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The Relationship between Crime and Unemployment

Abstract

This paper examines the relationship between motor vehicle theft and unemployment at the state level in an attempt to understand which perspective has the overriding effect. The rest of the paper explores whether there is a significant relationship between economic conditions and motor vehicle theft.

The Relationship between Crime and Unemployment

Matthew D. Melick

I. Introduction

Crime has been one of the major problems of civilization from the beginning, and its magnitude has increased over time. In the political arena, public policy regarding crime prevention has long been a hotly debated issue. In 1999, federal, state, and local governments combined to spend over \$146 billion or approximately \$521 per citizen on crime prevention and control (USDOJ, BJS, 2001). One source estimates the private sector expenditure on protection to be 73% higher than public expenditure (Freeman, 1999). Considering the enormous effort put toward extinguishing crime, it is amazing how little the crime industry has changed in contemporary history.

These statistics illustrate the expenditure on crime prevention and control; however, they do not include the cost of the crimes that are not prevented. For example, in 2000 the value of motor vehicles stolen was estimated at \$7.8 billion (this follows a decade long decrease in the motor vehicle theft rate) (USDOJ, FBI, 2001). Some experts consider this a transfer of wealth rather than a cost to society; however it does come at a premium to society as seen by the amount spent on crime control. This paper explores the relationship between motor vehicle theft and unemployment.

Economists traditionally use the unemployment rate as an indicator of the amount of legitimate employment opportunities available to individuals. Therefore, a high unemployment rate suggests that there are fewer employment opportunities available and thus the opportunity cost of choosing crime over legitimate work is low (Becker, 1968, Cornwell and

Trumbull, 1994, Ehrlich, 1996, Myers, 1983, and Witte, 1980). However, sociologists look at the unemployment rate as being an indicator of the “supply of suitable victims” as well as the traditional economic perspective (Britt, 1994 and Cantor and Land, 1985). They suggest that as the unemployment rate increases there is a proportional decrease in the supply of suitable victims because people have less to steal. This occurs because as unemployment increases there are fewer cars on the road. This paper examines the relationship between motor vehicle theft and unemployment at the state level in an attempt to understand which perspective has the overriding effect.

The rest of the paper explores whether there is a significant relationship between economic conditions and motor vehicle theft. Section II will discuss the literature that is important in developing an economic model of crime and the relationship between unemployment and crime. Also in Section II, I will expound upon a theoretical model that is partially taken from the previous literature. This theory leads to Section III, which establishes my empirical model and explains the variables that are important to my theory. Finally, in Section IV, I will present the results of my regression analysis on the relationship between unemployment and the motor vehicle theft rate.

II. Background and Theory

Historically, there have been two major schools of thought regarding the unemployment-crime relationship, the first school focuses on the “supply of offenders” while the second school focuses on the “supply of victims.” Economists have traditionally focused on explaining the economic behavior of po-

“Considering the enormous effort put toward extinguishing crime, it is amazing how little the crime industry has changed in contemporary history.”

tential offenders and the way they react to changes in economic conditions. One basic notion is that in order for an individual to maintain a certain standard of living during a period of unemployment he/she will become more likely to commit a criminal act. However, after being unable to fully substantiate their hypothesis that a positive relationship should exist between unemployment and crime a new school of thought developed. Sociologists and criminologists have recently begun studying how unemployment affects the supply of suitable victims. Higher unemployment rate is correlated with a wider decrease in production and consumption; therefore there is less new merchandise in the “market” to be stolen. As Cantor and Land (1985) note, a crime requires not just the supply of a motivated offender but also a suitable target. The following is a review of major points that are required to develop a full structural model of the unemployment-crime relationship.

