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Economics Student Theses and Capstone Projects. 137.

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Punitive Profit: An Analysis of Privatization and Prisons as Engines of Economic
Growth

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April 30, 2019
Economic Thesis

*This thesis submitted in partial fulfillment of the requirements for the course Senior Seminar (EC
375), during the Spring Semester of 2019*

*While writing this thesis, I have not witnessed any wrongdoing, nor have I personally violated
any conditions of the Skidmore College Honor Code*

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Abstract

During the Prison Boom period (late 1980s through 2000), the US saw a dramatic increase in the number of prisons across rural America. Increasingly, policy makers came to see and use prisons as vehicles of economic growth intended to invigorate stagnant economies. This paper seeks to analyze the effectiveness of these promises by analyzing the effect of prisons on per capita income, unemployment, and poverty rates. I build on previous scholarship by differentiating between public and private prisons in my analysis. My results suggest that prisons are ineffective in spurring long term growth and that private prisons perform significantly worse than their public counterparts.

Section I. Introduction

The Prison Boom resulted in the unprecedented construction of over a thousand prisons across the United States. Though much attention has been paid to the causes and motivations for mass incarceration, prison proliferation has taken a back seat in recent scholarship. A disproportionate number of these prisons were built in non-urban areas as part of a campaign of last resort for economic development (Besser & Hanson 2005). This phenomenon coincided with the rise of privatization of public services, notably including the rise of prison privatization. These two phenomenon may seem distinctly separate, but in fact prison privatization works to undermine the stated goals of prisons as a vehicle for economic growth. This paper evaluates the interaction between the two, asking what is the effect of prison placement and prison type (public or private) on the economic growth of the host county? The answer to this question carries powerful policy implications as policy makers struggle to contend with the issue of mass incarceration, now catapulted to the forefront of the American social justice scene. Is it morally sound to economically bind communities to an industry reliant on the steady flow of incarcerated

persons (significantly, black and brown persons)? Is it fair to privatize state corrections and allow corporations to profit off of incarceration? As the nation grapples with these complicated moral questions, often the most important factor is overlooked: are these practices even effective? Is it worth it to enter into this dubious moral gray area to use prisons as growth industry? This paper seeks to answer this question and evaluate the efficacy of the practice of prisons as growth industry, taking into account the corresponding rise in prison privatization.

Previous literature tends to have dealt with the two questions disparately, focusing either on economic development or on prison privatization. Notable results from the field suggest that private and public prisons do offer different growth factors. Hart, Shleifer, and Vishny (1997) found that private prisons cut costs in the areas of personnel and punishment. Private prisons had higher turnover rates, lower staffing levels, reduced training, and lower wages than public institutions. Genter et. al (2013) found that increased privatization levels across the state's correctional system reduced wages and staffing levels across the board, including at public institutions. These findings support the conclusion that private prisons operate differently than public ones, and thus offer reduced economic development effects than their public counterparts. The actual efficacy of prisons as growth industry is also called into question through the work of Perdue and Sanchagrin (2016), Wolman and Spitzley (1996), and Besser and Hanson (2005), all of whose findings suggest that prisons offer dubious actual growth effects. Wolman and Spitzley (1996) concluded that prisons offer more in political gains for policy makers who tout prisons as growth industry, regardless of their actually meager growth effects.

The purpose of this paper is to evaluate the claim concerning that mythical prison promise: do they actually deliver economic growth? And does the status of the prison as public

or private affect its influence on the host county? To answer these questions, I evaluate prison effect on three measures of economic growth including per capita income, poverty rate, and unemployment levels. I take into account the status of prisons as public or private in my analysis. To address endogeneity concerns, I use a two least squares regression using an instrumental variable. My paper differs from previous scholarship by addressing the question of privatization in my model, and in my analysis. As my research suggests, prison type plays an important role in the potential efficacy of prisons as vehicles for economic growth.

My results suggest that prisons are a mixed blessing in their goal of delivering economic growth to their host communities. Private prisons are even less helpful than public institutions. Examining my development factors over a thirteen year period from 2000 to 2013, the introduction of a prison corresponded with decreased unemployment rates and poverty rates, but also significantly decreased per capita income. My findings suggest that prisons may provide enough to keep economically struggling communities alive, but they are by no means a salvation that delivers significant growth.

This paper is organized into five main sections. Section I is the introduction. Section II presents a review of previous literature on the topic. Section III discusses my data and analytical model. It is followed by Section IV, which discusses my results. Section V offers concluding remarks and suggests areas for further research. Following, please find included all tables and results referenced in the text.

Section II. Literature Review

This paper rests firmly on two major developments in the United States carceral system over the last forty years. The first was the prison proliferation movement, known popularly as the Prison Boom. This movement corresponded with rising prison populations and thus the necessity for new prisons, but it also led to a shift in the geographic distribution of prisons. The second prominent thread is the rise of privatization of the prison system, a phenomenon that enjoyed a strong resurgence during the 1980s. Previous literature tends to focus on one event or the other. I will cover significant and relevant analyses of both.

Firstly, the Prison Boom resulted in the unprecedented construction of over a thousand prisons across the United States. Prison is a somewhat loose term, and is commonly used to encompass all facilities connected with the criminal justice system intended for the holding of prisoners (convicted or not). This includes local jails, state prisons, federal correctional centers, and immigration detention facilities. Since 1970, counties across the nation built an astounding 1,152 new prisons, growth unparalleled in any other era of US history. To put this into perspective, in 2012 the total number of prisons in the US was 5,393, meaning over 20% of all US prisons were built during the Boom (Badger 2012).

The Prison Boom also led to a shift in the geographic distribution of prisons. Prior to 1980, only about a third of prisons were located outside of metropolitan areas. In contrast, between 1990 and 1999 a prison opened its doors every fifteen days in rural America (Beale 2001). As a result, the majority of prisoners are now housed in non-urban areas. One important motivator for this shift was the view that prisons served as engines of economic growth.

