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The Puzzle of Indiana's Economy through the Great Recession

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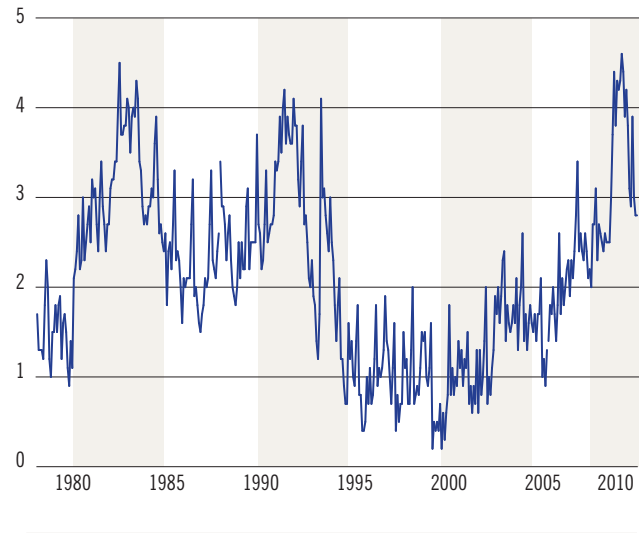
Introduction

The most recent economic downturn—often labeled the Great Recession—lasted from the fourth quarter 2007 through the second quarter 2009, during which the nation experienced a variety of significant economic changes.

From late 2007 through late summer 2008, gasoline prices rose by roughly 25 percent, taking the price at the pump from \$3.00 to over \$4.00 per gallon. Home prices fell across the country and were accompanied by increased foreclosures. From mid-September 2008, through March 2009 the U.S. stock market dropped astonishingly, with a decline over six months roughly comparable to the stock crash from October 1929 to the summer of 1933. Though other common indicators of the business cycle, such as unemployment rates and loss in gross domestic product point to a more modest recession of perhaps second or third worst post-WWII downturn, this recession has been memorably long and unpleasant. It also leaves economists with a number of puzzles, including the very different state level experiences in the business cycle.

This research focuses on one such phenomenon, the differential outcomes of two highly homogenous states: Michigan and Indiana. Both states are manufacturing intensive, with Indiana having a somewhat larger share of income from manufacturing. Both states are geographically similar and closely share demographic backgrounds, educational attainment and other features that, on the surface, would suggest very similar experiences during the recession. However, at its worst, Michigan saw an unemployment rate of 14.9 percent, while Indiana’s peaked at 10.8 percent. A multi-faceted analysis allows a better understanding of the factors that contributed to the difference. We will explore such issues as the share and composition of automobile and automobile parts industries, the size and scope of government and the differential effect of the stimulus in both states. We begin with an analysis of both economies during recession.

FIGURE 1: Difference in Unemployment Between Michigan and Indiana, 1978-2010



Indiana & Michigan through the Recession

The Indiana and Michigan economy have been remarkably similar over the past several decades. As of 2009, the share of manufacturing income in Indiana was 22.2 percent, and was 16.8 percent in Michigan. Michigan’s population was 9.9 million, and there were 6.5 million Hoosiers in 2010. While Michigan’s unemployment rate has consistently been higher than Indiana’s, the three deepest recessions of the past thirty years saw the unemployment rate difference increase significantly, the greatest observed during the most recent recession.

However, some analysis of this differential tells an interesting story. To better understand the unemployment rates of both states over the great recession, we first sought to identify the source of variation in unemployment rates between the two states. A favored tool is a type of statistical model that estimates the relationship between various national factors and the size of monthly changes in unemployment. The reason for this test is that if, for example, Michigan was more sensitive to changes in national automobile sales, then higher unemployment rates in a recession would be expected and the experience of the last recession would be no mystery. The results of several factors on variability of changes in the unemployment rate appear in Table 1.

TABLE 1: Effect of Selected Variables on the Variance of State Unemployment Rate[^]

	Indiana	Michigan
3-month lagged automobile sales	-0.00741***	-0.0538
Monthly Dummy (seasonality)	-0.01161***	-0.01961***
Recession	0.069424***	0.102097*

[^]This estimate is derived from the variance estimate of a generalized, autoregressive conditional heteroskedastic estimate of the $Y=XB'+\hat{Y}\Theta'+e$; $\sigma^2=XB'+e$. The estimation method was a maximum likelihood.

