey City	NJ
39	-0.653	Middlesex--Somerset--Hunterdon	NJ	102	0.906	Montgomery	AL
40	-0.641	Lancaster	PA	103	1.037	Trenton	NJ
41	-0.573	Austin--San Marcos	TX	104	1.041	Youngstown--Warren	OH
42	-0.516	Pensacola	FL	105	1.083	Fort Wayne	IN
43	-0.482	Fayetteville	NC	106	1.151	Toledo	OH
44	**-0.473**	**Lansing--East Lansing**	**MI**	107	1.168	Indianapolis	IN
45	-0.434	Davenport--Moline--Rock Island	IA--IL	108	1.188	Dayton--Springfield	OH
46	-0.398	Lubbock	TX	109	1.210	Buffalo--Niagara Falls	NY
47	-0.396	Utica--Rome	NY	110	1.210	Kansas City	MO--KS
48	**-0.292**	**Kalamazoo--Battle Creek**	**MI**	111	1.218	Atlanta	GA
49	-0.282	Melbourne--Titusville--Palm Bay	FL	112	1.267	Beaumont--Port Arthur	TX
50	-0.213	Canton--Massillon	OH	113	1.271	Mobile	AL
51	-0.179	Raleigh--Durham--Chapel Hill	NC	114	1.287	Miami	FL
52	-0.163	Erie	PA	115	1.288	Baton Rouge	LA
53	-0.158	Charleston--North Charleston	SC	116	1.294	Jackson	MS
54	-0.136	Tallahassee	FL	**118**	**1.377**	**Saginaw--Bay-Midland**	**MI**
55	-0.132	Des Moines	IA	119	1.394	New Orleans	LA
56	-0.085	Salinas	CA	120	1.679	Birmingham	AL
57	-0.074	Hamilton--Middletown	OH	121	1.822	Newark	NJ
58	-0.021	Augusta--Aiken	GA--SC	122	1.984	Cleveland--Lorain--Elyria	OH
59	-0.012	Dutchess County	NY	123	2.055	Milwaukee--Waukesha	WI
60	0.039	Lakeland--Winter Haven	FL	**124**	**2.169**	**Flint**	**MI**
61	0.045	South Bend	IN	**126**	**2.685**	**Detroit**	**MI**
62	0.071	Oklahoma City	OK				

Table A-5. Rank of Metro Areas on Business Dynamics Factor Score

Rank	Factor score	Metro area		Rank	Factor score	Metro area	
1	−2.282	San Jose	CA	65	−0.054	Buffalo--Niagara Falls	NY
2	−2.222	Hickory--Morganton--Lenoir	NC	66	−0.035	Shreveport--Bossier City	LA
3	**−1.547**	**Grand Rapids–Muskegon-Holland**	**MI**	67	−0.024	Erie	PA
4	−1.542	Appleton--Oshkosh--Neenah	WI	69	−0.003	Rochester	NY
5	−1.304	Dayton--Springfield	OH	70	0.019	Austin--San Marcos	TX
6	−1.293	Greenville--Spartanburg--Anderson	SC	71	0.028	San Diego	CA
7	−1.269	Stockton--Lodi	CA	72	0.031	Des Moines	IA
8	−1.245	Modesto	CA	73	0.093	Raleigh--Durham--Chapel Hill	NC
9	−1.223	Fort Wayne	IN	74	0.127	Tucson	AZ
10	−1.216	Orange County	CA	75	0.146	Corpus Christi	TX
11	−1.187	Rockford	IL	76	0.154	Visalia--Tulare--Porterville	CA
12	−1.156	South Bend	IN	77	0.175	Springfield	MO
13	−1.096	Milwaukee--Waukesha	WI	78	0.215	Lubbock	TX
14	−1.055	Lancaster	PA	79	0.222	Binghamton	NY
15	−1.028	York	PA	80	0.242	Lincoln	NE
16	−1.020	Hamilton--Middletown	OH	81	0.244	Tulsa	OK
17	−0.994	Toledo	OH	82	0.249	Little Rock - North Little Rock	AR
18	−0.953	Dallas	TX	83	0.259	Bakersfield	CA