Since Becker (1968), there have been numerous contributors to the study of the relationship between economics and crime. Becker’s leading theory shows the decision making process of potential criminals. Becker uses a simple cost-benefit analysis in which criminals make their decisions by considering the benefit of committing a crime and subtracting from that the probability of being caught multiplied by the severity of punishment if caught. Becker argues that potential criminals establish a baseline from their individual risk preferences that helps them decide whether or not they will commit a certain crime. Ehrlich’s (1996) “market model” of crime is based on the model created by Becker (1968) and a few key assumptions: (1) all actors (criminals, victims, “buyers” of crime, and law enforcement) behave in an optimizing behavior, (2) there are certain general expectations about illegitimate work, including punishment, and (3) there is a distribution of risk preferences. From these main theoretical assumptions Ehrlich builds his theory on the “supply of offenses.” The model reads as follows, net return per offense equals expected payoff minus direct costs of activity minus foregone wages from legitimate activity minus the probability of conviction multiplied by the severity of punishment. It can be summarized as net return = payoff-cost – legit wage – (probability convict x punishment). In the model, expected payoff refers to the nominal financial gain from the activity. The direct costs are the monetary amount that the criminal puts toward preparing and completing the activity. Fore-

gone wages are the opportunity cost of choosing illegitimate work over legitimate work. Therefore, if the theory is correct the net return per offense must exceed some level before the individual will undertake it, depending on each person’s risk preference. Some individuals may gain more utility from work in illegal areas than legal areas, so the point where these individuals turn to crime is lower. Other individuals may experience a disutility resulting from the illegal activity. These individuals would typically demand a higher net return before getting involved in crime. Ehrlich’s (1996) theoretical model for the supply of illegitimate activity has been used in research numerous times over the years.

Britt (1994) lays out a theory that has been developed from a more sociologically critical point of view. The two theories that he focuses on are very important in explaining the relationship between crime and unemployment. The two theories are the motivational perspective and the opportunity perspective. The motivational perspective is the intuitive theory that economists expect to exist in the relationship between unemployment and crime. Its premise is that a positive relationship exists between crime rates and unemployment rates. As he explains, this could exist for a number of reasons, but mainly because as the economic condition deteriorates people are motivated to resort to crime as a source of income.

The second notion is the opportunity perspective, which “sees crime as a supply of potential offenders and suitable victims.” During rough economic periods people and places become less suitable victims because they themselves do not have money or excess material goods and also because personal property is more guarded. Therefore, a negative relationship between economic circumstances and crime should exist. Britt’s results show that the opportunity perspective has the dominant effect across crimes¹.

My first hypothesis is that the opportunity effect will outweigh the motivational effect in the present with regards to motor vehicle theft. This means that there will be a negative relationship between existing unemployment rates and motor vehicle theft rates. When unemployment is at higher levels and economic conditions are poor there are fewer opportunities to

¹ *Britt’s model includes homicide, rape, aggravated assault, robbery, burglary, larceny, and motor vehicle theft. He discovers the opportunity effect to be significant for each of the crimes at the national level with the exception of motor vehicle theft, which had a negative sign but was not statistically significant.*

commit property crimes. A possible explanation is that the current unemployment rate determines how many people and much property is circulating in society. If unemployment is high people are not going to spend as much, so there will be fewer new cars on the streets. In fact, people are less likely to leave home if unemployment is high because by staying home they save money.

Britt (1994), as well as Cantor and Land (1985) suggest that a motivational effect exists between changes in unemployment and the crime rate. In theory it should exist because as more people become unemployed they may not be familiar with handling the economic discomfort. Also, as people become unemployed for an extended period they consider the opportunity cost of choosing illegitimate work as being zero because he/she is not sacrificing any legitimate employment opportunity. For both of these individuals the payoff from the crime does not have to be as high as it would for an individual who would consider the opportunity cost to be positive. Britt also suggests a psychological factor that relates to being unemployed for an extended period and an individual disposition toward criminal behavior. He suggests that people become irrational economic actors and disgruntled citizens. So these individuals are willing to undertake more illegitimate opportunities

than an employed individual or a person who is in unemployment for only a short period of time. Therefore, my second hypothesis is that the motivational effect dominates the opportunity effect and that there is a positive relationship between the change in the unemployment rate and the motor vehicle theft rate.