These partial results provide some insight to the factors that increase the variance of unemployment in both Indiana and Michigan. The variables of greatest interest have been isolated here. First, changes in the sales of cars and light trucks over the previous quarter have small effects on the variance of the unemployment rate in Indiana and no statistically discernable effect in Michigan. This result would seem surprising since Michigan has a slightly higher share of its employment in automobiles and parts manufacturing than Indiana. Michigan has many Big Three assembly plants, which tend not to lay off workers as frequently. Second, Michigan is a bit more seasonal in its unemployment rate, perhaps reflecting more miles of recreational lakes and a modestly colder winter. Finally, a recession leads to higher variability in unemployment in Michigan than in Indiana, which is empirical support for the phenomenon we investigate in this policy brief.

The next step involves the creation of a forecasting model of monthly unemployment rates in U.S. states. To better un-

derstand the current recession, we compare both states to the national economy over a long period. We then end the formal relationship modeling at the beginning of the 2007-2009 recession, and simply forecast the unemployment rate in both states over the recession. This provides us a comparison of what we actually observed with what we could expect to happen in both states as national economy dipped into recession, car sales plummeted and the national unemployment rate rose to 10.6 percent.

The results were very surprising. The model predicted with great accuracy, the increase and subsequent decline in Michigan's unemployment rate (Figures 2 and 3). However, the model greatly missed the impacts to Indiana. While the increase in unemployment occurred much more quickly than forecast, the actual unemployment rate was far beneath the expected rate in the Hoosier state.

As is clear from both Figures 2 and 3, the forecasts of state unemployment rates performed very well for over 20 years. However, a subtle but important point emerges from these estimates. Beginning in late summer 2007, the ability of this model to predict the rise in unemployment rates in Indiana weakened considerably. At this point, the performance of the two identical models diverged dramatically, and Indiana's economy performed far better than the model predicted. Michigan's economy continued to conform to what would be expected. This divergence in economic performance provides a starting point to examine other economic and fiscal aspects that could explain this divergence.