19	**−0.918**	**Detroit**	**MI**	84	0.272	Oklahoma City	OK
20	**−0.907**	**Kalamazoo--Battle Creek**	**MI**	85	0.286	Mobile	AL
21	−0.894	Riverside--San Bernardino	CA	86	0.337	Charleston--North Charleston	SC
22	−0.879	Fort Worth Arlington	TX	87	0.352	Pittsburgh	PA
23	−0.869	Nashville	TN	88	0.374	Seattle--Bellevue--Everett	WA
24	−0.779	Johnson City	TN--VA	89	0.381	Santa Barbara	CA
25	−0.773	Greensboro--Winston-Salem--High Point	NC	90	0.434	Salt Lake City	UT
26	−0.749	Fayetteville	NC	91	0.467	Reno	NV
27	**−0.720**	**Flint**	**MI**	92	0.477	Orlando	FL
28	−0.716	Huntsville	AL	93	0.488	Denver	CO
29	−0.697	Oakland	CA	94	0.529	Jacksonville	FL
30	−0.687	Houston	TX	95	0.551	Tallahassee	FL
31	−0.666	Middlesex--Somerset--Hunterdon	NJ	96	0.553	Syracuse	NY
32	−0.653	Akron	OH	97	0.605	Galveston--Texas City	TX
33	−0.611	Fayetteville--Springdale--Rogers	AR	98	0.613	Eugene--Springfield	OR
34	−0.610	Indianapolis	IN	99	0.632	Scranton--Wilkes-Barre--Hazleton	PA
35	−0.607	Birmingham	AL	100	0.665	Lakeland--Winter Haven	FL
36	−0.604	Baton Rouge	LA	101	0.666	Tacoma	WA
37	−0.589	Richmond--Petersburg	VA	102	0.672	Bergen--Passaic	NJ
39	**−0.558**	**Lansing--East Lansing**	**MI**	103	0.702	Boulder--Longmont	CO
40	**−0.552**	**Saginaw—Bay City-Midland**	**MI**	104	0.740	Newark	NJ
41	−0.551	Knoxville	TN	105	0.807	Boise City	ID
42	−0.539	Canton--Massillon	OH	106	0.893	Salinas	CA
43	−0.534	Reading	PA	107	0.894	Pensacola	FL
44	−0.515	Augusta--Aiken	GA--SC	108	0.895	Colorado Springs	CO
45	−0.490	Madison	WI	109	1.012	Tampa--St. Peterburg	FL
46	−0.440	Peoria--Pekin	IL	110	1.030	Santa Rosa	CA
47	−0.423	Lexington	KY	111	1.073	Spokane	WA
48	−0.418	Cleveland--Lorain--Elyria	OH	112	1.085	Jersey City	NJ
49	−0.392	Davenport--Moline--Rock Island	IA--IL	113	1.205	Melbourne--Titusville--Palm Bay	FL
50	−0.386	Atlanta	GA	114	1.275	San Luis Obispo	CA
51	−0.353	Allentown--Bethlehem--Easton	PA	115	1.433	Dutchess County	NY
52	−0.342	Vallejo--Fairfield--Napa	CA	116	1.462	Provo--Orem	UT
53	−0.335	Montgomery	AL	117	1.561	Fort Lauderdale	TX
55	−0.283	Beaumont--Port Arthur	TX	118	1.592	Utica--Rome	NY
56	−0.235	Kansas City	MO--KS	119	1.807	Miami	FL
57	−0.212	Ventura	CA	120	1.809	Monmouth--Ocean	NJ
58	−0.189	Macon	GA	121	1.869	Daytona Beach	FL
59	**−0.186**	**Ann Arbor**	**MI**	122	1.941	Fort Myers-Cape Coral	FL
60	−0.182	New Orleans	LA	123	2.046	Fort Pierce	FL
61	−0.159	Jackson	MS	124	2.206	West Palm Beach	FL
62	−0.123	Youngstown--Warren	OH	125	2.212	Sarasota--Bradenton	FL
63	−0.096	Fresno	CA	126	2.240	Atlantic--Cape May	NJ
64	−0.095	Trenton	NJ				

