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Investing in Our Future: A State-Level Analysis of the Relationship Between Education Funding and Economic Growth

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Investing in Our Future: A State-Level Analysis of the Relationship Between Education Funding and Economic Growth

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Abstract

This research paper aims to investigate associations between education investments and economic growth on the state level. These relationships are measured in terms of two dependent variables: state gross domestic product output and cumulative personal incomes by state. These dependent variables, or indicators of economic growth were selected from previous supportive literature. The present study analyzes publicly available aggregate school finance data reports and aggregate GDP output reports for the year of 2018. Two hypotheses were tested to assess these associations. The results of the present study showed significant, positive associations for both tested hypotheses. This study further supports existing literature stating that educational investment impacts economic growth on the state-level.

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Introduction

There is no shortage of research into the relationship between education investment and the impact on economic growth. Research running the gamut has attempted to synthesize this relationship (Deskins, et al. 2008). Education spending and economic growth has intrigued various academic disciplines spanning decades because of the potential implications for federal and state level funding allocation (Baldwin, et al., 2011). Unfortunately, the existing research is hyper-focused on longitudinal economic prosperity. A majority of the literature leans toward higher education data and views economic growth as an exclusively long-run phenomenon (Akpolat, 2014).

For the purpose of this research, a long-term analysis was utilized by looking at 2018 Census Bureau education finance filings, 2018 GDP outputs (state level GDP and cumulative personal income levels by state). A data set was developed using federal, state, and local level financial distributions for education with regard to state population. Educational financial distributions encapsulate federal, state, and local level source amounts as well as indebtedness within the education system.

The previous research focusing on higher education is in line with human capital theory, a development theory that is widely considered a determinant of economic growth (Akpolat, 2014). It is built on the idea that higher education produces a more readily available workforce, technology advancements, and research (Akpolat, 2014). This does leave a large gap in the data concerning elementary-secondary level education and the implications on economic growth. Elementary-secondary level education encapsulates early education, college preparation, increased technology needs, and workforce development. These are educational programs facing

an increase in demand, but no reflection of that demand within the educational budgetary allocations (Busch, 2012).

Even though there is a surplus of data concerning higher education funding and economic growth, the argument is still lacking sufficient explanation. This is because educational investments are not random. Public school funding on the federal level is determined based on population and other extraneous factors like growth projections (Deskins et al., 2008). The U.S. Constitution designates the states as being responsible for public K-12 education (Spellings, 2014). The federal funding that is provided to states is made on a supplemental basis in the form of two primary sources of support: Elementary and Secondary Education Act (ESEA) and No Child Left Behind Act of 2001 (NCLB) (Spellings, 2014). This means that public education is funded almost exclusively by state and local sources; there is no standard/baseline for education. This lack of standard for educational funding results in disparities in educational equity (Baker et al., 2014).

Public education funding on the state level typically comes from a combination of local property taxes, state income taxes, and sales taxes (Howell & Miller, 1997). This means that education funding is highly influenced by tax revenue, and therefore population and affluence/economic prosperity within the state (Howell & Miller, 1997). From this, it is understood that state and local level education financials vary, but they are also influenced by factors that could be deemed a result of reverse causality (Bils and Klenow, 2000). In layman's terms, this phenomenon refers to when variables (independent and dependent) are associated but instead of the independent impacting the dependent variable it is actually the other way around. Regardless of this possibility, determining if there is a relationship present between state level

elementary-secondary education financing and an increase in state level economic growth could, in turn, influence future state level funding allocations. Local education funding having an impact on state level economic growth could serve as an incentive for private investors to make donations/grants to public education foundations and other supporting entities (Busch, 2012).

Existing Literature

The following literature review highlights previous research studies that explore similar relationship associations as the present research paper. The review is categorized by topic. Similar research is grouped together and discussed subsequently.

Education Spending and Economic Growth-U.S.

A longitudinal regression analysis over 18 years on the 48 continental U.S. states found that increasing K12 (elementary-secondary education) funding appeared to reduce the teacher-pupil ratio and increased high school attainment (Baldwin et al., 2011). This research investigated both direct and indirect relationships between state investments in education and economic growth. The primary dependent variable in this study was GSP or gross state product, a state-based breakdown of gross domestic product. The research also suggested a positive relationship between higher education spending and economic growth. They concluded that greater investment in K-12 and higher education spending has a stronger empirical foundation than in previous decades.

