Crisis and Crime:
Examining the Effect of Macroeconomic Conditions on Criminal Activity During the Great Recession

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Abstract

What effect did declining macroeconomic conditions during the Great Recession have on criminal activity? Many criminologists and psychologists suggest that certain individuals, particularly low-income and low-education males, may be more inclined to engage in crime during periods of poor macroeconomic performance. If this theory is true, then economic policies become useful tools for governments to prevent crime. To test this Economic Theory of Crime, I regress various macroeconomic indicators such as unemployment rates and GDP per capita on property crime, violent crime, and total crime levels in each state. I also perform a split-sample analysis to determine if this hypothesized effect holds only for specific regions with the United States. Furthermore, much of the decline in the American economy occurred in the manufacturing and retail sectors. Therefore, I also examine if shifts in the industrial composition of a state's economy have a significant effect on the amount of crime in that state. Contrary to the Economic Theory of Crime, I find that declining macroeconomic conditions due to the 2008 recession such as rising unemployment rates and declining GDP per capita have no statistically significant effect on property, violent, or total crime over the same time period. Because the hypothesized effect does not occur, I conclude that the Economic Theory of Crime does not hold during the Great Recession.

Acknowledgements

Introduction

What effect does a poor economy have on crime? Or more specifically, will declining macroeconomic conditions cause crime levels to increase? This question is often asked during periods of economic underperformance, such as the recession that occurred in the United States in 2008. Common intuition suggests that a bad economy will leave some out of work and will decrease annual income for many. Some criminologists and social scientists theorize that the rise of unemployment and decrease in income that results from a recession will cause crime levels to increase as some individuals turn to criminal activity to provide for their basic necessities. This theory is known as the Economic Theory of Crime. If this theory is correct, then policymakers have an even strong incentive to prevent recessions from occurring or lasting too long, as the poor economy will compound society's problems by driving crime levels up.

In this thesis, I will analyze the extent to which increases in state unemployment rates and decreases in state GDP per capita affected crime levels at the state level from 2003 to 2012. Like other research on this topic, I will examine the effects of unemployment and GDP per capita on violent, property, and total crime levels. However, I will also examine the effect of industry shifts on these crime levels. The 2008 recession disproportionately affected jobs in the manufacturing and retail sectors of many states. Unlike previous research, my analysis will determine if states that saw large declines in these two sectors saw significantly larger increases in crime than states where the relative importance of manufacturing and retail was unchanged. I also provide a split-sample analysis to determine if certain regions observe larger changes in crime due to the recession than other regions.

Contrary to common intuition, I find that rising unemployment rates and declining GDP

per capita have no statistically significant effect on crime levels at the state-year level. It is not easy to attribute this effect to potential endogeneity, as most accounts point to a negative effect, not a non-effect. For example, if states with low employment also have lower spending on anti-crime policies, this would produce a negative effect. Moreover, I have collected data on an exhaustive set of controls precisely to control for these potential omitted variables. Additionally, states that saw significant declines in their manufacturing and retail sectors did not observe significantly different effects on their crime levels. The regional analysis yields the same result, that declining macroeconomic conditions have no observable effect on crime during the period surrounding the Great Recession. These results indicate that the Economic Theory of Crime does not hold for this time period.

The remainder of the thesis is structured as follows. In the next section, I provide a literature review. Next, I provide background on criminal activity in the United States and its historical relationship with key economic variables. I then describe the theoretical mechanism that underlies my hypotheses, followed by the data and empirical strategy used in my analysis. I then turn to the main findings of my analysis. The final section concludes and discusses potential opportunities for future research on the topic.

Literature Review

There has been a significant amount of research conducted on the relationship between macroeconomic conditions and crime rates. Much of this research focuses on the unemployment rate, as it is presumed to give the most accurate depiction of the state of the labor market and the economy as a whole. The common intuition is that negative changes in the economy or the labor market will lead to increases in crime while positive changes will lead to decreases in crime.

This is known as the Economic Theory of Crime. It theorizes that an increase in unemployment (or other negative change in the macroeconomy or labor market) will lower the opportunity cost of engaging in criminal activity and that some individuals will now be willing to risk incarceration or other punishment in the pursuit of a big payoff from these illegal activities.

One paper that uses this theory is "Identifying the Effect of Unemployment on Crime" by Stephen Raphael and Rudolf Winter-Ebmer (Journal of Law and Economics, April 2001). Raphael and Winter-Ebmer examined unemployment and crime (both violent and property) data from 1971 to 1997 and concluded that a 1 percent decrease in the unemployment rate caused a decline in the property crime rate of between 1.6 and 2.4 percent, and that a 1 percent decrease in the unemployment rate causes a decline in the violent crime rate of one-half of a percent. They controlled extensively for what they called pro-cyclical variables such as alcohol consumption, drug use, and gun availability. According to their analysis, previous research had been unable to accurately quantify the unemployment-crime relationship because these factors had been excluded, causing the effect of unemployment on crime to be understated. They also used two instrumental variables for unemployment to avoid the possibility of reverse causality—that states with high crime rates will have fewer employable people and that it is actually crime rates that drive unemployment. Reverse causality of this kind would overstate the effect of unemployment on crime, so using instrumental variables enabled them to ensure that the effect was not skewed in either direction. They used state defense contracts and exposure to oil price shocks as two separate instrumental variables on the assumption that they can only affect state crime rates through their effect on the state's unemployment rate. They also control extensively for the effect of potential confounding variables such as the proportion of a state's population that is black, incarcerated, living in poverty, or living in metropolitan areas.

Like my research, Raphael and Winter-Ebmer's analysis examines unemployment and crime at the state-year level and controls for state and year fixed effects. They also break down crime into seven different felonies in two different categories: violent and property crimes (based on the format of the FBI's Uniform Crime Reports). However, my research focuses on the time period surrounding the 2008 recession instead of the 1980s and 1990s when crime rates largely followed the same general trend as unemployment rates. In addition to using state unemployment rates, I further disaggregate employment into five main economic sectors (based on data from the BLS's Quarterly Census of Employment and Wages) and attempt to determine if shifts in the industrial composition of a state's economy have an effect on crime at the state level.

Another influential piece of research on this topic was conducted by Eric Gould, Bruce Weinberg, and David Mustard. Their paper was titled, "Crime Rates and Local Labor Market Opportunities in the United States: 1979-1997", and like Raphael and Winter-Ebmer's research, it considers the unemployment-crime relationship during the 1980s and 1990s. However, this paper identifies crime as a function of employment and wage opportunities specifically for young, unskilled men. They argue that young men with low education levels are the most likely segment of the general population to commit crimes and be influenced by lowered opportunity costs for criminal activity. If the unemployment rate rises or the average annual wage decreases for this group, they predict a corresponding increase in the crime rate. Their results also demonstrate that this relationship is strongest for property crime rates and only weak for violent crime rates.

This research differs more substantially from my own in that the unit of analysis in this regression is not at the state level but the county and individual levels. While I use GDP per capita as a measure for personal income, their research actually records income measurements

for individuals. For that reason, Gould, Weinberg, and Mustard have to control for not just county and year fixed effects, but also variations in individual observations such as education levels and levels of parental care. They also explain that crime rates have very low-frequency variation, so they analyze a 10-year change (1979-1989) in order to examine how unemployment and crime rates trend over time. Unlike other research on this topic, this paper actually considers the annual income for workers in the retail industry, but only as a control for reverse causality at the county level. My own research seeks to build on this use of data at the industry level and predict how changes in the industrial composition of a given state will affect crime in that state.

While the first two papers attempt to explain crime rates as a function of poor labor market conditions (high unemployment and low wages), Kristin Finklea's paper, "Economic Downturns and Crime", instead looks specifically at how the business cycle affects crime rates. She considers six recessions from 1960 to 2007 (not including the 2008 recession), and, unlike the previous two papers, concludes that unemployment rates and crime rates tend to diverge just as much as they converge. Thus, she disputes the Economic Theory of Crime and argues instead for a theory that emphasizes the availability of opportunities for crime. According to her theory, crime rates will not increase when unemployment rises if people stay home more often and if there are fewer high-value goods to steal or vandalize. Thus, crime is not directly linked to changes in unemployment in her analysis.

Unlike previous work on this topic and my own research, Finklea considers a multitude of measures of macroeconomic conditions such as unemployment, GDP, and consumer confidence. However, she argues that this data is aggregated at such a high level (national) that the observations are of too heterogeneous of a group to be able to say that changes in unemployment can accurately predict changes in crime. To illustrate this, she examined the

effect of high foreclosure rates during the first year of the 2008 recession and determined that a high concentration of foreclosed homes in a neighborhood will increase the availability of criminal opportunities and will likely lead to a higher crime rate. However, the extent to which the number of foreclosed homes affects the crime rate depends on the neighborhood, which is more likely to be a homogeneous group of people. She concludes that this availability of homes to be vandalized and burglarized is what can drive property crime rates up, not the state of the economy as a whole.

