

Higher educational attainment of the workforce is associated with greater employment growth and greater employment stability of the Great Lakes region metropolitan areas. In the study, ten-year employment growth from 1990 to 2010 of 62 metropolitan areas in Michigan, Illinois, Indiana, Ohio and Wisconsin were compared to respective levels education attainment and employment diversity in 1990 and 2000. The findings show a strong correlation with educational attainment and 10-year employment growth and a strong negative association with employment swings. Further findings show that industrial diversity enhances economic growth and reduces swings in employment. The findings are significant as policy makers struggle to design policies that generate economic growth.

### *Methods*

State and metropolitan statistical area data was collected from the Bureau of Labor Statistics, Current Employment Statistics. Employment growth and stability was measured for the time periods from January, 1991 to December 1999 and from January 2001 to December 2009. First, average annual employment growth trends are estimated for each metropolitan area for the 1990's and for the 2000s. Employment swings are estimated as deviations from the long-term trends. Employment stability is measured as the sum of squared deviations from the growth path, and is estimated over the 1990s and 2000s separately. Employment stability would suggest low sum of squared errors from the average annual growth, while MSAs with significant employment fluctuations will have high values.

Industry diversity was calculated for the year 1990 and 2000 using employment by industry. A Herfindahl index was created using employment shares in ten broad industry categories.<sup>1</sup> The Herfindahl index is calculated as the sum of the squared employment shares over all sectors of the MSA and has a range between 0.1 and 1, where higher numbers denote greater specialization, or concentration in a few industries. Educational attainment was measured by the percent of the population 25 and over with a bachelor's degree or post graduate degree and collected from the U.S. Census for 1990 and 2000. Finally, an indicator variable that takes a value of one for 1990s measures and zero otherwise was used to control for the decade of measure.

### *Findings*

The table below reports the findings for measures of total employment, goods producing employment and services providing employment. The positive coefficient of 0.046 on education to total employment growth suggests that MSAs with a greater share of workforce with a bachelor's degree or post graduate degree experienced greater total employment growth between 1990 and 2000. That is, increasing the share of the workforce with a bachelor's degree by one percent resulted in an average annual growth of total employment by 0.0465 of a percent. The negative coefficient on total employment swings suggests that greater educational attainment reduced employment fluctuations in these MSAs. Both coefficients were statistically significant, as shown with p-values less than 0.05. This indicates there is at least a 95% level of confidence that a negative association exists. Alternatively, MSAs that had higher employment concentrations in a few sectors tended to exhibit lower employment growth and larger employment swings, as shown with the signs of the coefficients. The associations were also statistically significant.

Separating out goods producing employment and services providing employment provides more insight to our findings. Educational attainment does not appear to be associated with goods producing

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<sup>1</sup> BLS Super industry categories

employment growth, but is with service providing employment, as indicated with the p-values. That is, education most impacts the growth of the service sectors. However, educational attainment appears to have reduced employment cycles of both goods producing and services providing sectors. Similarly, industry concentration may have had a lesser impact on goods producing than service providing sectors, as indicated by the high p-value. Higher levels of concentration unambiguously increased employment swings in both sectors.

	Total Employment Growth Swings		Goods Employment Growth Swings		Services Employment Growth Swings	
Variable	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
	<i>Prob.</i>	<i>Prob.</i>	<i>Prob.</i>	<i>Prob.</i>	<i>Prob.</i>	<i>Prob.</i>
Education	4.645	-0.025	3.731	-0.075	3.885	-0.029
	0.00	0.01	0.21	0.00	0.00	0.00
Concentration (Herfindahl)	-10.345	0.086	-8.898	0.141	-10.975	0.149
	0.00	0.00	0.26	0.02	0.00	0.00
1990s	2.309	-0.002	4.158	-0.009	1.788	0.001
	0.00	0.15	0.00	0.00	0.00	0.62
Constant	-0.970	0.020	-3.101	0.048	-0.159	0.018
	0.00	0.00	0.00	0.00	0.51	0.00
R-squared	0.68	0.10	0.59	0.12	0.59	0.26
Adjusted R-squared	0.67	0.07	0.58	0.09	0.58	0.24
S.E. of regression	0.75	0.01	1.70	0.01	0.70	0.01
Sum squared resid	67.60	0.00	345.33	0.02	58.16	0.00
F-statistic	84.09	4.30	57.29	5.27	58.44	14.13
Prob(F-statistic)	0.00	0.01	0.00	0.00	0.00	0.00
N	124	124	124	124	124	124

### Conclusions

The findings show the importance of investing in higher education for economic growth and stability. They also suggest that economic growth incentives that concentrate employment into a few sectors may actually negate long-term economic growth and stability.