

ABSTRACT

The Effect of the 1993 Texas Prison Expansion on the Texas Labor Market

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In 1993, the Texas Department of Criminal Justice began a prison expansion project. From 1993 to 1995, Texas prison capacity nearly doubled. The prison expansion led to a large, exogenous increase in Texas worker imprisonment, therefore making it possible to examine how prison growth altered the labor market opportunities for workers in Texas. Using the economic theory of labor market equilibrium for guidance and a natural experiment methodology for the research design, my thesis evaluates the causal effect of the 1993 Texas prison expansion on employment and real wages of Texas workers.

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THE EFFECT OF THE 1993 TEXAS PRISON EXPANSION ON THE TEXAS LABOR
MARKET

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DEDICATION

I dedicate this thesis to my dad, William M. Reihle, Sr., who always stands behind me when times are tough. His grand support during my undergraduate career provided a foundation for me to achieve a college education and survive the Honors Program.

CHAPTER ONE

Literature Review

Introduction

Over the last fifty years, economic progress in the United States has been associated with college education. Despite real wages in the labor force rising considerably over the last fifty years, these gains were not equally distributed among all workers. John, Murphy, and Pierce (1993) reveal that real average weekly wages for the least skilled male workers declined approximately 5 percent, whereas wages for the most skilled workers rose by 40 percent.

The economic opportunities for workers have been affected by numerous factors; therefore, understanding the impact of some of these forces is important for policy makers. One such factor affecting workers' economic opportunities has been the dramatic changes in imprisonment rates. Between 1975 and 2005, the Texas prison incarceration rate increased by more than 400 percent from 111 to 488 prisoners per capita (Raphael and Stoll, 2009). Since the predominant increase in imprisonment has focused on workers with less schooling and poor economic opportunities, the effect that the 1993 Texas prison expansion has had on labor markets is important.

The association between prisons, crime, and labor markets are well established. There are two purposes of my thesis. First, I am interested in the connection between the growth in Texas imprisonment and the labor market opportunities for Texas workers. Second, my thesis will evaluate the causal effect of reductions in the labor supply of

Texas workers on the Texas labor market by conducting a natural experiment in which Texas prison capacity nearly doubled from 1993-1995. (Mechoulan, 2011) The prison expansion led to a large, exogenous increase in Texas worker imprisonment, and therefore allows us to examine how prison growth has altered the labor market opportunities for workers in Texas. Briefly stated, my thesis will evaluate the impact of the 1993 Texas prison expansion on the employment and real wages of Texas workers by using the economic theory of labor market equilibrium for guidance and a natural experiment methodology for the research design itself.

Placement of Thesis in Literature

Before I delve into the experiment, I want to highlight some papers containing previously conducted research of other scholars that relate to my thesis topic.

Within the economic literature, my thesis resembles two separate literatures: the natural experiment studies of imprisonment, and the natural experiment studies of labor markets. Except for one paper by Borjas, Grogger, and Hanson (2010), I am not aware of a study that examines labor markets themselves through use of natural experiments involving exogenous increases in imprisonment. As I will discuss later, Borjas, Grogger, and Hanson (2010) are interested in the effect of changing economic opportunities for low-skill workers via changes in immigration on crime and imprisonment itself, whereas my study asks the reverse question – how has changes in imprisonment affected the labor markets themselves? My main contribution with this thesis will be my novel use of a natural experiment in Texas; over a short period of time, this natural experiment caused the number of workers in the Texas population to fall considerably through the building of new prisons and expanding prison capacity.

Most of the prison studies solely evaluate theoretical predictions regarding the economics of crime, such as sentencing's effect on recidivism (Drago, Galviati, and Vertova, 2009), and incarceration's effect on crime itself via incapacitation (Buonanno and Raphael, 2013).

In Drago, Galviati, and Vertova (2009), the authors study the effect of prison sentences on recidivism using a natural experiment in Italy that exogenously varied prison sentences for former convicts. In July 2006, the Italian Parliament passed the Collective Clemency Bill, which pardoned 25,813 prisoners. Using the individuals' remaining sentence at the date of the pardon, the experiment reveals the remaining sentence's variation in order to illuminate how exogenous prison sentence manipulation affects the response of former inmates' propensity to recommit a crime. (Drago, Galviati, and Vertova, 2009)

By using the setting of the natural experiment, the administrators of this study were able to solve a fundamental problem concerned with the response of individuals with regards to a variation in the severity of punishment; this is typically tested by analyzing the effect of increased criminal sanctions on crime rates. Through exploitation of the natural experiment's generation of exogenous variation in prison sentences at the individual level, the administrators of this test were able to eliminate any possible bias that could be connected to policy makers' endogenous response and the effect of incapacitation, in order to reveal potential criminals' behavioral response. (Drago, Galviati, and Vertova, 2009)

The Collective Clemency Bill states that "if a former inmate recommit a crime within 5 years following his release from prison, he will be required to serve that

remaining sentence suspended by the pardon (varying between 1 and 36 months) in addition to the sentence given for the new crime” (Drago, Galviati, and Vertova, 2009)

The Italian Department of Prison Administration (DAP) provided the administrators of this study a dataset that includes records of all of the individuals released as a result of the bill’s collective pardon law from August 1, 2006 until February 28, 2007. Included in the sample are data on 25,813 individuals, of which 81 percent were released on August 1, 2006. With regards to each individual, the dataset provides information on whether or not the individual reoffends within the specified period – the time between the individual’s release from prison and February 28, 2007. (Drago, Galviati, and Vertova, 2009)