Perhaps the most extensive research on the unemployment-crime relationship during the 2008 recession was done by a criminologist, Christopher Uggen, in his paper, "Crime and the Great Recession". Unlike my research, which examines data as recent as 2012, Uggen's paper only considers 2007 to 2010, and he acknowledges that this limited time frame may not be comprehensive enough to observe the full effect that unemployment caused by the recession has on crime. Uggen also only observes data at the national level, and so he does not directly answer my research question by concluding that the increase in the national unemployment rate had little to no effect on national crime rates. Interestingly enough, Uggen actually found that the rate of decline in crime accelerated for six of the seven types of felonies (all except burglary). Based on this finding, he concludes that crime rates are likely more responsive to changes in other macroeconomic and social factors rather than just the state of the labor market. While he does not adopt another theory to explain the relationship between unemployment and crime, he explicitly argues against the Economic Theory of Crime. Additionally, Uggen includes data from the National Crime Victimization Survey, arguing that many crimes are not reported to the police and so the FBI's Uniform Crime Reports actually understate the amount of crime taking place. None of the other research on this topic, my own included, includes this second data set.

Finally, Jim Bisbee's paper, "Deviance and Government Capacity", attempts to provide empirical support for the Economic Theory of Crime by measuring the effect that income has on deviant behavior. Based on a county-level analysis from 1982 to 2007, he concludes that there is a statistically significant negative relationship between income and deviant behavior due to increased opportunity costs for criminal activity as income rises. While he does not consider Finklea's availability of opportunity theory, he does argue against the theory that crime rates decrease as income rises because governments will have increased revenue with which to better police communities. Thus, crime rates decrease not because government has a better capacity to deter and prevent crimes but because individuals have a disincentive to commit crimes as their incomes rise. By using trade shocks as an instrumental variable for income, he found that a 1 percent increase in net residential income causes a decline in property crimes by 6.4 offenses per 10,000 individuals, of which only 0.3 offenses are attributable to the government capacity channel.

Another piece of research that has proven important is Philip Cook and Gary Zarkin's paper, "Crime and the Business Cycle". They argue that there are four ways in which crime rates can be affected by recessions: employment opportunities, criminal opportunities, consumption of "criminogenic commodities" (alcohol, drugs, guns), and the response of the criminal justice system. Based on their analysis, crime rates should vary with the business cycle based on the number of employment opportunities as well as the availability of goods that complement criminal behavior (alcohol, drugs, and guns). Criminal opportunities can either increase or decrease during a recession depending on the prevalence of goods to steal and the amount of time that people spend at home. Furthermore, responses by the criminal justice system will vary between states based on tax revenues and effective policing. These four ways in which the

business cycle can affect crime form the basis for the different theories on the unemployment-crime relationship. My research primarily considers the first way, that poor employment opportunities will lead to increases in crime. I also consider the idea that changes in the criminal justice system can affect crime by controlling for police protection spending at the state level.
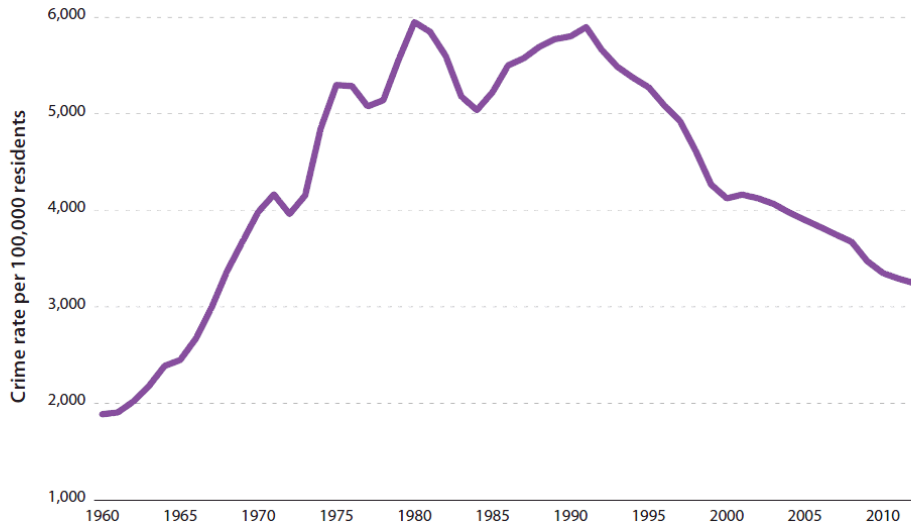
Background

Crime rates across the United States have been steadily declining since the early 1990s, including during and after the 2008 recession. Beginning in the 1960s, both violent and property crime rates began to rise, reaching their highest levels around 1980 and remaining high until the early 1990s. In the mid 1980s, the crack cocaine market began to expand to unprecedented levels, which many researchers have argued accelerated the rise of crime in the Unites States, particularly in urban cities. Since the mid 1990s, however, both violent and property crime rates have declined dramatically back to pre-1970 levels. Figure 1 below depicts the rise in crime beginning in 1960 before peaking in the early 1990s and then declining by 45 percent from 1990 to 2012. Figure 2 illustrates a similar pattern for both property and violent crime trends.

Figure 1:

Crime Rate in the United States, 1960–2012

After being particularly elevated during the 1970s and 1980s, the crime rate fell nearly 45 percent between 1990 and 2012.
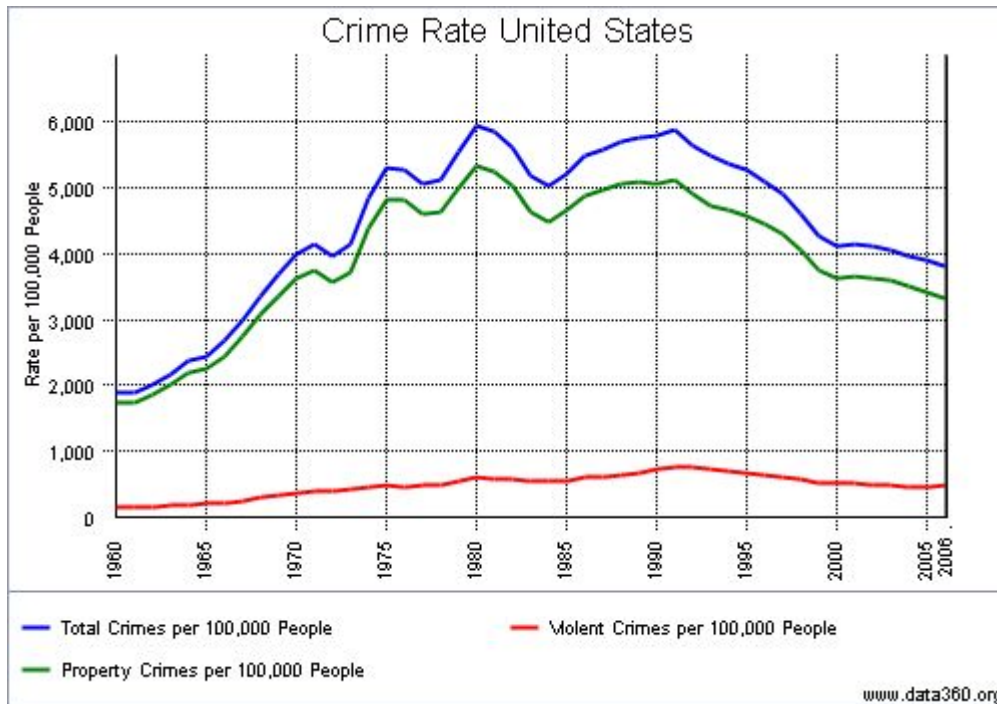
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Figure 2:

Crime Rate United States

- Total Crimes per 100,000 People
- Violent Crimes per 100,000 People
- Property Crimes per 100,000 People

www.data360.org

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Many theories have been offered to explain this sudden decline in crime beginning in the early 1990s, and it is likely that no one theory can explain this trend alone. Rather, the decline of crime in America is likely due to multiple factors including changes in law, police tactics, culture, and population demographics (as argued by Frank Zimring in his book, *The City That Became Safe*). In 1994, President Clinton signed the Violent Crime Control and Law Enforcement Act into law in an effort to increase federal funding for police departments, prisons, and crime prevention programs. Furthermore, many police departments began to practice hot-spot policing, a policy that concentrates law enforcement resources on high crime areas. Some cities, such as New York City under Mayor Giuliani, adopted the Broken Windows Theory to policing where small crimes such as vandalism and public drinking are more aggressively punished in an effort to create an environment of lawfulness and public order and prevent more serious crimes. Usage rates for drugs linked to violent crime, such as crack cocaine, also began to decline in the early 1990s. Finally, the American population began to age during the 1990s, and younger men are typically the demographic most likely to engage in criminal activity.

