The Effects of Public Capital Expenditure on State Productivity: A Panel Data Analysis

Authors

Oluwadunsin Agbolabori

Jaewook Song

Blake Walker

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Abstract

This paper provides an extension on the article *Why Has Productivity Growth Declined? Productivity and Public Investment* by Alicia H. Munell. We expand on Munell's research by analyzing more recent socioeconomic data and testing for heterogeneity. The results of our analysis show that public capital investment has a larger impact for states with a higher GDP per capita, implying that investment into public capital may not be an effective strategy to increase GDP growth for low-income states.

Introduction

The role that public capital plays in economic growth is a widely debated topic among economists. This topic became of particular interest during the 1970s and 1980s when economic growth began to decline, while state spending for public capital was also declining. One paper on this topic *Why Has Productivity Growth Declined? Productivity and Public Investment* by Alicia H. Munnell concluded that public capital investment does play a crucial role in a state's economic development and growth. Another article *Do states optimize? Public capital and economic growth* by David Alan Aschauer found that most states in the United States did not invest in public capital optimally, which contributed to the decline in economic growth seen during the stagflation era.

This paper seeks to expand on the existing literature on this topic. Specifically, we want to determine whether the results seen from Munnell's article will remain robust when introduced to more modern data. We also introduce new covariates into our analysis to provide more accurate results. We also test whether the direct effect that public capital has on economic growth suffers from heterogeneity from different income levels. In other words, we test to see whether the

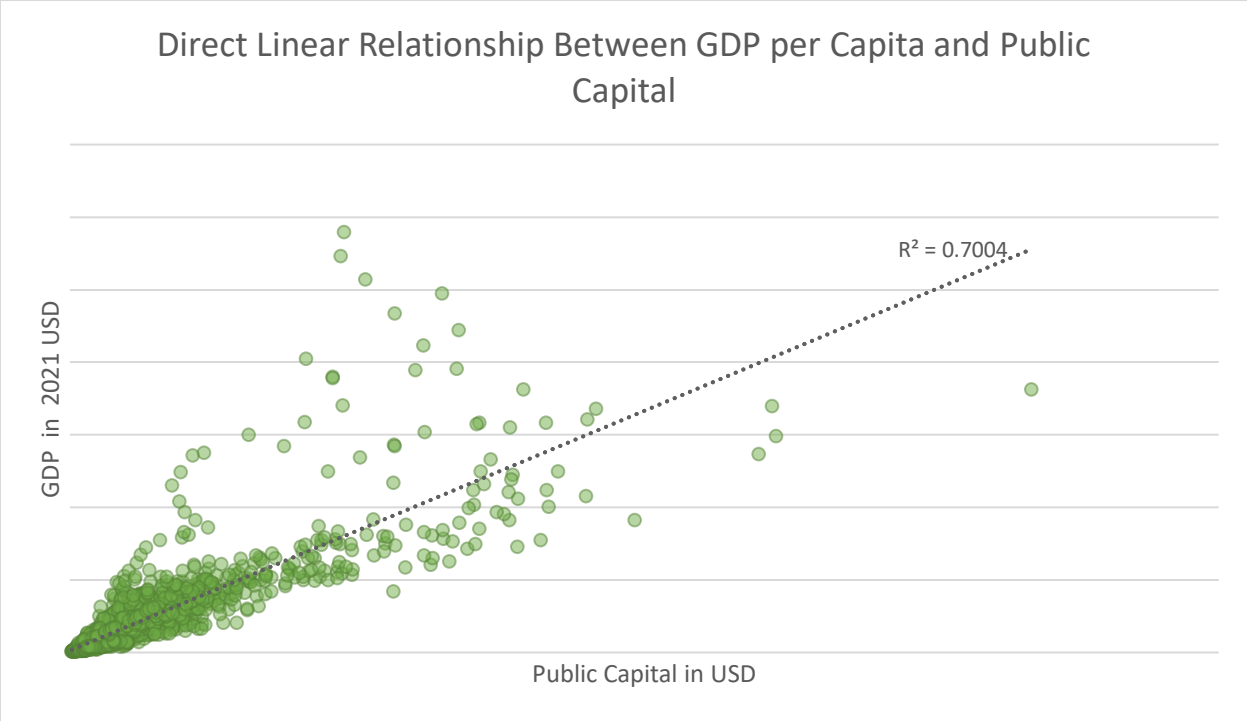
impact that public capital investment has on economic growth changes when observing states that have been clustered by GDP per Capita. We theorize that public capital investment will have various effects on a state's economic output depending on the income level of that state.