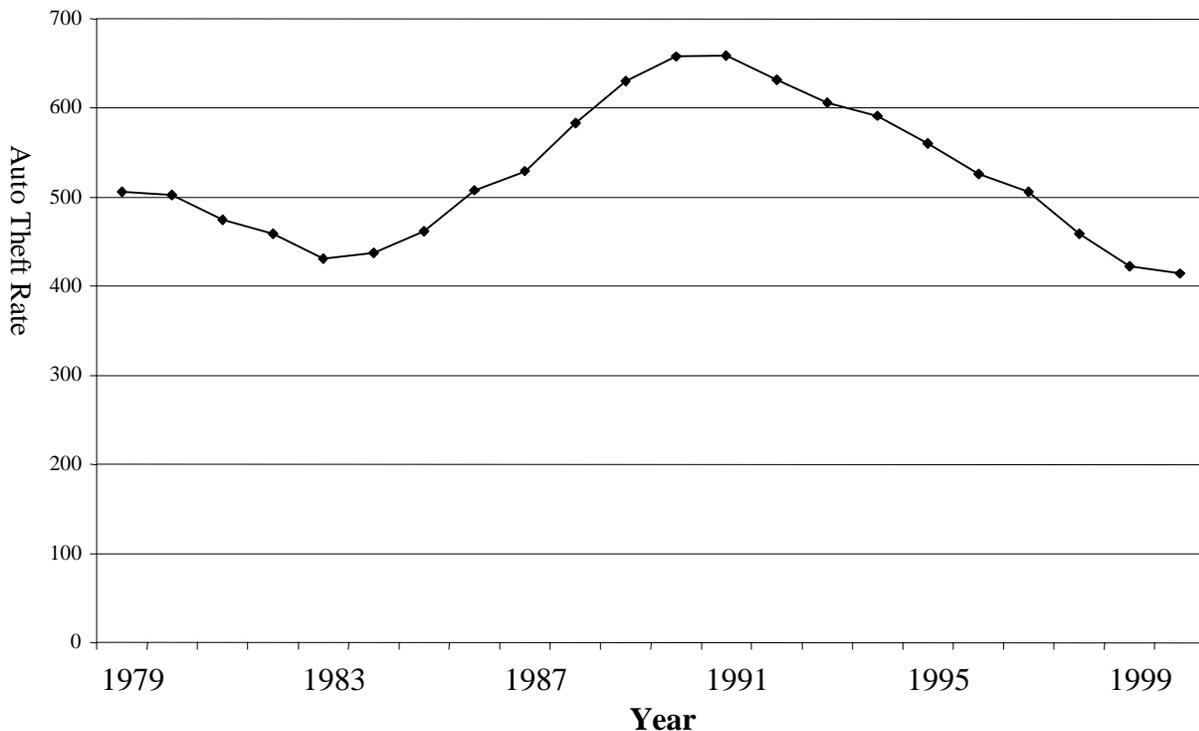
III. Empirical Model

A. Data

In order to capture the relationship between motor vehicle theft and unemployment over the past quarter century I develop a model that is similar to the model that Britt (1994) uses. The model will be tested using cross-sectional time series data from ten different states within the United States over the past twenty years. The states were selected to create a stratified sample based on population density, since more populous states historically have a higher crime rate (USDOJ, BJS, 2001). The sample contains ten states ranging from the most densely populated to the forty-sixth most densely populated state based on the 2000 United States Census.

The dependent variable is the motor vehicle theft rate (MVTR) as reported by the FBI (1979-2001) since 1979. The motor vehicle theft rate is defined as the number of vehicles stolen per 100,000 inhabitantsⁱⁱ. Over the past quarter century the rate

Figure 1: National Auto Theft Trend - 1979-2000



has fluctuated greatly, culminating in a continuous decrease over the past ten years, as shown in Figure 1.