At the state level, there are several variables that can have a significant affect on the prevalence of crime. As previous research on this topic has demonstrated, macroeconomic variables such as unemployment and wages were powerful predictors of crime rates from the 1970s through the 1990s. My thesis will examine if this relationship between economic variables and crime continues to hold today. In addition to macroeconomic variables, the amount of money each state spends on education and policing can provide some explanation for why certain states have seen more drastic decreases in crime rates than other states. As discussed above, differences in drug usage rates can help explain differences in violent crime trends between states. In my analysis, I control for each of these non-economic variables in order to accurately quantify the

effect of each macroeconomic variable—unemployment, GDP per capita, and the relative size of key industries—on crime levels in each state.

Beginning in December of 2007, the United States entered a recession that would last 19 months until June of 2009 and would be described by the IMF as the worst global recession since the end of World War II. This recession has come to be known as the 2008 recession, or the Great Recession. At home, rapidly declining home prices triggered a subprime mortgage crisis that threatened the solvency of major American banks and resulted in record-setting drops in stock prices. Abroad, foreign banks and financial institutions faced similar problems and suffered from a decline in consumption by the United States. The combination of deteriorating domestic and foreign economic conditions resulted in a dramatic decline of the economic well being of most Americans, thus providing the conditions that the Economic Theory of Crime predicts will result in an increase in crime. Given this context of dramatic declines in macroeconomic conditions, we should expect to observe increases in criminal activity if the Economic Theory of Crime holds.

All three of my main economic predictors—unemployment, wages, and key industry importance—declined significantly during the Great Recession. The national unemployment rate rose from 5% in 2008 to over 10% by the end of 2009. 7 million Americans were considered unemployed in early 2008, but this figure had doubled to 15 million by 2009. To make matters worse, the official unemployment rate may not capture the full extent of the damage, as many workers simply stopped looking for work and dropped out of the labor force. Today, the labor force participation rate is at its lowest level since 1978. Additionally, wages have declined significantly for the average American worker. The median male worker earned an income of just over $32,000 in 2010, a figure roughly equivalent to the inflation-adjusted income of the

median male worker in 1968. The median household income declined from a peak of over

$52,000 in 2007 to $49,000 in 2010, a figure not seen since 1996. Furthermore, 95 percent of the

gains in income have gone to the wealthiest 1 percent of Americans since 2009. Thus, middle

and lower class Americans have been hurt not only by the recession but also by the recovery.

One of the defining characteristics of the 2008 recession is the effect that it had on certain

sectors of the American economy. Prior to the beginning of the recession in December 2007,

manufacturing and retail were the largest industries in 35 states. Health services was the largest

industry in 13 states, most of which were in the northeast. However, by the end of 2012,

manufacturing and retail were the largest industries in only 12 states, and health services had

become the largest industry in 35 states. The figures below from the Bureau of Labor Statistics

(BLS) depict this decline in manufacturing (blue) and retail (red) and the rise of health services

(orange) between 2007 and 2012. Accommodations and food service (purple) was the largest

industry in Nevada and Hawaii throughout the recession, and Washington DC continues to have

a large professional services industry (green).

Figure 3:

Major industries with highest employment, by state 2007

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- Manufacturing
- Retail trade
- Health care and social assistance
- Professional, scientific, and technical services
- Accommodation and food services
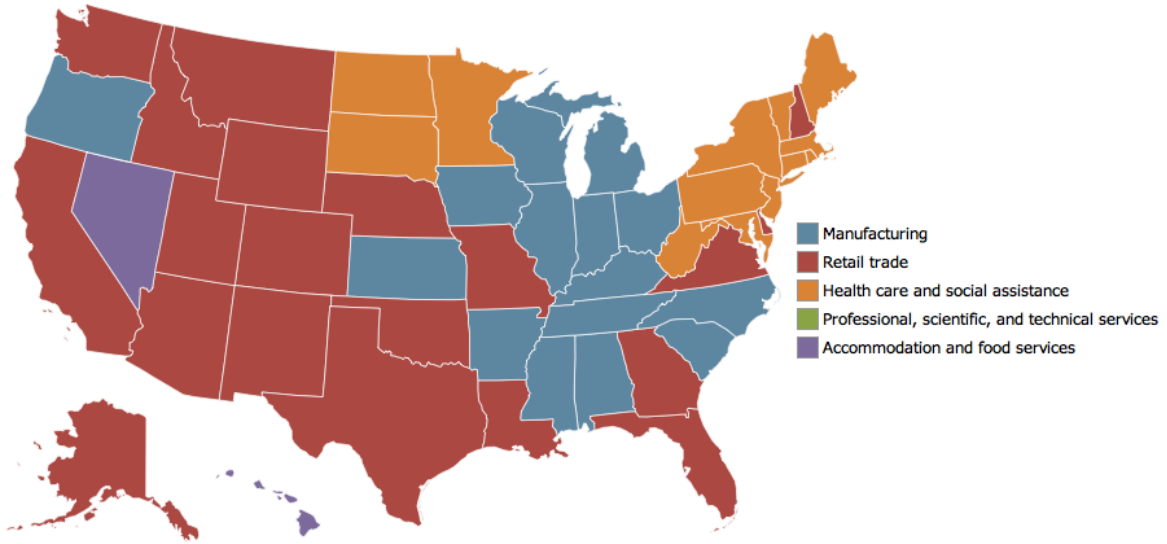
Figure 4:

Major industries with highest employment, by state 2012

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- Manufacturing
- Health care and social assistance
- Retail trade
- Professional, scientific, and technical services
- Accommodation and food services
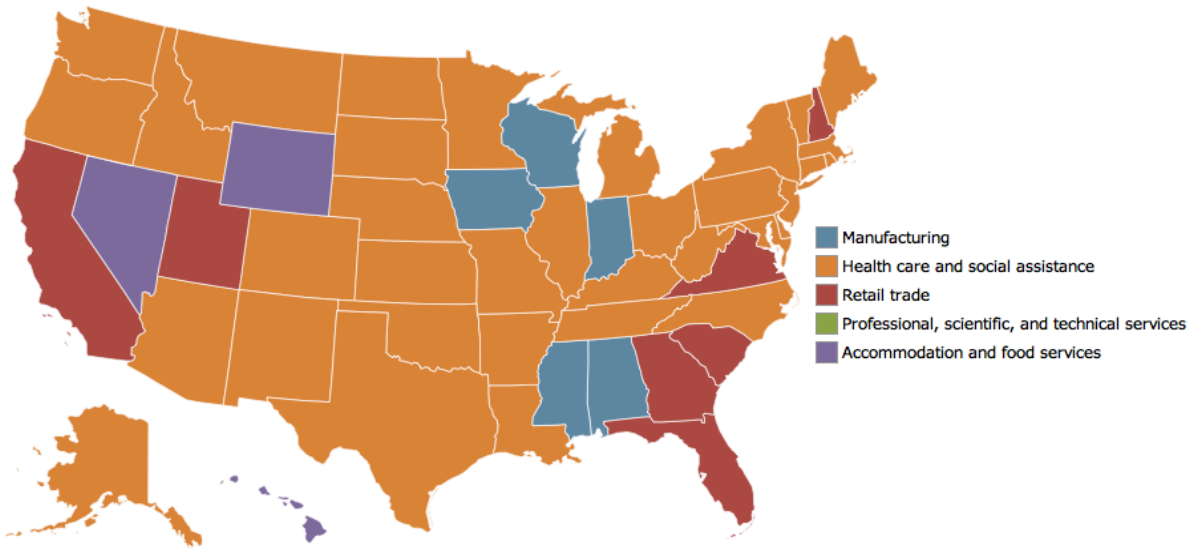
These figures do not show a dramatic increase in the number of health services jobs. Rather, they indicate that the manufacturing and retail industries largely collapsed across the United States due to the 2008 recession. While there was moderate growth in the health services industry from 2002-2013, the decline in manufacturing and retail jobs far outpaces the increase in health services jobs, resulting in high overall unemployment rates that lingered until well after the recession officially ended in June of 2009. The United States as a whole added approximately 1.5 million health services jobs from 2008-2012, but it lost nearly twice that many manufacturing and retail jobs in the same time span. My thesis will examine how these changes in the industrial composition of a state's economy affects crime levels in those states.

Theoretical Mechanisms

I hypothesize that declining macroeconomic conditions as a result of the 2008 recession will lead to an increase in property crimes but not violent crimes. As an economic indicator, the unemployment rate is said to be a leading indicator at the peak of the business cycle and a lagging indicator at the trough. As the recession officially began in December of 2007 and ended in June of 2009, the unemployment rate began to rise in the months leading up to the winter of 2007 and remained high long after the summer of 2009. This stagnantly high unemployment caused loss of employment and income for many Americans. If the Economic Theory of Crime is correct, then this decrease in employment and income will decrease the opportunity cost of criminal behavior for those who are unemployed. Based on rational calculation of the costs and benefits, the marginal benefit of crime has now been increased because unemployed individuals now need to find other ways to provide for their basic needs, and crime can provide a much more efficient way of satisfying these needs than trying to work multiple part-time jobs. If unemployed individuals calculate that the benefits of crime are now worth the potential costs of

being arrested or incarcerated, then they will turn to criminal behavior to provide for their basic needs that were once satisfied by employment.