Due to the complexities of determining the causal relationships of factors that can influence economic output, we will estimate the effect that unobserved covariates have on GDP. To accomplish this, we implemented the process developed by Altonji et al in 2005. The inclusion of the Altonji method allows us to analyze whether our results are robust after accounting for unobserved factors. Since the previously mentioned studies did not attempt to measure the effects that the unobservable would have on their results, our inclusion of the Altonji method can serve as an extension of the literature.

Empirical Method

We wanted to confirm Munnell's hypothesis that the expansion of public capital affects productivity (GDP) is still valid today. According to this paper, public capital accounts for about 45% of the value of private capital and is an essential element in the analysis of productivity growth. Public capital can be considered a major contributor to GDP, especially since it can create an orderly environment that promotes all private production. Highway construction, for example, allows truckers to avoid detours and get their goods to market in a much shorter amount of time, which means that producers pay drivers lower wages and trucks wear less. means. Thus, public investment in highways allows private companies to produce products at a lower total cost, which in turn contributes to the improvement of society's overall productivity (GDP). It is self-evident that there will be some relationship between

Figure 1: Relationship between GDP per Capita and Public Capital



public capital and productivity (GDP). Before the full-scale analysis, we felt the need to first examine the correlation between GDP and public capital and how strong it is.

Figure 1 shows the relationship between GDP per capita and public capital in the USA. Figure 1 shows the correlation between the annual GDP per capita of the USA from 1980 to 2018 and the annual average of public investment in the Contiguous United States. According to Figure 1, GDP per capita and Public Capital have a positive correlation, and the correlation is strong. (R^2= 0.7004) This can be the basis for explaining GDP due to the increase in public capital. Having confirmed that there is a correlation between GDP and public capital, we want to measure the causal effect of public capital using a Fixed Effect Model.

$$Y_{it} = \alpha_{it} + \beta Public_{it} + \gamma X_{it} + \delta_{it} + \mu_i + \epsilon_{it} \quad (1)$$

In the equation above, the dependent variable is GDP, measured in millions of USD. We use state-level data that includes all the Contiguous United States. For our measures of public investment, we use three variables Highway capital, Utility capital, and public capital. Highway capital is the state's investment in the equipment and land needed to construct roads and highways, and utility capital is the state's investment in the equipment and land needed for the expansion and maintenance of utilities, such as gas, electricity, and water. Public capital consists of the sum of highway capital and utility capital. The unit of measurement for these independent variables is in USD. X_{it} are the control variables, which consist of the population and unemployment rate, state expenditure for health services, investment in education, state expenditure for welfare programs, and the number of crimes in each state in the year. These control variables are essential because they show the unique characteristics of each State and the economic situation of the state. The population and unemployment rate are collected for each year, and health expenditure is the amount spent for the health of residents in each state. Education represents the government's investment in education, and the welfare variable is the amount invested for the welfare of residents in the state. Finally, the number of crimes variable is the sum of property crimes and violent crimes in the state, and it is measured annually. The unit of Health, Education, and Welfare variables is USD, and the crime variable is the sum of the number of crimes committed in one year. α_{it} and δ_{it} are state-fixed and year-fixed effects, respectively. μ_i is an error term to control for the unobservable time-invariant characteristics of an individual company, and ϵ_{it} is a common error term that fluctuates in both time and cross-section.