One supportive study for this relationship discussed in the above paragraph comes in the form of a time-series analysis examining the long-run relationship between education spending and economic growth (Deskins, et al., 2008). The results from this long run data analysis indicate that when public education finances are run through own-source revenues, they exhibit a positive effect on state GDP in the long-run (Deskins et al., 2008). Own-source revenues refer to

revenues collected by state and local governments from its own source (Alt, 2017). This research article contributed to the literature by showing an association between public school spending and economic growth in the long run. Unfortunately, the research article did not specify if the public education spending was in reference to public higher education universities or public K-12 education spending.

Research and Development Investment

Research and development investment has been one of the frontrunners of focus for educational funding and economic growth relationship data. One longitudinal panel data analysis was collected on the 48 continental states in the U.S. to determine the return investments in higher education (Baldwin & MacCracken III, 2013). From this collected data Baldwin and McCracken (2013) used multiple regressions to reveal that state and local government spending on research and development in higher education has a significant positive association with per capita income growth. Research and development spending in higher education is also positively associated with GSP (gross state product) growth, according to this research.

Another article published in 2016, showed that research and development investment performed within a state has significant, positive effects on the state GDP in the long run (Blanco et al., 2016). The research also found strong evidence of positive research and development spillovers among U.S. states. The baseline comparison data showed that for every dollar ($1) research and development investment added into a state's own GDP, an average of nearly five dollars ($5) of GDP was created in other states (Blanco et al., 2016). This output and productivity spillover across state lines should serve as a basic incentive to promote internal investment into education research and development. A 2018 article further explores the productivity spillover effects of higher education spending on per capita growth. This research

showed that regardless of the source of financing, the total effect of higher education funding is positive on per capita growth (Ojede et al., 2018). Their findings also suggest that although both higher education funding and highway spending are positively related to per capita growth, higher education funding has greater per capita growth-related spillover effects (Ojede, et al., 2018).

Cognitive Skills

Another focus in education investment and economic growth research looks at specific educational milestones as indicators of productivity. Hanushek and Woessman (2012) explored this idea in their research concerning cognitive skills and economic outcomes. They utilized cross-country growth regressions to compare cognitive skills and economic outputs across various time periods and countries. From these regressions they were able to conclude that differences in cognitive skills lead to significant differences in economic growth (Hanushek & Woessman, 2012). Throughout all of their data alterations and modeling there was a consistent result showing that one standard deviation higher in a country's cognitive skill level in the workforce is associated with a near two percent increase in annual growth in per capita GDP (Hanushek & Woessman, 2012). GDP increase as a result of educational investment is further supported by a cointegrated regression analysis conducted by Akpolat (2014). This research showed that funding education expenditures is more efficient in increasing GDP in developed countries like the U.S. compared to developing countries Akpolat, 2014).

Economic growth being positively connected to higher education funding, as indicated above, should incentivize policy makers to reallocate federal and state-level funding to be more educationally promotive. The source of that funding distribution for reallocation is an important consideration. One that Acosta-Ormaechea and Morozumi (2017) addresses in their research

concerning public education spending reallocations and economic growth. Their use of neoclassical growth models related per capita GDP to two variable types: control and state level. The summarized results of the models show that while any type of spending reallocation towards education exhibits some growth promoting effects, the most robust results appear when the funding reallocation comes from health and social protection and is specific to when the country has low-income levels (Acosta-Ormaechea & Morozumi, 2017).

Theoretical Foundation

The primary foundational and research supported theory that shows a relationship between education spending and state level economic growth exists within the human capital theory. Human capital theory was initially referenced by Walsh (1935) and later Mincer (1958). This theory asserts that various components of human development: knowledge, skills, experience, training, etc. are investments in human capital which, over time, accrue profit/benefits in themselves (Mincer, 1994). Investment in education results in technological developments and innovations that cyclically enhances human capital and productivity (Baldwin & McCracken III, 2013). States with more robust public schools contribute to human capital because it attracts higher quality laborers. Parents that recognize the significance of quality education tend to migrate to states that more heavily invest in education for their children (Quan & Beck, 1987). This influx in population as a result of educational investment, enhances private and public benefit accruement which is reflected in measures like GDP and per capita income (Baldwin & McCraken III, 2013; Evans & Oneal, 1995). Education attainment has also been shown to indirectly impact economic growth by decreasing income inequality, fertility rates, infant mortality rates, homicide rates, and increasing life expectancy (McMahon, 2000).