Because violent crimes like murder and rape do not provide a source of income, unemployed individuals are unlikely to turn to violent crime. Committing murder does not provide any increased benefit now that a person is unemployed, and the costs of committing murder are still very high. The rational calculation of violent criminal activity is unchanged by changes in employment. Property crimes, on the other hand, do provide a source of income for newly unemployed people. Burglary, motor vehicle theft, and grand larceny can all provide very high income. Whereas employed individuals do not need this illegal source of income to provide for their basic needs, unemployed individuals have a substantial need for income. Unemployment causes the rational calculation of committing property crimes to move in favor of committing crime. If unemployed individuals believe that the benefits now outweigh the costs, then they will engage in committing property crimes.

In addition, much of the increase in unemployment affected individuals who, based on previous research, are already more likely to engage in criminal behavior. At the state level, many states underwent significant industry shifts as a result of the recession. Before the recession, many states had large manufacturing and retail industries that employed many lower and middle-class workers. However, the 2008 recession caused these industries to be completely wiped out in many states, causing many lower income and low-education workers to become unemployed. This loss of employment lowers the opportunity cost of criminal behavior for these individuals, and so these states should experience larger increases in crime than states that did not have large manufacturing or retail industries. States with small manufacturing or retail sectors still experienced increases in unemployment, but the shift in industry was not so severe

that it displaced many workers who were more likely to turn to crime.

Other theories on the causes of crime must be taken into account in my regression. Much of the previous research on the unemployment-crime relationship has suggested that certain social factors (education levels, expenditures on policing, drug and alcohol abuse rates) actually play a larger role in explaining variations in crime among the states. These social variables serve as control variables to ensure that variations among state crime levels are explained exclusively by variations in macroeconomic conditions (unemployment rate, GDP per capita, industry shifts) rather than by social factors.

My primary and secondary hypotheses are as follows:

Primary:

H_1: If the Economic Theory of Crime applies, then declining macroeconomic conditions in a given state will lead to increases in crime in that state.

Secondary:

H_2: If the Economic Theory of Crime applies, then increases in a state's unemployment or decreases in income will have no effect on the level of violent crime in that state.

H_3: If the Economic Theory of Crime applies, then increases in unemployment or decreases in income will lead to increases in the level of property crime in that state.

H_4: If the Economic Theory of Crime applies, then decreases in employment in manufacturing and retail will lead to larger increases in crime than decreases in employment in professional services, health services, and accommodations and food service.

Data

Dependent Variables

In my analysis, I use three dependent variables: aggregate crime, property crime, and violent crime. All crime data was obtained from the FBI's Uniform Crime Reports. Crime figures are presented in total number of crimes in a given state and are broken down into two categories: violent crimes and property crimes. Violent crimes include murder and non-negligent manslaughter, forcible rape, robbery, and aggravated assault. Property crimes include burglary, larceny theft, and motor vehicle theft. I also have data on these specific crime types. Aggregate crime is simply the sum of property crimes and violent crimes in a given state in a given year. Descriptive statistics for all three measures of crime are shown in the table below. All summary statistics include data from all 50 states plus the District of Columbia and cover the time period 2003-2012. Thus, my unit of analysis is the state-year.

Dependent Variable Summary Statistics					
	(1)	(2)	(3)	(4)	(5)
VARIABLES	Observations	Mean	Std. Dev.	Min	Max
Aggregate Crime	510	216,268.800	251,138.600	12,662	1,425,264
Property Crime	510	190,132.100	218,096.000	11,895	1,227,194
Violent Crime	510	26,136.730	34,049.610	493	205,551

Independent Variables

I use three variables as indicators of the strength of the economy in each state: the unemployment rate, GDP per capita, and the relative size of key industries. State unemployment rates are provided by the Bureau of Labor Statistics' Local Area Labor Statistics through the US

Department of Labor. They are calculated by taking the number of individuals who are not

employed but have taken active steps to seek employment in the last four weeks and dividing it

by the civilian labor force, or the number of non-military and non-institutionalized people who

are at least 16 years-old and looking for work. GDP per capita statistics are provided by the US

Department of Commerce's Bureau of Economic Analysis. A state's GDP per capita is defined

as the total output of all goods and services produced in that state divided by the state's

population. GDP per capita is often used as a measure of average income for a state's residents.

Finally, my data on the relative size of key industries in each state is provided by the Bureau of

Labor Statistics' Quarterly Census of Employment and Wages. I measure employment in five

key economic sectors: manufacturing, retail, health services (such as medical technicians and

insurance workers), professional services (such as doctors, lawyers, and business services), and

accommodations and food services. These are the five largest industries in the United States, and

the relative size of each industry in a given state can serve as a proxy for measuring the

economic wellbeing of certain social classes. Thus, this data is presented as percentages of the

state's total workforce. Summary statistics on these variables are presented in the table below.

	Independent Variable Summary Statistics				
	(1)	(2)	(3)	(4)	(5)
VARIABLES	Observations	Mean	Std. Dev.	Min	Max
Unemployment Rate	510	6.244	2.201	2.483	13.750
GDP per capita	510	48,813.84	18,985.56	30,333.00	177,934.00
Percent of employment in manufacturing	510	11.743	4.781	0.205	23.584
Percent of employment in retail	510	14.122	1.889	3.985	18.455
Percent of employment in health services	510	14.325	2.559	7.197	20.676
Percent of employment in professional services	510	14.405	3.852	7.912	32.722
Percent of employment in accomodation services	510	10.860	3.099	7.279	29.790

Control Variables

I incorporate several control variables into each of my specifications in order to rule out the possibility that social factors are confounding the quantitative relationship between the state of the economy and crime levels. First, I include data from the US Census Bureau on each state's expenditures for education and police protection. State expenditures are presented as the dollar amount spent on each item. These two variables control for the possibility that crime rates are influenced primarily by the quality of policing or the long-term economic potential of its people. I also incorporate data on alcohol and drug use rates for each state from the Substance Abuse and Mental Health Data Archive's (SAMHSA) National Survey on Drug Use and Health. This data is presented as the percentage of each state's population that responded "Yes" to a survey asking if they had used alcohol or any kind of illicit drug in the previous month. As much of the crime-related research of the 1980s and 1990s demonstrates, the presence of heavy drug or alcohol use has had significant effects on crime levels, and these controls ensure that no such affect occurs in my analysis. Unlike much of the other research on the economy-crime relationship, I include a control for the average weekly unemployment benefit amount (AWBA) disbursed by each state for those claiming Unemployment Insurance (UI). This data is provided by the US Department of Labor's Office of Unemployment Insurance through the Division of Fiscal and Actuarial Services. As my theoretical mechanism assumes that a decline in employment or wages will result in higher crime levels, this control ensures that the effect of a decline in employment or wages is not covered up by high UI benefits. Finally, I control for differences in state populations by adding in a variable for the log of population. This data is also provided by the FBI's Uniform Crime Report. Summary statistics on each of my control variables are presented in the table below.

VARIABLES	(1) Observations	(2) Mean	(3) Std. Dev.	(4) Min	(5) Max
Education Spending	500	10,300,000.00	11,800,000.00	838,579.00	75,000,000.00
Police Spending	500	256,113.90	274,105.80	10,349.00	1,683,827.00
Avg. Weekly Unemployment Benefits	510	276.326	51.015	171.410	424.610
Alcohol Usage (% of population who used in past month)	459	0.515	0.073	0.254	0.653
Drug Usage (% of population who used in past month)	459	0.085	0.018	0.041	0.156
Log. Population	510	15.093	1.036	13.125	17.454

Below, I provide correlation statistics between my primary economic indicators and total crime levels. As predicted by the Economic Theory of Crime, the relationship between crime and unemployment rates is positive, and the relationship between GDP per capita and crime is negative. The correlation coefficient, however, is relatively weak in both cases, likely because social factors also play a large role in determining the crime level. The correlation between industry size and crime is surprising because manufacturing employment and crime have a positive relationship whereas the Economic Theory of Crime predicts that an increase in manufacturing employment would result in less crime as more low and middle-income workers would be employed. Retail employment and crime have a negative correlation, and this coincides with my expectation, as fewer low-income jobs should result in higher crime levels.