The results of this study reveal that the recidivism of inmates is significantly reduced when a policy exists that allows inmates to shorten their current sentence at the cost of a longer sentence in the event of recidivism after completing their current sentence. Additionally, the results yield solid evidence that an increase in expected punishment of one month reduces the probability of committing a crime. The administrators of this study discovered that recidivism rates are much higher without the residual sentence mechanism included in the bill. (Drago, Galviati, and Vertova, 2009)

For a 7-month period, the researchers estimated an elasticity of -0.74 with regards to the “propensity to recommit a crime with respect to the average sentence that individuals expect...” This tells us that a 50 percent increase in the expected sentence should reduce recidivism rates over the course of seven months by 35 percent. Interestingly, the recidivism rate for women (0.046) is much lower than the rate for men

(0.118); also, the residual sentence's impact is lower. (Drago, Galviati, and Vertova, 2009)

Buananno and Raphael (2013) also deals with the national collective pardon in Italy. Specifically, this case discusses the effect of the release of one-third of Italy's prison inmates resulting from the pardon. The economic purpose in this study is to (1) "test for a discontinuous break in national crime rates corresponding to the mass release," (2) "test for the effect of the return of the incarceration rate to its predicted steady state level on national crime rates," and (3) "exploit regional variation in prison releases based on the province of residence of pardoned inmates." Solutions to these questions could reveal an efficient method of inducing less serious penalties on less-dangerous offenders while at the same time selectively incarcerating offenders who pose the greatest risk to society. (Buananno and Raphael, 2013)

This study draws data from multiple sources: (1) crimes reported to the police during the period of January 2004 through December 2008 from the Italian Ministero dell'Interno; (2) monthly national prison population data from the Ministero della Giustizia; (3) micro-data on all pardoned inmates; and (4) statistics on prison total per province as of June 2006. (Buananno and Raphael, 2013)

This study found that the release of prisoners in August 2006 due to the Italian collective pardon resulted in "sizable increases in crime." Furthermore, this study shows evidence that the number of violent crimes slightly increased as well as a result of the pardon. (Buananno and Raphael, 2013)

It is important for readers of my thesis to recognize the research of Drago, Galviati, and Vertova (2009) as well as Buonanno and Raphael (2013) because these

papers focus on the theoretical predictions regarding the economics and crime.

Understanding the previous work dealing with economics and crime provides readers of my thesis a clear vision of why my work is unique, yet relevant, to previous works evaluating economics and crime.

For the most part, questions regarding the effect of exogenous expansion of imprisonment on labor market outcomes (the scope of my thesis) have not been thoroughly studied compared to questions about prison's effect on crime.

My thesis is somewhat similar to Card's Mariel Boatlift paper; Carington's Alaska pipeline paper; and Borjas, Grosser, and Hanson's immigration and incarceration paper. The main difference between my thesis and these papers is that these papers do not evaluate the effect of imprisonment on wages and employment, which is the focus of my thesis.

Card (1990), examines the effects of the Mariel Boatlift in 1980 on Miami, Florida's labor market. Specifically, this paper analyzes the effect of the Mariel immigration on wage and unemployment rates of low-skilled workers in Miami. (Card, 1990)

The incident in Miami in which there was an exogenous increase in the supply of immigrants to the Miami labor market created an opportunity for a study utilizing a natural experiment. The Mariel Boatlift aftermath's effect on the Miami labor market is an example of one of these studies. (Card, 1990)

Beginning in May of 1980 and ending in September of 1980, 125,000 Cuban immigrants entered Miami "on a flotilla of privately chartered boats." The reason for why so many Cubans entered into the U.S. is because of a declaration by Fidel Castro on

April 20, 1980, that “Cubans wishing to emigrate to the United States were free to leave from the port of Mariel.” Of the Cuban immigrants who entered Miami as a consequence of the Mariel Boatlift incident, 50 percent stayed permanently in Miami. As a result, Miami’s labor force grew by 7 percent, and the amount of Cuban workers in Miami increased by 20 percent. “The experiences of the Miami labor market in the aftermath of the Mariel Boatlift provide a natural experiment with which to evaluate the effect of unskilled immigration on the labor market opportunities of native workers.” (Card, 1990)

The basis of the data used in this study is 1979-1985 micro-data from a sample of the Current Population Survey (CPS) containing individuals merged into outgoing rotational group samples. Based on this data, Card’s study discovered that the wage rates of low-skilled non-Cuban workers were unaffected by the inflow of Mariel Boatlift Cuban immigrants. Interestingly, low-skilled non-Cuban workers showed no evidence of an increase in unemployment. (Card, 1990)

Instead, the data suggests that the Miami labor force absorbed the Mariel Boatlift immigrants with negligible effects on other groups. Furthermore, there is no evidence of any substantial effect of the Mariel Boatlift immigrants’ arrival on the wage and unemployment of earlier immigrants into the Cuban population. (Card, 1990)

Due to the fact that the labor market in Miami is atypical compared to other local labor markets in the United States, one must take caution when interpreting the straightforward nature of the findings in this study. Despite the problems experienced by Mariel Boatlift immigrants as a result of about 60,000 refugees within a six-month period, Miami was “better prepared to receive them than any other city.” During the two decades preceding the Mariel Boatlift incident, a constant flow of Cubans entered Miami.