Figure 2: Average GDP Per Capita from 1980 to 2018 by State

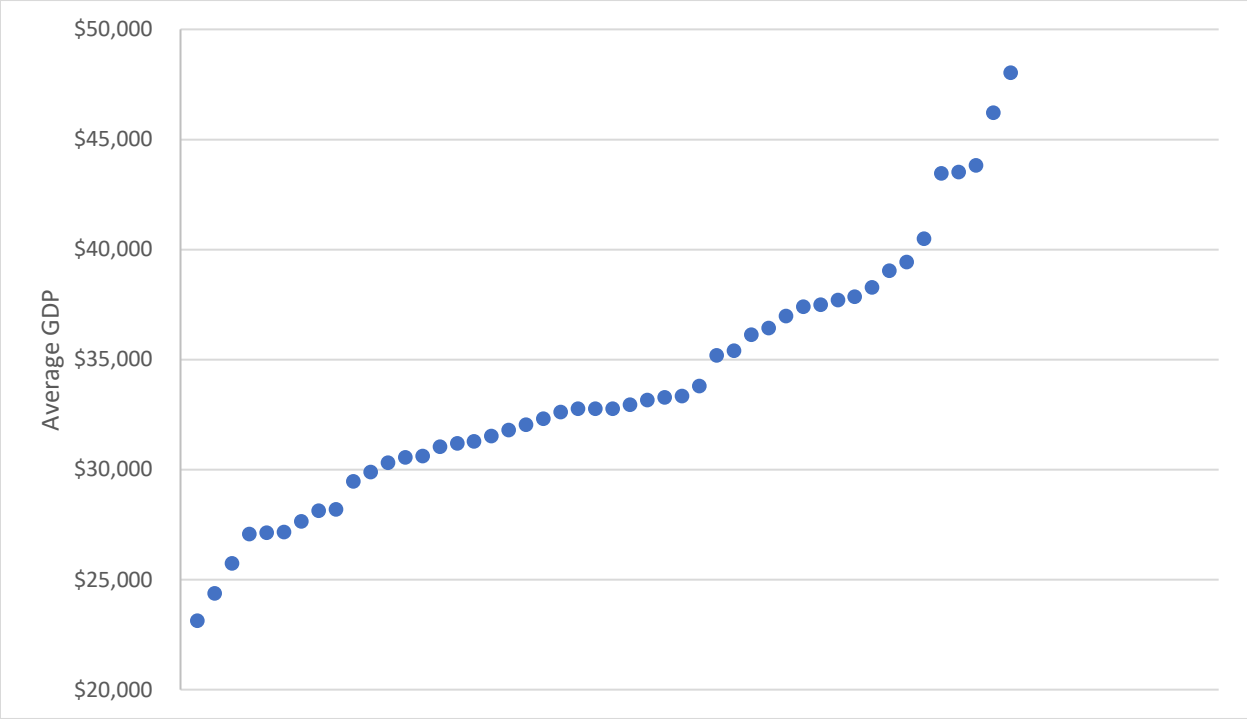


Table 1: Clustering by average GDP Per Capita

Group	State	Average GDP
Low	MISSISSIPPI, WEST VIRGINIA, ARKANSAS, MONTANA, ALABAMA, IDAHO, SOUTH CAROLINA, KENTUCKY, MAINE, OKLAHOMA, NEW MEXICO, FLORIDA, VERMONT, ARIZONA, TENNESSEE, MICHIGAN	$28,200
Middle	UTAH, MISSOURI, INDIANA, OREGON, SOUTH DAKOTA, OHIO, KANSAS, RHODE ISLAND, WISCONSIN, NORTH CAROLINA, IOWA, LOUISIANA, PENNSYLVANIA, GEORGIA, NEW HAMPSHIRE, NEBRASKA	$32,906
High	NORTH DAKOTA, TEXAS, VIRGINIA, MARYLAND, NEVADA, MINNESOTA, ILLINOIS, COLORADO, CALIFORNIA, WASHINGTON, NEW JERSEY, MASSACHUSETTS, WYOMING, NEW YORK, CONNECTICUT, DELAWARE	$40,113

* The Average GDP Per Capita is the sum of the average GDP Per Capita by year for each group and divided by total states number 16.