In accordance with the human capital theory, it would be expected that an increase in education funding would result in higher GDP outputs and other economic indicators of economic growth. In this instance, the indicators of economic growth being measured are state level gross domestic product output (GDP) and cumulative personal income per state.

Purpose of Study

The purpose of the following research study is to investigate the relationship between education funding and the impact on economic growth by state. The primary focus is on state and local level funding allocations towards elementary-secondary (K-12) education and its association to economic growth. The measures of economic growth within this study are represented by two primary indicators: state level gross domestic output and cumulative personal income by state.

Research Question

The leading research question in this study is as follows: Is there a relationship between elementary-secondary education spending and economic growth? A more specific sub-question is, do higher levels of state and local source elementary-secondary education spending result in economic growth within the state?

These research questions helped in the creation and development of the two following hypotheses and variables. An explanation and justification for each hypothesis is provided below.

Hypothesis 1: States with higher amounts of state and local funding for elementary-secondary education will have higher gross domestic product output.

This hypothesis was formulated from looking at the previous research variables. Gross domestic product on the state level is a primary indicator of economic growth and is widely accepted in economic growth research (Akpolat, 2014; Baldwin & MacCracken III, 2013; Deskins et al., 2008; Tomljanovich 2004). The independent variables were chosen based on previous research and understood relationship to educational funding distribution on the local and state levels (Baldwin & MacCracken III, 2013; Deskins et al., 2008).

Hypothesis 2: States with higher amounts of state and local funding for elementary-secondary education will have higher average personal incomes (cumulative).

Similarly, the second hypothesis was developed by looking at previous research on education spending and economic growth. Personal income is a popular and widely used indicator of economic growth and prosperity (Aghion et al., 2009). This particular dependent variable is the cumulative value of personal incomes by state. The same independent variables were selected for this hypothesis as the first hypothesis for consistency.

Methodology

This study utilizes an exploratory non-experimental design to investigate the relationship between state education funding and the impact on economic growth. The present data set developed for this research was assembled using various publicly available data records. The primary source of data came from the 2018 Public School System Finance Data report from the U.S. Census Bureau, Department of Commerce. Data collected for the annual survey of school system finances were state aggregates compiled from multiple sources. Similarly, the data collected for state GDP and personal income figures were collected from the U.S. Department of

Commerce, Bureau of Economic Analysis- this is also publicly available state aggregate data. All of these data sources are considered public record and therefore, are not confidential as authorized by title 13, United States code, section 9 (U.S. Census Bureau Methodology, 2020).

Participants

The participants for the present study are the 50 U.S. states. The data is a compilation of various variables from public school finance reports and state GDP output reports. Within the 2018 Public School System Finance Data report there were financial reports given for 14,840 school systems across the 50 states. Of those 14,840 schools- 12,258 are considered independent school districts, 1,235 are dependent education service agencies, and 1,147 are dependent school systems (U.S. Census Bureau Methodology, 2020). The collected data from the census bureau is not subject to sampling error because the Census Bureau attempts to contact every school system. To mitigate coverage error, the Census Bureau performs validity checks against various other data sources including NCES and state totals released by state education agencies (U.S. Census Bureau Methodology, 2020). The census bureau staff also reviews the aggregates and compares numbers to previous year data to ensure consistency (U.S. Census Bureau Methodology, 2020). The state GDP and personal income data reported by the U.S. Bureau of Economics is assembled and presented in a similar aggregate fashion.

Data Collection

The school system finance data for 2018 was primarily collected via F-33 forms from the U.S. Census Bureau. The F-33 form is a comprehensive financial breakdown report that details all revenues by source, expenditures, indebtedness, and cash and security holdings (U.S Census Bureau Questionnaires, 2019). Any gaps or missing data in the 2018 finance report was filled using other available data sources. The Census Bureau has arrangements with state government

education departments to utilize information collection systems that hold existing finance information (U.S. Census Bureau Methodology, 2020). The data collection process for the school system finance report begins in January when states submit data from the previous year (U.S. Census Bureau Methodology, 2020). The data collection process typically takes a little longer than a year.