FIGURE 2: INDIANA Forecasted vs. Actual Unemployment Rate, 1978-2010

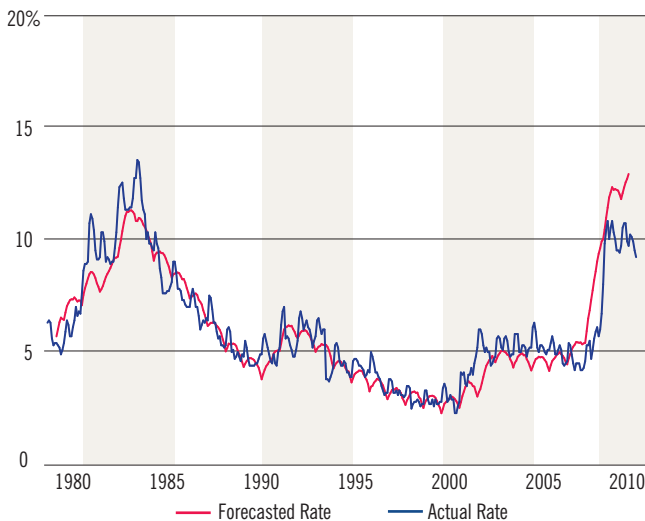


FIGURE 3: MICHIGAN Forecasted vs. Actual Unemployment Rate, 1978-2010

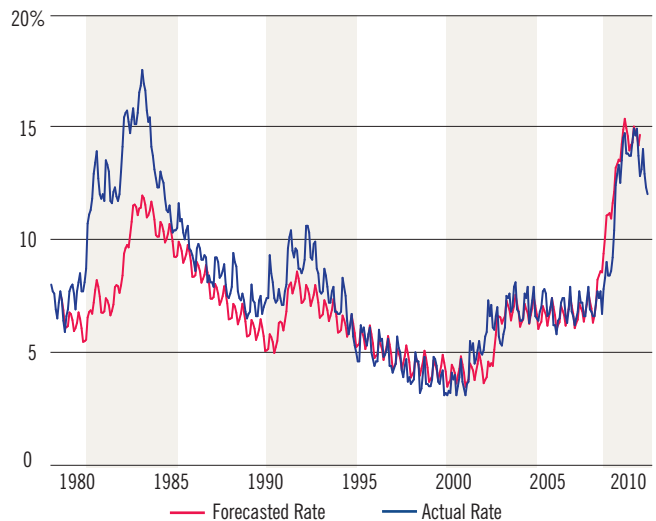
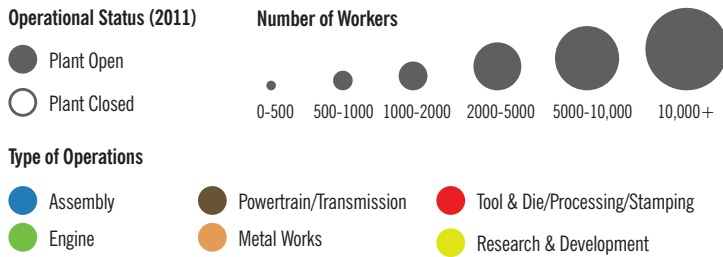
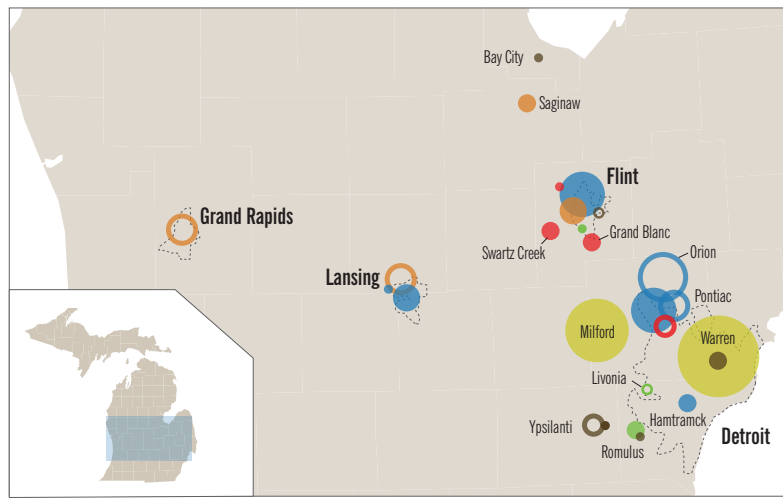
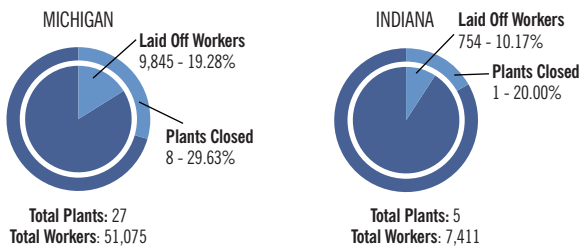