At its most basic, there are numerous positive incentives for counties, states, and the federal government to build correctional facilities in rural communities. Firstly, rent and land

costs in urban areas are at a premium. Land in rural areas is much cheaper, so it makes economic sense to build facilities there. Furthermore, prison location is a decision often made by elected officials and legislators. As such, they have a vested interest in placing new facilities in areas that offend the fewest number of people. To affluent communities, prisons are most commonly thought of as an inferior public good that inflicts negative externalities on its host communities. A prison is seen as an eyesore and a potential safety risk. Burayidi and Coulibaly (2009) found that locating prisons in small communities changes demographic information about the community in a way that makes it an unattractive location for industry. Using Census Bureau data, they found the addition of a prison decreased per capita income and decreased education levels. For wealthier communities, these factors make the addition of a prison a negative prospect, and one they would actively petition and work against (i.e. the “Not in my backyard slogans”).




For lower income and smaller, rural communities on the other hand, prisons offer other externalities that could be construed as positive. Prisons can offer political clout, as prisoners are counted in the district of their incarceration, inflating populations and affecting redistricting lines even though the majority of states do not allow inmates to vote (Burayidi and Coulibaly, 2009). However, the most motivating factors are often economic. Prisons are seen as stable sources of revenue and jobs, and increasingly came to be touted as deliverers of economic salvation. Private prisons offer an added benefit by delivering significant tax revenue to county and state governments (Kilborn 2001). These factors lead depressed, rural areas to not only apply for prisons, but to even compete for them. The main motivator for rural, prison construction is economic development.

Cherry and Kunce (2001) concluded that, in a study of California's prison location decisions, lawmakers are most likely to select rural, depressed communities as locations for new prisons, both due to the decreased cost to the state (lower land prices), and the opportunity to market the new prison as a potential for economic development. Unable to attract private commerce, struggling communities are often willing to accept prisons in their backyards, and, as the results of the study shows, lawmakers undoubtedly consider the economic conditions of potential host communities in their decision making process (Cherry and Kunce 2001). Cherry and Kunce used a probit model and compared the condition of California counties during the time of prison placement and construction. Their results indicated that among the twenty-two prisons built during the time of their study, all were placed in areas with low population densities and high unemployment rates. The most significant indicators for prison placement were high unemployment rates, high levels of existing infrastructure, and low education rates.

Eason (2010) used a rare event logistic regression to develop a model that uses rural town demographics to predict prison location decisions during the prison boom. Eason's findings suggest that there is no one archetypal model that typifies the standard prison town. Instead, regional differences were the most significant indicator of prison town - i.e. using the regional level as an analysis Eason could develop an effective prototype of the standard prison town for that region and use it to predict prison citing. Eason's second significant finding was that prison placement does not appear to cause racial and economic inequality as previous scholarship has hypothesized, but more so that prison citing is the result of "concentrated rural disadvantage." Over 70% of rural prisons built during the prison boom were placed in the southern United States. In this region, town population size, percent Black, and poverty were positively correlated

with prison siting. Eason's findings support my decision to focus on one region in particular, because of regional preferences in location decisions.


Hoyman and Weinberg's (2006) findings suggest that demographics also play an important role in prison location decisions in addition to the factors of socio-economics and race. In a study of North Carolina using data on prisons constructed between 1970 and 2000, the authors found that population density, owner-occupants (if people own the home they live in), and college graduates are negatively correlated with prison siting. In their study, race was a less significant predictor. Though it may be difficult to generalize these findings beyond North Carolina, this study emphasizes the importance of demographics on motivating prison location decisions. Like Eason (2010), their results show that prisons are sited in areas with persistent poverty in rural areas.

Another important facet of the prison boom it is necessary to take into account is the rise  of prison privatization. In an effort to cut costs and encourage competition, many states have also privatized prison management. To reduce costs and still deal with the rising stock of prisoners in the United States, states contract out prison construction and management to third party providers. Different states have different contracts with different companies. Prior scholarship has mostly focused on cost and quality comparison studies between private and public institutions. More limited research has been focused on the different economic development effects of private and public prisons. I will focus on these in particular. However, it is important to note that there are numerous challenges with comparison studies between public and private prisons. Primarily, private institutions have different reporting standards than their public counterparts and are often held to different quality guidelines (Volkh 2014). As such,


comparison studies can be challenging. Studies that look at prison effects on factors external to the prison help to reduce this problem because changes in internal prison practices are less pertinent to results.

Hart, Shleifer, and Vishny (1997) developed a model to investigate the trade-off between cost savings and quality when the government contracts out services generally provided by the state. They focus their analysis on prisons and found that incomplete contracts encourage private providers to cut costs at the expense of uncontracted quality. They define incomplete contracts as contracts that do not expressly contract for all circumstances that affect provider's incentives. In theory, a complete contract should offer the same quality as the state providing the service itself. However, when the provider has the leeway to reduce costs they do so. This cost-cutting provides more profits for the private contractor and, in the case of prisons, it is very difficult to contract for all measures of quality. Two areas the authors outline as risk areas are the very limited guidelines outlining the use of force and personnel hiring and training. Their research found that instances of violence are much higher in private prisons, as well as problems with understaffing, lower wages, high turnover rates, and inadequate training. This paper figures strongly into my own because it suggests that private prisons act differently than public prisons. Their incentive to cut costs at the expense of quality appear to influence factors that would limit the effects of economic development such as decreased wages and understaffing.