Furthermore, large amounts of Central Americans and Nicaraguans have immigrated into Miami during the years since the Mariel Boatlift incident. Ultimately, Miami's consistent absorption of immigrants over the years makes the Mariel Boatlift immigrants' move to Miami appear as one part of a long-term pattern. (Card, 1990)

Carrington (1996), is a study involving a pipeline construction project in Alaska that measures labor market responses to temporary demand shocks. "Built between 1974 and 1977, the Trans-Alaska Pipeline was the largest privately financed construction project in world history." This construction project provided an ideal opportunity to observe how labor markets respond to temporary demand shocks, and then analyzes the extent to which the Alaskan data can be explained by the model. (Carrington, 1996)

This paper is relevant to my thesis because it examines the roles of wage rigidity, elastic labor supply, and adjustment costs involved in the generation of observed labor market fluctuations. This study achieves its purpose by demonstrating both a theoretical and empirical analysis of the Alaskan labor market during the construction of the Trans-Alaska Pipeline System (TAPS) during the 1970s. (Carrington, 1996)

The data used in this study that illuminates the features of the Alaskan economy is drawn from the U.S. Statistical Abstract. Data from the unemployment insurance reports of Alaskan employers is also used in this study. Since the 1960s, these reports have been collected, of which the results have been reported in three of The Alaska Department of Labor's publications: Statistical Quarterly, Alaska Economic Trends, and Wage Rates for Selected Occupations. Despite the lack of individual-level information, "these data provide useful industry-level data on employment, hours, earnings, and wages throughout this period." (Carrington, 1996)

Five conclusions are drawn from this study: “(1) local labor markets are capable of substantial wage flexibility, (2) local labor supply is quite elastic on both the intensive and extensive margins, (3) cross-industry spillover effects are important but not uniform, (4) employment adjustment costs were apparently linear or negligible rather than convex, and (5) even positive labor demand shocks may have adverse effects on consumer prices, crime, and other measures of social welfare.” (Carrington, 1996)

This paper identified two unique features of Alaska. “First, it is possible that Alaska, unlike most U.S. states, has an imperfectly elastic long-run labor supply curve, as Alaskan climate and culture do not appeal to every-one.” If this is the case, a larger labor supply response and thus a smaller increase in wages might occur in projects like TAPS. (Carrington, 1996)

“Second, the Alaskan economy is accustomed to enormous seasonal swings in employment and population.” As a result, it appears that the large increase in labor demand might not have been very shocking to Alaska’s economy since the Alaskan economy was already prepared. Furthermore, it is possible that other states who have not had much experience with large changes in labor demand might have witnessed much less smooth changes in wages and employment. (Carrington, 1996)

Regardless of the unique features of both Alaska and TAPS, insight into general labor market dynamics can be discovered through examination of such an enormous demand shock. (Carrington, 1996)

Borjas, Grogger, and Hanson (2010) examines the relationship between immigration and black wages, employment, and incarceration. Since my thesis uses a natural experiment methodology to evaluate the impact of mass incarceration on the labor

market outcomes and opportunities for workers, this study is informative to my thesis because it examines how a large inflow of workers into the labor force affects the opportunities for workers already in the labor force. Thus, even though the source of the inflow of workers in this paper is different from the source of the outflow of workers presented in my thesis, and the fact that this study focuses on immigration's effect on incarceration rather than the effect of incarceration on the labor market, this paper is relevant to the subject of my thesis. (Borjas, Grogger, and Hanson, 2010)

Drawn from the 1960-2000 U.S. census, the data used in this study “reveal a strong correlation between immigration and black wages, black employment rates, and black incarceration rates.” The authors of this study discovered a decrease in the wage of black workers, a decrease in the employment rate, and an increase in the rate of incarceration as the supply of workers in a certain skill group increases due to immigration. (Borjas, Grogger, and Hanson, 2010)

This study found that a 10 percent increase in the supply of a certain skill group resulting from immigration is associated with a 2.5 percent black wage decrease, a 5.9 percent black employment decrease, and a 1.3 percent black incarceration rate increase. (Borjas, Grogger, and Hanson, 2010)

Interestingly, regarding white men, “the same 10% increase in supply reduces the wage by 3.2%, but has much weaker employment and incarceration effects: a 2.1-percentage-point reduction in the employment rate and a 0.2-percentage-point increase in the incarceration rate.” This concludes that rates of incarceration and employment for black men are more sensitive to immigration than those of white men. (Borjas, Grogger, and Hanson, 2010)

It must be noted that despite the attempt by the authors of this study to control for other factors that may account for the large shifts in black incarceration and employment rates over the forty-year period examined in this study, it is impossible to control for every possible factor. (Borjas, Grogger, and Hanson, 2010)

Furthermore, the authors noted that much of the increase in the incarceration rate and the decrease in the employment rate in the black population remains unexplained despite the evidence suggesting that these trends were affected by immigration. This means that despite immigration's role in the increase in black incarceration and decrease in black employment, the black incarceration rate would have still increased, and the black employment rate would have still decreased if there were no immigration. (Borjas, Grogger, and Hanson, 2010)

While the papers discussed in this chapter are not identical to my thesis, it is important for readers to attain a brief overview of completed works pertaining to population inflow and outflow, incarceration, employment, and wage. By having knowledge of works dealing with these subjects, readers can better understand the uniqueness and significance of my thesis as it relates to these subjects.

