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Assessing the Effects of Small Business Activity on West Virginia's Mining Counties

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ABSTRACT

This study analyzes the effects of small business activity on economic growth in West Virginia's mining counties. These counties have historically suffered due to a lack of economic diversity, which has exacerbated the negative impacts of coal busts, as there are no businesses to absorb the shock when the prices of coal plummet and mining companies lose significant sums. This study utilizes a panel regression to assess the impact of small business activity on the growth of Gross County Product, Total County Employment, and Personal County Income. This study also controls for determinants of economic growth, such as manufacturing wage, unemployment rate, college education rate, and population density. The study fails to find reliable evidence that an increase in small business activity boosts economic growth, with few exceptions. The study finds a correlation between lower fluctuation of growth rates and an increase in each economic indicator's growth rates.

Introduction

Since its inception in the 1850s, West Virginia has experienced numerous boom and bust cycles due to the changing demand for its rich coal deposits. In 1883, coal was in high demand due to the rapid growth of railroads into the US, making West Virginia a hotbed of coal production and economic development. During the 1970s, when demand for coal went up massively in the wake of OPEC oil embargoes, the average earnings per worker went up 5.5% according to Black et. al (2005). The West Virginia Center on Budget and Policy (2013) adds that economic output per worker was almost double the national average. However, the period from the 1980s onward has shown extreme declines, as lifting the oil embargo meant West Virginia lost significant earnings and personal income statewide due to the coal bust according to O'Leary and Boettner (2011). West Virginia has been heavily affected by their boom-bust cycles, but the localities most affected by the cycles have undoubtedly been West Virginia's "mining counties."

Defined as counties with at least 14% of their total jobs in coal mining, the mining counties practically rely on coal mining to keep their economies afloat, making them even more susceptible than the rest of the state to the coal-fueled economic swings.

Coal-Producing State and County	Underground		Surface		Total	
	Number of Mines	Production	Number of Mines	Production	Number of Mines	Production
West Virginia	**70**	**68,393**	**81**	**15,056**	**151**	**83,448**
Barbour	2	2,403	-	-	2	2,403
Boone	4	2,194	6	823	10	3,018
Fayette	2	882	9	1,475	11	2,357
Grant	-	-	1	50	1	50
Greenbrier	-	-	2	142	2	142
Kanawha	3	2,522	3	658	6	3,180
Logan	14	6,608	10	1,885	24	8,493
Marion	1	6,813	1	196	2	7,009
Marshall	2	16,010	-	-	2	16,010
Mcdowell	17	1,485	14	1,090	31	2,575
Mercer	1	56	2	422	3	478
Mingo	2	108	10	2,204	12	2,312
Nicholas	2	821	4	263	6	1,084
Ohio	1	8,313	-	-	1	8,313
Raleigh	6	3,597	6	3,232	12	6,829
Randolph	2	439	2	54	4	494
Taylor	1	4,042	-	-	1	4,042
Tucker	1	1,427	-	-	1	1,427
Webster	-	-	1	196	1	196
Wetzel	1	7,039	-	-	1	7,039
Wyoming	8	3,633	10	2,364	18	5,997

Figure 1. Production of Mining Counties in West Virginia

The impact on the twenty-one counties manifested itself during each swing, as the mining counties outpaced state average economic productivity by nearly 100% during the booms and lost double the average statewide earnings during the bust, as per the WVCBP. The mining counties continue to differ from the state in their recovery from the bust, which has been significantly slower and less regenerative than it has for West Virginia. O'Leary and Boettner explain that state earnings since the original coal boom grew 177% and personal income growth increased from 1.3% to 2.2%, a recovery supplemented by increased productivity in industries outside the mining sector. Conversely, for the mining counties, Black et al (2002) find that earnings grew by only 144% since the 1970s boom and the mining counties experienced per-capita income growth at a 2.3% slower rate. Unlike the larger state, there were no other industries to supplement the loss the mining industry took, making a recovery harder. The WVCBP reports that in keeping with the original effects of the coal bust, the mining counties' economies have remained overall more depressed than the rest of the state, with earnings growth significantly lower and personal income growth much more volatile.