Data collection and methodology for 2018 state GDP and personal income reports are slightly more complex. GDP by state consists of three separate but interrelated factors: labor income, business taxes, and capital income (Pritzker et al., 2017). The Bureau of Economic Analysis has a ten-step process to estimate and collect state GDP. The ten-step process is detailed in the table below (See Table 1).

Table 1

GDP State Estimation Process Steps

Step	The GDP by state estimation process is divided into ten consecutive steps as follows:
1	Estimate labor income using data from BEA's state personal income accounts
2	Estimate non-corporate capital income also using data from BEA's SPI accounts
3	Estimate business taxes less subsidies paid to business by the government using data from the Census Bureau, other federal agencies, and state government agencies.
4	Estimate total GDP by state for goods-producing industries based on value-added data from the Department of Agriculture and the Census Bureau.
5	Estimate corporate capital income for the services-producing industries using financial data reported by company for regulated industries and Census Bureau gross receipts and payroll data for non-regulated industries. For government enterprises, capital income is based on revenues and expenditures data from the Census Bureau.

GDP State Estimation Process Steps Cont.

Step	The GDP by state estimation process is divided into ten consecutive steps as follows:
6	Compute the remaining component, GDP by state or corporate capital income. For the goods-producing industries in step 4, the corporate capital income component of GDP by state is computed as the difference between GDP by state and the sum of labor income, noncorporate capital income, and business taxes less subsidies. For the services-producing industries in step 5, GDP by state is computed as the sum of labor income, business taxes less subsidies, and capital income.
7	Scale GDP by state components to the national estimates of GDP by industry components produced by BEA's Industry Accounts.
8	Compute Fixed Investment from research and development expenditures and exertainment, literary, and artistic originals expenditures separately.
9	Add fixed investments to GDP by state components to compute total GDP by state.
10	Finally, compute real GDP by state by applying national chain-weighted price deflators to current-dollar GDP by state estimates.

Pritzker, Moyer, & Thompson, 2017 Gross Domestic Product by State Estimation Methodology III

Measures

The variables for the present study were selected based on supportive literature and identified gaps in research (Akpolat, 2014; Baldwin & MacCracken III, 2013; Deskins et al., 2008). They were chosen out of the collective aggregate data reports mentioned previously. The dependent variables in this constructed data table include:

- GDP (state): Gross Domestic Product output value by state in millions of dollars

- Personal Income: The amount of cumulative personal income reported for each state in millions of dollars

The independent variables, like the dependents, were also selected from the aforementioned aggregate summary data tables. The independent variables are as follows:

- State population: Total census reported state populations for 2018
- State sources of elementary-secondary education funding: Amount of funding distributed on the state level to elementary-secondary education (per state)
- Local sources of elementary-secondary education funding: Amount of funding distributed on the local level to elementary-secondary education (per state)
- Indebtedness amount per state: Cumulative amount of reported indebtedness by education systems per state
- Enrollment in elementary-secondary education per state: Number of students in each state enrolled in elementary-secondary education

The definitions/operationalizations of the above variables are as indicated by the original aggregate data tables. They are listed in the order as they appear in the compiled data set.

Data Analysis

To analyze the research data in the present study, univariate and regression analyses were conducted to examine the relationships between the dependent and independent variables. Due to the scale and continuous nature of both the independent and dependent variables, linear regression tests were conducted for both hypotheses 1 and 2. Regression analysis was selected to model and predict the relationships between the independent and dependent variables. The results of the models are detailed below.

Results

The research findings from the linear regression models are indicated in the subsequent sections. A descriptive analysis was also conducted prior to the linear regression models to help provide context to the data. Those figures are also present below.

Descriptive Values

Due to the large-scale nature of the variable values (thousands and millions), descriptive analysis was run first to give context to the data. These descriptive statistics are detailed below in Table 2.