** The data for Average GDP Per Capita is from 1980 to 2018 year.

We believe that clustering the states based on a range of factors could provide further insight for our analysis. Therefore, we divided the 48 states into three groups using the average of GDP per capita 1980 through 2018 data. Figure 2 shows the average value of public capital from 1980 to 2018 for individual states. The states in each group and the average public capital for that group are shown in Table 1. If we look at the average public capital of these groups, the low group is $28,200, the middle group is $32,906, and the high group is $40,113, showing a significant difference. Therefore, we think that analyzing the states by groups will provide useful analysis results. After performing regression analysis using the Fixed Effect Model for each of these groups, we want to check how much the coefficient of public capital differs from the total value or from other groups. If the coefficient of public capital in all groups is statistically valid and its direction is consistent with the coefficient value analyzed for the whole group, we can find a reason for increasing public capital's influence on GDP.

Data

We use state-level data for 48 US states from 1980 to 2018 (39 years) to examine the impact that public capital investments by the state government have on the gross domestic product of each state.

We collect data for the gross domestic product (GDP) from the Bureau of Economic Analysis (BEA) of the US Department of Commerce. Data on health expenditure, public welfare expenditure, education expenditure, and public capital investment, which were further divided into sub-categories namely, highway capital and utility capital investments, all come from the US Census Bureau’s, Census of Governments and Annual Survey of State and Local

Government Finances, US Bureau of Economic Analysis, and the US Bureau of Labor Statistics. A major concern we faced during the data collection phase was our inability to find data regarding utility capital investment for certain periods which led to the occurrence of omitted variables.

The data for population and crime rates is available for each state from the U.S. Census Bureau, the leading source of statistical information about the nation's people, and the Federal Bureau of Investigation, respectively. This sort of information is always made available every year, and it

shows data at both state and regional levels. Crime data is further categorized into property and violent crimes with each having its subcategories. Our population data is annual population estimates of the total population for each state and year.

The constructed dataset has 48 states' information where our states we represented by numbers 1 to 48. Our data represents all the Contiguous United States. Table 2 shows the summary of the statistics, which are used in the analysis

We represent the periods and states without data for our utility capital investment variable as zero, 0 and this was later transformed to a value of one to observe the natural logarithm of the variable.

Data for other variables like population, health expenditure, highway capital, public welfare expenditure, utility capital, education expenditure, GDP, unemployment rates, public capital, and crime are available for each year in each state.

To obtain the state-level data for the total crime, we add up the cases of property crimes to the cases of violent crime for each period at the state level.

***Table 2**: Summary Statistics (1980-2018, N=1872 for all variables).*

Type	Variables	Unit	Mean	SD	Min	Max
Independent Variables	Public Capital (Utility + Highway Capital)	USD	945,435	1,205,540	28,398	13,357,302
	Utility Capital	USD	84,950	426,944.1	0	6,668,554
	Highway Capital	USD	860,485	1,022,265	28,398	13,357,302
Control Variables	Education Expenditure	USD	3,131,826	3,948,465	99,477	38,211,572
	Population	No. of People	5,646,234	6,073,844	453,589	39,144,818
	Health Expenditure	USD	515,034	644,397.8	12,638	4,131,125
	Public Welfare Expenditure	USD	5,808,573	10,174,960	42,639	129,137,332
	Crime	No. of Cases	235,501	296,706.6	1,054	2,061,761
	Unemployment	Percentage Rate	5.8970	2.095711	2.300	17.800
Dependent Variable	Gross Domestic Product (GDP)	Million USD	207,986	297,552.2	4,856	2,895,101

Result and Discussion

Table 3: Analyze the effect of Public Capital, Highway Capital, utility Capital to GDP through 1980 to 2018.