The mining counties present an unique topic of analysis due to their extremely poor economic diversity compared to the rest of the nation. O'Leary and Boettner find that in the mining counties, 22.8% of jobs were in mining, compared to 4.7% for the rest of West Virginia and only 0.5% for the United States. Such a large share is unique to the mining counties. Even further, utilizing the Hachman index for county-level calculations of economic diversity, which takes the form $HI = \frac{1}{(\Sigma_j(\frac{EMP_{countyj}}{EMP_{statej}})(EMP_{countyj})}$. It is found that the mining counties have an average HI of 0.16 compared to the state average of 0.43, where an HI of 1.0 is considered a diverse economy. Thus, their position as such an extreme example of a lack of economic diversity makes them an interesting topic to analyze when trying to discern what improves economic diversity, and which improver of diversity helps the economy best.

This paper examines a potential solution to the mining counties' economic challenges: small business. Small businesses are often reported as important drivers of economic growth and promoters of economic diversity and stability on a national level. The Small Business & Entrepreneurship Council reports that small businesses account for 44% of all economic growth in the United States. However, small businesses are prominent locally as well. The SBA reported that they created two-thirds of new net jobs in their communities. Forbes agrees that small businesses are the primary sources of job growth during a recession. Bruce et. al (2009) and Breitzman and Hicks (2008) reported that small businesses are the primary innovators in local communities, accounting for 24% of patents in the top 100 emerging clusters of innovation in total, and most of the patents come from communities instead of corporations. Francis (2016) adds that small businesses increase economic diversification and reduce income inequality within localized economies. The general literature agrees that small businesses are important to the growth of local economies, especially those that have been struggling with economic downturns for significant periods. Smallbone et al. (2012) report that small businesses are best for struggling localities as they show underlying resistance and high levels of adaptability and flexibility. In an

analysis of reactions to economic crises in the United Kingdom and New Zealand, business performance and profit margins either increased or remained the same in over 55% of small businesses. Thus, when an economy is affected by circumstances outside its control, small businesses are often the most effective at responding to the crisis and remaining productive and profitable.

Legislation to develop small business activity more robustly in West Virginia would be an important step to assist the heavily affected counties in their economic recovery. However, small business legislation has been absent in recent years, with money instead going to large businesses, such as a $66 million loan approved by the West Virginia EDA to multiple large business ventures inside and outside the state. With such funding being apportioned to large businesses, the policy conversation regarding business development in West Virginia is not particularly dynamic and multi-faceted, potentially preventing the state from accessing an important opportunity for economic recovery. This paper assesses whether small business legislation that boosts small business activity in West Virginia's mining counties would grow the economy.

The present study assesses the impact of small business activity and development on the economic growth of West Virginia's mining counties through a series of three models of panel regressions. It begins with a review of the previous literature regarding West Virginia, small business activity, entrepreneurship, and the comparison of large and small businesses. It then describes the data utilized in the study and summarizes it. After, it describes the methodology used to analyze the data. Finally, the results are presented, showing the effect of specific variables of small business activity on indicators of economic growth, and implications for legislation in West Virginia are discussed. The results show that small business activity overall has little effect on economic growth within the mining counties. All measures on all economic indicators but one are statistically insignificant. Small business employment on Personal County Income is the only measure with statistical significance.

Literature Review

The debate over which business type has the greatest economic impact has been long-standing and wide-ranging. Until the 1960s, the overwhelming view was that large businesses were the primary drivers of growth. Gebremariam et. al (2004) explain that large firms with the human capital and resources to produce shone compared to small businesses that could not replicate the efficiency of their larger counterparts. Without computer-based technology, the businesses with the capacity to have the most employees and production were the most effective. Small businesses were seen as detrimental to growth, as they took resources away that large businesses could have used to develop further. However, this view has shifted in recent years as production has decentralized. Acs (1999) explains that decentralized production caused large businesses to downsize, as they realized their large and clumsy business structures could not handle the capacity of increased production in a globalized system. Researchers also began to find new evidence for the effectiveness of small businesses. Birch (1979, 1990) and the U.S. Small Business Administration (1999) reported an extreme inverse correlation between the size of a business and how many jobs it creates, as well as a large relationship between the number of small business firms and net job growth in any area. At the same time, Covarrubias et. al (2020) reports that after the year 2000, large business concentration has proven to be associated with lower investment, higher prices, and lower productivity growth, put down to a decrease in competition, inefficiency, and barriers to entry that have become very difficult to surpass.

