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Essays on the Economics of Crime and Econometric Methodology: Dissertation Summary

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Despite recent declines, crime remains at the forefront of the problems facing society. In a Gallup poll conducted earlier this year that asked respondents to identify the most important problem facing their community, crime was the problem cited by 12 percent of those surveyed, ranking second behind only education. This anxiety about crime is not unjustified; an estimated 31 million crimes were committed in 1998, translating to a victimization rate of roughly 11.5 crimes per 100 residents. Because crime is a significant concern, it is important to understand the causes and consequences of criminal activity. This thesis focuses on the relationship between work and crime.

The remarkable decline in both violent and property crime during the 1990s, coupled with improved job prospects for low-wage workers, has fueled speculation that an improvement in economic conditions may be partly responsible for the reduction in crime rates. The first chapter of this dissertation, "Wages and Youth Arrests," addresses the question of whether higher wages cause teenagers to commit less crime. The second chapter, "The Effect of Criminal Victimization on Employment and Income," improves social cost calculations by calculating earnings losses suffered by victims of violent and property crime. The third chapter, "efficient Bootstrapping for GMM" (written jointly with Bryan W. Brown and Whitney K. Newey), focuses on inference for generalized method of moments estimators.

Chapter 1
Wages and Youth Arrests

Economists, criminologists, and policymakers have long speculated on the relationship between economic conditions and crime. Becker (1968) proposed that "a rise in the income available in legal activities . . . would reduce the incentive to enter illegal activities and reduce the numbers of offenses." Others have noted that the relationship between the economy and crime also runs in the opposite direction: high crime rates may inhibit economic growth. For example, arrest and incarceration may lower the future earnings and employment prospects of the offender, as suggested by previous

studies. In addition, high levels of crime may encourage employers to change location or discourage new business formation, contributing to slower economic growth and a decline in regional employment prospects. The economy and crime may be linked through other channels as well. In particular, property crime rates have been shown to increase with economic growth. Criminologists speculate that a strong economy increases the quantity and value of consumer goods that can be stolen, thereby raising the returns to property crime.

The low levels of crime in recent years have generated renewed interest in this relationship. The National Crime Victimization Survey (NCVS) estimates that there were approximately 31 million criminal victimizations in 1998, the fewest number recorded since 1973. This low level of crime is not the result of a long, gradual decrease, but rather the result of a recent, dramatic reduction in crime. From 1993 to 1998, violent crime victimization rates have fallen by roughly 27 percent, and property crime victimization rates have seen an even sharper decrease of 32 percent. A variety of explanations have been advanced to explain this trend: increases in the number of police officers per capita and changes in the law enforcement strategies used by the police; growth in the number of criminals incarcerated; declines in the drug trade; rising private expenditures on security guards and protection; and improvements in the labor market prospects of young workers.

The remarkable growth of the U.S. economy in recent years has focused attention on this last explanation. Although many studies have examined the relationship between crime and the economy, these studies have (for the most part) measured the effect of unemployment on the level of crime. Such studies tend to find that lower rates of unemployment are associated with lower levels of crime but that the effect is moderate in magnitude (Freeman 1999). In addition, even the largest estimate of the effect of unemployment on crime is too small to explain much of the variation in crime. The uncertain conclusions from this empirical evidence on the relationship between economic condi-

tions and crime may be attributed, in part, to two factors. First, unemployment rates are only one measure of the labor market prospects faced by criminals; potential earnings may also play a role in crime participation decisions. Second, previous studies may fail to take into account that high crime rates inhibit economic growth. This failure may bias estimates of the responsiveness of crime to economic conditions.

This chapter uses exogenous variation in teenage wages to address the question of whether youth crime is responsive to economic conditions. I compare state-level changes in the mean log wage of teenagers and the change in teenage arrest rates between 1989 and 1992. I employ an instrumental variables strategy that uses the 1990 and 1991 increases in the federal minimum wage as a source of exogenous variation in the wages of teenagers. Two-stage least squares estimates show that while arrest rates for violent crimes do not respond strongly to changes in wages, participation in burglary, motor vehicle theft, vandalism, and robbery is negatively related to market wages. Using these estimates, elasticities of arrest rates with respect to market wages are between –1 and –2 for property crime. These results suggest that rising wages may account for as much as 30 percent of the fall in youth arrest rates in recent years.

Chapter 2
The Effect of Criminal Victimization on Employment and Income

Despite recent declines, crime remains a major concern. Law enforcement agencies reported 12.5 million crimes in 1998, corresponding to roughly 4.6 crimes reported per 100 residents. Responses collected in the NCVS show that police reports significantly understate the level of crime: respondents reported 31 million crimes in 1998, a rate of 11.5 victimizations per 100 residents.

Society devotes significant resources toward preventing crime. In 1997, the criminal justice system had a budget on the order of $100 billion, almost half being spent on police, a third on corrections, and the remainder on the judicial system (Freeman 1999). Law enforcement agencies in the United States employed 0.64 million sworn officers and 0.25 million civilian employees in 1998. Including civilian employees, the overall law enforcement employment rate was 3.4 employees per 1,000 residents. In addition to these public expenditures, significant private resources were allocated to crime prevention activities; Cunningham, Strauchs, and Van Meter (1991) reported that private expenditures exceeded governmental expenditures by 73 percent.