CHAPTER TWO

The Texas Prison System

Significance

The goal of this chapter is to assess the Texas prison system during the time period in which the Texas prison system started considering rapid expansion. It is important for readers to attain knowledge of the events leading up to the 1993 Texas prison expansion because this knowledge will help the reader understand the depth of the Texas prison system as well as why the Texas prison system plays a huge role in the world of incarceration. Due to the role the Texas prison system plays as a leader and innovator in the world of incarceration, I chose Texas as the focus of my study.

This chapter provides a brief overview of the Texas prison system in recent years, discusses the high-profile court case *Ruiz v. Estelle*, and highlights the 1993 Texas prison expansion.

Background

In 1972, the Texas prison system owned 100,000 acres of land. During the same year, William J. Estelle replaced George Beto as the director of the Texas Department of Corrections when Beto retired. The inmate population increased rapidly during the 1970s as the state population increased. Specifically, Texas' population grew by 19 percent between 1968 and 1978, and the Texas prison population grew by 101 percent. Whereas the national incarceration rate in the mid-1970s was 86.9 per 100,000, Texas' rate was

143.7. By the beginning of 1978, Texas' prison population reached 22,439. (Lucko, 2013)

Significant change characterized the TDC during the 1970s and 1980s. The change includes population growth, new units opening, and legal challenges regarding prison management. The biggest prisoners' case in U.S. prison history, Ruiz v. Estelle, proved challenging for the TDC. The case, filed in 1972 by inmates, was issued a ruling by Chief Judge William Wayne Justice. (Lucko, 2013)

Justice ruled that the condition of prisons violated the Eighth Amendment. Specifically, the courts discovered that the conditions of the prisons allowed cruel and unusual punishment. Justice provided remedies to the situation: TDC would reduce overcrowding, enhance prisoner recreation and rehabilitation programs, and cease practices which compromise the welfare and safety of prisoners. Long-winded litigation followed Justice's ruling as the TDC adjusted to the provisions of the ruling. (Lucko, 2013)

Despite the litigation, Texas opened up several new prisons during the 1980s. Meanwhile, changes in the functions of some of the older prisons took place. Describing each change would not fruitfully contribute to the purpose of this paper because doing so would deviate from the scope of this paper. (Lucko, 2013)

A series of directors administered the TDC during the 1980s. Following the resignation of William Estelle in 1983 due to issues concerning the Ruiz case and claims of mistreatment and mismanagement of prisoners, Dan McKaskle was selected to serve as interim director. In 1984, Raymond Procunier became the new director of the TDC. He served until 1985, when health and personal reasons forced him to resign. Succeeding

Procurier was Lane McCotter. McCotter remained director of the TDC until 1987, when he resigned as a result of difference of opinion with Texas Governor William Clements. In 1987, James Lynaugh, the acting director of the TDC, was named director by the board. (Lucko, 2013)

Between August 31, 1983 and August 31, 1988, the inmate population grew from 36,769 to 39,664. Although this increase appears minute, the turnover rate of inmates is very high. For example, 33,816 inmates entered into the Texas prison system between August 1987 and August 1988. Meanwhile, 33,428 inmates were released through parole or discharge, to mandatory supervision, or after the termination of shock probation. (Lucko, 2013)

Beginning in 1988, in order to support the increased number of convicted felons, the TDC constructed several new units. Through the creation of prerelease institutions in Marlin, Woodville, Dayton, and Snyder, as well as maximum-security units at Gatesville and Amarillo, the TDC expanded prison capacity by 10,000. At Kyle, Cleveland, Venus, and Bridgeport, the TDC opened four 500-bed prerelease facilities. In 1990, the TDC planned the construction of 1,000-bed medium-security units in Frio, Freestone, and Childress, as well as 2,250-bed maximum-security units in Beeville, Jefferson County, and Abilene. (Lucko, 2013)

By 1988, the Texas prison system expanded its industrial operations to include factories that produced goods for the TDC and other agencies. The factories produced soap, highway signs, refinished furniture, shoes, woodwork, cardboard boxes, mattresses, garments, fabricated metal products, retreaded tires, license plates, and stainless steel. (Lucko, 2013)

Within the prisons were print shops, textile mills, record-conversion facilities, and bus-repair facilities. Building maintenance and construction on prison property was performed by some prisoners. Two more inmate jobs included food processing and farming. In total, the TDC employed over 19,000 staff members as well as 779 Windham School personnel as of August 1988. (Lucko, 2013)

In 1989, the administrative structure of the TDC was changed according to Texas legislature. Three branches of the prison system were abolished: the Texas Adult Probation Commission, the Board of Pardons and Paroles, and the Texas Corrections Board. The three branches were merged into one administrative body: the Texas Department of Criminal Justice. Thus, the TDC was renamed the TDCJ, Institutional Division. The TDCJ is administered by nine members. The director of the TDC, Lynaugh, became the executive director of the TDCJ. As executive director, Lynaugh managed all three of the agencies of the new department. (Lucko, 2013)

The year 1992 marked the end of most federal controls over the TDCJ when a settlement was reached between the courts and TDCJ. Despite the settlement, Chief Judge Justice decided to continue federal control over various aspects of the TDCJ. In 2002, federal control over Texas prisons ceased when *Ruiz v. Estelle* was deemed closed. (Elliott, 2002)

Ruiz v. Estelle (1980)

When Ruiz hand wrote his complaint while imprisoned, Texas prison architecture was representative of the “telephone pole” design. In the “telephone pole” design, long halls intersect at right angles. These long halls combine housing wings with activity areas. Prisoners march through the halls to their designated activity areas. The primary

duty of security officers working in the prisons is to coordinate the prisoners within each hall and corridor. (Justice, 1980)