As the view of the general literature shifts to prefer small businesses for economic efficiency and development over large businesses, the idea of a "small business" has been broken down into two parts; entrepreneurial small businesses looking to expand their influence, and established and local, small businesses. The creation and development of small businesses via entrepreneurial activity have shown to be important to economic growth. Baumol (1968) analyses the entrepreneur as a part of economic growth, stating that large percentages of growth come from innovation that is in most cases driven by entrepreneurs. This view continues to

hold today. Ribiero-Soriano (2017) describes entrepreneurship as a driving force within the economy today due to the current situation of the world, in which marketing is easier than ever and new business ideas are more accessible to more people. Fuellhart and Glasmeier (2003) elaborate that entrepreneurs are likely to innovate, and it is this innovation that sparks competition within markets and creates new markets. Studies utilizing examples from Germany, the USA, and Cameroon show that surviving start-ups (i.e. those without overwhelming debt) increase productivity and are directly correlated to employment growth (Acs and Armington, 2004; Audretsch and Keilback, 2004; Djoutsa Wamba et al, 2017). The creation of new small businesses via entrepreneurship has been proven throughout the literature to increase employment, spark innovation, create new markets, and increase productivity, all of which increase economic growth. Local small businesses are also shown to have an impact; Civic Economics (2002; 2004) finds that out of every $100 spent at local small stores, $28-41 remained within the local economy. However, for entrepreneurial chains with more than 500 employees, this local rate of return was only $8. Another study done by Civic Economics in a different neighborhood found even higher rates of return for local businesses; $68 out of every $100. Both types of small business development bolster the local economy in different ways. Entrepreneurship is vital for innovating to increase competition within a local community. Established small businesses instead of large retail stores or "small chains" circulate significantly more money back into the local economy.

Even further than different types of small businesses, different facets of small business activity within a region have been analyzed to determine what makes a small business so impactful. Two of the most extensively analyzed factors are small business births and deaths. Sadeghi (2008) established that a business's "birth" should be measured from when that business has "zero employment in one quarter and positive employment in the same quarter of the next year," following the OECD and Statistics of US Businesses's definitions. Sadeghi's definition of deaths is the opposite, a business with positive employment in one quarter and zero employment in the same quarter of the next year. The zero employment then must extend for four quarters. His research stems from an analysis utilizing longitudinal data from West Virginia. Spletzer (2000) surveyed the impact of establishment births and deaths on job creation, finding that they accounted for 19% of the movement in the job market quarterly, and over half on a triennial basis. Spletzer's study used the same methodology as Sadeghi, the OECD, and SUSB when collecting data about small business births and deaths. Sadeghi's results agree with Spletzer's, indicating that a significant portion of job market movement can be attributed to business births and deaths.

Studies regarding businesses' relationship to economic growth are typically conducted nationally, statewide, or municipally. This study largely follows the methods of Bruce, et al, (2009), which answers the present question for all 50 states but does not delve deeper into the county level. This study provides a different perspective; looking at a set of counties that necessitate economic development within West Virginia. Gebremariam et. al, the closest parallel to this study as it also specifically analyzes West Virginia, differs in that it analyzes small business growth in West Virginia, and uses aggregate time-series data. The present study focuses on counties in West Virginia and presents its data on a non-aggregate yearly basis. This study additionally expands on the work of Gebremariam by using a more robust set of small business and economic growth measures and introducing more control variables.

