Desperation and Desperados: Economic Correlates and Bank Robbery in the United States; 1990-2000

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ABSTRACT

This study examines bank robberies across the fifty states and the District of Columbia for the decade of the 1990s. It was determined that bank robberies are positively associated with the ratio of police officers to population, and the unemployment rate. Bank robberies are also negatively associated with the poverty rates across states and over time. It was hypothesized that bank robberies were associated with the business cycle, and the police and poverty variables were included as control variable. There are serious policy implications because the evidence does not support the common belief that increased police forces are a deterrent to bank robbery, and that persons in poverty are not the cohort from which bank robbers emerge. The unemployment rate is significantly correlated with bank robberies and suggests that the expectations of economic hard times in the near term are perhaps the motivations for robbery as an economic activity.

INTRODUCTION

Criminal activity is often conceptualized as abnormal or economically irrational. Perhaps, to the extent that some criminal activities may be the result of impulsive behavior there may be some truth to certain criminal acts being abnormal conduct. However, the 1992 Nobel Laureate in Economic Science, Gary Becker, wrote in 1968 that crime may be a simple matter of cost-benefit analysis. In fact, much of the literature concerning bank robbery demonstrates that the crime is generally well planned, including escape routes and methods. For example, Buchler and Leineweber (1991) found that in 84.8 percent of 351 incidents of solved bank robbery cases, the robbers admitted to a certain level of planning. Servay and Rehm (1988) reported that based on their sample, 75 percent of the bank robberies were planned crimes. These findings suggest that in large measure robbers rationally weigh the costs and benefits of committing the crime.

The decade of the 1990s exhibits an interesting pattern in the number of bank robberies in the United States. In examining Table 1 one can see that 1991 was the peak of the cycle for bank robberies at 9,388, as the economy improved over the decade the number of bank robberies declined to a low of 6,599 in 1999. Giving rise to the casual observation that bank robberies may be correlated with the business cycle. It is also clear from the data in Table 1 that the average bank robbery nets an amount equal to roughly one month of per capita GDP for the robbers. This suggests that robberies must be frequently repeated if the average bank robber is to make a living from this criminal activity; which may also be more consistent with a temporary way to "earn" an income, rather than a career choice.

Table 1: U.S. Bank Robberies 1990-2000

Year	Number of Robberies	Average Loss Per Robbery	Total Losses for the Year From Bank Robberies
1990	7,837	3,244	25,423,228
1991	9,388	3,177	29,825,676
1992	9,063	3,325	30,134,475
1993	8,647	3,308	28,604,276
1994	7,029	3,551	24,959,979
1995	6,758	4,015	27,133,370
1996	8,046	4,207	33,849,522
1997	7,876	4,802	37,820,552
1998	7,584	4,489	34,044,576
1999	6,599	4,552	30,038,648
2000	7,127	4,379	31,209,133

There is a substantial body of literature concerning the economics of criminal activity (e.g., Cameron, 1988; Falkinger and Walther, 1991; Leung, 1995; and Polinsky and Shavell, 1992). However, very little academic attention has been specifically paid to robberies, and particularly to bank robberies. Bank robberies are unique crimes because these robberies, unlike any others, are federal crimes. The Congress made bank robbery a federal crime because of the rash of robberies of banks that occurred during the Great Depression, and the habit of infamous robbers like John Dillenger *et al,* of multiple state robbery sprees (J. K. Galbraith, 1962). Because not only do local law enforcement authorities seek bank robbers, but their ranks are reinforced with the full weight of the Federal Bureau of Investigation thereby increasing the risk of being arrested and prosecuted for this particular crime.

The purpose of this paper is to examine bank robbery in the United States from 1990 through 2000. The data for all the fifty states and the District of Columbia are used to determine if the business cycle and variations in the poverty rates are statistically associated with the number of robberies. In other words, the casual observation from the

data presented in Table 1 is going to be rigorously tested to determine if the variations in bank robbery across states can be explained by the variations in economic conditions as indicated by the unemployment rate and percentage of population below poverty, controlling for law enforcement across the various states. If the crime of bank robbery is associated with the business cycle then this evidence has serious implications for both law enforcement and economic policy.

