



Analyzing Manufacturing Employment Decline in Western Pennsylvania

Raymond W. Englert



ALLEGHENY COLLEGE

Introduction or Overview

Manufacturing has historically been a significant feature of the economy in Pennsylvania, employing hundreds of thousands of workers and composing a large proportion of the total output in the State. Many studies examine the national trend of declining manufacturing employment, yet few studies analyze this decline on a State or regional level. Western Pennsylvania has been a hub of manufacturing for many decades, yet little is known about the causes of the ongoing employment decline in this economically significant sector.

Research Hypothesis/Objectives

This study hypothesizes that manufacturing employment in Western Pennsylvania within the past two decades has been negatively affected by the following factors: market changes, increased automation, population demographic changes, and foreign competition. Following analysis of this hypothesis, the study then asks: what can businesses and policymakers do to improve manufacturing employment after gaining a better understanding of the causes of the employment decline in the region?

Methodology or Approach

Using data from 25 counties composing Western Pennsylvania, as well as national data related to major trends, each factor from the central hypothesis was tested individually and together through regression models in Stata. Five balanced panel regressions were conducted featuring robust standard errors and fixed effects. Testing focused on data from 2004 to 2020, as these years had available data for each tested factor. Results of these regressions were then analyzed, offering potential explanations of the results as well as advice for businesses and policymakers in the region.

Major Outcomes, Results and Conclusion

Through testing, it was discovered that market changes, increased automation, population demographic changes, and foreign competition all had a significant effect on manufacturing employment in Western Pennsylvania. GDP growth was found to increase employment, while years with poor economic performance negatively impacted manufacturing employment. Total employment was unexpectedly found to negatively impact manufacturing employment as it increased, however this may be the result of the related data, or the resilience of manufacturing jobs during times of greater unemployment. Automation was found to negatively affect manufacturing employment, which is a significant threat to the sector's future as automation technology is forecasted to improve, while the US robotics market is already one of the five largest globally. Population decline was found to be a serious growing threat to manufacturing employment in the region, as the population size had a positive relationship/correlation with manufacturing employment, making the trend of shrinking populations in the region a threat. Foreign imports from Canada, China, and Mexico were interestingly found to benefit manufacturing employment, while greater US exports to Canada and China were found to negatively impact manufacturing employment. Manufacturing employment may thus benefit from cheap imports in the US, or may simply have a correlation to the greater number of imports in times of positive economic performance. Given the results, businesses and policymakers were urged to be mindful of the population growth in their region, to support workers with automation that doesn't replace jobs, and to cautiously welcome foreign imports into the economy.