The existing research on small businesses has extensively explored how impactful they are towards economic growth, and many of the studies mentioned within this review have been instrumental in guiding this study's process and results.

Data

This study utilizes panel data from the US Census Bureau, the St. Louis Federal Reserve database (FRED), and the Regional Economic Analysis Project. The data sample was measured across the 21 mining counties of West Virginia from 2003 to 2020.

This analysis utilizes the SBA's definition of a small business, which states that a small business has fewer than 500 employees. The study examines county-wide totals of firms (number of businesses), establishments (number of business locations), payroll, employment levels, and small business births and deaths per year (small businesses whose employment began the year at zero or ended the year at zero. Examining such a broad set of statistics provides a more accurate measure of how much small businesses influence the economy. It is important to understand how each facet of small business activity impacts the economy to get a full picture of the effect of small businesses. In addition, this wide range of variables is important for legislators in policy discussions to discern how increased investment into small business development should be approached, as the outcome of which measures of small business activity are the greatest could spark different legislative initiatives. For example, the number of small business births being determined to have the greatest effect on economic growth could prompt legislators to invest in further entrepreneurship programs and benefits. However, if the total small business payroll had the greatest impact, changes in wage legislation would be recommended.

To present an effective analysis of small businesses' impact on a county's economy, other mediums of economic growth must be controlled to get an accurate picture of the data. First, the cost of producing goods in each county was calculated by measuring the wages of manufacturing workers. Dhongde and Wang (2021) report a positive correlation between the number of people in the labor force who are college-educated and economic growth. As human capital is considered an important facet of an economy that determines where entrepreneurs set up businesses and where people have the most money to put into the economy, it is important to analyze and control for the main determinants of how much people can help an economy grow. As such, the percentage of people with a bachelor's degree or higher within each county was measured. Higher educated people will facilitate a faster-growing economy than people with low education and experience. Population density by county was recorded to determine the effect of the intensity of each county's market on its economy. State unemployment rates are also included in this analysis, to provide a proxy of the general economic health of the county. All control variables in the regression model are expressed as their log to preserve normality with the data, although they are not recorded as such in the summary.

Gross County Product, Total County Employment, and Personal County Income growth rates were collected from the Regional Economic Analysis Project database. These variables highlight a county's economic performance across different dimensions. Gross County Product is utilized as a close proxy to each county's performance but does not account directly for how well off the people within each county are. Total County Employment analyzes the health and growth of the job market in each county but does not measure the overall economic performance of the county. Personal County Income measures the people's financial health within each county but does not account for the job market. Each variable complements each other, resulting in a full picture of the economic growth in each county. These variables are measured in the form of growth per year. Thus, while some economic studies find it necessary to lag the independent variables to control for the simultaneity of small business growth and economic growth, this study avoids that problem, as while the data starts from 2003, the 'lag' is implicit in the fact that the growth rates are calculated using data from 2002 and the independent variables begin in 2003.

Shown below are summary statistics of the data used for regression. Table 1 provides an overview of small business activity from 2003-2020, revealing interesting findings. First, the averages of firms, establishments, employment, births, and deaths have all decreased. Almost all these statistics gradually increased until the mid-2010s and then declined markedly. The only variable to increase is payroll, which is unsurprising given wage increases over time. The trend differs in Table 2, where GDP growth shows a similar decrease in the mean from 2003 to 2020, but not a similar decline from the mid-2010s. Instead, GCP growth fluctuates considerably from endpoint to endpoint, and the standard deviation of the difference in GCP growth year-on-year averages a massive 10.23, with a mean of 0.46, including outliers. However, total county employment and personal county income increased on average from 2003-2020 and experienced significantly less fluctuation. The difference in TCE growth had a 6.43 standard deviation and a -0.085 mean. PCI growth had a 4.76 standard deviation

and a -0.18 mean difference of percent change per year. For the mining counties, less fluctuation of growth rates leads to more growth of GCP, TCE, and PCI.

