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U.S. Department of Justice
National Institute of Justice

100681

THE ROBBERY OF FINANCIAL INSTITUTIONS:

EXECUTIVE SUMMARY*

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January 1986

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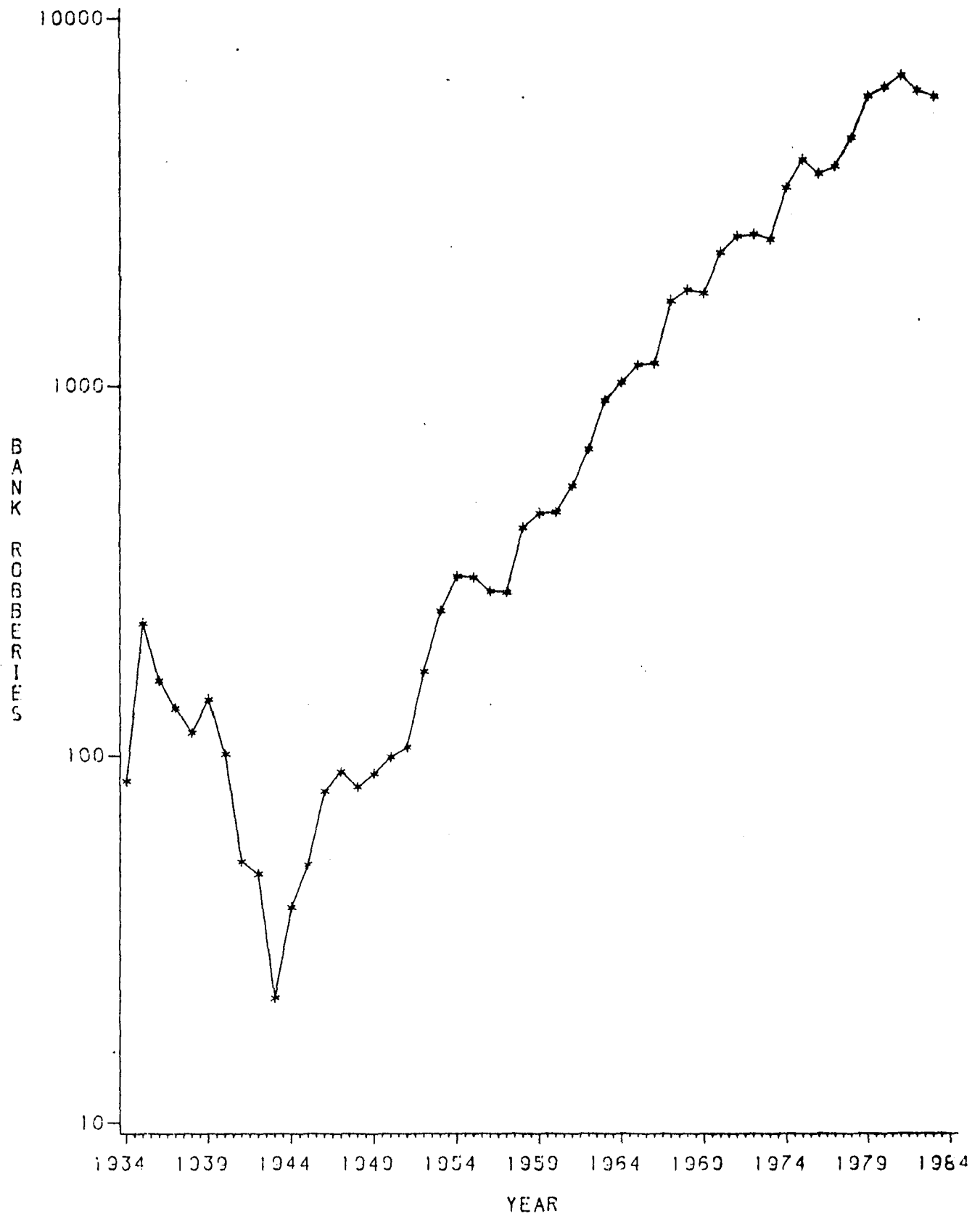
Executive Summary

INTRODUCTION

In recent years financial institutions, the federal government, and law enforcement agencies have devoted considerable resources to the fight against bank robbery.[1] In 1968 the Bank Protection Act established minimum security standards for all federally insured bank and saving and loan offices. As a result, since 1970, financial offices are the most security conscious commercial establishments in the United States. Law enforcement agencies, both local and federal, respond quickly and investigate these offenses intensely. These factors, along with a little help from the offenders, combine to produce a clearance rate (about 78 percent) higher than that for any other serious crime.