FIGURE 4: GM Plant Comparison, Michigan vs. Indiana

A. MICHIGAN

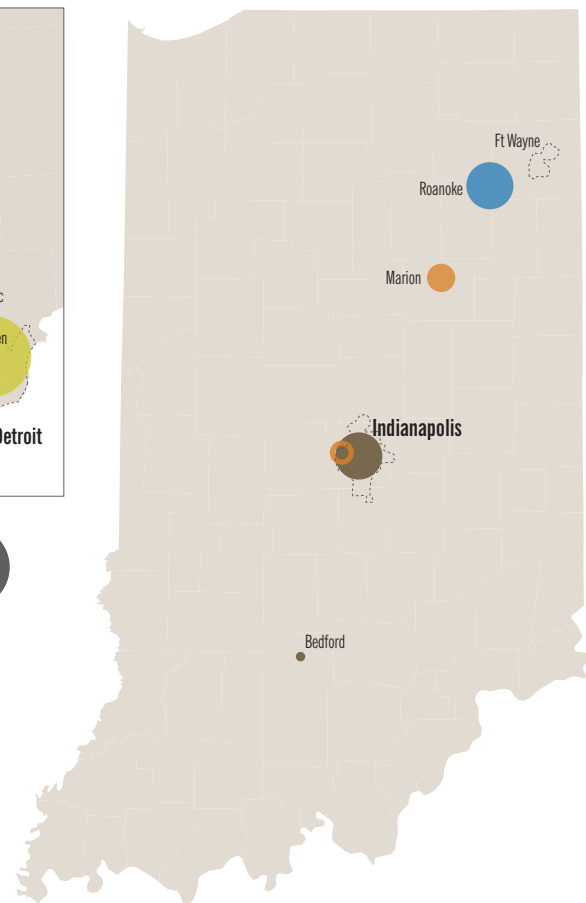


Plant Closings vs. Workers Terminated

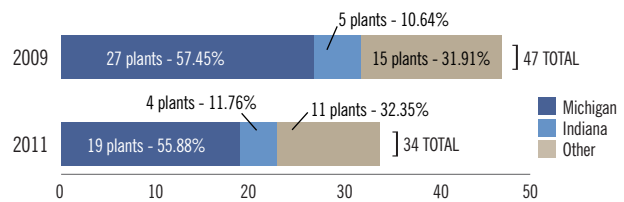


Source: GM Global Operations, <http://www.gmdynamic.com/gmability>

B. INDIANA



Distribution of Total GM Plants by Location, 2009-2011



Factors of Influence

No single issue (e.g. the housing bubble in 2006-2007) can be pinpointed as the cause of change in the unemployment rate between two states. Many factors, including General Motors filing bankruptcy, the high foreclosure rates, differences in state fiscal liabilities and the \$856 billion Stimulus bill, offer clues to the divergence of unemployment rates of both Indiana and Michigan during the 2007-2009 recession. We review some specific issues.

Automotive Sector

Both Indiana and Michigan have long histories as large manufac-

turing centers for the automotive industry in the U.S. Indiana is home to manufacturing centers for auto-makers such as General Motors, Toyota, Chrysler, and Honda. While a large percentage of manufacturing in Indiana is focused on the automotive industry, the industry plays a smaller role than in Michigan, where investment in automobile manufacturing is proportionately larger. More importantly, the share of employment in domestic auto producers is far higher in Michigan than in Indiana. In 2006, Indiana was home to five GM plants, four Chrysler, one Toyota, and one Honda plant. Considering only the top three auto manufacturers, Michigan housed 11 Chrysler, 15 Ford, and

27 GM plants.¹ This comparison shows the significant difference of investment in the automotive industry between the two states. While Michigan was home to manufacturing for GM, Ford, Toyota, Honda, and Chrysler, with over 50 plants in 2006, only 10 plants were located in Indiana. This comparison of investment between Indiana and Michigan plays a significant role in each state's manufacturing diversity and survivability during the recent recessionary times.

General Motors in Indiana and Michigan

General Motors filing for bankruptcy in 2008 has become one of the most notable events of the recession, making the future careers of many GM employees uncertain. In 2009, General Motors announced the closing of 14 of their total of 47 plants in the US. Of the 14 facilities to be closed, seven were located in Michigan, displacing 8,645 of their 49,875 employees. In contrast, only one plant was closed in Indiana, displacing 754 out of 7,411 total employees. Additionally, Indiana fared well amidst the GM bankruptcy, hiring 230 employees at the Marion, IN stamping plant. Furthermore, GM invested \$364 million into expanding this existing facility (WTHR). When compared to Michigan, this expansion and investment in automotive manufacturing in Indiana is one likely and considerable cause of the state's reduced severity in the unemployment rate of the manufacturing sector. See Figure 4 and Appendix for more specific information.

Income and Wages

Another indication of why Indiana was spared a larger rise in unemployment can be found in the difference in wage rates between Indiana and Michigan. According to the Bureau of Labor Statistics, workers in Indiana saw a decline in hours of one hour per week between 2007 and 2009. In contrast, workers in Michigan lost roughly 1.6 hours per week. Additionally, workers in Indiana saw a \$3.51 per week increase in their wages, while Michigan workers saw a \$22.93 per week decrease in their wages. These changes play a significant role in a state's current economic condition. According to the Chicago Federal Reserve, wage rates correlate directly to unemployment indicating that wages tend to decrease when the unemployment rate increases. This correlation should be noted, considering Indiana's wage rate increased during the recession, which could have bearing on the slightly more favorable unemployment rate experienced during the recession.