As for the control variables, manufacturing wages go up significantly on average, as does the unemployment rate and percentage of college-educated individuals. The population density decreases, explained by the fact that in West Virginia, more people are dying than being born currently as per the Census Bureau. A decrease in population explains part of the decrease in GCP, however, the decrease seems counterintuitive to the increase in TCE the counties experience. However, the R^2 value when regressing the change in population density on TCE is a mere 0.074, revealing that a shrinking population density has little bearing on the growth of TCE.

Table 1. Summary Statistics for Small Business Activity

	2003		2020	
Variables	**Mean**	**SD**	**Mean**	**SD**
Small Business Firms	755	915	518	700
Small Business Establishments	859	1117	697	899
Small Business Employment	12869	19610	10651	15963
Small Business Payroll	208736	315611	215797	324236
Small Business Births	77	97	49	63
Small Business Deaths	84	99	62	75

Table 2. Summary Statistics for Economic Activity

	2003		2020	
Variables	**Mean**	**SD**	**Mean**	**SD**
GCP Growth	5.14%	2.39	1.08%	5.55
TCE Growth	1.53%	4.28	2.78%	4.51
PCI Growth	3.42%	2.79	6.2%	1.61
Manufacturing Wage	$610.33	214.95	$960.8	277.86
Unemployment Rate	7.66%	1.54	9.5%	1.8
College Education Rate	13.63%	5.05	17.38%	6.64
Population Density	92.13	95.18	85.23	89.44

Methods

This study utilizes the econometrics software Gretl to examine the impacts of small business development on the economy. There are three fixed-effects panel regression models each representing one of the facets of economic growth (GCP, TCE, PCI). A fixed-effects model is the most appropriate model in this case as the parameters utilized in the study are all non-random values collected from the small business workers of West Virginia's mining counties. Each panel model has 18 units of time and 21 cross-sectional units, for 378 observations per model. The equation used for this multivariate regression takes the form $y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5$.

Results

Tables 3-5 present the regression results of this study. The respective dependent variables for each table are GCP, TCE, and PCI. As shown by the tables, almost all the small business measures do not have a statistically significant effect on any dependent variables, except for small business employment on Personal County Income.

Beginning with Table 3, none of the small business measures have a statistically significant effect on GCP, and the only control variable with a statistically significant effect is the manufacturing wage, where an increase in manufacturing wage decreases GCP. It should be noted that the R^2 of the GCP model is significantly higher compared to the other two models (0.1598 average R^2 compared to 0.1021 for TCE and 0.0958 for PCI). This is 36% and 41% higher than the other two respectively, showing that the model explains the variance in GCP greatest by a significant margin.

Table 4 has similarities to Table 3 in that none of the small business measures have a statistically significant effect on total employment growth within each county. Where it also lines up with Table 4 is that the manufacturing wage again harms total employment growth. Notably, the absolute value of the manufacturing wage coefficient in Table 4 is less than half of the absolute value of the coefficient in Table 3, making it clear that manufacturing wage is more impactful on GCP than it is on total employment. However, Table 4 also shows that other control variables have statistically significant effects on employment, such as college education (positive across all measures) and population density (positive for establishments, employees, payroll, and births).

In Table 5, the employment measure is statistically significant, specifically showing that growth in small business employment has a slight decrease in PCI growth. Thus, given that median PCI growth is 3.57%, the results indicate that an employment change by 1 unit would decrease median PCI growth by 0.0003 units. For a better measurement, a 5% employment change would result in a decrease of median PCI by 0.0015% to 3.564%. Thus, even though small business employment has a statistically significant effect on median PCI, the effect makes very little impact on median PCI. There are also multiple significant control variables. Manufacturing wage once again is statistically significant across all measures, although once again the coefficient is quite smaller across each measure than for the previous dependent variables. Its significance has also reduced; whereas in Tables 3 and 4 it was significant at $p < 0.01$, in Table 5 it is significant at the $p<0.1$ and $p<0.05$ levels. The unemployment rate is also statistically significant with a negative coefficient, so an increase in the unemployment rate would effect a decrease in PCI. Finally, the college education rate is statistically significant with a positive coefficient.