Correlation: Crime and Unemployment Rate

	Aggregate Crime	Unemployment Rate
Aggregate Crime	1	
Unemployment Rate	0.1853	1

Correlation: Crime and GDP per capita

	Aggregate Crime	GDP per capita
Aggregate Crime	1	
GDP per capita	-0.0684	1

Correlation: Crime and Industry Sizes						
	Aggregate Crime	Percent of employment in manufacturing	Percent of employment in retail	Percent of employment in health services	Percent of employment in professional services	Percent of employment in accomodation services
Aggregate Crime	1					
Percent of employment in manufacturing	0.0336	1				
Percent of employment in retail	-0.1649	0.2199	1			
Percent of employment in health services	-0.2413	0.0217	0.1646	1		
Percent of employment in professional services	0.2521	-0.4409	-0.7039	-0.2405	1	
Percent of employment in accomodation services	-0.1625	-0.4399	0.0184	-0.3647	-0.07	1

Empirical Approach

My primary specifications will be fixed-effect regressions examining indicators of the state of the economy in each state and their effect on the total amount of crime in that state. This will provide a direct answer for my primary hypothesis, that deteriorating macroeconomic conditions lead to increases in crime if the Economic Theory of Crime holds. My unit of analysis for each specification is the state-year, looking at all 50 states and the District of Columbia over the years 2003-2012. Thus, my regressions are using panel data. I also incorporate state fixed effects, year fixed effects, and state level trends into each specification. These added effects will control for changes in crime trends across time and within each state. These effects are absolutely necessary to include as crime levels have dramatically declined across the United States since the mid-1990s. They also control for certain time-invariant factors such as racial demographics that vary between states but can have an impact on the crime level that is normal within each state.

To fully determine the effect that changes in economic conditions have on criminal behavior, I also perform regression specifications using both property crime and violent crime as dependent variables. As my theoretical mechanism argues that poor economic conditions drive individuals to commit crimes in order to satisfy their basic needs, I expect to observe more

statistically significant effects on property crime than on violent crime.

I first use my three primary economic indicators—unemployment rate, GDP per capita, and the relative size of key industries—in specifications with each of the three measures of crime, but I also perform regional analyses with unemployment rates and industry sizes to determine if certain regions of the United States are affected by changes in the economy more than other regions. I also perform a regression in which I interact unemployment with the average weekly unemployment benefit amount (AWBA) to determine if states with higher benefit levels see different effects on crime than states with lower benefit levels. Finally, I generate a 1-year lag variable for each of the five major economic sectors and run a specification to determine if the impacts of industry shifts on crime have a delayed effect.

I employ several controls to ensure that changes in criminal activity are exclusively caused by changes in the economy. Previous research on this topic has suggested that social factors such as education spending, policing, population, and drug and alcohol use rates can have a significant impact on variations in crime levels. I control for all of these in addition to the average amount of UI benefits disbursed by each state to ensure that my results are not skewed by these social factors and that my analysis truly isolates the effect of economic conditions on crime levels. In each specification, these control variables are listed after the main independent variables.

Each of my specifications is listed below. Each of my specifications includes state and year fixed effects as well as state level trends. Standard errors for each specification are clustered at the state level. My three primary specifications are listed below where Y represents each of my three measures of crime. The Greek letter α denotes the quantitative effect of each variable

on crime. The subscripts S and T denote the state and year of each variable measurement. ε denotes the error term. δ_t denotes year-fixed effects, and β_s denotes state-fixed effects. $\beta_s t$ denotes state-level trends.

My regional specifications are conducted as a split-sample analysis with each regression being run separately using a command to specify which regions to include. These specifications are run with both unemployment rates and industry sizes (also the first and third specifications listed below). States are divided into six regions: West, Southwest, Southeast, New England, Midwest, and Mid-Atlantic.

1. $Y_{st} = \alpha_1(\text{Unemployment Rate}_{st}) + \alpha_2(\text{Education Spending}_{st}) + \alpha_3(\text{Police Spending}_{st}) + \alpha_4(\text{Avg. Weekly Benefit Amount}_{st}) + \alpha_5(\text{Alcohol Use Rate}_{st}) + \alpha_6(\text{Drug Use Rate}_{st}) + \alpha_7(\text{Log. Population}_{st}) + \delta_t + \beta_s + \beta_s t + \varepsilon_{st}$

2. $Y_{st} = \alpha_1(\text{GDP per capita}_{st}) + \alpha_2(\text{Education Spending}_{st}) + \alpha_3(\text{Police Spending}_{st}) + \alpha_4(\text{Avg. Weekly Benefit Amount}_{st}) + \alpha_5(\text{Alcohol Use Rate}_{st}) + \alpha_6(\text{Drug Use Rate}_{st}) + \alpha_7(\text{Log. Population}_{st}) + \delta_t + \beta_s + \beta_s t + \varepsilon_{st}$

3. $Y_{st} = \alpha_1(\text{Percent of employment in manufacturing}_{st}) + \alpha_2(\text{Percent of employment in retail}_{st}) + \alpha_3(\text{Percent of employment in health services}_{st}) + \alpha_4(\text{Percent of employment in professional services}_{st}) + \alpha_5(\text{Percent of employment in accommodation services}_{st}) + \alpha_6(\text{Education Spending}_{st}) + \alpha_7(\text{Police Spending}_{st}) + \alpha_8(\text{Avg. Weekly Benefit Amount}_{st}) + \alpha_9(\text{Alcohol Use Rate}_{st}) + \alpha_{10}(\text{Drug Use Rate}_{st}) + \alpha_{11}(\text{Log. Population}_{st}) + \delta_t + \beta_s + \beta_s t + \varepsilon_{st}$

I also run a specification including a 1-year lag effect of industry sizes on all three crime levels. This regression accounts for the possibility that some individuals who become unemployed or lose pay due to industry shifts will initially attempt to find work at a different

company or in a different industry, and thus the effect on crime levels may be delayed. Subscripts t+1 in the specification below denote the lag effect.

4. $Y_{st} = \alpha_1(\text{Percent of employment in manufacturing}_{st}) + \alpha_2(\text{Lag. Percent of employment in manufacturing}_{st+1}) + \alpha_3(\text{Percent of employment in retail}_{st}) + \alpha_4(\text{Lag. Percent of employment in retail}_{st+1}) + \alpha_5(\text{Percent of employment in health services}_{st}) + \alpha_6(\text{Lag. Percent of employment in health services}_{st+1}) + \alpha_7(\text{Percent of employment in professional services}_{st}) + \alpha_8(\text{Lag. Percent of employment in professional services}_{st+1}) + \alpha_9(\text{Percent of employment in accommodation services}_{st}) + \alpha_{10}(\text{Lag. Percent of employment in accommodation services}_{st+1}) + \alpha_{11}(\text{Education Spending}_{st}) + \alpha_{12}(\text{Police Spending}_{st}) + \alpha_{13}(\text{Avg. Weekly Benefit Amount}_{st}) + \alpha_{14}(\text{Alcohol Use Rate}_{st}) + \alpha_{15}(\text{Drug Use Rate}_{st}) + \alpha_{16}(\text{Log. Population}_{st}) + \delta_t + \beta_s + \beta_s t + \varepsilon_{st}$

Finally, I generate an interaction term between unemployment rates and the average weekly unemployment benefit amount (AWBA) to determine if changes in unemployment rates have different effects in states with larger UI benefits than in states with smaller benefits. This specification is run with all three measures of crime and is listed below.

5. $Y_{st} = \alpha_1(\text{Unemployment Rate}_{st}) + \alpha_2(\text{Unemployment Rate}_{st} \times \text{Avg. Weekly Benefit Amount}_{st}) + \alpha_3(\text{Avg. Weekly Benefit Amount}_{st}) + \alpha_4(\text{Education Spending}_{st}) + \alpha_5(\text{Police Spending}_{st}) + \alpha_6(\text{Alcohol Use Rate}_{st}) + \alpha_7(\text{Drug Use Rate}_{st}) + \alpha_8(\text{Log. Population}_{st}) + \delta_t + \beta_s + \beta_s t + \varepsilon_{st}$

Results

The Economic Theory of Crime predicts that declining macroeconomic conditions, such as increases in unemployment or declining wages, will result in higher crime levels. This hypothesized effect is said to occur due to the declining opportunity cost of criminal activity for certain low-income or low-education individuals who are more predisposed to crime than the rest of society. Because this theory predicts that individuals turn to crime in order to satisfy their basic needs that were once met by employment or higher wages, I expect to observe higher property crime levels but not violent crime levels. Furthermore, I consider the possibility that unemployment in certain economic sectors is more likely to influence crime levels than unemployment in other industries. For example, it seems more plausible that a laid-off factory worker turns to crime than a laid-off doctor or lawyer. Thus, to answer my primary hypothesis, I test each of these economic indicators—unemployment rates, GDP per capita, and the relative size of key industries—to see if they have a significant causal effect on crime levels. In Table 1 below, I regress each of these economic indicators on aggregate crime. Table 2 shows the effect that each indicator has on property crime, and table 3 does the same with violent crime.