	Total Public Capital		Highway Capital		Utility Capital	
	(1)	(2)	(3)	(4)	(5)	(6)
	GDP	GDP	GDP	GDP	GDP	GDP
Public capital	0.1495 ***	0.0230***				
	(0.0243)	(0.0041)				
Highway capital			0.1542***	0.0213***		
			(0.0276)	(0.0062)		
Utility capital					0.1889***	0.0279***
					(0.0423)	(0.0089)
Population		0.0303***		0.0290***		0.0324***
		(0.0065)		(0.0067)		(0.0057)
Unemployment		-1972.1*		-1746.7		-2287.1**
		(1143.764)		(1104.3)		(1109.582)
Health		0.0156		0.0186*		0.0252**
		(0.0099)		(0.0105)		(0.0095)
Education		0.0168***		0.0156***		0.0203***
		(0.0044)		(0.0051)		(0.0047)
Public Welfare		0.0107***		0.0115***		0.0102***
		(0.0016)		(0.0019)		(0.0020)
Crime		-0.1128***		-0.1280***		-0.1138**
		(0.0333)		(0.0388)		(0.0406)
Fixed effect	YES	YES	YES	YES	YES	YES
N	1,872	1,872	1,872	1,872	1,872	1,872
R^2	0.6966	0.9798	0.6473	0.9788	0.4699	0.9772

* p < 0.05, ** p < 0.01, *** p < 0.001

** State and year fixed effects

Table 3 shows the results of our main regression analysis. Table 3 shows the results of using independent variables as public capital, highway capital, and utility capital, respectively, and shows the results including simple regression analysis and MLS regression using control variables.

As seen in table 3, the resulting value of the coefficient of the independent variable in all models was statistically valid at the 99% level. For model (2) every $1 increase in public capital, GDP increases by $23,000. The dependent variable estimated is the total GDP of each state, so the

effect of public capital can be considered overestimated. However, spending on public capital could be influenced in a way where many people behave as free riders, so these results are convincing. For model (4) every $1 increases in highway capital, GDP increases by $21,300. And for model (6) every $1 increases in Utility Capital, GDP increases by $27,900. These results show that the importance of utility capital is increasing in society. And as shown in the data section, the total amount of utility capital is lower than that of highway capital, so the marginal productivity could be higher for utility capital. For the control variables, population, education, and public welfare variables have a positive effect on GDP. Population growth is one of the fundamental causes of growth in economic output due to increases in the labor supply, and increased spending on education and welfare are investments into human capital, which can increase an individual's contribution towards GDP. Conversely, unemployment rate and crime variables are found to have a negative effect on GDP, and health is not statistically significant. An increase in the unemployment rate will reduce productivity in the state, which will result in a decrease in GDP. And an increase in the number of crimes will threaten the stability of society, creating an environment that reduces GDP. The direction of the influence of these control variables is expected. The health variable is statistically significant only in the models using Highway and Utility Capital, implying that there could be an endogenous relationship.

We want to check the results of applying this model to each group. The results are shown at the Table 4, Table 5, and Table 6. According to Table 4, none of the models except models 1 and 3 are statistically valid. This means that the effects of all dependent variables estimated together with the control variables are not statistically significant. The results are completely contrary to our group's expectations, which thought that the effect of public capital could be maximized in a

place with low GDP. One reason for this result is that the group is 16 states with low GDP Per Capita. This means that the per capita (productivity of the states) are low, and this result can

Table 4: Analyze the effect of Public Capital, Highway Capital, utility Capital to GDP from 1980 to 2018 in the low-income group.

	Total Public Capital		Highway Capital		Utility Capital	
	(1)	(2)	(3)	(4)	(5)	(6)
	GDP	GDP	GDP	GDP	GDP	GDP
Public capital	0.1272***	0.0156				
	(0.0127)	(0.0101)				
Highway capital			0.1321***	0.0172		
			(0.0090)	(0.0113)		
Utility capital					0.0277	0.0065
					(0.03667)	(0.0095)
Population		0.0367***		0.0359***		0.0421***
		(0.0046)		(0.0052)		(0.0027)
Unemployment		-4378.8**		-4146.0**		-5017.2***
		(1487.347)		(1509.991)		(1563.262)
Health		0.0070		0.0077		0.0101
		(0.0065)		(0.0070)		(0.0071)
Education		0.0146**		0.0149**		0.0151***
		(0.0054)		(0.0054)		(0.0048)
Public Welfare		0.0086**		0.0084**		0.0085***
		(0.0030)		(0.0031)		(0.0029)
Crime		-0.0394		-0.0378		-0.0462
		(0.0528)		(0.0532)		(0.0445)
Fixed effect	YES	YES	YES	YES	YES	YES
N	624	624	624	624	624	624
R^2	0.8375	0.9817	0.8497	0.9818	0.4645	0.9801