These results reveal that small business activity does not affect economic growth within West Virginia's mining counties. The only measure of economic growth that is affected is Personal County Income, and that is only by one measure of small business activity - employment - on a very small level. Manufacturing wage is shown to have negative effects on all aspects of economic growth, especially on GCP. The college education rate and population density have positive effects on TCE and PCI, and the unemployment rate has a negative effect on PCI. These results are surprising considering prior literature establishing the effectiveness of small business activity in growing local economies.

Table 3. Regression results of GCP on small business and economic activity

	Firms	Establishments	Employees	Payroll	Births	Deaths
Measure	0.0088 (0.0069)	0.0097 (0.0069)	0.0001 (0.0005)	-1.048e-5 (1.836e-5)	0.0208 (0.0250)	0.0263 (0.0306)
Manufacturing Wage	-0.0197*** (0.00493)	-0.0199*** (0.0048)	-0.0210*** (0.0048)	-0.0205*** (0.0048)	-0.020*** (0.005)	-0.0202*** (0.0049)
Unemployment	-0.3635	-0.364	-0.403	-0.435	-0.368	-0.395

Rate	(0.270)	(0.269)	(0.271)	(0.271)	(0.273)	(0.268)
College Education Rate	0.366 (0.376)	0.372 (0.376)	0.341 (0.381)	0.318 0.375	0.322 (0.375)	0.325 (0.375)
Population Density	-0.044 (0.171)	-0.050 (0.169)	0.038 (0.162)	0.0594 0.154	0.0133 (0.1596)	0.011 (0.160)
Constant	12.988 (17.946)	11.856 (17.938)	11.985 (18.152)	14.021 (18.151)	13.612 (18.005)	13.532 (17.996)
R^2	0.161	0.162	0.158	0.159	0.160	0.159

Notes: *,**,***: Statistical significance at the p<0.1,0.05,0.01 levels.
Entered are regression coefficients followed by standard errors in parentheses.

Table 4. Regression results of TCE on small business and economic activity

	Firms	Establishments	Employees	Payroll	Births	Deaths
Measure	0.0002 (0.0041)	0.0002 (0.0041)	-0.0002 (0.0003)	6.099e-6 (1.1e-5)	-0.0009 (0.0148)	0.0169 (0.0183)
Manufacturing Wage	-0.0081*** (0.0034)	-0.0087*** (0.0028)	-0.0078*** (0.0023)	-0.0083*** (0.0029)	-0.0081*** (0.0030)	-0.0076*** (0.0029)
Unemployment Rate	0.118 (0.162)	0.119 (0.162)	0.098 (0.162)	0.129 (0.162)	0.115 (0.163)	0.128 (0.161)
College Education Rate	0.498** (0.225)	0.499** (0.226)	0.469** (0.228)	0.502** (0.225)	0.498** (0.225)	0.497** (0.224)
Population Density	0.168 (0.102)	0.168* (0.101)	0.194** (0.097)	0.165* (0.092)	0.172* (0.095)	0.145 (0.095)
Constant	-18.284* (10.779)	-18.314* (10.782)	-17.211 (10.875)	-19.137* (10.880)	-18.339* (10.803)	-17.674 (10.785)
R^2	0.101	0.102	0.103	0.102	0.101	0.104

Notes: *,**,***: Statistical significance at the p<0.1,0.05,0.01 levels.
Entered are regression coefficients followed by standard errors in parentheses.