Table A-6. Rank of Metro Areas on Urban Assimilation Factor Score

Rank	Factor score	Metro area		Rank	Factor score	Metro area	
1	4.567	Miami	FL	63	−0.360	Sarasota--Bradenton	FL
2	4.315	Jersey City	NJ	64	−0.362	Tulsa	OK
3	2.937	San Jose	CA	65	−0.369	Nashville	TN
4	2.151	Orange County	CA	66	−0.374	Kansas City	MO--KS
5	2.113	Oakland	CA	67	−0.376	Greenville--Spartanburg--Anderson	SC
6	2.073	Salinas	CA	68	−0.378	Augusta--Aiken	GA--SC
7	1.901	Vallejo--Fairfield--Napa	CA	69	−0.390	Salt Lake City	UT
8	1.665	Bergen--Passaic	NJ	70	−0.391	Toledo	OH
9	1.518	Stockton--Lodi	CA	71	−0.392	Fort Myers-Cape Coral	FL
10	1.482	Houston	TX	72	−0.416	Lincoln	NE
11	1.381	Ventura	CA	73	−0.422	Raleigh--Durham--Chapel Hill	NC
12	1.305	Riverside--San Bernardino	CA	74	**−0.451**	**Ann Arbor**	**MI**
13	1.265	Fort Lauderdale	TX	75	−0.454	York	PA
14	1.219	Modesto	CA	76	−0.468	Davenport--Moline--Rock Island	IA--IL
15	1.157	San Diego	CA	77	−0.469	Buffalo--Niagara Falls	NY
16	1.130	Visalia--Tulare--Porterville	CA	78	−0.479	Peoria--Pekin	IL
17	1.091	Newark	NJ	79	−0.483	Scranton--Wilkes-Barre--Hazleton	PA
18	1.046	Fresno	CA	80	−0.483	Cleveland--Lorain--Elyria	OH
19	1.031	Middlesex--Somerset--Hunterdon	NJ	81	−0.485	Melbourne--Titusville--Palm Bay	FL
20	0.894	Dallas	TX	82	−0.492	Reading	PA
21	0.845	Trenton	NJ	83	−0.506	Appleton--Oshkosh--Neenah	WI
22	0.564	Santa Barbara	CA	84	−0.508	Baton Rouge	LA
23	0.555	Corpus Christi	TX	85	−0.519	Rochester	NY
24	0.537	Galveston--Texas City	TX	86	−0.522	Lubbock	TX
25	0.489	Seattle--Bellevue--Everett	WA	87	**−0.526**	**Flint**	**MI**
26	0.474	Austin--San Marcos	TX	88	−0.527	Huntsville	AL
27	0.463	Orlando	FL	89	−0.548	Des Moines	IA
28	0.452	Denver	CO	90	−0.561	Oklahoma City	OK
29	0.366	Bakersfield	CA	91	−0.600	Lexington	KY
30	0.350	Reno	NV	92	−0.609	Boise City	ID
31	0.319	Fort Worth Arlington	TX	93	**−0.615**	**Lansing--East Lansing**	**MI**
32	0.318	Fayetteville	NC	94	−0.620	Akron	OH
33	0.306	Santa Rosa	CA	95	−0.622	Birmingham	AL
34	0.233	West Palm Beach	FL	96	−0.637	Spokane	WA
35	0.211	Tucson	AZ	97	−0.638	Erie	PA
36	0.192	Atlanta	GA	98	−0.645	Montgomery	AL
37	0.109	Tacoma	WA	99	−0.672	Hamilton--Middletown	OH
38	0.102	Tampa--St. Peterburg	FL	100	−0.690	Knoxville	TN
39	0.062	Milwaukee--Waukesha	WI	101	−0.699	Johnson City	TN--VA
40	−0.007	Dutchess County	NY	102	−0.707	Macon	GA
41	−0.049	Monmouth--Ocean	NJ	103	−0.711	Provo--Orem	UT
42	−0.074	Jacksonville	FL	104	−0.716	Pittsburgh	PA
43	−0.080	Lakeland--Winter Haven	FL	105	**−0.738**	**Saginaw—Bay City-Midland**	**MI**
44	−0.127	Rockford	IL	106	−0.742	Charleston--North Charleston	SC
45	**−0.180**	**Detroit**	**MI**	107	−0.761	Madison	WI
46	−0.214	Beaumont--Port Arthur	TX	108	−0.776	Eugene--Springfield	OR
47	−0.226	New Orleans	LA	109	−0.789	Canton--Massillon	OH
48	−0.227	Colorado Springs	CO	110	−0.803	Youngstown--Warren	OH
49	−0.234	Fayetteville--Springdale--Rogers	AR	111	**−0.803**	**Kalamazoo--Battle Creek**	**MI**
50	−0.248	Allentown--Bethlehem--Easton	PA	112	−0.804	Boulder--Longmont	CO
51	−0.252	Fort Wayne	IN	113	−0.809	Syracuse	NY
52	−0.255	Greensboro--Winston-Salem--High Point	NC	114	−0.812	Daytona Beach	FL
53	−0.259	Hickory--Morganton--Lenoir	NC	115	−0.841	Mobile	AL
54	**−0.278**	**Grand Rapids–Muskegon-Holland**	**MI**	116	−0.867	Utica--Rome	NY
55	−0.279	Fort Pierce	FL	117	−0.871	Little Rock - North Little Rock	AR
56	−0.285	Indianapolis	IN	118	−0.893	Shreveport--Bossier City	LA
57	−0.300	Atlantic--Cape May	NJ	119	−0.924	Jackson	MS
58	−0.301	Richmond--Petersburg	VA	120	−0.978	Springfield	MO
59	−0.312	South Bend	IN	121	−0.993	Pensacola	FL
60	−0.315	San Luis Obispo	CA	122	−1.037	Binghamton	NY
61	−0.320	Dayton--Springfield	OH	123	−1.061	Tallahassee	FL
62	−0.350	Lancaster	PA				