Genter, Hooks, and Mosher (2013) looked at prison effect on local employment in rural US counties from 1997-2004. They took into account prison privatization in their model, and compared the employment effects of private versus public correctional institutions. They also controlled for the potential ways in which privatization of a state's prison system influences

publicly operated prisons within that system. Significantly, states with high levels of privatization appeared to negatively impact staffing levels of public prisons as well. In general, public prisons have larger staffs with higher wages. The largest expense of a prison is staff and wages - for private prisons attempting cost savings, the easiest place to save is on personnel. Genter, Hooks, and Mosher (2013) found that the introduction of a private prison actually correlated with negative employment growth. Though private prisons offer some, though limited, job opportunities, these are often volatile. Because of depressed wages, inadequate training, and associated issues with low staffing levels (increased inmate violence for example), private prisons have extremely high turnover rates. Also, the majority of upper-level staffing positions are taken by non-local people. This is because these positions often require training, experience, and education not found in these economically depressed communities. This paper is extremely relevant to my project because it examines one of the central tenants of my thesis: the effect of prison location (both public and private) on employment. Though this is only one factor in  economic development, it is an important one. Genter, Hooks, and Mosher (2013) utilized instrumental variables in their model including the unemployment rate in 1970 and the number of housing units in 1950.

Besser and Hanson (2005) looked at the effect of prison location on the small town level using census bureau data from 1990 and 2000. They found that prison towns did not see growth that outpaced non-prison towns. They also saw a rise in minority population, unemployment, and poverty. One potential flaw in using census bureau data is that the prisoners are counted in the county of their incarceration, not from their home community. This means that prison towns have high minority populations, even though the majority of these minorities are incarcerated.

Besser and Hanson found that prison towns had substantially higher minority populations than comparable towns without prisons. This change however, is most likely due to the demographics of the prison versus a radical change in the town's population demographics. Unfortunately  when regional differences were controlled for, Besser and Hanson found that prison towns actually experienced less growth than their non-prison counterparts. They used all non work-release prisons in the continental US. This is an important note because work-release prisons allow prisoners to perform labor outside of the prison. This has the potential to negatively impact local employment and potentially cancel out development advantages. Besser and Hanson also addressed another important economic development facet of prisons - many towns offered substantial tax breaks or other incentives to try to lure prisons within their jurisdictions. As such, potential economic benefits offered by prisons such as an increased tax base were canceled out.

Wolman and Spitzley (1996) focused their paper on a comprehensive literature review and compilation of the existing literature on local economic development. Their evidence suggests that prisons are not effective methods of development. Their model considers the opportunity costs of investing in a prison - when governments choose a prison they divert resources away from potentially more beneficial programs. Wolman and Spitzley also take into account the potential intangible benefits offered by politicians touting prisons as economic development. They found that economic development projects are as significant symbolically as they are important for delivering tangible results for politicians. As such, policy makers may be focused more on suggesting and pushing for projects that deliver questionable results (such as a prison) because of the symbolic benefits it offers to constituents. This is highly significant

because it demonstrates the importance of rigorous scholarly review of these claims. Educated voters can, in theory, see through these potentially false claims to push their representatives to pursue more substantiated methods of development.

Scott et. al (2010) performed an input/output analysis to determine prisons effect on job growth. They were particularly concerned with the question of crowding out. Did the addition of a prison crowd out other kinds of job creation? or did the prison truly create new jobs without causing losses elsewhere. Their results suggest that prisons actually do have a significant crowding out effect, though the total net effect depends largely on the size of the jurisdiction in question. This follows the findings of Burayidi and Coulibaly (2009) who's work suggests that the negative demographics resultant from the inmate population reduces the chance of future outside investment and makes the community less attractive for other industries. Though a prison creates jobs for guards, wardens, and administrators, it also decreases the chance that other industry will enter the community and provide future employment. Scott et. al's results demonstrate that more diverse economies suffer less job loss with the addition of a prison than smaller and comparatively less diverse (i.e. weaker) economies, primarily because the prison will not negatively affect demographics to the same level as it will in a small community. This has strong implications for the trend of placing prisons in rural areas with stagnant growth. Their findings suggest prisons could be more of a curse than a boon, as these small and already struggling economies are likely to see a larger crowding out effect than that of a larger and more robust economy.

Perdue and Sanchagrin (2016) looked at the depressed region of Central Appalachia and examined the extrogenous impact on economic development measures of the introduction of a

prison to rural counties. They use a fixed-effects model and looked at three indicators: poverty rate, per-capita income, and unemployment rate. Using a fixed-effects model excluded Perdue and Sanchagrin's work from the endogeneity problem that plagues comparable studies.

Unfortunately, they found that prison counties had lower unemployment rates, but higher rates of poverty and lower per-capita incomes. These results held true with several different models. This was an unexpected result because as general economic theory dictates, lower unemployment corresponds with higher wages. Their results suggest that prisons do provide some benefit in terms of employment, but at the cost of driving down average income. The author's also addressed the fact that high-paying jobs at the prisons primarily went to people from outside of the host community who had the necessary education and experience for the role. For the average community member, life was not measurably better than before the prison's construction.

It is important to note, however, that the researchers did not take into account whether the prisons constructed were public or private institutions. Another important point to touch on is that prisoners are counted in the US census in the county of their incarceration. As such, prisoners will naturally skew statistics. Significantly, prisoners are included in per-capita income statistics. This will naturally deflate county per-capita income. This can also create false impressions of counties as a whole, as rising populations can be caused by a prison opening (not necessarily new growth attracting residents) or a prison closing, which could make an area look more in distress than it is. Most significantly, this calls into question their results concerning per-capita income because prisoners would inherently greatly decrease the per-capita of the host county, regardless of the actual effect of the prison on civilian income.