Table 1: Economic Indicators and Aggregate Crime			
VARIABLES	(1) Aggregate Crime	(2) Aggregate Crime	(3) Aggregate Crime
Unemployment Rate	-1,470.194		
	(1,764.639)		
GDP per capita		-0.170	
		(0.515)	
Percent of employment in manufacturing			-2,995.188
			(3,665.614)
Percent of employmen in retail			-705.318
			(4,743.963)
Percent of employment in health services			3,553.560
			(3,643.808)
Percent of employment in professional services			-5,288.821
			(5,470.260)
Percent of employment in accomodation services			-2,639.774
			(4,743.609)
Education Spending	-0.000	-0.000	-0.000
	(0.003)	(0.003)	(0.003)
Police Spending	-0.058	-0.057	-0.055
	(0.039)	(0.040)	(0.037)
Avg. Weekly Unemployment Benefits	10.770	12.682	14.182
	(92.551)	(94.415)	(94.063)
Alcohol Usage	20,255.859	18,250.317	13,102.178
	(38,808.332)	(38,553.195)	(34,423.977)
Drug Usage	-17,956.677	-26,563.391	-38,959.040
	(61,320.308)	(59,325.043)	(67,697.531)
Log. Population	130,271.480*	140,158.571*	122,190.539*
	(69,426.787)	(71,168.895)	(64,948.268)
Observations	450	450	450
Number of states	50	50	50
R-squared	0.820	0.819	0.824
State fixed effects	Y	Y	Y
State level trends	Y	Y	Y
Year fixed effects	Y	Y	Y

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Note: Standard errors clustered at the state level are shown in parentheses.

Table 2: Economic Indicators and Property Crime

VARIABLES	(1) Property Crime	(2) Property Crime	(3) Property Crime
Unemployment Rate	-1,056.743		
	(1,653.445)		
GDP per capita		-0.230	
		(0.433)	
Percent of employment in manufacturing			-2,232.261
			(3,322.257)
Percent of employment in retail			-120.540
			(4,016.058)
Percent of employment in health services			3,895.464
			(3,138.647)
Percent of employment in professional services			-4,937.057
			(4,745.878)
Percent of employment in accomodation services			-2,933.907
			(4,067.404)
Education Spending	-0.001	-0.001	-0.001
	(0.003)	(0.003)	(0.003)
Police Spending	-0.053	-0.052	-0.050
	(0.039)	(0.040)	(0.038)
Avg. Weekly Unemployment Benefits	9.294	11.407	10.988
	(91.195)	(92.924)	(92.164)
Alcohol Usage	14,485.741	13,022.032	7,091.613
	(32,723.877)	(32,649.573)	(29,388.417)
Drug Usage	-22,664.299	-29,002.675	-42,148.959
	(51,592.358)	(50,166.451)	(58,067.254)
Log. Population	101,859.242*	111,122.910*	98,163.620*
	(58,825.895)	(60,526.125)	(50,901.928)
Observations	450	450	450
Number of states	50	50	50
R-squared	0.806	0.806	0.811
State fixed effects	Y	Y	Y
State level trends	Y	Y	Y
Year fixed effects	Y	Y	Y

*** p<0.01, ** p<0.05, * p<0.1

Note: Standard errors clustered at the state level are shown in parentheses.

Table 3: Economic Indicators and Violent Crime

VARIABLES	(1) Violent Crime	(2) Violent Crime	(3) Violent Crime
Unemployment Rate	-413.451*		
	(241.988)		
GDP per capita		0.060	
		(0.140)	
Percent of employment in manufacturing			-762.928*
			(450.373)
Percent of employment in retail			-584.778
			(1,167.791)
Percent of employment in health services			-341.904
			(825.263)
Percent of employment in professional services			-351.764
			(845.879)
Percent of employment in accomodation services			294.133
			(1,009.826)
Education Spending	0.001	0.001	0.001
	(0.000)	(0.000)	(0.000)
Police Spending	-0.005	-0.005	-0.005
	(0.005)	(0.005)	(0.004)
Avg. Weekly Unemployment Benefits	1.476	1.276	3.193
	(12.979)	(12.927)	(13.846)
Alcohol Usage	5,770.118	5,228.285	6,010.565
	(8,023.516)	(7,906.647)	(7,374.980)
Drug Usage	4,707.622	2,439.284	3,189.918
	(16,214.022)	(15,829.302)	(15,677.052)
Log. Population	28,412.238	29,035.661	24,026.918
	(21,980.289)	(22,738.037)	(24,135.071)
Observations	450	450	450
Number of states	50	50	50
R-squared	0.799	0.796	0.798
State fixed effects	Y	Y	Y
State level trends	Y	Y	Y
Year fixed effects	Y	Y	Y

*** p<0.01, ** p<0.05, * p<0.1

Note: Standard errors clustered at the state level are shown in parentheses.

As shown in Table 1 above, none of my economic indicators have a statistically significant effect on aggregate crime. Even after controlling extensively for social factors such as education spending, policing, and unemployment benefit levels, large increases in unemployment and decreases in GDP per capita appear to have no significant effect on overall crime. A 1 percent increase in the unemployment rate actually results in a decrease in aggregate crime by 1,470 crimes, but the mean of aggregate crime is over 216,000, so this effect is insignifacant and miniscule. A $1 increase in GDP per capita results in a drop in aggregate crime by .17 crimes, but again, this effect is very small relative to the means of GDP per capita and aggregate crime. A 1 percent increase in the size of manufacturing and retail sectors leads to a decrease in aggregate crime by 2,995 and 705 crimes respectively, but these effects are insignificant compared to the mean of aggregate crime. Of these key economic indicators, GDP per capita and industry sizes effect crime in the direction predicted by the Economic Theory of Crime, but unemployment rates appear to work against the Economic Theory of Crime. Thus, my analysis does not appear to support my primary hypothesis that declining economic conditions results in higher crime levels.

It also seems to refute my fourth hypothesis, that decreases in employment in manufacturing and retail will lead to larger increases in crime than decreases in other industries. Decreases in employment in professional and accommodation services result in large but statistically insignificant increases in crime, but decreases in healths services employment will actually result in an increase in crime. Again, none of these effects are statistically significant. However, I should observe increases in crime alongside decreases in manufacturing and retail if the Economic Theory of Crime holds.

The same results are true for each specification where an economic variable is regressed

on property crime. None of the economic indicators have a statistically significant effect on property crime levels. Once again, unemployment rates actually have a negative relationship with property crime whereas the Economic Theory of Crime hypothesizes that increases in unemployment should result in increases in crime. My analysis shows that a 1 percent increase in the unemployment rate results in a decrease in property crime by 1,056 crimes. Once again, the Economic Theory of Crime correctly predicts that GDP per capita and industry sizes will have a negative relationship with crime A $1 increase in GDP per capita results in a drop in property crime by .23 crimes, but this result is not statistically significant either. Finally, a 1 percent increase in the relative size of manufacturing and retail sectors results in a decrease in property crime by 2,232 and 120 crimes respectively. None of these results, however, are statistically significant. Because the mean of property crime is so high (over 190,000), these small effects are irrelevant, thus providing no support for my third hypothesis.

My regressions involving violent crime produce two interesting results, one that coincides with the Economic Theory of Crime and one that contradicts it. While GDP per capita has no statistically significant effect on violent crime levels (as my second hypothesis predicts), unemployment rates actually have a statistically significant negative relationship with violent crime at the 10 percent significance level. A 1 percent increase in the unemployment rate results in a decrease in violent crime by 413 crimes. Because the mean of violent crime (26,000) is much smaller than that of property crime (216,000), this effect is significant. However, it is very unexpected. The Economic Theory of Crime predicts that changes in the state of the economy should have no effect on violent crime as violent crime is traditionally not understood to be motivated by economic necessity. However, this analysis demonstrates that declining economic conditions will actually lead to a decrease in violent crime. One possible explanation for this

effect is that the individuals who are most likely to commit violent crimes are actually committing property crimes during periods of economic decline to satisfy their basic needs. Thus, offenders actually commit a lower level of crime during recessions because violent crime will not provide for their needs during bad economic times in the same way as property crime.

The other interesting result is that the relative size of manufacturing industries has a statistically significant negative effect on violent crime at the 10 percent significance level. A 1 percent increase in the relative size of manufacturing results in a decrease in violent crime by 762 crimes. While the Economic Theory of Crime predicts that changes in the state of the economy should have no effect on violent crime levels, it is possible that an increase in manufacturing employment, which provides well-paying jobs for many low-income low-education men who might otherwise turn to crime, creates more stability in the lives of those who would commit violent crimes. Thus, this explanation does not work by raising the opportunity cost of criminal activity (as the Economic Theory of Crime does) but by creating a stable environment that prevents individuals from living in unstable states of mind that could motivate them to commit violent crimes. Regardless of the explanation, these two results both refute my third hypothesis, that economic declines have no effect on violent crime levels.