Table A-7. Rank of Metro Areas on Legacy of Place Factor Score

Rank	Factor score	Metro area		Rank	Factor score	Metro area	
1	−3.230	Jersey City	NJ	66	0.320	Salt Lake City	UT
2	−2.717	Utica--Rome	NY	67	0.346	Oakland	CA
3	−2.462	Scranton--Wilkes-Barre--Hazleton	PA	68	0.369	Eugene--Springfield	OR
4	−2.169	Binghamton	NY	**69**	**0.370**	**Detroit**	**MI**
5	−1.874	Syracuse	NY	70	0.374	Colorado Springs	CO
6	−1.759	Rochester	NY	71	0.394	Macon	GA
7	−1.617	Bergen--Passaic	NJ	72	0.414	Bakersfield	CA
8	−1.582	Buffalo--Niagara Falls	NY	73	0.418	San Luis Obispo	CA
9	−1.401	Erie	PA	74	0.434	Galveston--Texas City	TX
10	−1.364	Dutchess County	NY	75	0.439	Tacoma	WA
11	−1.323	Reading	PA	76	0.442	Jackson	MS
12	−1.309	Davenport--Moline--Rock Island	IA--IL	77	0.475	Reno	NV
13	−1.285	Lincoln	NE	78	0.498	Boise City	ID
14	−1.235	Allentown--Bethlehem--Easton	PA	79	0.511	Augusta--Aiken	GA--SC
15	−1.183	Trenton	NJ	80	0.513	Boulder--Longmont	CO
16	−1.182	Pittsburgh	PA	81	0.527	Raleigh--Durham--Chapel Hill	NC
17	−1.174	Peoria--Pekin	IL	82	0.527	Richmond--Petersburg	VA
18	−1.056	Canton--Massillon	OH	83	0.556	Shreveport--Bossier City	LA
19	−1.001	Miami	FL	84	0.557	Beaumont--Port Arthur	TX
20	−0.980	Appleton--Oshkosh--Neenah	WI	85	0.571	Austin--San Marcos	TX
21	−0.975	Des Moines	IA	86	0.585	San Diego	CA
22	−0.919	Newark	NJ	87	0.603	Santa Rosa	CA
23	−0.900	York	PA	88	0.603	Little Rock - North Little Rock	AR
24	−0.880	Toledo	OH	89	0.621	Knoxville	TN
25	−0.854	Madison	WI	90	0.622	New Orleans	LA
26	**−0.851**	**Lansing--East Lansing**	**MI**	91	0.626	San Jose	CA
27	−0.842	South Bend	IN	92	0.629	Huntsville	AL
28	−0.829	Lancaster	PA	93	0.650	Ventura	CA
29	−0.817	Milwaukee--Waukesha	WI	94	0.665	Houston	TX
30	−0.761	Fort Wayne	IN	95	0.686	Stockton--Lodi	CA
31	−0.714	Rockford	IL	96	0.688	Corpus Christi	TX
32	−0.688	Youngstown--Warren	OH	97	0.703	Greensboro--Winston-Salem--High Point	NC
33	−0.683	Cleveland--Lorain--Elyria	OH	98	0.714	Dallas	TX
34	**−0.676**	**Saginaw—Bay City-Midland**	**MI**	99	0.728	Fayetteville	NC
36	−0.595	Spokane	WA	100	0.737	Greenville--Spartanburg--Anderson	SC
37	−0.539	Springfield	MO	101	0.791	Tucson	AZ
38	−0.528	Dayton--Springfield	OH	102	0.793	Fort Worth Arlington	TX
39	**−0.446**	**Kalamazoo--Battle Creek**	**MI**	103	0.811	Modesto	CA
41	−0.408	Akron	OH	104	0.845	Nashville	TN
42	**−0.391**	**Grand Rapids–Muskegon-Holland**	**MI**	105	0.873	Fort Lauderdale	TX
43	−0.334	Johnson City	TN--VA	106	0.897	Birmingham	AL
45	−0.268	Atlantic--Cape May	NJ	107	0.907	West Palm Beach	FL
46	**−0.267**	**Ann Arbor**	**MI**	108	0.924	Orange County	CA
47	−0.250	Fayetteville--Springdale--Rogers	AR	109	0.982	Melbourne--Titusville--Palm Bay	FL
48	−0.213	Middlesex--Somerset--Hunterdon	NJ	110	0.992	Tallahassee	FL
49	−0.184	Visalia--Tulare--Porterville	CA	111	0.997	Montgomery	AL
50	−0.178	Indianapolis	IN	112	1.003	Pensacola	FL
51	−0.171	Lexington	KY	113	1.048	Sarasota--Bradenton	FL
52	−0.149	Fresno	CA	114	1.110	Charleston--North Charleston	SC
53	0.001	Denver	CO	115	1.125	Lakeland--Winter Haven	FL
54	0.050	Monmouth--Ocean	NJ	116	1.160	Vallejo--Fairfield--Napa	CA
55	0.109	Provo--Orem	UT	117	1.178	Riverside--San Bernardino	CA
56	0.115	Santa Barbara	CA	118	1.178	Mobile	AL
57	**0.123**	**Flint**	**MI**	119	1.189	Fort Pierce	FL
58	0.125	Salinas	CA	120	1.211	Daytona Beach	FL
59	0.129	Oklahoma City	OK	121	1.229	Tampa--St. Peterburg	FL
60	0.135	Kansas City	MO--KS	122	1.269	Jacksonville	FL
61	0.147	Tulsa	OK	123	1.276	Atlanta	GA
62	0.150	Seattle--Bellevue--Everett	WA	124	1.316	Fort Myers-Cape Coral	FL
63	0.189	Lubbock	TX	125	1.319	Orlando	FL
64	0.282	Hickory--Morganton--Lenoir	NC	126	1.375	Baton Rouge	LA
65	0.315	Hamilton--Middletown	OH				

