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Link between unemployment and crime in the US: A Markov-Switching approach [☆]

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ABSTRACT

This study has two goals. The first is to use Markov Switching models to identify and analyze the cycles in the unemployment rate and four different types of property-related criminal activities in the US. The second is to apply the nonparametric concordance index of Harding and Pagan (2006) to determine the correlation between the cycles of unemployment rate and property crimes. Findings show that there is a positive but insignificant relationship between the unemployment rate, burglary, larceny, and robbery. However, the unemployment rate has a significant and negative (i.e., a counter-cyclical) relationship with motor-vehicle theft. Therefore, more motor-vehicle thefts occur during economic expansions relative to contractions. Next, we divide the sample into three different subsamples to examine the consistency of the findings. The results show that the co-movements between the unemployment rate and property crimes during recession periods are much weaker, when compared with that of the normal periods of the US economy.

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1. Introduction

Although economic theory anticipates the existence of a positive relationship between unemployment and crime, empirical works have found mixed results. [Chiricos \(1987\)](#) reviewed 68 studies about the relationship between crime and unemployment rate, and found that only less than half of these studies have found positive significant effects of unemployment on crime rates. That is, most of these studies have shown a negative or no relationship between crime and unemployment.

[Cantor and Land \(1985\)](#) and [Cook and Zarkin \(1985\)](#) are among those who have tried to explain these mixed findings of the empirical studies. [Cook and Zarkin \(1985\)](#) stated that during the recession, the opportunity cost of attempting to crime and also the legitimate opportunities of earning income deteriorate. Therefore, the number of property and violent crimes escalate; they called this the motivation effect.¹ In addition, recession might cause a reduction in the policing due to lower tax revenues of governments. The results of this change might be a lower chance of crime detection and punishment; hence, it might increase the crime rate. On the other hand, during recession, the number and quality of criminal opportunities decline ([Cook, 2010](#)), because more people stay at home, which increases the guardianship of properties, and hence, the number of burglary victims would decrease. The same could be said for the robbery, because people carry less cash, and as [Cook \(2010\)](#) stated, they have more tendencies to defend what they have. [Cantor and Land \(1985\)](#) called this the opportunity effect. Motivational and opportunity effects would produce upward and downward fluctuations in crime rates; consequently, the net effect of unemployment, as an indicator of bad economic conditions, on crime is ambiguous. In other words, when the opportunity effect is larger

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¹ In fact, motivational effect, originally, has been introduced by [Becker \(1968\)](#).

(smaller) than the motivation effect, there would be a negative (positive) link between unemployment rate and crime. Therefore, the effect of a business cycle, proxied by unemployment, on crime might go in either direction or even it could be null.²

Besides, as Cantor and Land (1985) argued, the occurrence timing of these two effects could be different, i.e., opportunity effect would appear instantaneously, whereas the motivation would respond with a lag (Arvanites and Defina, 2006). In fact, the opportunity effect is instantaneous, but the motivation effect needs time; hence, it is lagged. Moreover, these two effects have opposite signs and, therefore, they might cancel each another.³

As mentioned earlier, the association between the unemployment rate and crime has been investigated extensively in different studies. However, no unequivocal support for the link between unemployment and crime has been found. Some of these studies have employed national aggregate data (Kollias and Paleologou, 2012; Cook and Zarkin, 1985; Cantor and Land, 1987; Hale and Sabbagh, 1991; Allen, 1996; Greenberg, 2001; Fallahi et al., 2012); while others; such as those by Entorf and Spengler (2000), Levitt (2001), and Edmark (2005), based their investigation on subnational; i.e. state- or county-level data. Phillips and Land (2012) are among those who analyzed this subject at the county, state, and national levels to shed more light on the impact of data aggregation level on findings. Andersen (2012) used neighborhood-level panel data to examine the association between crime and unemployment. Britt (1997) and Lee and Holoviak (2006) examined age-specific data on crime; whereas Witt et al. (1999) highlighted the importance of gender on crime.