Next, I perform a split-sample analysis where states are grouped into six different regions, and I determine if changes in unemployment or industry sizes have varying effects on crime levels depending on the region in which they occur. Results for these specifications are presented in Tables 4 and 5 below.

Table 4: Regional Unemployment and Aggregate Crime

VARIABLES	(1) Aggregate Crime (West)	(2) Aggregate Crime (Southwest)	(3) Aggregate Crime (Southeast)	(4) Aggregate Crime (New England)	(5) Aggregate Crime (Midwest)	(6) Aggregate Crime (Mid Atlantic)
Unemployment Rate	-3,593.461	-15,635.270	256.720	391.434	-132.870	9,174.352
	(2,889.748)	(11,620.420)	(3,220.137)	(681.390)	(1,753.628)	(5,884.590)
Education Spending	-0.005***	0.003	0.012**	0.000	0.001	-0.002
	(0.001)	(0.004)	(0.005)	(0.001)	(0.003)	(0.001)
Police Spending	-0.142***	0.124	-0.040	0.013	0.007	-0.017
	(0.017)	(0.166)	(0.089)	(0.009)	(0.026)	(0.012)
Avg. Weekly Unemployment Benefits	43.579	40.972	-84.037	142.239	51.883	90.513
	(146.853)	(233.805)	(117.487)	(81.808)	(155.945)	(220.548)
Alcohol Usage	-27,165.347	-154,886.590	98,060.487	17,927.243	-3,758.681	-20,900.889
	(66,308.933)	(326,842.221)	(75,633.841)	(27,777.230)	(116,722.669)	(81,218.013)
Drug Usage	-65,531.795	368,634.042	-27,798.626	725.519	19,962.088	296,999.049
	(71,806.384)	(580,396.817)	(243,500.037)	(30,530.782)	(249,618.365)	(305,431.465)
Log. Population	52,509.608	-61,104.514	216,865.196*	85,602.159	196,885.507	-709,086.026*
	(148,730.400)	(356,471.480)	(103,870.553)	(126,366.258)	(197,417.181)	(326,921.230)
Observations	99	36	108	54	108	45
Number of states	11	4	12	6	12	5
R-squared	0.940	0.860	0.769	0.878	0.914	0.939
State fixed effects	Y	Y	Y	Y	Y	Y
State level trends	Y	Y	Y	Y	Y	Y
Year fixed effects	Y	Y	Y	Y	Y	Y

*** p<0.01, ** p<0.05, * p<0.1

Note: Standard errors clustered at the state level are shown in parentheses.

Table 5: Industry Employment by Region

VARIABLES	(1) Aggregate Crime (West)	(2) Aggregate Crime (Southwest)	(3) Aggregate Crime (Southeast)	(4) Aggregate Crime (New England)	(5) Aggregate Crime (Midwest)	(6) Aggregate Crime (Mid Atlantic)
Percent of employment in manufacturing	-2,834.355	50,831.491	3,180.801	-593.409	604.521	-2,191.974
	(8,669.419)	(158,233.953)	(4,618.862)	(3,329.570)	(3,223.496)	(15,999.030)
Percent of employment in retail	25,234.573**	78,350.448	-16,047.430	-1,702.022	5,879.246	-14,678.155
	(9,159.243)	(108,840.784)	(12,330.321)	(3,448.771)	(9,252.019)	(28,819.276)
Percent of employment in health services	7,155.300	-49,485.413	9,605.455	-2,748.678	4,488.374	-9,741.009
	(9,253.083)	(100,102.260)	(9,383.952)	(3,328.003)	(6,516.769)	(13,145.613)
Percent of employment in professional services	5,226.555	3,172.840	-27,269.830**	-3,794.284**	-2,692.112	-4,036.065
	(9,725.011)	(5,946.794)	(9,292.173)	(1,132.786)	(5,114.286)	(10,140.359)
Percent of employment in accomodation services	-18,328.551***	116,674.401	-21,796.748	449.212	8,185.445	21,471.933
	(4,369.963)	(123,435.418)	(13,657.287)	(5,189.259)	(11,692.807)	(35,553.201)
Education Spending	-0.005***	0.006*	0.009***	0.001	0.001	-0.002
	(0.001)	(0.002)	(0.003)	(0.001)	(0.003)	(0.001)
Police Spending	-0.133***	-0.059	0.012	0.007	-0.011	-0.020
	(0.014)	(0.254)	(0.041)	(0.008)	(0.019)	(0.012)
Avg. Weekly Unemployment Benefits	-16.483	241.740	-7.442	106.788	54.774	266.440
	(177.538)	(256.939)	(81.442)	(66.707)	(128.888)	(254.368)
Alcohol Usage	-35,438.753	99,929.057	111,030.568	15,276.317	-1,720.254	49,188.804
	(52,861.535)	(310,757.067)	(72,246.377)	(32,483.257)	(103,676.136)	(134,616.356)
Drug Usage	-111,180.846	-273,037.178	-154,683.075	26,762.649	60,187.827	388,158.071
	(71,583.161)	(537,039.405)	(221,318.349)	(56,558.012)	(197,313.929)	(270,543.161)
Log. Population	-1,497.482	-764,276.925	175,801.923	112,073.032	304,520.782	-422,167.878
	(98,007.528)	(716,819.848)	(149,892.191)	(117,252.854)	(271,462.355)	(569,048.717)
Observations	99	36	108	54	108	45
Number of states	11	4	12	6	12	5
R-squared	0.947	0.898	0.834	0.896	0.924	0.942
State fixed effects	Y	Y	Y	Y	Y	Y
State level trends	Y	Y	Y	Y	Y	Y
Year fixed effects	Y	Y	Y	Y	Y	Y

*** p<0.01, ** p<0.05, * p<0.1

Note: Standard errors clustered at the state level are shown in parentheses.

As shown in Table 4 above, unemployment has no statistically significant effect on aggregate crime levels in any of the six regions. However, unemployment has a negative relationship with crime in the West, Southwest, and Midwest states while it has a positive relationship with crime in the Southeast, New England, and Mid Atlantic states. The only regions where unemployment seems to have a larger effect on crime are the Southwest and Mid Atlantic states. In the Southwest, a 1 percent increase in unemployment leads to a decline in crime by 15,635 crimes. This result is likely not statistically significant because the standard deviation of crime in this region is very large (11,620). The same is true of the Mid Atlantic, where the standard deviation is 5,884. However, a 1 percent increase in unemployment in the Midwest leads to an increase in crime by 9,174 crimes in those states. If the Economic Theory of Crime held over this time period, I would expect to observe positive relationships between unemployment and crime for all six regions. Because no such relationship is observed, this evidence casts doubt on the Economic Theory of Crime holding for this time period.

Table 5 considers the possibility that the declining employment in certain industries has a greater effect on crime in certain regions of the United States than in others. Because the 2008 recession saw a dramatic decline in America's manufacturing sector, which provided jobs for thousands of low and middle-income individuals, I expected to observe significant increases in crime in regions where manufacturing was a key industry, such as the Midwest. However, no such phenomenon occurred. While changes in manufacturing employment have varying effects on crime in different regions, none of these effects are statistically significant.

Retail employment actually has a positive relationship with crime in the West. In the West, a 1 percent increase in retail employment as a percentage of total employment leads to an increase in aggregate crime by 25,234 crimes. This appears to contradict the Economic Theory of

Crime, as increases in retail employment should result in lower crime as more low-income individuals find employment in the retail industry. However, many states in the West, such as California and Hawaii, have very large accommodation service businesses. It is possible that the recession laid off many individuals employed in the accommodations industry, thereby forcing them to find employment in retail, which often pays less. Thus, growth in retail in the West can be seen as a poor substitute for accommodation service jobs, and an increase in retail employment can lead to an increase in crime in this way. In fact, accommodation service employment has a very statistically significant negative effect on crime at the 1 percent significance level in the West. A 1 percent increase in accommodation service employment results in a decrease in aggregate crime by 18,328 crimes. Taken together, a decrease in accommodation service employment and a corresponding rise in retail employment can lead to lower wages for low-income workers and thus a higher crime level. Therefore, these results do not necessarily contradict the Economic Theory of Crime.

In New England and in the Southeast, professional services employment has a statistically significant negative effect on crime at the 5 percent significance level. A 1 percent increase in professional services employment results in a decrease in aggregate crime by 27,269 crimes in the Southeast and by 3,794 crimes in New England. This result provides some support for the Economic Theory of Crime because a decrease in employment will result in an increase in crime. However, the Economic Theory of Crime predicts that increases in crime will result from decreases in employment in lower income industries, not high income industries like professional services. Thus, this data provides some support for my primary hypothesis but not in the way in which the Economic Theory of Crime anticipates.