Table 2
Descriptive Statistics for Study Variables

Variables	Mean	Median	Mode	SD
GDP in Millions	400185.451	233929.900	33256.3	523387.660
Personal Income by Millions	349789.249	215308.700	33422.7	440125.627
State Population	6962146.10	4659690.00	577,601	8111195.32
State Sources	6739887.88	4386842.00	564898.00	8459638.52
Local Sources	6445828.98	3362538.00	$49,864.00	8858065.17
Indebtedness	9370412.51	4996489.00	$0.00	16411863.6
Enrollment	952,591.37	665,783.00	48,205	1149512.17

State GDP and Cumulative Personal Income values (top two variables) were reported in the millions of dollars. This means that the descriptive statistics for these two variables are very high. For example, the mean value of personal cumulative income in the 50 states and D.C. is $349,789,249.00. Similarly, the mean value for state GDP output in millions is $400,185,451.00. The remaining variables are presented in the thousands (state population, enrollment) or the thousands of dollars (state sources, local sources, indebtedness).

Findings

Two hypotheses were tested within the present study. The findings are organized below and subsequently by hypothesis.

States with higher amounts of state and local funding for elementary-secondary education will have higher gross domestic product output.

The results of the first model, $R^2 = .99$, $F\ (5,44) = 1164.31$, $p < .001$, indicate that both state and local funding had statistically significant relationships with state-level GDP, where higher levels of both types of funding were associated with higher levels of state-level GDP output (see table 3). Each increase of $1,000 in state funding was associated with an increase of $.03 million or $30,000 of state-level GDP output. Each increase of $1,000 of local funding was associated with an increase of $.01 million or $10,000 of state-level GDP output. Both state education funding amounts and local education funding amounts were positive, significant predictors of state GDP output.

The control variables for this model: state population, enrollment, and indebtedness showed varying results in their relationship with state-level GDP output. State population did not show a statistically significant impact ($p > .1$) on state GDP output. Similarly, indebtedness did not show a statistically significant relationship with state-level GDP output ($p > .1$). Enrollment, however, did show a statistically significant impact ($p < .001$) on state GDP output. Every increase in 1,000 kids enrolled in the public education system in a state is associated with an increase of $.21 million or $210,000 of state-level GDP output.

The unstandardized B and confidence interval (90.0%) lower and upper bound values are detailed in Table 3. A 90% confidence interval was selected as a result of the small population sample size (50 states and D.C). The compilation of these variables was also collected from

various aggregate data sources. This variability, and small sample size, lends itself to the decision to have a wider confidence interval (Panizza & Presbitero, 2014; Hair et al., 2006).. The 90% confidence interval within this model indicates that the 90% of the interval estimates should be contained within the identified upper and lower bounds.

Table 3

State and Local Funding Amounts and GDP

Variable	B (90% Confidence Interval)
State Sources	.03 (.025, .032) ***
Local Sources	.01 (.006, .011) ***
State Population	.00 (-.002, .003)
Enrollment	.21 (.16, .25) ***
Indebtedness	-.001 (-.003, .001)
Constant	-35773.32 (-52490.79, -19055.85) **
R^2	.99

Note: * $p < .05$, ** $p < .01$, *** $p < .001$

States with higher amounts of state and local funding for elementary-secondary education will have higher average personal incomes (cumulative).

The results of the second model, $R^2 = .99$, F (5,44) = 801.708, $p < .001$, indicate that both state and local funding had statistically significant relationships with average personal incomes, where higher levels of both types of funding were associated with higher average personal incomes (cumulative) outputs. Each increase of $1,000 in state funding was associated with an increase of $.02 million or $20,000 of cumulative personal income. Each increase of $1,000 of local funding was associated with an increase of $.01 million or $10,000 of cumulative personal income. Both

state education funding amounts and local education funding amounts were positive, significant predictors of cumulative state average personal incomes.

Two of the three control variables for this model had statistically significant associations with the average personal incomes (cumulative by state): enrollment ($p < .001$) and indebtedness ($p < .01$). State population was not found to be statistically significant to the dependent variable within this model ($p > .1$). Each enrollment increase of 1,000 kids in the education system per state showed an association to an increase of $250,000 cumulative, average personal income per state. This model showed that for every $1,000 contributed to educational indebtedness per state, there is an association to (-) $5,000 deficit to average personal incomes (cumulative by state). Meaning that for every added $1,000 that state education systems go in debt, there is an association to the loss of $5,000 in cumulative personal incomes. Similar to the first model, a 90% confidence interval was chosen.