* p < 0.05, ** p < 0.01, *** p < 0.001

** State and year fixed effects

occur when productivity cannot be improved through an increase in public capital. Public capital can be considered to contribute to productivity improvement by providing an environment where people can work efficiently. However, if there is a fundamental shortage of jobs or a high unemployment rate, the effect of public capital may not be meaningful. According to Table 4, it is statistically significant that the unemployment variables are significant in all models. Of course, it is also true that GDP can be increased by investing substantial amounts of capital to

increase jobs. But most of the 16 regions with low GDP coincided with the 16 regions with low public capital investment. (An analysis by group according to the difference in average public capital from 1980 to 2018 is introduced in the appendix.) Therefore, we think that it would have been impossible to improve productivity through large-scale public capital in the region. The control

variables are generally consistent with the results of Table 3 except crime variable which are not significant.

Table 5: Analyze the effect of Public Capital, Highway Capital, utility Capital to GDP from 1980 to 2018 in the middle-income group.

	Total Public Capital		Highway Capital		Utility Capital	
	(1) GDP	(2) GDP	(3) GDP	(4) GDP	(5) GDP	(6) GDP
Public capital	0.0847***	0.0163***				
	(0.0133)	(0.0046)				
Highway capital			0.0847***	0.0165***		
			(0.0134)	(0.0046)		
Utility capital					1.0652*	-0.0984
					(0.5182)	(0.0896)
Population		0.0323***		0.0325***		0.0295***
		(0.0075)		(0.0074)		(0.0076)
Unemployment		-2973.2**		-2958.5**		-3019.9**
		(1116.783)		(1117.762)		(1305.88)
Health		0.0160*		0.0158*		0.0208**
		(0.0082)		(0.0082)		(0.0073)
Education		0.0145***		0.0145***		0.0177***
		(0.0034)		(0.0034)		(0.0036)
Public Welfare		0.0098***		0.0098***		0.0110***
		(0.0013)		(0.0013)		(0.0014)
Crime		-0.0298		-0.0306		-0.0153
		(0.0257)		(0.0253)		(0.0218)
Fixed effect	YES	YES	YES	YES	YES	YES
N	624	624	624	624	624	624
R^2	0.8474	0.9836	0.8462	0.9836	0.6807	0.9808

* p < 0.05, ** p < 0.01, *** p < 0.001

** State and year fixed effects

According to the results in Table 5, when public capital increases by $1, GDP increases by $16,300. This shows a positive effect as shown in Table 3. In the case of highway capital, if $1 increases, GDP increases by $16,500. For utility capital the result is not statistically significant. Control variables shows the direction of the effect generally like that of other models. The control variables have almost same impacts as shown at the Table 4. All the variables except Crime variable are significant, and the results were consistent with common sense.

Table 6: Analyze the effect of Public Capital, Highway Capital, utility Capital to GDP from 1980 to 2018 in the high-income group.