The plaintiffs (Ruiz and inmates) in *Ruiz v. Estelle* alleged that the design of the prisons is largely responsible for the unlawful practices and conditions present within the Texas prison system. In order to support the argument of the plaintiff, the plaintiff revealed vast evidence that modern penologists disapprove the use of large institutions such as those used in the TDC (currently the TDCJ). During trial, penologists testified that personal acquaintance between the warden and the inmates, employees, officers, and staff is required in order to maintain an effective and humane prison environment. (Justice, 1980)

Furthermore, penologists suggest that the warden, through consistent personal observations and inspections, should be familiar with every operation of the facility. This means limiting the size and population of facilities to a level such that information about operations, inmates, employees, officers, and staff are easily accessible by the warden. (Justice, 1980)

In defense against the plaintiffs' arguments, the defendants (William J. Estelle and TDC) claimed that the design and size of Texas prisons is not unconstitutional. They argued that, instead, Texas prison architecture is representative of a penological philosophy not ideal in the eyes of penological experts. (Justice, 1980)

In his written opinion, Chief Judge Justice asserts that it is not the position of the courts to decide between competing prison system philosophies as long as the philosophies in question are constitutional. However, even if courts actively avoid

partaking in management of prison systems, constitutionally guaranteed rights cannot be compromised. (Justice, 1980)

Relief was granted to the plaintiffs in the form of changes to be made within the Texas prison system. In Justice's words, the changes included in the relief consisted of "[reducing] the inmate population at each unit, [increasing] the security and support staff, [furnishing] adequate medical and mental health care, [and bringing] all living and working environments into compliance with state health and safety standards." (Justice, 1980)

Furthermore, prison officials "will be charged with the duty of instituting, performing, and supervising practices that will extirpate and abate staff brutality, the use of building tenders, abuse of the disciplinary process, and further violations of the inmates' rights to access to the courts." (Justice, 1980)

The courts understood that accomplishing these changes within the TDC would be very challenging due to the necessity to eliminate very old practices of the TDC. Nevertheless, the evidence presented in the case shows that the TDC's organizational structure present at the time created an environment too adverse for the necessary changes to take effect. Thus, the structure would need change. (Justice, 1980)

In order to combat the obstacles preventing the necessary changes from occurring, the court appointed a special master to ensure that the defendants would comply with the remedies. The role of the special master was to oversee the actions of the TDC, meanwhile verifying that the TDC fruitfully administers changes in correction facility operations and conditions. In order to ensure effectiveness of the special master, the

powers, responsibilities, and limitations of the special master were clearly understood by all parties upon Justice's appointment of the special master. (Justice, 1980)

Justice ordered that federal jurisdiction over the TDC (presently the TDCJ) will continue until "such time as the court determines that full and complete relief has been obtained for the plaintiff class." (Justice, 1980)

1993 Texas Prison Expansion

The demand for more beds within Texas prisons began in 1985, resulting from an increasing state population, stricter policies for violent crimes, tougher restrictions on parole (including longer time behind bars before eligibility for parole), and the increase in the war on drugs. (Dworaczyk, 1997)

In order to clear up any confusion regarding the connection between Ruiz v. Estelle and the prison capacity increase, I included details in this chapter that explain the details of Ruiz v. Estelle. The only connection between this case and the demand for an increase in prison capacity was Judge Justice's ruling imposing criteria for space requirements under the new housing restrictions/requirements. The Ruiz case alone did not cause the demand for increased prison capacity within Texas prisons. Instead, a variety of factors contributed to the demand for increased prison capacity. (Dworaczyk, 1997)

The increase in demand for prison capacity led TDCJ to ask the Texas Legislature to propose to Texas voters four amendments to the Texas Constitution which would allow general obligation bonds totaling \$3 billion – of which TDCJ would receive \$2.3 billion for use toward increasing prison capacity by about 101,000. The Texas voters approved the amendments. (Dworaczyk, 1997)