DATA AND METHOD

The data collected for this study includes eleven years of data for each of 50 states and the District of Columbia for a total of 561 observations of panel data. Number of bank robberies for each state was collected from the U.S. Department of Justice, Federal Bureau of Investigation, Bank Crime Statistics, Federally Insured Financial Institutions, issues 1990 through 2000. Total population for each state was collected from the Bureau of Economic Analysis web site. Robbery per 100,000 population (ROB-POP) was then calculated. The data for unemployment rate (UR) were obtained from the U.S. Bureau of Labor Statistics, *Geographic Profile of Employment and Unemployment* annual issues 1990-2000. The data for poverty rate (POVTY-RT) came from the Census Bureau web site which shows the percentage of the population living at or below the poverty level. The data for the number of law enforcement employees (officers) came from the Uniform Crime Reports/ Crime in the United States, years 1990-2000 Table 77 Full-time Law Enforcement Employees- State. Given the population for each state, the variable police per 10,000 of population (POLC-Pop) was then calculated. Finally, the data for the population density (POP-DENS) were obtained from the *Statistical Abstract of the United States* issues 1990 through 2000.

A linear relationship between incidents of robbery in each state (dependent variable) and the level of unemployment, number of police officers, the percentage of population at or below poverty rate, and the population density (explanatory variables) is assumed. The model is initially estimated using the Ordinary Least Squares (OLS) method. However, because the patterns of bank robbery, unemployment rate, population density, etc. are different for each state, it may be more appropriate to use the panel data estimation methods that control for the heterogeneity due to the state variable.

The model to be estimated is:

$$ROB\text{-}POP_{it} = \alpha + \beta 1\ UR_{it} + \beta 2\ POVTY\text{-}RT_{it} + \beta 3$$

$$POP\text{-}DENS_{it} + \beta 4\ POLC\text{-}POP_{it} + \varepsilon_{it}$$

If the model is estimated using a fixed-effects, one-way error component regression model, the following assumption is also made:

$$\varepsilon_{it} = \mu_i + \upsilon_{it}$$

In the one-way error component model, μ_i denotes the time-invariant and unobservable individual state-specific effects and υ_{it} denotes the remainder disturbance with the mean 0 and variance-covariance $\sigma^2_v I_{nt}$ (Baltagi 1995).

The panel data used to estimate this model consist of *i* cross-sectional units where *i* =1, 2, . . ., 51 for the fifty states and the District of Columbia observed at each of *t* time periods, *t* = 1, 2, . . ., 11 (1990 through 2000). The results of statistical analysis of data are reported in the following section.

STATISTICAL EVIDENCE

Table 2: Determinants of Bank Robbery in the United States (1990-2000) OLS Model

	Variable Coefficient	Standard error	b/St. Er.	P-value
Constant	.033	.4870	.6210	.5350
POP-DENS	-.001	.0004	-3.044	.0023
UR	.328	.6030	5.427	.0000
POVTY-RT	-.959	.2530	-3.789	.0002
POLC-POP	.0813	.0197	4.118	.0000

R-Squared:	.0691
Adjusted R-Squared:	.0624
F-statistic:	10.32
Prob (F-statistic):	.0000

Table 3: Determinants of Bank Robbery in the United States (1990-2000) Fixed-Effects Model

	Variable Coefficient	Standard error	b/St. Er.	P-value
POP-DENS	-.0063	.0055	-.6100	.5416
UR	.1183	.0389	3.044	.0023
POVTY-RT	-.0441	.0208	2.120	.0648
POLC-POP	.0425	.2492	1.704	.0883

R-Squared:	.8433
Adjusted R-Squared:	.8266
F-statistic:	50.42
Prob (F-statistic):	.0000

Table 2 reports the results when the model is estimated using the ordinary least squares and Table 3 presents the results of estimation when the fixed-effects model and panel data were used. In Table 2 the measure of overall significance as indicated by the F-statistics show a statistically significant model. However, the goodness-of-fit as measured by the R-squared or Adjusted R-squared at .069 and .062, respectively, do not suggest much explanatory power for the model. It is interesting to note that in Table 2 individual coefficients (with the exception of the constant term) are all significant levels better than one percent.

Because heterogeneity due to the STATE variable was suspected, using panel data and STATE as the variable of stratification and a fixed effects model was estimated. The results are reported in Table 3. To establish whether the fixed-effects model is indeed a more appropriate method, the following test offered by Greene (1990) was conducted.

The F ratio test statistic is:

$$F(n-1, nt-n-K) = \frac{(R_u^2 - R_p^2)/(n-1)}{(1-R_u^2)/(nt-n-K)}$$

Where u indicates unrestricted model (X variables and STATE effects) and p for pooled or restricted model (the OLS model) with a single overall constant term. Also, n represents number of cross-sectional units, t time periods, and K the number of regressors. In this case F-statistics had 50 and 506 degrees-of-freedom in the numerator and denominator, respectively. The test produced an F-statistic with a value of 49.989 where the p-value of the test was virtually zero. This result suggests that the fixed effects model is the appropriate model to be used here.