¹Lists of automotive plants compiled from various sources, including USA Today, GM, Ford, Toyota, and Honda. See References for detailed citations.

Tax Climate

Across the U.S., many firms have shut down operations, idled manufacturing plants, or laid off workers due to economic hardships as a result of the recession. However, the recession offered a chance for companies to trim excess expenditures and learn to operate more efficiently using fewer resources. One major financial burden all businesses encounter is taxation. The tax rates can play a major role in a firm's ability to overcome a recessionary period, and more importantly the firm's ability to retain employees. According to the Tax Foundation, Indiana ranks 21st on the Index for Corporate taxes in the U.S. for 2011, whereas Michigan ranks 48th. Similarly, Indiana ranks 10th in the nation for its favorable business tax climate, with Michigan at 17th (2011). Over the past five years, these tax indexes show Indiana has continued to exhibit more favorable taxes rates for businesses than neighboring Michigan. This favorable tax environment is especially critical the tail end of this recession. In recent decades, new firm location decisions have been dominated by the availability of skilled labor. In the aftermath of this recession, that is a less pressing concern, and so investment decisions regarding firm location and expansion appear to be more heavily influenced by state and local fiscal conditions.

Expectations of Tax Increases

Business and residents also make location and investment decisions based upon expectations of tax changes. In 2007, Indiana faced enormous voter anger over rising property taxes in many jurisdictions. As a consequence, in the 2007-2008 legislative session, Indiana passed property tax caps, shifted remaining school funding to the state and raised sales taxes from six cents to seven cents (see HB 1001). The net result was a decrease in taxes for Hoosiers.

During the same legislative session, Michigan proposed an 11.5 percent increase in the personal income tax, an increase in sales taxes and a new 21.99 percent surcharge on the Michigan Business Tax (MBT). The MBT passed on September 30, 2007 and the rate was raised again by the legislature prior to the January 1, 2008 implementation date (see 2007 PA 36). Voter outrage prompted the state legislature to drop the increases in the MBT, but the net result of this legislative session was a tax increase on Michigan residents.

The divergence in tax changes between the two states is at least partially reflective of the budget reality facing them. As Table 2 illustrates, Michigan has significantly larger bond debt and unfunded pension liabilities than Indiana, though in relative terms

TABLE 2: State Debt and Liabilities

	GDP \$millions	Bond Debt		Unfunded Pension Liabilities	
		Share of GDP	Total (\$millions)	Share of GDP	Total (\$millions)
Indiana	267,600	1.7%	4,629	4.5%	12,070
Michigan	372,400	5.0%	18,471	4.6%	17,200
Illinois	644,200	13.6%	87,804	10.9%	70,064
Ohio	483,400	3.4%	16,436	13.2%	63,999

Source: Center for Retirement Research, Boston College, Bureau of Economic Analysis, Moody's Investor Service, and author's calculations.

the unfunded pension liabilities are very similar. The source of these unfunded liabilities is shown in Table 3.

The consequence of significant fund debt and unfunded pension liabilities is that businesses and residents perceive a higher likelihood of future tax increases. This leads to dampened investment, which translates into fewer jobs. This hypothesis — known as the Ricardian Equivalence — suggests taxpayers treat government indebtedness as akin to the promise of a future tax increase, and adjust accordingly.² Though too early to draw concrete conclusions on the matter, perhaps the differential expectations about future taxes plays a role in the relative size of the recession and recovery in Indiana and Michigan.

Foreclosures

The housing bubble preceding the 2007-09 recession damaged the financial stability of many Americans and forced many into foreclosure. As workers are laid off or displaced, the relationship between unemployment and foreclosures can be clearly recognized. This means that as the unemployment rate rises, the total number of foreclosures also increases. According to Foreclosures.com (2011), Indiana currently has 7,972 homes on the market as foreclosures. This number is overshadowed by the number of foreclosures, in Michigan, with a total of 20,441 foreclosed homes. This number of foreclosures in Michigan is staggering when compared to the population differences between the states. Michigan has roughly 50 percent more residents (9,883,640) than Indiana (6,483,802) in 2010, but has incurred more than 2.5 times the number of foreclosed homes as of February 17, 2011.