Table A-8. Rank of Metro Areas on Income Equality Factor Score

Rank	Factor score	Metro area		Rank	Factor score	Metro area	
1	−2.542	Vallejo--Fairfield--Napa	CA	63	−0.109	Oakland	CA
2	−1.737	Appleton--Oshkosh--Neenah	WI	64	−0.102	Allentown--Bethlehem--Easton	PA
3	−1.406	Fort Wayne	IN	65	−0.066	Middlesex--Somerset--Hunterdon	NJ
4	−1.381	Santa Rosa	CA	66	−0.065	Reading	PA
5	**−1.325**	**Grand Rapids–Muskegon-Holland**	**MI**	67	−0.059	Knoxville	TN
6	−1.224	Colorado Springs	CO	68	−0.029	Dallas	TX
7	−1.212	Monmouth--Ocean	NJ	69	0.011	Erie	PA
8	−1.178	York	PA	70	0.043	Austin--San Marcos	TX
9	−1.114	Tacoma	WA	71	0.093	Dayton--Springfield	OH
10	−1.100	Lancaster	PA	**73**	**0.113**	**Detroit**	**MI**
11	−1.093	Hamilton--Middletown	OH	**74**	**0.113**	**Kalamazoo--Battle Creek**	**MI**
12	−1.088	Des Moines	IA	75	0.154	Johnson City	TN--VA
13	−1.071	Denver	CO	76	0.185	Toledo	OH
14	−1.037	Fayetteville--Springdale--Rogers	AR	77	0.186	Little Rock - North Little Rock	AR
15	−0.967	Seattle--Bellevue--Everett	WA	78	0.189	Eugene--Springfield	OR
16	−0.962	Hickory--Morganton--Lenoir	NC	79	0.191	Richmond--Petersburg	VA
17	−0.952	Melbourne--Titusville--Palm Bay	FL	80	0.278	Syracuse	NY
18	−0.918	Ventura	CA	81	0.285	West Palm Beach	FL
19	−0.895	Sarasota--Bradenton	FL	82	0.288	San Diego	CA
20	−0.884	Atlantic--Cape May	NJ	83	0.302	Spokane	WA
21	−0.834	Salt Lake City	UT	84	0.305	Huntsville	AL
22	−0.824	Peoria--Pekin	IL	85	0.339	Oklahoma City	OK
23	−0.816	Orlando	FL	86	0.342	Utica--Rome	NY
24	−0.776	Boise City	ID	87	0.358	Cleveland--Lorain--Elyria	OH
25	−0.769	Lincoln	NE	**88**	**0.376**	**Saginaw—Bay City-Midland**	**MI**
26	−0.765	Jacksonville	FL	89	0.401	Modesto	CA
27	−0.762	Kansas City	MO--KS	90	0.406	Lexington	KY
28	−0.753	Dutchess County	NY	91	0.409	Raleigh--Durham--Chapel Hill	NC
29	−0.749	Rockford	IL	**92**	**0.433**	**Flint**	**MI**
30	−0.728	Indianapolis	IN	93	0.457	Pittsburgh	PA
31	−0.723	Tulsa	OK	94	0.470	Boulder--Longmont	CO
32	−0.696	Salinas	CA	95	0.589	Trenton	NJ
33	−0.695	Fayetteville	NC	96	0.590	Rochester	NY
34	−0.692	San Jose	CA	97	0.621	Newark	NJ
35	−0.691	Fort Myers-Cape Coral	FL	98	0.650	Riverside--San Bernardino	CA
36	−0.679	Daytona Beach	FL	99	0.674	Charleston--North Charleston	SC
37	**−0.662**	**Ann Arbor**	**MI**	100	0.768	Beaumont--Port Arthur	TX
38	−0.644	San Luis Obispo	CA	101	0.779	Binghamton	NY
39	−0.612	Reno	NV	102	0.796	Houston	TX
40	−0.536	Provo--Orem	UT	103	0.813	Santa Barbara	CA
41	−0.485	Greensboro--Winston-Salem--High Point	NC	104	0.836	Birmingham	AL
42	−0.458	Fort Lauderdale	TX	105	0.858	Buffalo--Niagara Falls	NY
43	−0.430	Fort Pierce	FL	106	0.863	Mobile	AL
44	−0.409	Davenport--Moline--Rock Island	IA--IL	107	0.868	Augusta--Aiken	GA--SC
45	−0.408	Fort Worth Arlington	TX	108	0.902	Miami	FL
46	−0.339	Atlanta	GA	109	0.984	Stockton--Lodi	CA
47	−0.338	Bergen--Passaic	NJ	111	1.043	Montgomery	AL
48	−0.331	Tampa--St. Peterburg	FL	112	1.124	Jersey City	NJ
49	−0.317	Lakeland--Winter Haven	FL	113	1.128	Baton Rouge	LA
50	−0.303	Scranton--Wilkes-Barre--Hazleton	PA	114	1.237	Pensacola	FL
51	−0.303	Akron	OH	115	1.336	Corpus Christi	TX
52	−0.288	Nashville	TN	116	1.368	Tucson	AZ
53	−0.274	Madison	WI	117	1.682	Macon	GA
54	−0.253	Canton--Massillon	OH	118	1.864	Jackson	MS
55	−0.230	Milwaukee--Waukesha	WI	119	1.897	Lubbock	TX
56	−0.174	Springfield	MO	121	1.937	Shreveport--Bossier City	LA
57	−0.171	Youngstown--Warren	OH	122	2.019	New Orleans	LA
58	**−0.150**	**Lansing--East Lansing**	**MI**	123	2.045	Tallahassee	FL
59	−0.136	Greenville--Spartanburg--Anderson	SC	124	2.454	Bakersfield	CA
60	−0.127	Galveston--Texas City	TX	125	2.861	Fresno	CA
61	−0.126	Orange County	CA	126	2.884	Visalia--Tulare--Porterville	CA
62	−0.112	South Bend	IN				