King and Huling (2003) used an interrupted time series design to measure the effects of prison siting on employment and income of rural counties in upstate New York. Their period of analysis was slightly earlier, and they examined data from 1977 to 2000. King and Huling (2003) were able to access detailed County Business Pattern data for their selected sample period. The intent of their study was to evaluate employment and income effects that specifically affected residents living in the prison counties from before the prison was constructed. Their results are somewhat bleak. When isolating effects to only residents from the pre-prison period, development effects were severely limited. The town's prior population did not see any significant increase in employment or income as compared to other non-prison counties over the same period. King and Huling (2003) offer several potential explanations for this. Firstly, many of the local population lacked the education or experience necessary to take on many of the staffing positions available at the prison. Though local people could step in to become guards or janitors, administrative and managerial positions often hired from outside the community. Additionally, the small towns often did not carry materials and supplies necessary for or in the amounts necessary to support the prison. As such, much of the money from the prison went out of town to manufacturers and distributors, instead of to local businesses. For these reasons, any economic effects from the prison in the form of income or employment did not often correspond to growth and positive benefits for the host community itself.

As evidenced by the literature examining the development effects of prison placement, different scholars have adopted many alternate strategies to effectively measure and analyze this question. It is significant to note that few however, directly take into account the status of the prison as public or private. Though some studies do not face this challenge, for example King

and Huling (2003) avoid this problem because New York state does not allow private prisons, none specifically tackle the question of institution type and its effect on development. Several examples used in different analyses include fixed effects (Perdue and Sanchagrin, 2016), instrumental variable estimate (Genter et. al. 2013), input/output analysis (Scott et. al 2010), and interrupted time series (King and Huling, 2003). There are different strengths and weaknesses between these different models and studies. Perdue and Sanchagrin's (2016) fixed effects model corrects for heterogeneity between counties in their study. This is a potential strength of their study. However, their use of per capita income data is potentially flawed because the data counts inmates in its demographic data. Because inmates do not have substantial incomes, this naturally drags down the data. Genter et. al's (2013) use of an instrumental variable avoids problems of endogeneity by developing an estimator for prison location. However, these estimators are often highly regionally dependent and can be difficult to scale to a nation-wide level. King and Huling's (2003) model works well for their data set, but would be difficult to replicate on a larger scale. Because they had both control and treatment counties (counties with and without prisons), they could perform a unique analysis of the data. Though this would be ideal, it is difficult to generate treatment and control variables.

Due to the shortage of studies specifically examining the development effects of prisons, I looked at some other examples of exogenous institutions affecting development growth. Bonanno and Goetz (2012) looked at the effect of WalMart on local economic development. Like a private prison, WalMart offers employment opportunities, but with low wages and high turnover. Also like a prison, WalMart tends to move into areas with higher poverty rates. Bonanno and Goetz discuss several potential models for determining if WalMart's location

decision is based on the poverty of the host county, or if the presence of WalMart negatively affects the county's poverty rate by increasing it. WalMart wages tend to be so low that many workers still remain on food stamps and other poverty relief programs, even though they are employed. I looked into this topic to see other ways scholars dealt with the endogeneity problems present within my research question. Bonnano and Goetz (2012) developed an estimation for Wal-Mart location decisions based on the hub and spoke Wal-Mart distribution model. They estimated where the stores would be located using their model and then used this data as a proxy instrumental variable for the actual store locations. Though prisons do not have the same hub-and-spoke distribution model that would dictate construction like Wal-Mart, their work does carry merit for my project in that I could generate a model that predicts prison location but that has nothing to do with economic development. Just as Bonnano and Goetz's estimations of Wal-Mart location has no actual effect on host county economic development, my model for prison location would likewise not affect development and thus would not create endogeneity problems.

In sum, previous literature tends to have dealt with the two threads of development and privatization separately. A notable gap in the literature exists in the space between the two. Do private prisons deliver different development effects than public prisons? I hope to build on the work of previous researchers and investigate how private and public prisons affect their host communities differently. My research suggests the two interact with each other and thus my analysis hopes to take into account both. Private prisons offer lower wages, higher turnover rates, and lower staffing levels, all variables that potentially affect development factors.

Section III. Analytical Framework

This paper aims to evaluate the effects of prison location and prison type on development factors including poverty rate, unemployment, and per-capita income. Based on Hart et. al's (1997) privatization model, I hypothesize that private prisons will deliver less measurable benefit than public prisons. Specifically, I hypothesize that private prisons will reduce per-capita income. I do not expect the magnitude of this difference to be large because previous literature suggests that prisons deliver minimal consistent economic results (Besser and Hanson, Cherry and Kunce). To evaluate my research question, I follow in the footsteps of Genter et. al. and perform a Two-Least Squares analysis.

Using a two-stage least squares regression allows me to address endogeneity problems within my model. As demonstrated in Cherry and Kunce (2001), policy makers select depressed and rural counties for prison location because it offers cost savings to the state. Many rural counties compete to host prisons believing that it will offer economic development benefits that will positively spur the local economy (Eason 2010). Many rural prison towns were once thriving communities with previously dried up industries - for example, when coal mining left Appalachia, it left behind many communities with significant infrastructure and an unemployed workforce. To try to revitalize a region often decimated by destructive extractive resource management, prisons were an attractive and easy option to try to fill the void. As such, it is very likely my dependent variables influence my independent variables. This would invalidate any of my statistical findings. To correct the problem, I will use an instrumental variable (Genter et. al 2013).