Table 6 below considers the possibility that declining employment may have a delayed

effect on crime levels. This specification provides the strongest support for my fourth hypothesis, as an increase in retail employment results in a decrease in both aggregate crime and property crime.

Table 6: Industry Employment including 1-year lag

VARIABLES	(1) Aggregate Crime	(2) Property Crime	(3) Violent Crime
Percent of employment in manufacturing	-364.728	-151.246	-213.482
	(4,474.740)	(4,147.295)	(446.198)
Lag. Percent of employment in manufacturing	-6,479.750	-5,656.010	-823.740
	(4,515.254)	(4,000.280)	(776.173)
Percent of employment in retail	4,492.145	4,567.532	-75.387
	(4,699.155)	(4,219.158)	(1,029.136)
Lag. Percent of employment in retail	-14,164.484*	-13,018.782*	-1,145.703
	(7,755.356)	(6,691.462)	(1,471.975)
Percent of employment in health services	11,792.212	10,787.657	1,004.555
	(9,442.926)	(7,938.385)	(1,634.375)
Lag. Percent of employment in health services	-9,227.271	-7,130.768	-2,096.503
	(11,840.834)	(9,699.663)	(2,351.892)
Percent of employment in professional services	-4,226.335	-2,582.510	-1,643.826
	(6,854.176)	(6,011.002)	(995.090)
Lag. Percent of employment in professional services	1,018.955	-521.818	1,540.773
	(4,599.211)	(3,997.023)	(949.479)
Percent of employment in accomodation services	6,273.393	5,630.157	643.236
	(5,059.276)	(4,644.393)	(1,134.120)
Lag. Percent of employment in accomodation services	-8,442.772	-8,045.608	-397.164
	(5,828.449)	(5,668.195)	(639.069)
Education Spending	0.000	-0.000	0.000
	(0.003)	(0.003)	(0.000)
Police Spending	-0.067	-0.069	0.002
	(0.064)	(0.062)	(0.004)
Avg. Weekly Unemployment Benefits	-37.127	-39.226	2.099
	(160.292)	(147.588)	(20.643)
Alcohol Usage	6,699.752	-1,316.245	8,015.998
	(45,255.714)	(39,266.845)	(8,378.222)
Drug Usage	-15,435.796	-15,686.175	250.379
	(73,306.411)	(64,476.610)	(14,308.277)
Log. Population	-8,326.023	-6,473.311	-1,852.713
	(98,933.885)	(79,236.887)	(28,238.180)
Observations	400	400	400
Number of states	50	50	50
R-squared	0.808	0.790	0.827
State fixed effects	Y	Y	Y
State level trends	Y	Y	Y
Year fixed effects	Y	Y	Y

*** p<0.01, ** p<0.05, * p<0.1

Note: Standard errors clustered at the state level are shown in parentheses.

In the regressions above, a 1 percent increase in retail employment as a percentage of total employment will result in a decline in aggregate crime by 14,164 crimes and a decline in property crime by 13,018 crimes in the following year. These results are both statistically significant at the 10 percent significance level. This directly coincides with what the Economic Theory of Crime would predict, that an increase in employment in retail means that more low-income individuals (those most likely to commit crimes) are employed and, therefore, have a higher opportunity cost for engaging in criminal activity. However, the lag variable indicates that changes in the size of retail industries at the state level will have a delayed effect on both aggregate crime and property crime levels.

Finally, I consider in Table 7 below the possibility that changes in unemployment rates have varying effects on state crime levels depending on the amount of unemployment benefits paid out in those states. Using an interaction term of the state's unemployment rate and the state's average weekly unemployment benefit amount (AWBA), I observe that there is no statistically significant difference in effects depending on the size of the benefit payment. The Economic Theory of Crime predicts that crime levels should increase as people are made economoically worse off. However, this analysis shows that states with less generous unemployment benefits do not observe stronger effects on crime when economic conditions decline. Once again, this regression appears to indicate that a statistically signifianct negative relationship exists between the unemployment rate and violent crime at the 10 percent significance level.

Table 7: Unemployment and Avg. Weekly Benefits

VARIABLES	(1) Aggregate Crime	(2) Property Crime	(3) Violent Crime
Unemployment Rate	-3,883.259*	-2,472.533	-1,410.726*
	(2,189.395)	(2,113.630)	(746.633)
Unemployment Rate x Avg. Weekly Unemployment Benefits	8.946	5.248	3.699
	(5.918)	(4.999)	(2.422)
Education Spending	-0.000	-0.001	0.001
	(0.003)	(0.003)	(0.000)
Police Spending	-0.058	-0.053	-0.005
	(0.039)	(0.040)	(0.005)
Alcohol Usage	18,165.049	13,149.809	5,015.240
	(39,783.858)	(33,690.860)	(7,822.288)
Drug Usage	-21,623.304	-24,560.590	2,937.286
	(62,332.212)	(52,792.901)	(15,663.757)
Log. Population	133,589.937*	104,168.374*	29,421.563
	(72,590.069)	(62,101.861)	(21,152.255)
Observations	450	450	450
Number of states	50	50	50
R-squared	0.821	0.807	0.802
State fixed effects	Y	Y	Y
State level trends	Y	Y	Y
Year fixed effects	Y	Y	Y

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Note: Standard errors clustered at the state level are shown in parentheses.

Conclusion

The Economic Theory of Crime predicts that declining macroeconomic conditions will result in higher crime levels. Specifically, it predicts that rising unemployment rates and declining GDP per capita will result in higher property crime levels and, because property crime constitutes a large majority of total crime, higher aggregate crime levels as well. Additionally, the Economic Theory of Crime predicts that declining employment in industries such as manufacturing and retail, the industries that provide jobs for mostly low and middle-income workers, will also result in higher crime levels. However, when considering the period of time

surrounding the Great Recession (2003-2012), crime statistics provide very little support for this theory and, therefore, for any of my original hypotheses.

After controlling extensively for social factors such as state expenditures on education and policing, drug and alcohol use, and the average amount of money disbursed by each state in unemployment benefits, none of the major economic indicators tested have a statistically significant effect on crime levels. In several instances, my economic variables seem to have an effect on crime that contradicts the Economic Theory of Crime, such as my specifications that regress unemployment rates and industry sizes on violent crime levels. Although this theory predicts that economic declines will have no effect on violent crime levels, my analysis seems to indicate that a negative relationship between unemployment and violent crime does in fact exist over this time period. Thus, this evidence seems to refute my first three hypotheses because declining economic conditions do not lead to higher overall crime or property crime levels, yet they do have significant effects on violent crime levels.

Regional analyses provided only mild support for the Economic Theory of Crime. While unemployment rates continued to have no significant effect on crime levels, shifts in the relative size of industries in Western states do provide significant results. Decreases in accommodation services employment and increases in retail employment both result in higher aggregate crime levels. It is possible that some workers are laid off from their higher-paying accommodation service job and must accept a lower-paying retail job. This constitutes a decline in wages and results in higher crime levels, just as the Economic Theory of Crime predicts. However, this is different from my original hypothesis that declines in retail employment will lead to higher crime. In this case, higher retail employment is associated with higher crime.

Finally, my specification that included a one-year lag for industry-specific employment

provided stronger support for the Economic Theory of Crime than any of my other specifications. Rising retail employment has a statistically significant negative effect on aggregate crime and property crime, but this effect is not observed until the year after the increase in employment occurs.

This evidence provides important insight for policymakers who attempt to respond to economic declines by stimulating economic activity or creating an environment where businesses are more likely to hire new employees. While common intuition would suggest that a recession is likely to result in higher crime levels as more Americans lose their jobs or see their wages reduced, the data simply does not support this intuition. Stimulus policies that were passed into law on the grounds that they are necessary to maintaining social order and preventing high unemployment from causing increases in crime must be reconsidered in light of this empirical evidence.

Future research on this topic will have the benefit of observing the long-term effects of the 2008 recession on the size of certain industries in the US economy. While the manufacturing industry continues to be substantially smaller than it was before the recession, it is possible that the manufacturing industry will recover in the coming years. If America's manufacturing industry were to suddenly return, it would allow researchers to further test my fourth hypothesis, that higher employment in industries such as manufacturing that employ mostly low and middle-income workers will lead to lower crime levels.

Future research on the unemployment-crime relationship should also explore the possibility that increases in unemployment are resulting in higher cybercrime. Currently, no reliable data is available on the prevalence of cybercrime, as many cybercrimes go undetected or unreported. In the 21st century, it seems plausible that many criminals will choose to hack into

someone's bank account online rather than rob a local bank. If data were accessible on

cybercrime trends, it would add a more modern element to this research topic and could

potentially provide better support for the Economic Theory of Crime. Until that times comes,

however, empirical evidence suggests that declining macroeconomic conditions due to the Great

Recession of 2008 have not had significant effects on crime levels.

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