Table A-9. Rank of Metro Areas on Locational Amenities Factor Score

Rank	Factor score	Metro area		Rank	Factor score	Metro area	
1	2.081	Salt Lake City	UT	63	0.037	Erie	PA
2	1.469	Syracuse	NY	64	**0.020**	**Lansing--East Lansing**	**MI**
3	1.445	Riverside--San Bernardino	CA	65	0.006	San Jose	CA
4	1.433	San Diego	CA	66	−0.021	Charleston--North Charleston	SC
5	1.413	Buffalo--Niagara Falls	NY	67	−0.049	Binghamton	NY
6	1.291	Miami	FL	68	−0.067	Bakersfield	CA
7	1.287	Orlando	FL	69	−0.088	Salinas	CA
8	1.284	Tampa--St. Peterburg	FL	70	−0.106	South Bend	IN
9	1.236	Indianapolis	IN	71	−0.182	Pensacola	FL
10	1.197	Milwaukee--Waukesha	WI	72	−0.216	Atlantic--Cape May	NJ
11	1.187	Kansas City	MO--KS	73	−0.228	Peoria--Pekin	IL
12	1.176	Pittsburgh	PA	74	−0.246	Baton Rouge	LA
13	1.171	Cleveland--Lorain--Elyria	OH	75	−0.267	Canton--Massillon	OH
14	1.161	Dallas	TX	76	−0.287	Allentown--Bethlehem--Easton	PA
15	1.119	Rochester	NY	77	−0.311	Johnson City	TN--VA
16	1.082	Greensboro--Winston-Salem--High Point	NC	78	−0.316	Shreveport--Bossier City	LA
17	1.037	Tucson	AZ	79	−0.320	Fayetteville--Springdale--Rogers	AR
18	1.037	West Palm Beach	FL	80	−0.331	Mobile	AL
19	0.988	Denver	CO	81	−0.393	Daytona Beach	FL
20	0.969	Seattle--Bellevue--Everett	WA	82	−0.410	Utica--Rome	NY
21	0.929	Reno	NV	83	−0.424	Springfield	MO
22	0.928	Houston	TX	84	−0.451	Colorado Springs	CO
23	0.927	Fort Lauderdale	TX	85	**−0.507**	**Saginaw—Bay City-Midland**	**MI**
24	0.919	Orange County	CA	86	−0.515	San Luis Obispo	CA
25	0.915	Knoxville	TN	87	−0.553	Youngstown--Warren	OH
26	0.910	Nashville	TN	88	−0.581	Lancaster	PA
27	0.879	Dayton--Springfield	OH	89	−0.598	Tallahassee	FL
28	0.869	New Orleans	LA	90	−0.607	Melbourne--Titusville--Palm Bay	FL
29	0.857	Oklahoma City	OK	91	−0.624	Reading	PA
30	0.855	Fort Worth Arlington	TX	92	−0.654	Rockford	IL
31	0.827	Greenville--Spartanburg--Anderson	SC	93	−0.723	Corpus Christi	TX
32	0.810	Sarasota--Bradenton	FL	94	−0.796	Lubbock	TX
33	0.798	Tacoma	WA	95	−0.835	Jackson	MS
34	0.761	Toledo	OH	96	−0.863	Hickory--Morganton--Lenoir	NC
35	**0.697**	**Detroit**	**MI**	97	−0.872	Huntsville	AL
36	0.696	Atlanta	GA	98	−0.936	Santa Rosa	CA
37	0.648	Santa Barbara	CA	99	−1.024	Visalia--Tulare--Porterville	CA
38	0.629	Spokane	WA	100	**−1.054**	**Ann Arbor**	**MI**
39	0.590	Boise City	ID	101	**−1.065**	**Flint**	**MI**
40	**0.566**	**Kalamazoo--Battle Creek**	**MI**	102	−1.080	Trenton	NJ
41	0.537	Scranton--Wilkes-Barre--Hazleton	PA	103	−1.126	Lakeland--Winter Haven	FL
42	0.524	Lexington	KY	104	−1.127	Provo--Orem	UT
43	0.514	Little Rock - North Little Rock	AR	105	−1.164	Modesto	CA
44	0.513	Appleton--Oshkosh--Neenah	WI	106	−1.174	Augusta--Aiken	GA--SC
45	0.510	Newark	NJ	107	−1.186	Beaumont--Port Arthur	TX
46	0.485	Jacksonville	FL	108	−1.209	Jersey City	NJ
47	**0.433**	**Grand Rapids–Muskegon-Holland**	**MI**	109	−1.211	Bergen--Passaic	NJ
48	0.432	Akron	OH	110	−1.219	Fort Pierce	FL
49	0.417	Raleigh--Durham--Chapel Hill	NC	111	−1.240	Middlesex--Somerset--Hunterdon	NJ
50	0.374	Austin--San Marcos	TX	112	−1.262	Monmouth--Ocean	NJ
51	0.356	Oakland	CA	113	−1.272	Fayetteville	NC
52	0.352	Birmingham	AL	114	−1.276	Ventura	CA
53	0.326	Lincoln	NE	115	−1.345	Montgomery	AL
54	0.317	Des Moines	IA	116	−1.410	Vallejo--Fairfield--Napa	CA
55	0.276	Tulsa	OK	117	−1.433	Dutchess County	NY
56	0.274	Eugene--Springfield	OR	118	−1.454	Macon	GA
57	0.253	Richmond--Petersburg	VA	119	−1.594	Stockton--Lodi	CA
58	0.194	Madison	WI	120	−1.647	Boulder--Longmont	CO
59	0.190	Fort Myers-Cape Coral	FL	121	−1.750	Hamilton--Middletown	OH
60	0.185	Davenport--Moline--Rock Island	IA--IL	122	−1.994	York	PA
61	0.112	Fort Wayne	IN	123	−2.394	Galveston--Texas City	TX
62	0.074	Fresno	CA				