The well-publicized housing problems in Detroit and surrounding areas combined with the much more dramatic foreclosure problem could have contributed to the performance differences between the states. The direction of causation is quite obviously bi-directional, but the difference in this issue is far higher than the difference in unemployment rates would suggest.

TABLE 3: Unfunded Pension Liabilities

	Assets	Liabilities
INDIANA		
PERF	\$12,569,335	\$13,506,280
Teachers	\$8,029,821	\$19,162,626
Total	\$20,599,156	\$32,668,906
MICHIGAN		
Public Schools	\$44,703,000	\$56,685,000
SERS	\$11,106,969	\$14,233,710
Municipal	\$6,443,100	\$8,534,700
Total	\$62,253,069	\$79,453,410
ILLINOIS		
Municipal	\$22,754,804	\$27,345,113
Chicago Teachers	\$11,542,948	\$15,683,242
Universities	\$14,281,998	\$26,316,231
SERS	\$10,999,954	\$25,298,346
Teachers	\$38,026,044	\$73,027,198
Total	\$97,605,748	\$167,670,130
OHIO		
PERS	\$57,629,000	\$76,555,000
Police & Fire	\$10,794,093	\$14,830,742
School Employees	\$9,723,000	\$14,221,000
Teachers	\$54,902,859	\$91,440,955
Total	\$133,048,952	\$197,047,697

Source: Center for Retirement Research, Boston College.

The Stimulus and Related Programs

An issue commonly debated over the years is the economic effects of large government spending during a recession. Since the 2007-09 recession, the federal government has distributed nearly \$787 billion dollars through the American Recovery and Reinvestment Act of 2009 (Recovery.gov 2011). From February 17, 2009 to December 31, 2010, Indiana received over \$4.5 billion, which the Federal Office of Management and Budget (OMB) estimate created 10,974 jobs. During the same time period, Michigan received over \$8.4 billion, which OMB estimated created 15,116 jobs. It is significant here to examine the correlation between federal funding received and jobs created, particularly in terms of the cost per job in each state. Creating one job in Indiana took \$489,274, compared to the \$559,457 in Michigan. It can be seen that to create one job in Michigan required \$70,000 more than to create one job in Indiana. Though

²Barro, Robert J. (1974). "Are Government Bonds Net Wealth?". *Journal of Political Economy* 82 (6): 1095-1117

Michigan received more federal assistance as a result of the American Recovery and Reinvestment Act than Indiana, this did not necessarily generate enough jobs to counteract the loss of jobs in the state. If the OMB estimates are correct, then the efficiency of government job creation in both states is shockingly poor, albeit much worse in Michigan.

Closing Thoughts

Indiana and Michigan are remarkably homogeneous states, with similar populations, demographics and industrial structure. They are adjacent and enjoy very similar patterns of historical development. The experiences of both Indiana and Michigan's economies over the past 30 years have been similar. However, during this recession, the experience of the two states has diverged remarkably. This divergence is a subtle story of economic and fiscal conditions in both states. As of this writing, that story is not entirely clear, though we do know Michigan did far worse than Indiana through the recession. Michigan's economy performed much as predicted in our common model of state unemployment rates. However, using this same model, Indiana did far better than expected. This observation extends to overall economic growth as well. In 2010 Michigan grew by 2.9 percent, while Indiana's economy grew by 4.6 percent.

This policy brief analyzes this phenomenon through statistical tests that evaluate the cause of variance in unemployment rates. We look at the structure of the automobile industry, the fiscal and debt issues, the relative effect of foreclosures and the efficiency of job creation reported to the Office of Management and Budget.

Though too early for conclusive evaluation, indications appear that each of these factors potentially plays a role in the divergence of economic activity between the two states during the recession.

References

Aaronson, D. and D. Sullivan. 2000. Unemployment and wage growth: Recent cross-state evidence. *Economic Perspectives* 24(2): 54-71. http://www.chicagofed.org/digital_assets/publications/economic_perspectives/2000/2qep4.pdf

American Honda Motor Company. 2011. Major U.S. facilities list. <http://corporate.honda.com/america/facilities.aspx> (accessed February 2, 2011).