These studies not only differ in terms of aggregation level of the data used for analysis (e.g., state-level vs. national-levels), they also differ in their findings. Several studies have shown a positive relationship between unemployment and property crime, while others have found a negative relationship. For example, Edmark (2005) and Fallahi et al. (2012) showed that unemployment and auto-theft co-vary significantly, which means that the rate of auto-theft is higher during economic contraction. On the other hand, studies by Cook and Zarkin (1985), Allen (1996), and Phillips and Land (2012) suggested that the unemployment rate and rate of auto-theft move in opposite directions, that is, more auto-theft occurs during economic expansions. Yet, the study by Hale and Sabbagh (1991) is among those that concluded that unemployment has no significant influence on auto-theft.

The same is true for burglary; Cook and Zarkin (1985), Cantor and Land (1987), Allen (1996), and Edmark (2005) identified a positive co-movement between the unemployment rate and rate of burglary. However, Fallahi et al. (2012) and Phillips and Land (2012) came to a conclusion that the rate of burglary is significantly lower during recessions, i.e., a negative relationship between business cycles and burglary.

Larceny is another property crime that has gained attention from research community. The results about the link between larceny and unemployment are mixed and contradictory, with Cantor and Land (1987) and Hale and Sabbagh (1991) documenting a positive link, but Phillips and Land (2012) finding a negative relationship. The majority of studies on robbery found a positive significant effect of unemployment on robbery (Cook and Zarkin, 1985; Hale and Sabbagh, 1991; Allen, 1996), but Edmark (2005) claimed that there is no significant link between unemployment and robbery.⁴

An important step forward in understanding the relationship between crime and unemployment was introducing the effect of unemployment lag to the literature. Some scholars argue that it is the lagged unemployment, rather than current unemployment, that has a potential influence on crime; in fact, they try to distinguish the motivational and opportunity effects. Taking this point into consideration, Allen (1996) showed that lagged unemployment has a negative effect on larceny, burglary, and auto-theft. Greenberg (2001) and Allen (1996) revealed the same result for robbery. Yet, in another study, Cantor and Land (1987) showed that lagged unemployment positively affects larceny and burglary.

Most of these studies were carried out using multiple regression models, vector autoregression or error correction models. All of these methods assume a stable behavior of the variable under examination. However, the unemployment rate is directly related to business cycles and has a cyclical pattern; hence, linear models may provide a weak fit. The same is true for crime as well (see Freeman et al., 1999 for a survey). Consequently, one needs to use nonlinear models, such as the Markov Switching (MS) models. These models are able to capture changes in the behavior of time-series by allowing the switching between regimes or states.⁵ MS models have been used widely in the literature and have proven their ability to explain the changes in the pattern of time series.

This study has two goals. The first goal is to examine the behavior of different types of property-related felonies and the second goal deals with the potential relationship between the unemployment rate and property crime rates in the US economy. Our sampling period covers 1977:2 until 2004:4 and four types of property crimes⁶ are analyzed: burglary, larceny, motor-vehicle theft, and robbery.⁷

² The effect of business cycles on crime could be very complex, which makes the prediction of these effects really difficult (Cook, 2010).

³ It is worth mentioning that, as stated by Freeman et al. (1999), the estimated significant relationship between unemployment and crime does not necessarily show the causality between these variables.

⁴ As one of the referees of the present paper points out, one reason for these contradictory results might be the difference in the data type used to study the link. Some of these papers have used cross-section data; hence, the results show the relationship between unemployment and crime at one point of time. However, others have used time-series data; hence, the results show the link over time. Consequently, the former can be regarded as a static approach, while the latter is more similar to dynamic approaches. Therefore, it is better to be cautious in comparing the results of cross-sectional papers with that of the time-series ones.

⁵ In other words, MS models allow having multiple endogenously determined structural breaks in the data.

⁶ These four types of crime cover 92% of the total crime in the US in 2004.

⁷ As stated by Raphael and Winter-Ebmer (2001) and Grant and Martinez (1997), although robbery is considered a violent offence, in fact, it is motivated primarily by economic need; therefore, it would be better to study that along with other property crimes.

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