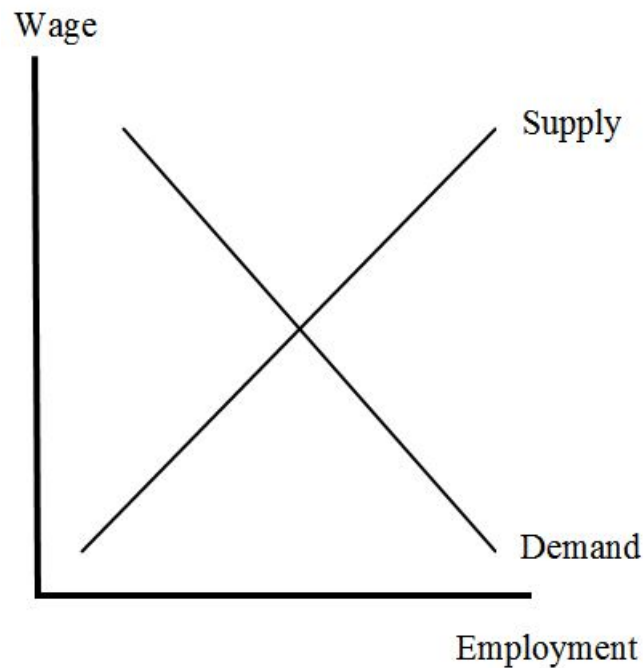
CHAPTER THREE

Methodology

Economic Theory of Labor Market Equilibrium

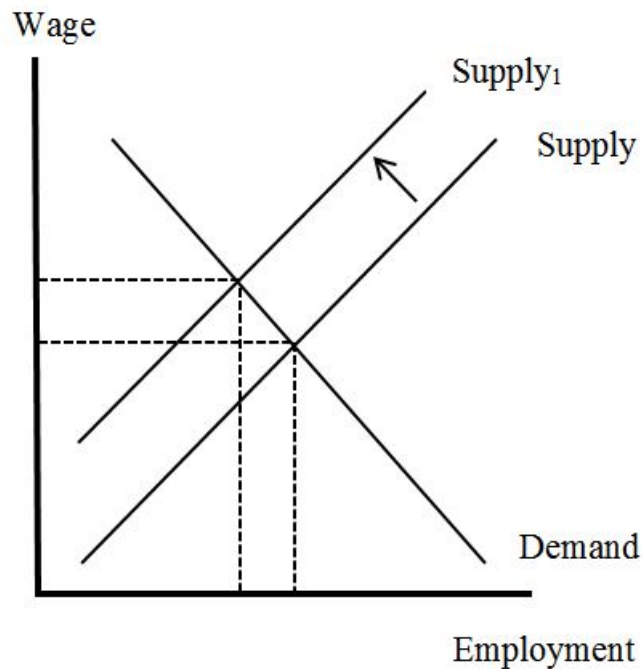
My study examines the effect of removing prisoners from the workforce on the wage rate and employment of workers in the Texas labor market. In the labor market equilibrium model, the supply of workers represents the supply curve, and the number of firms hiring workers represents the demand curve. Wage and employment are determined by the equilibrium of the labor supply and labor demand. The labor market equilibrium model is displayed in Figure 3.1.

Figure 3.1: Labor Market Equilibrium Model



According to the model, when the exogenous removal of prisoners from the Texas workforce decreases the number of workers in the workforce, the labor supply will shift to the left, and the labor demand will not change. This change will result in the equilibrium shifting both upward and leftward. The equilibrium shift will result in an employment decrease and a wage increase. The labor market equilibrium model's prediction of the effect of the exogenous removal of prisoners from the Texas workforce is displayed in Figure 3.2.

Figure 3.2: Labor Market Equilibrium Model Prediction



My thesis seeks to discover whether the prediction made by the labor market supply and demand model is accurately representative of what actually happened as a result of the removal of prisoners (resulting from the 1993 prison expansion) from the Texas workforce.

Texas Natural Experiment

I will evaluate the causal effect of the removal of prisoners (resulting from the 1993 Texas prison expansion) on wage and employment of Texas workers from 1992-1996 using a natural experiment. The prison expansion led to a large, exogenous increase in Texas worker imprisonment, and therefore allows us to examine how prison growth has altered the labor market opportunities for workers in Texas using a natural experiment.

Data

My data comes from the Current Population Survey (CPS). The CPS reports employment statistics of outgoing rotational groups of the Texas population. I chose to use this source due to the high credibility that many significant researchers place upon this source. I also use a graph computed by Stephane Mechoulan to describe the Texas prison expansion.

Calculation

I use tables to demonstrate the effect of the removal of prisoners from the Texas workforce on the Texas labor market. I narrow my analysis to four tables: (4.1) mean logarithms of real hourly earnings of workers age 20-54 in Texas and three comparison states, 1992-1996; (4.2) unemployment rates of individuals age 20-54 in Texas and three comparison states, 1992-1996; (4.3) means of log wages of whites in Texas by quartile of predicted wages, 1992-1996; and (4.4) means of log wages of blacks in Texas: actual and predicted, and by quartile of predicted wages.

CHAPTER FOUR

Results and Conclusion

Results

Tables 4.1 and 4.2 reveal wage and unemployment rate averages for whites and blacks in Texas and comparison states from 1992 through 1996. The comparison states include California, Florida, and Georgia. I chose these comparison states due to their large populations of whites and blacks.

Table 4.1. Mean Logarithms of Real Hourly Earnings of Workers Age 20-54 in Texas and Three Comparison States, 1992-1996

Characteristic	1992	1993	1994	1995	1996
Texas:					
Whites	0.936	0.933	0.992	0.972	0.974
Blacks	0.895	0.961	0.923	0.906	0.963
Comparison States:					
Whites	1.004	1.012	1.017	1.016	0.989
Blacks	0.965	0.973	0.980	0.946	0.961

Note: Entries represent the means of log hourly wages (deflated by the Consumer Price Index – 1999 = 100) for workers age 20-54 in Texas and three comparison states: California, Florida, and Georgia.

Source: Based upon samples of employed workers in the outgoing rotation groups of the Current Population Survey from 1992 through 1996.

Multiple characteristics of Texas are revealed in Table 4.1. First of all, mean wages are lower in Texas than in comparison states. The real wages of whites in Texas compared to real wages of whites in comparison states differ in pattern. In Texas, real wages for whites slightly decrease from 1992 to 1993, sharply increase from 1993 to

1994, moderately decrease from 1994 to 1995, and slightly increase from 1995 to 1996. In comparison states, real wages for whites increase from 1992 to 1994 and decrease from 1994 to 1996.

The wages in Texas remain relatively stable for whites after the significant wage increase from 1993 to 1994. Comparison of this pattern to the relatively stable wages for whites in comparison states, considering the non-existence of a recession in the U.S. immediately after 1992, suggests a positive impact of the prison expansion on wages of whites in Texas.