There are two main reasons that motor vehicle theft is chosen as the focus of this study over other crimes. The first reason is that past research has been criticized for attempting to bring murderers and rapists into a model that is best suited for rational actors. However, while it is hard to argue that murderers and rapists are in fact rational, it is much easier to consider a property thief an economically rational actor. Individuals that steal normally do so for some monetary gain. The second reason is that motor vehicle thefts are among the highest reported crimes due to insurance reasons (Freeman, 1999). Other property crimes often go unreported because people feel that reporting the incident to the police will not benefit them in any way.

The primary independent variable that is integrated into the model is the unemployment rate (UNEMP). The data for unemployment comes from the United States Department of Labor, Bureau of Labor Statistics. As noted in Section II, the unemployment rate is used by economists to show how potential criminals respond to the opportunity cost of legitimate work as it is labeled in Ehrlich (1996). Its primary purpose here, however, is to show whether the unemployment rate is an accurate measure of Ehrlich's opportunity cost or does the unemployment rate help explain that the supply of victims has decreased. If, as my hypothesis suggests, the opportunity perspective has the dominant effect on the motor vehicle theft rate then there will be a negative relationship between unemployment and the motor vehicle theft rate.

The second independent variable is the change in unemployment from year to year (DUNEMP) as reported by the Bureau of Labor Statistics. This is important to the model because it helps capture the motivational perspective. For example, if in year five the unemployment rate is three percent and in year six the unemployment rate increases to four percent people are going to look upon the situation as negative because more people are out of work even though in the historical perspective four percent is better than average. Therefore, this negative outlook could mo-

tivate some to commit crimes, even though the unemployment rate is still rather good in historical terms. Without the change variable though this higher theft rate matched with low unemployment would point to the opportunity perspective rather than the motivation perspective.

The last set of variables that make up the models are the variables for the states (NJ, NY, GA, MN, WI, MS, AZ, UT, SD). While serving as dummy variables these variables also help catch factors that are not explained in my model. They can be called fixed effect variables because they capture everything that is unique to the state. In theory, the more populous states should have a higher motor vehicle theft rate than the less populous states; therefore the coefficient should be greater for a state such as New Jersey or New York than for Utah or South Dakota.

B. Models

The object of this paper is to build on the empirical models laid out by Britt (1994) that finds no significant relationship between the current unemployment rate and the amount of motor vehicle thefts on the national level. Britt also finds a significant but theoretically backwards relationship between the change in unemployment and motor vehicle thefts on the national level. The first model uses state level data to create a relationship between unemployment, the change in unemployment, and motor vehicle theft that the aggregate data is unable to establish.

(Eq. 1)

$$MVTR = \beta_1 + \beta_2 UNEMP + \beta_3 DUNEMP + \beta_4 NJ + \beta_5 NY + \beta_6 GA + \dots + \beta_{12} SD + u$$

The second model will include a time trend component in addition to the first model in an attempt to help explain patterns over time.

(Eq. 2)

$$MVTR = \beta_1 + \beta_2 UNEMP + \beta_3 DUNEMP + \beta_4 NJ + \beta_5 NY + \beta_6 GA + \dots + \beta_{12} SD + \beta_{13} 1980 + \beta_{14} 1981 + \beta_{15} 1982 + \beta_{33} 2000 + u$$

IV. Results

The statistically insignificant results of the national level analysis show a need to adjust the unit of observation. The best unit of observation for the purposes of this study is the state level. Each state has its own characteristics that make it unique from the oth-

ⁱⁱ The manner in which this statistic is reported creates a relationship between time and MVTR because motor vehicle ownership rates change over time. In 1977 there were .76 vehicles per person over 16 years of age and grew to .90 vehicles per person over 16 years of age in 1990 (USDOT, BTS 2000).