In my county level analysis, I use the difference between and the number of housing units in 1950 and 1970 as instruments for prison location (Genter et. al). Prisons require existing infrastructure, and as evidenced by Eason (2010), Cherry and Kunce (2002), and Besser and Hanson (2005), select host communities that are economically stagnant with the intent of spurring growth. The number of housing units in 1950 provides a measure of the level of existing infrastructure. Towns with more housing units in the 1950s signifies the necessary infrastructure befitting a larger community. The difference between the number of housing units between 1950 and 1970 provides a measure of growth to determine if the community is thriving or stagnating. Genter et. al (2013) also included a spatial autocorrelation variable in their model. However, their results indicated that this variable did not significantly impact their model and thus I am not planning to include it in my own. Stage 1 of my Two-Least-Squares regression is as follows:

$$numfacilities_i = \beta_0 + \beta_1 HUDiff_i + \beta_2 HU50_i + \beta_3 rural + \varepsilon$$

The variable *numfacilities* is endogenous to my larger model and thus I generate *numfacilitieshat* which is my instrument. It is the number of correctional facilities per county. *HUDiff_i* and *HU50_i* are the variables for the number of housing units in 1950 and the difference between the number of housing units in 1950 and 1970 (my measure of growth). Data on housing units comes from the US Census Bureau. I also include the variable *rural_i*, which codes for the population status of the county. Because over 70% of prisons are now located in non-metropolitan areas (Beale 2001), this is an important variable to include in my estimator for *numfacilities*. County level prison data for *numfacilities* is drawn from the Bureau of Justice Statistics and the Vera Institute of Justice. The Vera Institute of Justice maintains a count of facilities per county in the United States and a database on the status of public and private

prisons. For the sake of comparison, I chose to only use male, medium security prisons. Though this does unfortunately limit my sample size, it allows me to better make comparisons between the prison types and to develop a better estimator. Because private prisons in my sample region are only medium security and male, I limited my data to only include public prisons of the same type. This helps me to control for potential differences between prison type in their development effects. For example, maximum security prisons require higher levels of staff, which would make any comparison between a public maximum security prison and a private medium security prison on unemployment levels inherently flawed. I then use my instrument to run the second regressions to determine the relationship with my independent variables:

$$percapitaincome_{it} = \beta_0 + \beta_1 numfacilitieshat_{it} + \beta_2 privrate_i + \varepsilon$$



$$unemployment_{it} = \beta_0 + \beta_1 numfacilitieshat_{it} + \beta_2 privrate_i + \varepsilon$$

$$poverty_{it} = \beta_0 + \beta_1 numfacilitieshat_{it} + \beta_2 privrate_i + \varepsilon$$

My three dependent variables are derived from Perdue and Sanchagrin's (2016) model which used these three variables as measures of economic development. It is important to note that my variable *percapitaincome* comes from Household Income data then divided by number of income-earners in the home. I used this data because prisoners are not included in Household Income data. Using simple per capita income data would thus be flawed because it would invariably be lower in prison counties. The data for *unemployment*, *percapitaincome*, and *poverty* come from the US Census Bureau and the US Bureau of Economic Analysis.

The variable *privrate* refers to the status of the present facilities as public or private. It is a unit of measurement derived from Genter et. al. to estimate the status of the prison as public or private. Because I use an estimator for location of prison, i.e. is there a prison present and if so,

how many, within a county, I also need to develop a model for estimating the status of the institution as public or private. Unfortunately, literature on this subject is scant and thus, I was forced to rely on an existing measure developed by Genter et. al. *Privrate* is a measure of the rate of privatization of the state's correctional system. States with higher levels of privatization are expected to have decreased economic gains as Genter et. al (2013) found that pervasive privatization exhibited a negative effect on wages and staffing levels of both public and private institutions within the state. I hypothesize that *privrate* will have a negative coefficient for *percapitaincome* and positive coefficients for *unemployment* and *poverty*. Because there is a possibility that the status of a prison as public or private could also be endogenous to the system, I use an estimator. *Privrate* is the estimator, not an actual count of the facility type. I expect *privrate* to have negative coefficients for *percapitaincome* and *unemployment*, and a positive coefficient for *poverty* (Perdue and Sanchagrin 2016). Though private prisons provide job opportunities, in comparison to public prisons they have lower wages, lower staffing levels, and higher turnover rates (Besser and Hanson 2005). As such, even though the presence of the prison will decrease the unemployment rate by offering more employment opportunities than no prison at all, low wages will also put downward pressure on incomes and increase poverty levels.

I chose to restrict my county level sample to the region of Central Appalachia. As defined by the Appalachian Regional Commission, this area includes the states of Kentucky, Tennessee, North Carolina, Virginia, and West Virginia. Central Appalachia provides a unique case study because it meets many of the standards assumed in my study. Firstly, there is well documented evidence that prisons built post-1990 in the region were placed with the intention of spurring economic growth. Essentially, changing national regulations on coal emissions provided a

renewed demand for low-sulfur coal - a product Appalachia has rich deposits of. However, the mining process for this coal was less labor intensive (requiring fewer employees) and involved significant environmental degradation in the form of Mountaintop Removal Mining (MSHA). The shift in focus in both mining style and coal type led to layoffs and the opening of vast tracts of land unattractive for other forms of industry. Prisons garner special attention to replace depleted mines because they can easily be built on sites decimated by mining, are under the jurisdiction of the state, and offer employment opportunities in both construction and daily operations (Scott 2010). During the Prison Boom period, Central Appalachia saw the addition of over twenty prisons (Perdue and Sanchagrin 2016) - all in rural areas with stagnant economies. Additionally, all of the states allow private prisons so I have a mix of both public and private prisons to analyze. Central Appalachia thus presents a compelling case study because of its unique conditions. Table 1 provides summary statistics for my sample.

Furthermore, the region works well for the selected instruments used to develop my instrumental variable. The work of Eason (2010), Hoyman and Weinburg (2006), and Wolman and Spitzley (1996) suggests that regional variance in prison location decisions present challenges in developing an effective model for country wide prison location decisions. Different factors figure prominently into location decisions that are highly regionally variant. For example, coal mining communities in Appalachia are strong contenders for prison placement in that region, but in California prisons are more likely to be placed in areas with a desert like climate unsuited for agriculture (Cherry and Kunce, 2002). My instruments of number of housing units in 1950, the difference in number of housing units between 1950 and 1970, and rural or metropolitan areas is ideally suited for the regional decision making process present in

Appalachia. In early iterations of my model I attempted to apply my instrument on a country wide basis, but as suggested by my literature review, found it to not be very explanatory for data on the national level. As such, I decided to focus my analysis on a regional basis, as follows from the work of previous scholars.