The combination of both high levels of criminal activity and high levels of expenditures on crime prevention leads to the question of whether society allocates the optimal level of resources to crime prevention. Analysis of this question requires estimates of the social costs of crime that include both direct monetary losses (lost property or medical bills, for example) and the cost of victims' pain and suffering, as well as indirect costs. Estimates of the first two components of the social cost of crime have been made by Perkins et al. (1996), who used the NCVS to tabulate victims' estimates of the property loss and medical bills associated with crime, and by Cohen (1988) and Miller, Cohen, and Rossman (1993), who used jury awards to victims of crime to measure the costs of victims' pain and suffering. Less is known about the magnitude of the indirect costs of crime.

In this chapter, I focus on one aspect of the indirect cost of crime: decreases in the earnings of victims of crime. Psychologists have documented a strong relationship between posttraumatic stress disorder (PTSD) and criminal victimization; they have also noted that individuals with PTSD suffer from lower employment rates as a result of the disorder. In addition, behavior undertaken by the victim to guard against repeat victimization may lead to changes in working patterns and, subsequently, a reduction in earnings. Victims, for example, may choose lower-paying jobs in safer neighborhoods, or may withdraw from the labor market entirely if they feel that work exposes them to sufficiently high levels of risk.

The effect of victimization on the employment status of victims is estimated using a longitudinal version of the NCVS that contains data on the employment outcomes and victimization history of a representative sample of U.S. households. Multiple observations for each individual allow estimation of models that control for both observed and unobserved differences between victims and non-victims of crime. The results suggest that violent crime victimization is associated with a transitory decrease in employment rates of between 2 and 3 percent, but that the decline lasts no more than 18 months after the victimization. Results for property crimes show little effect of victimization on employment rates.

Focusing solely on employment as a measure of the labor market consequences of crime may undercount employment-related costs of crime. For example, in order to reduce the risk of repeat victimizations, victims may choose to take lower-paying jobs in safer neighborhoods or in locations closer to home. Similarly, victims may reduce the number of hours that they work at their existing job. Neither of these costs are counted by estimates that focus on employment as the outcome of vic-

timization. To address this issue, I limit the sample to heads of households and estimate the effect of victimization on household income. Victims of violent crime suffer a short-lived decrease in household income of between 2 and 3 percent, but there is no income loss associated with property crime victimization.

Estimates of the effect of violent crime on employment and household income can be used to calculate the average earnings loss of crime victims. Using these estimates, violent crime is calculated to cost victims an average of $700 in lost earnings. These estimates of lost earnings are roughly equal to the direct costs of injuries and property loss of victimization (Perkins et al. 1996), suggesting that indirect costs may be an important component of the social cost of crime. On the other hand, estimates of lost earnings are significantly less than the pain and suffering costs estimated by Cohen (1988) and Miller, Cohen, and Rossman (1993). For violent crime, estimates of pain and suffering costs are more than 10 times the combined cost of lost or damaged property, medical bills, and lost earnings. The substantial difference between these estimates may be attributed, in part, to selection bias: violent crimes that lead to civil lawsuits may have higher costs than the average violent crime. Whatever the source, the discrepancy suggests that previous estimates of the pain and suffering costs of crime may overstate the social cost of crime.

Chapter 3
Efficient Bootstrapping for GMM

There are many important applications of generalized method of moments (GMM) estimators for cross-section and panel data. For example, there are a wide variety of GMM estimators for dynamic panel models. Also, instrumental variables estimators, which are also GMM estimators, are important in the estimation of treatment effects. It is well known that the usual asymptotic theory can be a poor approximation to the distribution of the estimators, particularly when there are many overidentifying restrictions or when the parameters of interest are not well identified. The bootstrap provides one approach to improvements in the approximation; this chapter describes a relatively efficient bootstrap method for GMM in cross-section and panel data. We show that our method improves on the standard asymptotic approximation under certain regularity conditions. We also illustrate that the improvement can be large, particularly in dynamic panel data models, using Monte Carlo simulations and an empirical example.

Hall and Horowitz (1996) previously proposed a bootstrap for GMM. Their approach is based on center-

ing the moment conditions in GMM, while ours is based on bootstrapping the original moment conditions with an efficient estimator of the distribution. Our approach has a computational advantage in that the bootstrap does not require modifying the form of the estimator. Also, our approach is asymptotically efficient relative to theirs. On the other hand, their approach has wider applicability than ours does because they cover dependent data and we do not.

The bootstrap uses an estimate of the distribution of the data to form an estimate of the distribution of a statistic. Under certain conditions, the improved approximation to the distribution of the statistic can be expressed in a form similar to an Edgeworth expansion. These expansions are based on large sample approximations that are of higher order in the sample size than the usual asymptotic approximation. There are also other approaches to improvements in approximation, including those of Bekker (1994) and Staiger and Stock (1997). Although to date there have been few comparisons of these different approaches, the bootstrap appears to work well in some examples where the parameters are well identified and there are many overidentifying restrictions.

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