	Total Public Capital		Highway Capital		Utility Capital	
	(1) GDP	(2) GDP	(3) GDP	(4) GDP	(5) GDP	(6) GDP
Public capital	0.1611***	0.0275***				
	(0.0302)	(0.0046)				
Highway capital			0.1774***	0.0328***		
			(0.0379)	(0.0056)		
Utility capital					0.1513***	0.0182*
					(0.0379)	(0.0103)
Population		0.0341***		0.0310***		0.0357***
		(0.0051)		(0.0051)		(0.0064)
Unemployment		-5029.9**		-5185.7**		-4372.3**
		(2062.095)		(2104.596)		(1871.837)
Health		0.0288**		0.0320**		0.0363**
		(0.0127)		(0.0133)		(0.0140)
Education		0.0135***		0.0110**		0.0170**
		(0.0042)		(0.0046)		(0.0060)
Public Welfare		0.0105***		0.0116***		0.0101***
		(0.0013)		(0.0015)		(0.0020)
Crime		-0.1206***		-0.1402***		-0.1469***
		(0.0179)		(0.0204)		(0.0435)
Fixed effect	YES	YES	YES	YES	YES	YES
N	624	624	624	624	624	624
R^2	0.7171	0.9888	0.6815	0.9887	0.5259	0.9852

* p < 0.05, ** p < 0.01, *** p < 0.001

** State and year fixed effects

According to the results in Table 6, when public capital investment increases by $1, GDP is expected to increase by $23,500. This shows a positive effect as shown in other tables, and the effect is the strongest compared to other models. Likewise, in the case of highway capital, if

there is a $1 increase in highway capital investment, GDP is expected to increase by $32,800, which is bigger than the highway effect in Table 5. Utility capital was estimated that a $1 increase would boost GDP by $18,200. The high group is the group with the highest GDP per capita, so this result contradicts with our initial theory. The control variables shows similar behaviors of the effects estimated for Table 3. Even the crime variable is significant for the high group models.

Conclusion

From the above results, we can confirm that there is a positive effect of public capital, highway capital, and utility capital on GDP. In all models except for the low group, the variables are found to be statistically significant and increase GDP, which was the main point we wanted to confirm in the project. Therefore, based on these results, we can conclude that public capital is still an important factor in determining state productivity and is still important even in modern times. Also, the control variables are statistically significant for all the models except for the crime variable and showed a generally estimated effect on GDP. From this, we can have confidence that our model is suitable for analyzing the relationship between GDP and public capital. As a result of comparing by group based on GDP per capita, it is confirmed that the effect of public capital in the high group is greater than that in the middle group. However, the small effect public capital has on the low-income group provides interesting implications. Perhaps human capital may play a more crucial role in the economic growth of low-income states; however, further analysis would be needed to verify this.

We have the following concerns for this project. First, our model assumes that the relationship between public capital and GDP is linear. If the relationship between public capital and GDP is

not linear, our model and results may lose some of its validity. For advanced research, we think that models other than the linear regression model are needed.

Lastly, we believe one concern is that more diverse data could be included into our models as covariates. For example, public capital's importance may differ depending on the political leaning of a given state. Therefore, if a specific party tends to expand public capital, the assumption of independence between the error term and the independent variable will soon be broken, so the problem of endogeneity may occur. Therefore, to solve this problem, it would be necessary to use the IV method or similar method to control for this.

Robustness Checks

We used two separate robustness checks. First, we tried to compare the coefficients of public capital by dividing the data into the 1980s-1990s and the 2000s-2010s and analyzing them. In addition, we employ the Altonji method to check the influence of the unobserved variables on GDP.

Table 7 shows the results of analysis by dividing the data into the 1980s-1990s and 2000s-2010s. According to these new models, public capital, highway capital, and utility capital all show the same trend regardless of the year. However, in the case of utility capital, it is not statistically significant in the 2000s-2010s. According to the results of the model, the influence of public capital and highway capital on GDP in 1980s-1990s is larger than in the latter period. This can be interpreted as the continued expenditure of public capital reduces marginal productivity. Most of the control variables have the same direction as the results in Table 3. However, the health variable was not statistically significant. Through these results, it is possible to confirm whether the trend is consistently maintained by separately analyzing the 1980s-1990s and 2000s-2010s as

a robustness check. (Population, Education public welfare are positive, and unemployment public welfare is negative which are same as table 3 and 7) According to Table 7, the model can be considered to pass the robustness check.

Table 7: Analyze the effect of Public Capital, Highway Capital, utility Capital on GDP by dividing it into 1980 & 1990s and 2000 & 2010s. Model (1), (3), (5) are for 1980 & 1990s. Model (2), (4), (6) are for 2000 & 2010s.