It is important to note I also performed various robustness checks. To test for multicollinearity, I used the Variance Inflation Factor (VIF). Multicollinearity could potentially pose a risk in my model because there could be a relationship between the number of facilities in a county and my variable *Private*. Potentially, counties with one public prison may also attract a private prison, as the two are managed and sited separately. Private corporations running prisons (in the Appalachian region, primarily CCA - Corrections Corporation of America) could also try to group their prisons together for ease of oversight and management. However, the outcome of the VIFs show that multicollinearity is not a concern in my model. The results from the test are included in Table 5, Table 6, and Table 7. The highest VIF reported was 1.19 for *Numfacilitieshat* in my Per Capita Income model. The average for the model was a VIF of 1.13. These are still low and non-concerning values which do not suggest multicollinearity is a serious problem with my results.

Section IV. Discussion of Results

Table 2, Table 3, and Table 4 detail the results of my 2LS estimates. I will discuss the findings from each model individually, and then reflect briefly on my results in sum. Table 2 provides the results of the 2LS estimate with Per Capita Income as the dependent variable. My instrumental variable for number of prison facilities, *numfacilitieshat*, had a negative effect on

per capita income. Though the value was not statistically significant, it makes sense given my hypotheses and literature review. As addressed previously, prison towns in Appalachia were selected specifically for their economic woes. As previous literature suggests, prisons do not often offer the economic salvation constituents are repeatedly promised. The presence of a prison actually drove down per capita incomes in the county. This is the same result Perdue and Sanchagrin (2016) found in their study. This phenomenon persisted even when I controlled for the introduction of the inmate population by using Household income to calculate per capita income instead of the per capita income statistics straight from the Census Bureau.

Even more interestingly, the variable *Privrate* had a negative coefficient of -\$2420.605. This means that if the prison within a county was estimated to be private, per capita incomes were further reduced from that of counties simply with a prison present. This value was significant to the 0.01 level. This also follows from the literature, as Hart et. al (1997) and Genter et. al (2013) found that private prisons cut wages and staffing levels to reduce costs. Though this is statistically significant, the value of decrease is in fact small. In the grand scheme of yearly incomes, around \$2,500 is not a large sum. This also makes sense however, because different states have different state minimum wage laws and prison labor unions with variant strengths. Also, different private prison contractors have variance across their wage rates as well. It follows that these inconsistencies between states would limit the changes between wages for both private and public prisons. For example, West Virginia has a higher minimum wage than the other states included in the sample. Wage differences between public and private prisons would thus differ by different amounts across different states, reducing the total income effect for the sample as a whole.

Table 3 provides the results from my 2LS estimate with Unemployment Rate as the dependent variable. The presence of a prison in the county had a negative coefficient of -9.265692. This was statistically significant to 0.10 level. This means that the presence of a prison resulted in a significant decrease in the county's unemployment rate. The variable *Privrate* also had a negative coefficient of -0.3408447. This was significant to the 0.05 level. Interpreting this coefficient means that if the prison present was estimated to be private, there was an additional decrease in the unemployment rate of 0.3408447. Though this is not a large amount, it is a somewhat surprising result. As previous literature outlines, private prisons employ fewer workers and at lower wages. It does not follow that private prisons would then cause an additional unemployment decrease as compared to public facilities. There are several potential explanations for this result. It is possible there are other factors at play that are not included in my model. For example, one of the potential benefits of private prisons is the amount of tax revenue they offer, both for property taxes and taxes on goods and services purchased by the prison, prison employees, and prisoners themselves. As Besser and Hanson (2005) found, the increased tax revenue could be an important boon to communities. For example, the privately run North Fork Correctional Facility in Sayre, Oklahoma provided for about one-third of the city's revenues until the facility was closed in 2003 (Besser and Hanson 2005). These funds were used to reinvest in the community and spur further economic growth. It is possible that private prisons in this case are offering similar tax revenues that could be reinvested in the community and thus creating jobs elsewhere. However, this would require further research because, as Besser and Hanson (2005) note, the competition between counties competing for prisons often led them to offer tax cuts and other incentives that reduced the tax revenue effects.

Table 4 showcases the results from my 2LS estimate with Poverty Rate as my dependent variable. My prison location estimator, *numfacilitieshat*, had a negative coefficient of 5.004027. This was significant to the 0.10 level. *Privrate* had a positive coefficient of 0.0192106. This was, however, not statistically significant. It also had a high standard deviation of 0.8010076, meaning I could not even say with 95% confidence if the coefficient for *privrate* is positive or negative. This suggests that there is not a strong or significant relationship between the prison type and the poverty rate. In this case, this makes sense because poverty rate is a more general measure of economic growth that does not immediately correspond to the anticipated effects of having a private versus a public prison. For example, just because a private prison offers lower wages than a public institution, it does not necessarily mean that the private prison employees will fall under the federal minimum poverty level and thus, would not necessarily have any effect on poverty levels. The coefficient on *numfacilitieshat* suggests that the presence of a prison decreases poverty levels by about five percentage points. Though only significant to the 0.10 level, this does support the notion that prisons do provide some measure of economic vitality to their host communities. This is a significant decrease in the poverty level.

However, this result was somewhat unexpected. Previous literature had actually found the opposite, finding instead that the presence of a prison resulted in an increase in the poverty rate (Perdue and Sanchagrin 2016). There are some differences between our two studies that may explain this incongruence. Firstly, Perdue and Sanchagrin (2016) used a fixed effects model for their data analysis instead of a two-least squares estimator. By using a fixed effects model, Perdue and Sanchagrin control for unobserved heterogeneity that might be present in my model. It is also important to note that my estimator is not perfect. Because I include the variable *rural*

in my estimator, my estimator is biased towards assuming prisons occur mostly in rural communities. Though this is true (Beale 2001, Badger 2012), it means that the few prisons in the sample set in metropolitan areas are potentially not included. DeFina and Hannon (2010) found that increased incarceration rates led to increased poverty rates, especially child poverty rates, in metropolitan areas. Thus, my model might be biased because of my estimator to preclude areas in which poverty would increase because the majority of inmates come from metropolitan counties (Kilborn 2001). The rural counties included in my model as prison counties are less likely to see a rise in poverty due to the incarceration effect than the excluded urban counties. This is just one possible explanation for why my results so significantly differed from previous literature.