If the conclusion of the 1990-1992 U.S. recession impacted the wage rate of whites in Texas, wages of whites should have changed significantly in 1993 rather than in 1994. In order to determine whether or not specific quartiles of white wages in Texas were affected more severely than other quartiles in Texas, I broke down wages of whites in Texas into quartiles. A more detailed examination of white wages can be found in Table 4.3.

The real wages of blacks in Texas compared to real wages of blacks in comparison states also differ in pattern. In Texas, real wages of blacks sharply increase from 1992 to 1993, sharply decrease from 1993 to 1995, and sharply increase from 1995 to 1996. In comparison states, real wages of blacks increase from 1992 to 1994, decrease from 1994 to 1995, and increase from 1995 to 1996.

The increase in real wages of blacks in Texas from 1992 to 1993 may have resulted from the conclusion of the 1990-1992 U.S. recession. What is not completely explained is the decrease in black wages from 1993 to 1995, and then the sudden increase from 1995 to 1996. Comparing the wage pattern of blacks in Texas to the relatively

consistent wage pattern of blacks in comparative states leaves vague the explanation for the wage pattern of blacks in Texas. Therefore, I want to further analyze the wages of blacks in Texas in order to determine the effect of the prison expansion on black wages. A more detailed examination of black wages can be found in Table 4.4.

Table 4.2 reveals the unemployment rates of whites and blacks in Texas and comparison states. With the exception of 1994, the unemployment pattern of whites in Texas decreases every year. In comparison states, the unemployment rate of whites fluctuates up and down from 1992 to 1996, but decreases in the long-run. Thus, it is difficult to conclude from this table that the prison expansion caused the unemployment rate of whites to generally decrease from 1992 to 1996. Instead, the unemployment rate decrease suggests a nationwide decrease rather than a local decrease.

The unemployment rates of blacks in Texas compared to comparison states suggest a different conclusion. In Texas, black unemployment decreased from 1992 to 1995. From 1992 to 1993, a significant decrease in unemployment occurred. From 1995 to 1996, black unemployment increased. In comparative states, black unemployment decreased from 1992 to 1993, increased from 1993 to 1994, decreased from 1994 to 1995, and increased from 1995 to 1996.

Considering the significant decrease in black unemployment in Texas from 1992 to 1993, and the minute decrease in unemployment in comparative states during the same period, it is fair to suggest that the 1993 prison expansion decreased the unemployment rate of blacks from 1992 to 1993. The change in black unemployment in Texas from 1994 to 1996 is very similar in pattern to the change in black unemployment in comparative states during the same period. Thus, the table does not suggest that the

change in the unemployment rate of blacks from 1994 to 1996 in Texas was caused by the Texas prison expansion. Instead, it suggests a nationwide shift in the black unemployment rate from 1994 to 1996.

Table 4.2. Unemployment Rates of Individuals Age 20-54 in Texas and Three Comparison States, 1992-1996

Characteristic	1992	1993	1994	1995	1996
Texas:					
Whites	5.860	5.759	6.252	5.428	5.196
Blacks	18.440	13.879	11.003	8.681	10.300
Comparison States:					
Whites	7.968	8.318	7.411	5.567	5.969
Blacks	11.111	11.024	12.595	7.590	8.594

Note: Entries represent unemployment rates, in percentages, for individuals age 20-54 in Miami and three comparison states: California, Florida, and Georgia. Samples are based on individuals in the labor force.

Table 4.3 examines the mean wages of whites in Texas by quartile. Separating the mean wages by quartile helps reveal the wage groups that were most affected by the Texas prison expansion. The difference between the wages in the fourth quartile and the first quartile represents the spread of the wage distribution.

From 1992 to 1993, the mean wages of all four quartiles increased, but the wages of whites in the fourth quartile increased more than wages of whites in the first quartile. In From 1993 to 1994, the first quartile was the only quartile to experience a wage increase. From 1994 to 1995, the fourth quartile was the only quartile to experience a wage increase. From 1995 to 1996, the first and second quartiles were the only quartiles to experience a wage increase.

Table 4.3. Means of Log Wages of Whites in Texas by Quartile of Predicted Wages, 1992-1996

Year	Mean of Log Wage via Quartile of Predicted Wage				Difference of Means: 4th - 1st
	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	
1992	0.577	0.742	0.954	1.178	0.601
1993	0.626	0.809	1.016	1.273	0.647
1994	0.654	0.804	0.991	1.224	0.570
1995	0.589	0.780	0.983	1.299	0.710
1996	0.610	0.783	0.972	1.275	0.665

Note: Predicted wage is based on a linear prediction equation for the log wage fitted to individuals in three comparison states. The sample consists of whites (male and female) between the ages of 20 and 54, inclusive, with credible wage data in the earnings supplement of the Current Population Survey. Wages are deflated by the Consumer Price Index (1999 = 100).

Stephane Mechoulan computed a graph of Texas prison capacity ranging from 1978 until 1998. (Mechoulan, 2011) In his graph, Mechoulan discovered a sharp increase in Texas prison capacity beginning in 1993 and ending in 1995. Considering Mechoulan’s discovery, Table 4.3 suggests that all quartiles benefited from the Texas prison expansion in 1993.

From 1993 to 1996, it appears that white workers in the second and third quartiles experienced an overall wage decrease, with the minute exception of the second quartile from 1995 to 1996. Overall, the first and fourth quartiles of white wages increased from 1992 to 1996, but the fourth quartile increased more than the first quartile.