Table A-10. Rank of Metro Areas on Urban/Metro Structure Factor Score

Rank	Factor score	Metro area		Rank	Factor score	Metro area	
1	−2.721	Lincoln	NE	64	−0.003	Tacoma	WA
2	−1.965	Corpus Christi	TX	65	0.003	Fort Pierce	FL
3	−1.943	Lubbock	TX	67	0.034	Galveston--Texas City	TX
4	−1.787	Colorado Springs	CO	68	0.059	Canton--Massillon	OH
5	−1.501	Reno	NV	69	0.071	Raleigh--Durham--Chapel Hill	NC
6	−1.491	San Jose	CA	70	0.133	Utica--Rome	NY
7	−1.384	Jacksonville	FL	71	0.140	Macon	GA
8	−1.327	Des Moines	IA	72	0.143	Hamilton--Middletown	OH
9	−1.294	Tulsa	OK	73	0.154	Fort Myers-Cape Coral	FL
10	−1.087	Madison	WI	74	0.185	Provo--Orem	UT
11	−1.087	Jersey City	NJ	75	0.204	Sarasota--Bradenton	FL
12	−1.060	Indianapolis	IN	76	0.210	Trenton	NJ
13	−1.046	Oklahoma City	OK	77	0.211	Seattle--Bellevue--Everett	WA
14	−1.026	Fort Wayne	IN	78	0.255	Binghamton	NY
15	−0.979	Milwaukee--Waukesha	WI	79	0.273	Dayton--Springfield	OH
16	−0.944	Montgomery	AL	80	0.277	Fayetteville--Springdale--Rogers	AR
17	−0.900	Salinas	CA	81	0.277	Greensboro--Winston-Salem--High Point	NC
18	−0.866	Springfield	MO	82	0.278	Ventura	CA
19	−0.854	Austin--San Marcos	TX	84	0.339	Melbourne--Titusville--Palm Bay	FL
20	−0.816	Toledo	OH	**85**	**0.370**	**Detroit**	**MI**
21	−0.783	Fresno	CA	86	0.383	Oakland	CA
22	−0.775	Shreveport--Bossier City	LA	87	0.390	Boulder--Longmont	CO
23	−0.731	Tucson	AZ	88	0.403	Cleveland--Lorain--Elyria	OH
24	−0.716	Peoria--Pekin	IL	89	0.421	San Luis Obispo	CA
25	−0.699	Rockford	IL	90	0.452	Youngstown--Warren	OH
26	−0.695	Fayetteville	NC	91	0.458	Knoxville	TN
27	−0.686	Tallahassee	FL	92	0.460	Daytona Beach	FL
28	−0.684	San Diego	CA	93	0.486	Lakeland--Winter Haven	FL
29	−0.639	Spokane	WA	94	0.500	Augusta--Aiken	GA--SC
30	−0.612	Lexington	KY	95	0.508	Birmingham	AL
31	−0.542	Little Rock - North Little Rock	AR	96	0.551	Rochester	NY
32	−0.514	Jackson	MS	97	0.559	Reading	PA
33	−0.508	Vallejo--Fairfield--Napa	CA	98	0.584	Salt Lake City	UT
34	−0.445	Erie	PA	99	0.612	Orlando	FL
35	−0.436	Stockton--Lodi	CA	100	0.613	Tampa--St. Peterburg	FL
36	−0.404	Beaumont--Port Arthur	TX	**101**	**0.628**	**Ann Arbor**	**MI**
37	−0.394	Mobile	AL	102	0.640	Atlantic--Cape May	NJ
38	−0.388	Kansas City	MO--KS	103	0.695	Richmond--Petersburg	VA
39	−0.366	Nashville	TN	104	0.770	Charleston--North Charleston	SC
40	−0.364	South Bend	IN	105	0.781	Fort Lauderdale	TX
41	−0.329	Baton Rouge	LA	106	0.808	Lancaster	PA
42	−0.328	Bakersfield	CA	**107**	**0.816**	**Kalamazoo--Battle Creek**	**MI**
43	−0.320	Huntsville	AL	108	0.871	Orange County	CA
44	−0.316	Eugene--Springfield	OR	109	0.923	Allentown--Bethlehem--Easton	PA
45	−0.310	Akron	OH	110	0.944	Pensacola	FL
46	−0.277	Denver	CO	111	0.958	Scranton--Wilkes-Barre--Hazleton	PA
47	−0.258	Modesto	CA	112	0.963	Miami	FL
48	−0.250	Santa Barbara	CA	113	1.030	Dutchess County	NY
49	−0.197	Davenport--Moline--Rock Island	IA--IL	114	1.050	Newark	NJ
50	−0.181	Boise City	ID	**115**	**1.064**	**Saginaw—Bay City-Midland**	**MI**
52	−0.175	Fort Worth Arlington	TX	116	1.084	York	PA
53	**−0.174**	**Flint**	**MI**	117	1.223	West Palm Beach	FL
54	−0.132	New Orleans	LA	118	1.245	Hickory--Morganton--Lenoir	NC
55	**−0.111**	**Lansing--East Lansing**	**MI**	119	1.246	Monmouth--Ocean	NJ
56	−0.103	Santa Rosa	CA	120	1.279	Pittsburgh	PA
57	−0.067	Houston	TX	121	1.292	Bergen--Passaic	NJ
58	−0.066	Visalia--Tulare--Porterville	CA	122	1.402	Johnson City	TN--VA
59	−0.057	Buffalo--Niagara Falls	NY	123	1.425	Atlanta	GA
60	−0.049	Appleton--Oshkosh--Neenah	WI	124	1.707	Riverside--San Bernardino	CA
61	−0.011	Dallas	TX	125	2.044	Greenville--Spartanburg--Anderson	SC
62	−0.006	Syracuse	NY	126	3.673	Middlesex--Somerset--Hunterdon	NJ
63	**−0.004**	**Grand Rapids–Muskegon-Holland**	**MI**				

REFERENCES

Ballard, Charles. 2006. "Further Thoughts on Taxes in Michigan." Prepared for the March 14, 2006 conference, "Where Do We Go From Here?" held in Ann Arbor, Michigan.

Bartik, Timothy J. 1989. "Small Business Start-Ups in the United States: Estimates of the Effects of Characteristics of States." *Southern Economic Journal* 55 (April): 1004–1018. Reprinted in *Entrepreneurship: Critical Perspectives on Business and Management*, Norris Kreuger, ed. London: Routledge, 2002.

———. 1991. *Who Benefits from State and Local Economic Development Policies?* Kalamazoo, MI: W.E. Upjohn Institute for Employment Research.

———. 1999. "Growing State Economies: How Taxes and Public Services Affect Private-Sector Performance." In *The End of Welfare: Consequences of Federal Devolution for the Nation*, Max B. Sawicky, ed. Washington, DC: Economic Policy Institute, pp. 95–126.