In sum, my results draw mixed conclusions in terms of my research question. My model found that per capita income decreased in prison counties (though not statistically significantly). The status of the prison as private caused a statistically significant decrease in per capita income. Though this stems from the literature, the addition of a prison also caused a decrease in unemployment rate. Private prisons similarly saw a decrease in unemployment level, but to a much lower extent. Both of these findings had statistical significance to some level. This is somewhat counterintuitive, because income decrease is often associated with economic stagnation while a reduction in unemployment often coincides with economic growth. My results also showed that the presence of a prison decreased poverty rates at a significant level. My findings do not support the assertion that private or public prisons have significantly differing effects on poverty rates. Though I have addressed possibilities of why this is the case, my result stood in opposition to conclusions drawn in previous literature.

It is also important to address limitations of my study, of which there are many. Though I do believe my paper offers an important first step in investigating the relationship between prisons, institution type, and economic development, I would be remiss to not accept shortcomings of my model. Firstly, my model is undoubtedly simple. One of the largest limitations of my model is that I did not include any control variables beyond the two independent variables *numfacilitieshat* and *privrate*. This was partially due to data limitations. Private prisons do not have the same reporting standards as public institutions, and thus, even data as simple as number of prisoners is not necessarily publicly available. For example, Perdue and Sanchagrin (2016) used facility size as one of their control variables in their model. They calculated facility size by number of inmates. This makes sense and would be an important control because larger prisons would require more employees, would potentially pay more taxes, and would require more support from the surrounding community. This could greatly influence economic development factors and provide more accurate results. Because of my data limitations, I was unable to include control variables such as prison size. Though I did attempt to control for deviations between facilities by limiting my sample set to medium-security male institutions, a more robust analysis would by necessity include more significant controls.

As was touched upon previously in my discussion of the results for dependent variable *poverty*, another significant problem with my model is my use of an instrumental variable. Though using an instrumental variable removes the endogeneity problem present in simply using *numfacilities*, it introduces new complications. Even though my estimator stems directly from the literature (Genter et. al) and is designed specifically to fit my sample region of Central Appalachia, it is by no means perfect. Though all of the variables I used to generate my

estimator, *HUDiff*, *HU50* and *rural* were statistically significant, my model still had a low adjusted R-squared value of 0.156. Though R-squared is not the be-all and end-all, it does suggest that my model does not offer a perfect fit for the data. The rest of my model rests on the estimator, and if my estimator is imperfect it follows then that the rest of my results will be the same. In addition, the decision to include the variable *rural*, which was statistically significant, reduces the probability any metropolitan prisons will be included in the estimator's conclusions of prison location. Though I do know the majority of prisons included in my sample are located in rural areas and the true intent of this paper was to examine specifically the prisons intended to spur economic growth in coal counties across Central Appalachia, it is still a flaw that metropolitan prisons may not necessarily be included by my estimator. This could potentially account for why my results for prison effect on poverty rates differs from that of previous scholarship. I also use an estimator for the status of prisons as public or private. This estimator, *privrate*, also comes directly from the literature and was developed by Genter et. al (2013). Unlike my estimator, *numfacilitieshat*, *privrate* was developed to be used on a country wide basis and was not created uniquely for my sample region of Central Appalachia. This could potentially reduce the efficacy of *privrate* on estimating facility type in this region in particular, as previous literature (Eason (2010), Hoyman and Weinburg (2006), and Wolman and Spitzley (1996)) found high regional variance in prison location decisions, thus making the development of an estimator on the national scale more challenging.

Unlike a whole country analysis, my decision to focus only on the region of Central Appalachia presents some risks. Firstly, it greatly decreases my sample set which increases the risk of a false positive or negative. It also reduces the potential of my results to be applied to the

United States as a whole - just because my results prove valid in one area of the country does not mean they will be transferable to a full country analysis. However, on the other hand, Central Appalachia presents an ideal case study of the US to focus on based on my hypothesis. Because prisons built in the region were placed in rural areas for the express purpose of spurring economic development, the area provides a useful place to analyze these effects. The region is also largely rural and based on single industries (mining for example). Any economic effects that take place in prison counties is likely the result of the addition of the exogenous variable, the prison, instead of some other unaccounted for factor. In addition, because it is doubtful that one single prison carries economic ramifications that extend beyond the county level, the county level analysis provides more detail and more accuracy on the specific effects on development factors that a prison offers than an analysis using a larger unit of analysis such as a state.

Section V. Conclusion

Overall, my results paint a somewhat contradictory portrait in evaluating the efficacy of prisons as engines of economic development and the relationship between prison type and development. The presence of a prison decreased per capita incomes, but at the same time reduced unemployment rates and poverty rates. Though the reduction of unemployment rates and poverty rates is a positive sign for prisons and their proponents, the decrease in per capita incomes tells a negative story about prisons and their ability to spur GDP growth.