Table 4

State and Local Funding Amounts and Average Personal Incomes (cumulative)

Variable	B (90% Confidence Interval)
State Sources	.02 (.017, .025) ***
Local Sources	.01 (.004, .009) ***
State Population	.00 (-.003, .003)
Enrollment	.25 (.20, .29) ***
Indebtedness	-.005 (-.007, -.002)**
Constant	-26815.144 (-43693.73, -9936.56)*
R^2	.99

Note: * $p < .05$, ** $p < .01$, *** $p < .001$

Discussion

The current study aimed to examine the relationship between education funding and economic growth on the state level. Each of the study hypotheses were supported by the findings present within this research. The significant results of the study are consistent with previous research findings that show positive associations between educational funding and economic growth.

The results from the first hypothesis showing a positive, significant relationship between state and local education funding and state level GDP outputs, are consistent with the findings of Baldwin, et al., (2011). They found that increasing K12 education funding increased high school attainment and impacted economic growth. Their primary dependent variable and measure of economic growth was gross domestic state product. Similarly, a research article by Deskins, et al., (2008) showed that education finances exhibit a positive effect on state GDP in the long-run. The present study expands on previous research by exploring a single-year association between both state and local level education funding and its impact on state level gross domestic product output. The previous research focused primarily on long-run data.

The results concerning the relationships between education funding and cumulative personal income are also supported by previous research. A study by Baldwin and McCracken III (2013) used longitudinal data on the U.S. states to determine return investments in higher education. Their multiple regressions revealed that state and local spending on research and development in higher education has a significant positive association with personal income growth. The research findings within the present study expand on the Baldwin and McCracken III (2013) data by highlighting the positive associations in elementary-secondary education

funding and personal income. The present research also expands the literature by showing a single-year, significant association between education spending and personal income.

Strengths & Limitations

The segments below highlight the various strengths and limitations of the present research study.

Strengths

The research questions and hypotheses within this study are supported by a plethora of previous literature and are built on a strong theoretical foundation. The theoretical foundation in question, the human capital theory, is a recognized and supported theory of community development (Mincer, 1994). The linear regression tests within this study show strong, consistent relationships among the tested variables. The results indicate positive, significant relationships for each of the tested hypotheses. Hypotheses 1 and 2 show significance levels of $p < .001$.

Limitations

Although the present research is supportive of the tested hypotheses and indicates positive significant relationships between the variables, there are several limitations to this study. First and foremost, the compiled data is not longitudinal and only represents educational spending and state GDP output for the fiscal year of 2018. This is problematic because the financial implications indicated by the 2018 fiscal data may not be reflective of the spending. Meaning that the GDP output for 2018 is unlikely to be a direct result of 2018 educational spending.

Second, there is some evidence of multicollinearity among the independent variables. This is a result of the variables measuring similar things. For example, the states that have higher state funding for education also have higher local funding amounts. This is because states that spending more on the state level, are more likely to have higher spending on the local level

(cyclical economic profitability). Another possible contributor to the multicollinearity is state population figures. States with higher populations will have more money invested into the education system on both the state and local levels in general. This is evidenced by federal education funding being determined on population distribution. It is for this exact reason that federal education funding distribution by state was not included as a variable in the above regression models, although it was included in the composition of the initial data set.

Third, the present results did not account for other significant indicators of economic growth like highway and infrastructure spending. These indicators are not universally recognized as markers of economic growth but have been cited by some literature as being important indicators (Baldwin & McCracken III, 2013).

Implications

The findings of the present study serve to inform and potentially impact future decision making for education funding allocations. Potential implications for various levels of application are detailed below.

Practice Implications

This research and the supportive literature indicating that investment in education impacts economic growth suggests that students are, in and of themselves, economic resources. The human capital theory further supports this notion by stating that investment of any kind into human beings reciprocally has economic return (Mincer, 1958; Mincer, 1994). This means that students should be seen as long-term investments for economic prosperity. In order for this to be achieved effectively, a few major shifts in the perception and roles of education systems would need to occur.