———. 2001. *Jobs for the Poor: Can Labor Demand Policies Help?* New York: Russell Sage Foundation.

———. 2006(a). "Michigan's Business Taxes and Economic Development: Possible Reforms." Testimony prepared for the Tax Restructuring Subcommittee, Tax Policy Committee, Michigan House of Representatives, February 14.

———. 2006(b). "Taking Preschool Education Seriously as an Economic Development Program: Effects on Jobs and Earnings of State Residents Compared to Traditional Economic Development Programs." Report to the Committee for Economic Development.

Blank, Rebecca M. and James M. Sallee. 2006. "Labor Markets and Human Capital Investment in Michigan: Challenges and Strategies." Prepared for the March 14, 2006 conference, "Where Do We Go From Here? An Agenda-Setting Conference for the Economic Issues Facing Michigan," cosponsored by the Center for Michigan, Gerald R. Ford School of Public Policy at the University of Michigan, and the Center for Local, State, and Urban Policy at the Ford School.

Bound, John, Jeffrey Groen, Gábor Kézdi, and Sarah Turner. 2004. "Trade in University Training: Cross-State Variation in the Production and Stock of College-Education Labor." *Journal of Econometrics* 121: 143–173.

Card, David, and Alan B. Krueger. 1995. *Myth and Measurement: The New Economics of the Minimum Wage*. Princeton, NJ: Princeton University Press.

Cherry Commission. 2004. *Final Report of the Lt. Governor's Commission on Higher Education and Economic Growth*. Lansing, MI: The Cherry Commission.

Eberts, Randall, George Erickcek, and Jack Kleinhenz. 2006. "Dashboard Indicators for the Northeast Ohio Economy: Prepared for the Fund for Our Economic Future." Federal Reserve Bank of Cleveland working paper no. 06-05.

Ernst & Young. 2004. "Total State and Local Business Taxes: A 50-State Study of the Taxes Paid by Business in FY 2003." *Quantitative Economics & Statistics* (January). Report by Robert Cline, William Fox, Tom Heubig, and Andrew Phillips.

———. 2005. "Total State and Local Business Taxes: Nationally 1980–2004 and by State 2000–2004." Council on State Taxation (COST) Special Report (April 12). Report by Robert Cline, Tom Neubig, and Andrew Phillips, with William Fox.

———. 2006. "Total State and Local Business Taxes: Nationally 1980–2005, by State 2002–2005, and by Industry 2005." *Tax Services* (March). Report by Robert Cline, Tom Neubig, and Andrew Phillips.

Fisher, Ronald C. 1997. "The Effects of State and Local Public Services on Economic Development." *New England Economic Review* (March/April): 53–67.

Glaeser, Edward, and A. Saiz. 2003. "The Rise of the Skilled City." NBER working paper 10191. National Bureau of Economic Research, Cambridge, MA.

Helms, Jay L. 1985. "The Effect of State and Local Taxes on Economic Growth: A Time Series Cross Section Approach." *The Review of Economics and Statistics* (February): 574-582.

Lynch, Robert. 2004. *Rethinking Growth Strategies: How State and Local Taxes and Services Affect Economic Development*. Washington, DC: Economic Policy Institute.

McGuire, Therese J. 2003. "Do Taxes Matter? Yes, No, Maybe So." *State Tax Notes* (June).

Michigan Department of Treasury. 2006. *Executive Budget Appendix on Tax Credits, Deductions, and Exemptions: Fiscal Year 2006.*

Michigan Senate Fiscal Agency. 2005(a). *Memorandum on Business Tax Package Passed by the House* (September 14).

———. 2005(b). *Summary of Legislatively Passed Single Business Tax Reduction* (December 14).

Moretti, Enrico. 2004. "Estimating the Social Return to Higher Education: Evidence from Longitudinal and Repeated Cross-Sectional Data." *Journal of Econometrics* 121: 175–212.

———. 2003. "Human Capital Externalities in Cities." NBER working paper 9641. National Bureau of Economic Research, Cambridge, MA.

Munnell, Alicia H. 1990. "How Does Public Infrastructure Affect Regional Economic Performance?" *New England Economic Review* (September/October): 11–33.

National Center for Education Statistics. 2005. "Educational Attainment of Persons 25 Years Old and Over for the 25 Largest States, by Sex: 2004." Table 13, 2005 Tables, *Digest of Education Statistics Tables and Figures*. Retrieved from http://www.census.gov/population/www/socdemo/education/cps2004.html.

Neumark, David. 1999. "The Employment Effects of Recent Minimum Wage Increases: Evidence from a Pre-Specified Research Design." Working Paper 7171. Cambridge, MA: National Bureau of Economic Research.

Neumark, David, and William Wascher. 1997. "Do Minimum Wages Fight Poverty?" Working Paper 6127. Cambridge, MA: National Bureau of Economic Research.

Oakland, William, and William A. Testa. 1996. "State-Local Taxation and the Benefit Principle." *Economic Perspectives*. Federal Reserve Bank of Chicago, pp. 2-19.

Peters, Alan H., and Peter S. Fisher. 2002. *State Enterprise Zone Programs: Have They Worked?* Kalamazoo, MI: W.E. Upjohn Institute for Employment Research.

Slemrod, Joel. 2006. "Michigan Taxes: What Are They? What Should They Be?" Presented at the March 14, 2006 conference, "Where Do We Go From Here?" held at the University of Michigan, Ann Arbor.

Wasylenko, Michael. 1997. "Taxation and Economic Development: The State of the Economic Literature." *New England Economic Review* (March/April): 37–52.