The inclusion of a variable to also control for and understand the effects of prison privatization adds an additional and important dimension to the analysis. Through it, my results suggest that my hypothesis was correct and that private prisons deliver less growth developments

than their public counterparts. Private prisons saw a highly statistically significant decrease in per capita income, a low (less than 0.5%) decrease in unemployment rate, and no apparent statistical relationship with poverty rates. This suggests that private prisons perform more poorly than public prisons in delivering on the promise of GDP growth. In fact, this decrease in per capita income could even undermine development goals. This is an interesting and significant externality associated with privatization. Often, states allow public services to be privatized because of the anticipated cost savings. Though these claims of cost savings are in themselves dubious (Volokh 2014), it is important that states take into account the reduced growth benefits offered by private institutions when making privatization decisions. And, as Genter et. al. (2013) concluded, increased privatization has additional consequences as it applies downward pressure on public prison wages and staffing levels as well. Essentially, my results suggest that private prisons offer no tangible positive benefits in comparison to public prisons, and offer highly statistically significant negative effects in the form of a reduction in per capita incomes.

As I've previously touched upon, this paper is by no means perfect, and many important and significant changes could, and should, be made by future researchers. To properly draw conclusions about the exact nature of prisons as vehicles for growth further analysis is needed. In evaluating the privatization question, I think an important area of future scholarship concerns the tax benefits offered by private prisons (that is, if local governments are not offering significant tax breaks and other incentives). Based on my results, private prisons offer no positive development effects except for the possibility of tax revenues, as seen in several case studies such as the North Fork Correctional facility in Oklahoma. This was mentioned only in passing however, and I think the issue deserves more attention and a more robust analysis. Other

potential areas for future research include a country wide analysis of prison effects on development factors, perhaps including more development factors as dependent variables, or a more specific analysis even on the county level that utilizes a DID or RDD model to offer more insight into potential effects. As any young scholar does, I hope that someone with more resources and access to data might pick up my mantle and continue the important work of comparing and analyzing the development effects of public and private prisons.

My results carry powerful implications for policy makers. Though admittedly my findings on public prisons do not deliver overwhelming support for or against prisons as engines of economic growth, these tepid results do speak loudly in and of themselves. If policy makers truly want to revitalize stagnant economies such as Central Appalachia's ex-coal mining towns, prisons are decidedly not the answer. As my apathetic results show, a prison delivers more as a campaign promise (Wolman and Spitzley (1996)) or as economic life support. The numbers do not tell the story of a community reinvigorated and growing, but a community in basically the same situation, though with some meager steps back, and other meager steps forward. Though the prison may have provided the jobs and money inflows necessary to keep the town alive, it looks more like a temporary band aid than a long term fix. In my thirteen year study, there were no conclusive signs of a community entering into a stage of significant growth. There are also associated long term concerns such as those outlined in Burayidi and Coulibaly (2009), who found that the introduction of a prison resulted in demographic shifts which made the community unattractive to alternate forms of industry and investment.

All of this, of course, precludes the largest elephant in the room: the dubious nature of mass incarceration itself, and its hand in hand relationship with prison proliferation. There is a

distinct moral gray area concerning this question of prisons as growth industry. If we keep propping up struggling communities with prisons, we as a nation only further tie ourselves to the harmful system of mass incarceration. One only has to flick on the news to see the families and lives destroyed. We are keeping one town alive by dragging people out of another; trading one person's job and livelihood for another's, condemned to a life behind bars. It is hard for me to ignore the human impacts of these choices. These economic decisions bear a large human cost. Though the evils of mass incarceration are not the focus of this paper, it is important to remember that this is the context and these are the consequences.

My results suggest that counties and communities should re-evaluate the use of prisons as vehicles of economic growth, and of the use of prison privatization as an effective way to offer cost savings to the state without externalities. My findings suggest that private prisons deliver even less benefit than public prisons, and can actually cause harm by causing a larger decrease in per capita incomes. As previous scholarship has suggested, prisons fail to deliver on their stated promise. Central Appalachian coal country may be bleeding out, but when policy makers choose prisons as the solution, they are only stemming the tide with bodies.

Section VI. Tables

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Table 1. Descriptive Statistics

	Total Sample	Tennessee	Kentucky	North Carolina	Virginia	West Virginia
Variables	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Per Capita Income	32.37 (3.31)	32.17 (2.36)	29.7 (1.89)	32.24 (2.55)	39.54 (3.01)	28.26 (2.88)
Unemployment Rate	6.76 (1.03)	7.8 (1.56)	8.0 (0.89)	6.9 (0.54)	5.2 (1.23)	5.9 (1.32)
Poverty Rate	13.5 (0.92)	18.2 (1.33)	19 (0.78)	17.2 (0.66)	11.8 (1.02)	18.3 (0.56)
Num. of Total Prisons	193	6	25	88	59	15
Count of Private Prisons	20	3	12	3	2	0

*Per Capita Income in thousands of dollars

Table 2. 2LS Estimates of Per Capita Income 

Variables	(i)
<i>Numfacilitieshat</i>	-20433.81

	(21383.6)
<i>Privrate</i>	-2420.605*** (614.8382)
Observations	2,509

Table 3. 2LS Estimates of Unemployment

Variables	(i)
<i>Numfacilitieshat</i>	-9.265692* (5.67742)
<i>Privrate</i>	-0.3408447** (0.1632417)
Observations	2,509

Table 4. 2LS Estimates of Poverty Rate

Variables	(i)
<i>Numfacilitieshat</i>	-5.04027* (2.78584)
<i>Privrate</i>	-0.0192106 (0.8010076)
Observations	2,509

Table 5. VIFs Per Capita Income

Variables	VIF	1/VIF
<i>Numfacilitieshat</i>	1.19	0.838184

<i>Privrate</i>	1.16	0.860486
Mean VIF	1.13	

Table 6. VIFs Unemployment

Variables	VIF	1/VIF
<i>Numfacilitieshat</i>	1.00	1.00
<i>Privrate</i>	1.00	1.00
Mean VIF	1.00	

Table 7. VIFs Poverty Rate

Variables	VIF	1/VIF
<i>Numfacilitieshat</i>	1.00	1.00
<i>Privrate</i>	1.00	1.00
Mean VIF	1.00	

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