These results suggest that the Texas prison expansion increased white wages of both the first and fourth quartiles, while most affecting the fourth quartile. These results

also suggests that the Texas prison expansion negatively affected white wages of the second and third quartiles.

Table 4.4 thoroughly analyzes the effect of the Texas prison expansion on the wages of blacks in Texas. The table includes the actual and predicted mean wages of blacks in Texas, the predicted mean wages of blacks broken down by quartile, and a comparison of actual mean wages of blacks in Texas with the mean wages of blacks in the rest of the U.S. (outside of Texas).

Table 4.4. Means of Log Wages of Blacks in Texas: Actual and Predicted, and by Quartile of Predicted Wages

Year	Mean of Log Wages in Texas			Mean of Log Wages by Quartile of Predicted Wages				Mean Log Wage of Blacks Outside Texas	Difference in Black Wages, Texas - Rest of U.S.
	Actual	Predicted	Actual - Predicted	1st	2nd	3rd	4th		Actual
1992	0.895	0.855	0.040	0.646	0.771	0.865	1.146	0.970	-0.075
1993	0.961	0.909	0.052	0.692	0.805	0.923	1.215	0.967	-0.006
1994	0.923	0.867	0.056	0.653	0.746	0.928	1.125	0.970	-0.047
1995	0.906	0.863	0.043	0.671	0.751	0.888	1.141	0.960	-0.054
1996	0.963	0.873	0.090	0.710	0.779	0.907	1.102	0.959	0.004

Notes: Predicted wage is based on a linear prediction equation for the log wage fitted to individuals in three comparison states. Predicted wages for blacks in Texas are based on coefficients for blacks in comparison states. Wages are deflated by the Consumer Price Index (1999 = 100).

The table reveals a 6.8% increase in real black wages in Texas from 1992 to 1996. As seen in the mean predicted wages of blacks in Texas, this increase resulted from the 1.8% increase in the quality of the black labor force which is measured by the increase in

mean predicted wages of blacks in Texas, and a 5% increase in the quality-adjusted wage gap between blacks in Texas and comparison states.

Therefore, about 26.471% of the increase is due to the increase in the quality of the Texas black labor force, and about 73.529% of the increase is due to the increase in the quality-adjusted wage gap between blacks in Texas and comparison states.

In the columns that divide the mean predicted wages of blacks in Texas, the distribution of mean predicted wages of each quartile are revealed. In the first quartile, the mean predicted wage increased by 6.4% from 1992 to 1996. In the second quartile, the mean predicted wage increased by 0.8% from 1992 to 1996. In the third quartile, the mean predicted wage increased by 4.2% from 1992 to 1996. In the fourth quartile, the mean predicted wage decreased by 4.4% from 1992 to 1996.

The difference between the mean black predicted wages of the first and fourth quartiles is higher in 1992 than in 1996; the mean wage difference between the first and fourth quartiles in 1996 was 10.8% lower than in 1992. This difference is consistent with the mean predicted wage increase in the first quartile from 1992 to 1996, and the mean predicted wage decrease in the fourth quartile from 1992 to 1996.

Comparing mean black wages in Texas with all states outside of Texas is a great way to analyze the effect of the Texas prison expansion on mean wages of blacks in Texas. This comparison controls for unobservable differences in the quality of the workforce between blacks in Texas and blacks in all other states (for example, education level). The last two columns of Table 4.4 display the mean black wage differential between Texas and all other states, considering education level completed and gender.

Considering the mean black wage in Texas increased from 1992 to 1996, and the mean black wage of all states outside of Texas remained relatively stable from 1992 to 1996, the data suggest a positive effect of the Texas prison expansion on the black wages in Texas.

Conclusion

The Texas prison expansion beginning in 1993 that exogenously pulled Texas workers from the Texas labor market provides a natural experiment that can be used to evaluate the Texas prison expansion's effect on the Texas labor market. My study focuses on the effect of the Texas prison expansion on the wage and unemployment rates of workers in the Texas labor market. While investigating the Texas prison expansion's effect on workers in the Texas labor market, it is fruitful to evaluate the prison expansion's effect on both white and black workers.

Regarding white Texas workers, the results of my experiment indicate that the unemployment rate decrease in Texas was part of a nationwide decrease rather than solely a Texas decrease. Furthermore, the results suggest that the Texas prison expansion increased white wages of both the first and fourth quartiles, while most affecting the fourth quartile, and negatively affected white wages of the second and third quartile.

Regarding black Texas workers, the results of my experiment indicate that prison expansion decreased the unemployment rate of blacks from 1992 to 1993, but the change in the unemployment rate of blacks from 1994 to 1996 was part of a nationwide shift in the black unemployment rate rather than caused by the Texas prison expansion. Furthermore, the results suggest that the Texas prison expansion increased black wages in Texas.

The results show that the actual labor market equilibrium effect for both white and black workers in Texas from 1992 to 1996 is identical to the predicted labor market equilibrium effect presented in Figure 3.2 in chapter three. This means that the exogenous removal of prisoners from the Texas workforce decreased the number of workers in the Texas workforce, resulting in the labor supply shifting to the left, the labor demand not shifting at all, and the equilibrium shifting both upward and leftward. The equilibrium shift resulted in an employment decrease and a wage increase. Therefore, the labor market equilibrium model accurately predicted the effect of the 1993 Texas prison expansion on the labor market for Texas workers.

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