Elementary-secondary education systems would need to shift from the model of serving as just an educational entity to serving as a central hub for resources for student well-being. In many districts across the country, this is already the case. Schools serve as a significant, supportive entity for students and their families. However, the availability of fiscal support for these resources is not consistent (Busch, 2012). Some of the holistic resource provisions could include food pantries, clothing and other necessities, comprehensive health-centers on campus for the whole family, after school programs to support working families, in house mental health services or referrals, and specialized programs.

Having consistent, secure avenues of fiscal support for the longevity of these programs could help eliminate barriers preventing educational equity (Busch, 2012). Currently in the United States, public education funding is supported primarily by state and local sources and is supplemented by federal grants (Baker et al., 2014; Spellings, 2014). This results in public education systems relying heavily on local sources of educational funding, like education foundations, to help to sustain programs that are not supported by federal or state level sources. In Fayetteville, Arkansas for example, the public education foundation has contributed over $4 million since their inception in 1992, to the public school district in Fayetteville for the purpose of funding programs and projects that contribute to educational equity (Fayetteville Public Education Foundation, 2021). This model (local funding sustainability) is not ideal, nor is it guaranteed for longevity (Busch, 2012). Instead, the roles of federal and local education funding should be reversed.

Along this same argument, schools could provide more guidance to students at the secondary education level with regard to the higher education application process and employment search. Social workers and counselors could help achieve this endeavor by

presenting various post-graduation options and research employment gaps/ demands within the community. This could help contribute to lower attrition rates, greater higher education acceptance rates, and cyclically, more economic profitability (Baldwin & McCracken III, 2013; Mincer, 1994).

Policy Implications

This research helped to show that higher investments in education have an association with higher state GDP output and personal income earnings. These aforementioned practice implication suggestions are great in theory. However, without more consistent educational investment on the federal and state level they remain to be just that: theoretical. State population and enrollment numbers in elementary-secondary education would still need to be taken into consideration, but regulations on minimal funding allocations should be established. This should include equitable educational opportunities for all students regardless of race, sex, gender, ethnicity, religion, and location.

Similarly, there should be an increase in wages and benefits for educators and educational professionals. This value should be in accordance with cost-of-living increases for each state. A standard funding distribution should also be provided to each teacher for school supplies that would realistically meet the needs of all students regardless of economic backgrounds. If investment in students is understood to be investments in economic profitability, it is common sense to increase investment in those utilizing the funding (educators and educational professionals). This is further supported by the human capital theory, as greater investment into educational professionals (individuals) would contribute to even higher economic profitability.

Research Implications

This research serves as a caveat for many future research endeavors. The present findings open numerous avenues of potential future implications. Some of the more obvious avenues of future research are detailed below.

In order to expand on the present findings, the next logical step would be to run longitudinal regressions focusing on elementary-secondary education funding. The present study evaluated a singular year; the fiscal year of 2018. For future research it would be important to establish the fiscal turnaround for financial distribution on the federal, state, and local level to determine when the economic output would actually be indicative of return investment. Meaning, what would be the ideal timeframe (10, 20, 30+ years) to actually show the economic impact of educational investment within a state.

The present research expanded the previous literature by looking at elementary-secondary education spending instead of higher education spending, which has been the primary focus of most established literature. This research could be further expanded by looking at county economic growth within a designated state and the county's proximity to higher education (presence vs. absence). Showing county level education funding distribution and the association to county level economic growth could help solidify the impact of local funding resources.

Another important area of future research with regard to education funding and economic growth has to do with poverty and inequality in funding distributions. Communities and states with high levels of poverty are unlikely to have the same levels of educational contributions as communities with higher affluence or greater number of individuals in the top socio-economic strata. Future research showing this relationship to economic profitability could help incentivize greater federal and state contributions to helping end the cycle of poverty

Conclusion

In summation, the findings within this study indicate that state and local level education funding has an association with state level economic growth for the fiscal year of 2018. Both models showed that the measured independent variables impacted the two dependent variables or measures of economic growth: state level GDP output and cumulative personal income by state. This research is supportive of existing literature and contributes to the argument for greater state investment in K-12 education. These findings further expand upon the existing literature by showing that even on the small scale (1 year analysis) there is an association between education investment and economic growth at the state level.

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