The goodness-of-fit measured by the adjusted R-squared of .8266 suggests significant explanatory power for this model (F statistic of 50.42). The coefficient for the population density variable, POP-DENS was not significant (P value of .5416). However, the remaining three variables' coefficients were all significant. The coefficient for the unemployment rate was significant at .01, and the coefficients for the poverty rate and police officers to population were both significant at .10.

DISCUSSION AND CONCLUSIONS

The population density and the police officer to total population ratio are control variables. The hypothesis was that bank robberies were an urban phenomenon. Thus to avoid under-specification of the model, a measure of the relative urbanization of the states over time seemed requisite. The respective measures of the urbanization are also likely highly correlated with one another. The authors were then left with a choice of measures and no *a priori* reason to select one over the others. POP-DENS was selected, from among many potential measures, as a single control variable simply because it was the most general measure of population concentration. The coefficient for POP-DENS was hypothesized to be positive to the extent that bank robbery is an urban problem as opposed to a rural problem (hence a negative coefficient). In this model it appears that the concentration of population appears not to be a significant predictor of bank robbery in the U.S. during the 1990s – a rather surprising result suggesting that perhaps another control variable for this presumed effect might prove more appropriate.

The coefficient for the ratio or police officers to population variable, POLC-POP has a positive sign. Competing hypotheses concerning the sign of this coefficient exist. There is a "chicken or egg" dilemma in evidence here. If police are truly a deterrent to crime we would expect a negative sign for this coefficient. However, on the other hand, if expansion of police forces occur as a result of criminal conduct (an expectation of future crime perhaps) we would expect a positive sign for this variable's coefficient. It is interesting to note that it is the latter theory rather than the former that appears to be consistent with the statistical evidence presented here.

The economic variables are essentially a stock (poverty) and a flow (unemployment rate) of economic desperation. Unemployment rates ebb and flow with the business cycle. Poverty, on the other hand, is generally less associated with short-term variation in macroeconomic activity, and hence less temporary than unemployment in general. Desperation can arise from temporary hard-times associated with unemployment, or from more permanent conditions such as poverty. Therefore, it seemed reasonable that both measures of economic desperation should be included in the model.

Although the unemployment rate is positively associated with bank robberies across the United States over this decade as hypothesized, the poverty rate is negatively associated with bank robberies. In other words, the flow of economic hard-times is a determinant of bank robbery, but the stock of hard-times (poverty) seems to mitigate bank robberies. This result seems at odds with commonly held belief that poverty is a breeding ground for crime and criminals.

The poverty rate is not highly correlated with the unemployment rate in the United States. The working poor constitute nearly fifty percent of those living in poverty and the bulk of the remainder of those in poverty are children and the elderly – hence not measured as part of the work force (H. M. Wachtel, 1984, offers an excellent review of the economics of poverty).

The evidence is consistent with an association of bank robbery and a change in expectations of the potential bank robber, i.e., a change to a more desperate view of economic prospects in the short-term (hence flow of desperation). This is consistent with the "average take" from bank robberies which approximates a rather middle of the distribution monthly income, hence, a replacement of income lost from becoming unemployed, rather than a far larger amount necessary to escape from poverty. The fall from economic grace for those who were in the middle or high income categories to potential poverty may provide the motivation for the decision to rob a bank.

If poverty is, indeed, a relative concept then we would expect this stock variable to have perhaps even a negative sign, if the desperation in poverty is fully expected and not motivation for crimes against banks. Desperation from poverty is not, for most, an abrupt change in economic circumstances. Much of the poverty suffered in the United

States is inter-generational and does give raise to quick changes in economic desperation, and it may be that it is the change in desperation that provides the motivation for bank robberies. It may also be that those in poverty may be more prone to other crimes, robberies of retail establishments close at hand (in their own neighborhood with which they are familiar hence requiring less planning or resources to rob). This hypothesis can be directly tested in future studies by examining other crimes using essentially the same model presented here. If may also be that the negative coefficient is the result of those living in poverty do not have a realistic criminal alternative. Children, the elderly, and the disabled make poor bank robbers and are likely not to choose this alternative as an occupation or to supplement their meager incomes. Single mothers have children whose appeal to their motherly instincts may mitigate the risk of long separations due to prison sentences for bank robbery.

The evidence here suggests some interesting policy recommendations. It does not appear that increased law enforcement is an appropriate deterrent to this particular crime. If there are any deterrent effects of increased police protection those effects are overwhelmed by the growth of police forces relative to bank robberies. Further, poverty seems not to be breeding grounds for this particular crime, but the flow of economic hardship resulting from unemployment does. Increase economic security may, therefore, be the most effective method to mitigate bank robberies in the United States.

Clearly these results suggest some interesting possibilities for follow-up empirical studies using this approach. It is obvious more research must be done on this important topic and that many of the ideas concerning police protection and criminal deterrence should be more actively examined.

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