Table 5. Regression results of PCI on small business and economic activity

	Firms	Establishments	Employees	Payroll	Births	Deaths
Measure	0.0031 (0.0028)	0.0024 (0.0028)	-0.0003* (0.0002)	-4.3353-6 (7.600e-6)	0.0027 (0.0102)	0.0096 (0.0127)
Manufacturing Wage	-0.0039* (0.0020)	-0.0041** (0.0020)	-0.0043** (0.0019)	-0.0042** (0.0020)	-0.0043** (0.0020)	-0.0041** (0.0020)
Unemployment Rate	-0.238** (0.111)	-0.244** (0.111)	-0.290*** (0.112)	-0.265** (0.112)	-0.250** (0.113)	-0.250** (0.111)
College Education Rate	0.501*** (0.155)	0.498*** (0.156)	0.435*** (0.157)	0.483*** (0.155)	0.486*** (0.155)	0.487*** (0.155)
Population Density	-0.058 (0.070)	-0.050 (0.070)	0.016 (0.066)	-0.021 (0.063)	-0.029 (0.066)	-0.039 (0.066)
Constant	3.565	3.239	5.376	4.018	3.557	3.76

	(7.428)	(7.434)	(7.475)	(7.510)	(7.456)	(7.445)
R^2	0.098	0.096	0.103	0.095	0.094	0.096

Notes: *,**,***: Statistical significance at the p<0.1,0.05,0.01 levels.
Entered are regression coefficients followed by standard errors in parentheses.

Discussion and Next Steps

These results are rather surprising, given the amount of literature that supports small businesses as a function of improving economic diversity, lessening the effects of downturns, and increasing economic growth. More research should be done into what about West Virginia's mining counties makes them a place where small businesses are not supportive for the economy, accounting for both quantitative factors such as earlier policies surrounding small business development and the influence of large corporations in the mining counties, or even qualitative factors such as West Virginians' differing attitude to small and large business. Nevertheless, it is encouraging to know that a potential solution to the mining counties economic woes has been eliminated – now, future research will be able to home in on other facets of increasing economic growth in the mining counties knowing that developing small businesses is not an effective way to do so.

Even though the results for small business ventures do not indicate any statistical significance, other regression results may hint at where the mining counties' economies might increase growth. For example, the college education rate was shown to have statistically significant effects on Total County Employment and Personal County Income. Considering the relatively low college education rate in West Virginia compared to the rest of the United States, future research that focuses on education as a main independent variable could indicate that policymakers should focus on increasing education rates to stimulate growth increases. As another possibility, the manufacturing wage was found to have negative effects on economic growth, making lowering the manufacturing wage another possible way to increase economic growth, and research into this possibility another interesting way to figure out how to alleviate the economic problems of the mining counties.

Conclusion

This study used a panel of the 21 mining counties of West Virginia over 18 years to determine if small business development would be a viable method of increasing the economic growth of these counties to assist their uniquely precarious economic situation. It was found, even after attempting to control for omitted variable bias, and with the simultaneity of small business growth and economic growth already accounted for, that small business activity does not significantly affect economic growth for Gross County Product, Total County Employment, or Personal County Income. Only small business employment was found to be significant on Personal County Income, and on a minimal level at that. As such, policymakers within West Virginia should look elsewhere in their attempts to bolster the mining counties' economies, possibly continuing their investment into large business development, or focusing on one of the many other ways to improve economic activity within a county. These results indicate that policy discussion and funding would prove fruitless if spent on developing small business activity.

More research should be done regarding the unique situation of West Virginia's mining counties. Their economies are singularly focused on mining, and increased diversity is necessary for the mining counties to escape the economic conditions that find them ranked as some of the worst counties to live in in the entire country. Other facets of improving the economy through increased diversity should be empirically explored, to assess a way in which West Virginia's mining counties can be helped economically.

Limitations

Unfortunately, this study faces an important limitation in fully analyzing the effects of small businesses on county economic growth. Information about important economic controls is not widely available at the West Virginian county level. Information about the share of GCP in different sectors of the economy is practically nonexistent, as is information about the distribution of ages of people within the county. Other omitted control variables in this study, utilized in other studies about small business growth, include county energy prices, tax policy variables such as sales tax and personal income tax, and the number of LLC organizations within counties. This may impact the study through omitted variable bias, as there is the potential that one or more of the data points the study was unable to report alter the result of the study. To reduce the possibility of omitted variable bias, this study analyzes as many control variables with multiple instances of reported data for each county as possible. Then, the study fills in the unreported gaps with averages of the reported data to keep the distribution the same, and to allow the panel model to balance.

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