Table 1: State Level Model

Adjusted R-squared = .705

CONSTANT	726.287
UNEMP**	-22.097 (-3.741)
DUNEMP**	23.651 (2.578)
NJ**	95.348 (2.396)
NY**	110.258 (2.793)
GA**	-105.499 (2.620)
MN**	-308.223 (-7.439)
WI**	-306.204 (-7.597)
MS**	-305.750 (-7.677)
AZ**	86.126 (2.163)
UT**	-326.863 (-7.960)
SD**	-523.224 (-12.025)

*significant at the .1 level, **significant at the .05 level

ers. Within the state, patterns of unemployment and motor vehicle theft are typically homogenous. Therefore, my first model addresses the same unemployment-crime relationship like the past research, but brings it down to the state level. Table 1 shows the results of the first model, which are indeed much more significant.

Unlike the analysis in the aggregate models, Table 1 shows that both unemployment and the change in unemployment are highly significant when measured at the state level. The constant in the equation refers to the base motor vehicle theft rate in Illinois, which was the state not assigned a dummy variable, under the condition of zero unemployment and no change in the unemployment rate. The coefficient for each state refers to that states standard deviation from Illinois' motor vehicle theft rate, for example New Jersey had

a coefficient of 95.348, which means that its standard motor vehicle theft would be 821.6, or 95.348 higher than Illinois'. The pattern of state coefficients that is suggested in the theory, more densely populated states have higher incidences of crime, holds nearly entirely true. However, there may also be other factors that determine a state's motor vehicle theft rate. One additional possibility is the motor vehicle ownership rate.

After the fixed effects of each state have been taken into account the effects that the unemployment rate (UNEMP) and change in the unemployment rate (DUNEMP) have across the states in the model are highly significant. Unemployment has a highly statistically significant relationship with the motor vehicle theft rate (MVTR). The results of the model suggest that for each percentage point increase in unemployment there will be approximately twenty-two fewer stolen vehicles per 100,000 inhabitants. Therefore the unemployment rate has the significant negative relationship that my hypothesis proposes. This suggests that the opportunity perspective outweighs the motivational perspective in the present.

The second independent variable, the change in the unemployment rate (DUNEMP), also has a statistically significant relationship with the motor vehicle theft rate (MVTR). However, as proposed in my second hypothesis this relationship is positive. The relationship is almost the direct opposite of the unemployment rate relationship, a deviation of one percentage point in the rate of change of unemployment translates in approximately twenty-four more motor vehicle thefts per 100,000 inhabitants. This suggests that people are in fact motivated by changes in the unemployment rate from one period to the next.

A simulation of the model is helpful to understand how a business cycle leads to changes in the motor vehicle theft rate. The equation to show how fluctuations in unemployment impact the motor vehicle theft rate using Illinois would read as follows:

(Eq. 3)

$$MVTR = 726.287 - 22.097UNEMP + 23.651DUNEMP$$

An example using five percent unemployment in year one with no change from the prior period, up to six percent unemployment in year two, and steady at six percent in year three projects motor vehicle theft rates of 615.80, 617.36, and 593.71 respectively. This shows that as unemployment initially in-

creases there is a marginal increase in MVTR. However, as unemployment becomes stationary at a higher

Table 3: State Level Model w/ Time Trend

Adjusted R-squared = .745

CONSTANT	704.31		
UNEMP	-21.212	1985	-42.101
	(-1.985)		(-.739)
DUNEMP	29.555	1986	-8.879
	(2.127)		(-.157)
NJ	96.705	1987	2.558
	(2.539)		(.046)
NY	111.072	1988	33.933
	(3.002)		(.619)
GA	-104.135	1989	71.375
	(-2.625)		(1.308)
MN	-306.618	1990	110.817
	(-7.064)		(2.021)
WI	-304.924	1991	109.223
	(-7.659)		(1.942)
MS	-306.689	1992	98.060
	(-8.027)		(1.727)
AZ	87.165	1993	96.402
	(2.284)		(1.739)
UT	-329.917	1994	87.777
	(-7.716)		(1.610)
SD	-520.716	1995	77.259
	(-10.497)		(1.415)
1980	-29.891	1996	29.442
	(-.495)		(.536)
1981	-13.156	1997	15.587
	(-.230)		(.283)
1982	-53.089	1998	-41.909
	(-7.75)		(-.752)
1983	-14.741	1999	-74.413
	(-.220)		(-1.321)
1984	3.743	2000	-101.455
	(.058)		(-1.741)

level MVTR drops considerably. This example shows how during periods of changing unemployment rates the motivational effect dominates, while during periods of stationary unemployment levels the opportunity effect dominates.