	Total Public Capital		Highway Capital		Utility Capital	
	(1)	(2)	(3)	(4)	(5)	(6)
	GDP	GDP	GDP	GDP	GDP	GDP
Public capital	0.0288***	0.0188***				
	(0.0051)	(0.0037)				
Highway capital			0.0247***	0.0213***		
			(0.0043)	(0.0043)		
Utility capital					0.0531***	0.0033
					(0.0102)	(0.0041)
Population	0.0263***	0.0399***	0.0243***	0.0391***	0.0265***	0.0444***
	(0.0050)	(0.0109)	(0.0043)	(0.0119)	(0.0051)	(0.0111)
Unemployment	-1179.1**	-4475.7***	-1060.3*	-4339.3**	-1214.0**	-4479.0***
	(520.2357)	(1559.092)	(602.5691)	(1619.356)	(590.5551)	(1651.006)
Health	0.0138	0.0214	0.0144	0.0214	0.0179	0.0255
	(0.0196)	(0.0164)	(0.0186)	(0.0162)	(0.0202)	(0.0172)
Education	0.0356***	0.0124**	0.0357***	0.0110**	0.0374***	0.0133**
	(0.0047)	(0.0050)	(0.0051)	(0.0055)	(0.0050)	(0.0059)
Public Welfare	0.0059***	0.0101 ***	0.0070***	0.0107***	0.0066***	0.0101***
	(0.0016)	(0.0019)	(0.0019)	(0.0020)	(0.0018)	(0.0024)
Crime	-0.1239***	-0.0256	-0.1202***	-0.0360	-0.1022***	-0.0336
	(0.0228)	(0.0309)	(0.0207)	(0.0319)	(0.0190)	(0.0385)
Fixed effect	YES	YES	YES	YES	YES	YES
N	960	912	960	912	960	912
R^2	0.9724	0.9477	0.9699	0.9486	0.9708	0.9392

* p < 0.05, ** p < 0.01, *** p < 0.001

** State and year fixed effects

Table 8 includes the delta of estimating the influence of unobservable factors using the Altonji method on our results in Table 3. The delta values of all the models are more than one, implying that the observables impact is more than unobservable. This proves that the model is an effective model that reveals the relationship between independent variable and dependent

variables. If there would be data for all the omitted elements that could not be observed, public investment, Highway capital, and Utility capital would still have a positive impact on GDP. According to Table 8, our model shows robust results.

Table 8: Using Altonji method to analyze the effect of unobservable variables with the main model.

	Total Public Capital		Highway Capital		Utility Capital	
	(1) GDP	(2) GDP	(3) GDP	(4) GDP	(5) GDP	(6) GDP
Public capital	0.1495 ***	0.0230***				
	(0.0243)	(0.0041)				
Highway capital			0.1542***	0.0213***		
			(0.0276)	(0.0062)		
Utility capital					0.1889***	0.0279***
					(0.0423)	(0.0089)
Population		0.0303***		0.0290***		0.0324***
		(0.0065)		(0.0067)		(0.0057)
Unemployment		-1972.1*		-1746.7		-2287.1**
		(1143.764)		(1104.3)		(1109.582)
Health		0.0156		0.0186*		0.0252**
		(0.0099)		(0.0105)		(0.0095)
Education		0.0168***		0.0156***		0.0203***
		(0.0044)		(0.0051)		(0.0047)
Public Welfare		0.0107***		0.0115***		0.0102***
		(0.0016)		(0.0019)		(0.0020)
Crime		-0.1128***		-0.1280***		-0.1138**
		(0.0333)		(0.0388)		(0.0406)
Delta		1.1193		1.0474		2.6366
Fixed effect	YES	YES	YES	YES	YES	YES
N	1,872	1,872	1,872	1,872	1,872	1,872
R^2	0.6966	0.9798	0.6473	0.9788	0.4699	0.9772

* p < 0.05, ** p < 0.01, *** p < 0.001

** State and year fixed effects

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