Barro, R. J. 1974. Are government bonds net wealth? *Journal of*

Political Economy 82 (6): 1095-1117.

Bunkley, N. 2009. GM designates 14 plants for closing. *New York Times*, June 1. <http://www.nytimes.com/2009/06/02/business/02union.html>

Carty, D. 2009. List of GM plants closing. CBS News, June 1. http://www.cbsnews.com/8301-503983_162-5054296-503983.html

Schmalz, J., R. Huggins and G. Petras. 2009. Where Chrysler's plants are located. *USA Today*, April 30. http://www.usatoday.com/money/autos/2009-04-30-chrysler-plants-map_N.htm (accessed February 2, 2011)

Ford Motor Company. 2011. Global operations. <http://corporate.ford.com/about-ford/global-operations> (accessed February 2, 2011).

Foreclosures.com. 2011. Foreclosure Homes. <http://www.foreclosure.com/foreclosures/> (accessed January 27, 2011).

General Motors Corporation. 2009. GM pulls ahead U.S. plant closures; Reaffirms intent to build future small car in U.S. June 1. http://www.gm.com/restructuring/docs/June1_Manuf_Optimization_Plan_Press_Release_FINAL.pdf

General Motors Company. 2010. GM global operations – U.S. Facilities. http://www.gmdynamic.com/company/gmability/environment/plants/facility_db/ (accessed February 2, 2011).

Recovery.gov. 2011. State/territory totals, as reported by recipients. <http://www.recovery.gov/pages/textview.aspx?data=recipientHomeMap> (accessed February 17, 2011).

Tax Foundation. 2011. State Business Tax Climate. <http://www.taxfoundation.org/research/topic/90.html> (accessed February 17, 2011).

Toyota Motor North America. 2011. Toyota operations in the United States. http://www.toyota.com/about/our_business/operationsmap_usa/ (accessed February 2, 2011).

WTHR. 2009. General Motors bringing jobs, money to Marion. <http://www.wthr.com/story/11348756/general-motors-bringing-jobs-money-to-marion?redirected=true> (accessed February 2, 2011).

Appendix

TABLE A.1: GM Plant Closing Comparison

A. MICHIGAN

Facility	City	Number Of Workers
GMPT Bay City	Bay City	400
Detroit/Hamtramck	Detroit/Hamtramck	1,482
Flint Truck Assembly	Flint	2,244
Flint Metal Center	Flint	1,186
Flint Tool & Die	Flint	207
GMPT Flint Engine	Flint	391
GMPT Flint North*	Flint	426
Grand Blanc Weld Tool Center	Grand Blanc	544
Grand Rapids Metal Center*	Grand Rapids	1,700
Lansing Craft Center	Lansing	398
Lansing Metal Center*	Lansing	1,200
Lansing Grand River	Lansing	1,206
Lansing Delta Township Assembly	Lansing	2,745
GMPT Livonia Engine*	Livonia	164
Milford Proving Ground	Milford	5,191
Orion Assembly*	Orion	3,800
Pontiac Assembly Center*	Pontiac	1,362
Pontiac Stamping Center*	Pontiac	666
Pontiac Centerpoint Campus	Pontiac	4,515
GMPT Romulus Engine	Romulus	867
GMPT Romulus Transmission	Romulus	420
GMPT Saginaw Metal Casting Operations	Saginaw	671
SPO Flint	Swartz Creek	500
GM Technical Center	Warren	16,916
GMPT Warren Transmission	Warren	941
GMPT Willow Run Transmission*	Ypsilanti	527
GMPT Ypsilanti Transmission Operations	Ypsilanti	406
TOTAL		51,075

*Note: *Plant now closed.*

B. INDIANA

Facility	City	Number Of Workers
GMPT Bedford Foundry	Bedford	366
Allison Transmission	Indianapolis	2,606
Indianapolis Metal Center*	Indianapolis	754
Marion Metal Center	Marion	1,053
Fort Wayne Assembly	Roanoke	2,632
TOTAL		7,411

*Note: *Plant now closed.*