The final model that this study addresses in-

cludes a time trend variable in addition to the model seen in Table 1. The results of this model, shown in Table 2, are nearly identical to the results of the original state-level model.

UNEMP and DUNEMP remain highly significant, both satisfy the .05 level. The new coefficients mirror the coefficients found in Table 1. While there is certainly a time trend, it does not follow the time trend that would be expected to capture the effect of changing ownership rates. In the first six out seven years of the model, 1980-1986, the trend suggests a decrease in the motor vehicle theft rate, while at the same time motor vehicle ownership rates were increasing. This means that while there were progressively more "suitable victims" there was not a noticeable increase in crime as a result.

While this model does not capture the effects of changes in ownership rates in the 1980s or the invention of affordable anti-theft devices in the mid and late 90s, it does provide further support for the findings of the original state level model. The results of the state level model offer many suggestions that have not been captured at the national level.

V. Conclusion and Implications

The results of this study suggest that some of the focus on the economics of crime needs to be re-directed from focusing solely on the supply of offenders toward looking at the supply of victims. Analogously, labor economists study both the supply of labor and the supply of jobs (known as the demand for labor) and any economics study field would be incomplete without reviewing both aspects. The idea of a negative unemployment-crime relationship is a new theory and as such it calls for much closer inspection. This study's ability to repeatedly present a significant relationship between unemployment and motor vehicle theft is something that most of the research focusing on the motivational aspect has been unable to conclusively prove for the past half century.

Common theory in public policymaking is that higher unemployment causes higher rates (Sedgwick, 1980). While there is certainly a link between unemployment and higher crime rates as shown through the change in unemployment variable it does not have the overriding impact that most theorists suggest. Certainly one explanation as to why individuals are not highly motivated to commit a criminal act shortly after they are unemployed is the safety nets that our society has installed to aid people through difficult

times. If these safety nets were to be removed, it is plausible that individuals would be more motivated to resort to criminal activity as a means of maintaining a steady income.

It must also be noted that individual behavior cannot be predicted by analysis at the macro level. However, the findings of this study indicate a pattern of behavior that has occurred over time and across regions. While individuals react differently to certain situations, this study shows that the dominant pattern is that the motivational effect, which has been so widely touted, does not have as much influence in the present as the opportunity effect.

This study also shows that the unit of observation plays a key role in determining the significance of the attempt to understand patterns of individual behavior. The insignificance of both the unemployment rate and change in the unemployment rate in the aggregate national level model compared with their high significance in the cross-sectional level models suggests that as the unit of observation decreases, the relationship between unemployment and crime becomes more obvious.

The results of this study lend themselves to numerous future research ideas. One of the most obvious areas that could be explained further is fixed effects of each state. As theory suggests there is certainly a relationship between population density, or urbanization, and the level of crime in a given region. However, examining Table 1 shows that it is not a linear correlation between population density and the "natural" level of crime. There are numerous factors that could potentially change the nature of a state's "average level of crime." Two factors that fit the theme of this study are unemployment benefits and the duration of unemployment, which both certainly vary across states and over time. Since I make the claim that unemployment benefits help reduce an individual's motivation to commit a criminal act it would be helpful to support the assertion with data in future research.

Also, it would seem obvious that there would be a relationship between motor vehicle ownership rates (across region and over time) and motor vehicle theft rates since a higher ownership rate suggests more suitable victims. This was not clearly picked up in the time trend. It is also possible that the inclusion of an age variable would help explain some of the fluctuations over time in the motor vehicle theft rate. As mentioned previously, the novelty of the opportunity perspective theory lends itself to much further research.

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