Unfortunately, over the past 40 years the robbery of financial institutions also has been one of the fastest growing violent crimes in the United States. Figure 1 presents the number of bank robberies in the United States from 1934 to 1984. In 1934 Congress made the robbery of a federally insured financial institution a federal crime. Over the following nine years the number of robberies declined to only 22 nationally in 1943. Since then, the number of offenses has increased at a dramatic and relatively constant

Figure 1

BANK ROBBERIES IN THE U.S.
PERIOD 1934 – 1984

SOURCE: TABULATION PROVIDED BY CRIMINAL INVESTIGATION DIVISION, FBI.

rate. In 1983 the number of bank robberies in the United States was 61 times higher than in 1950.

Figure 1 also offers some insight into the effectiveness of the two major policy changes related to bank robbery. The first, the Federal Bank Robbery Statute (1934), resulted in a significant reduction of bank robberies in the United States by 1943. This effect is due largely to the equivalent of a declaration of war by the F.B.I. on a small group of high rate offenders. The second initiative, the Bank Protection Act of 1968 (effective January, 1970), established minimal security equipment and procedures for financial institutions. Figure 1 confirms Anderson's conclusion that "there is little doubt whether the act finally passed by Congress has been successful in controlling bank robberies. It has not" (1981:19).

For comparison, Figure 2 presents total index crimes, violent crimes, and property crimes for the same period 1934-1984. If we look at violent crimes only (murder, rape, robbery, and aggravated assault), a distinctly different pattern emerges. Between 1950 (163,100) and 1959 (214,564) the number of violent crimes in the United States increased by 32 percent; between 1960 (285,200) and 1969 (655,061) violent crimes increased by 130 percent; and between 1970 (731,402) and 1979 (1,178,539) the increase was only 61 percent. In contrast to the bank robbery data, the number of violent crimes in 1981 was about 8 times that for 1950.

There have been a few attempts to explain this trend in bank robberies. In 1967, Hauge compared the 35 year (1931-1965) trend of bank robbery in California to the rest of the country. With extremely limited data he was able to conclude that the increases in the number of robberies experienced in California reflected actual increases in the rate of robbery. When adjusted for the number of banking offices and population changes, the increases

Figure 2

VIOLENT, PROPERTY & TOTAL INDEX CRIMES
PERIOD 1934 – 1984

SOURCE: COMPILED FROM UNIFORM CRIME REPORTS, FBI.
LEGEND: + = TOTAL INDEX CRIMES   # = PROPERTY CRIMES   X = VIOLENT CRIMES

persisted. More recently Nagin (1975) used bank robbery trends to test deterrence theory. Employing several measures of certainty, severity and demographic context, he found no consistently strong effect that would suggest a deterrence to bank robbery. However, specification problems and the presence of a few of the predicted relationships prohibited an outright rejection of the theory. The tentative conclusion to be drawn from these studies is that the increases experienced over the last four decades are not simply a function of either population or expanded banking opportunities nor have the high arrest and conviction rates had much aggregate impact on the number of offenses.

Other studies have attempted to identify regularities in the distribution of offenses against banking facilities by using the financial institution or the offense as the unit of analysis. In an early study of this type Camp (1968) questioned 132 convicted bank robbers about their offenses. In general, he found that the robberies were usually precipitated by an acute financial crisis. Banking facilities were viewed as targets with adequate capital and a low probability of resistance. Given the decision to rob a financial institution, Camp then asked about the specific factors which the offenders considered in selecting a particular institution. Location was by far the most important consideration, with escape being a primary concern. Other items which were mentioned with some frequency included the presence of a guard, the small size of the facility, proximity of the police, and physical structure of the office. Importantly, except for the presence of a guard, very few of the respondents mentioned the type of security system employed by the facility (1968:110-114).

In a more recent, but less rigorous study, Tiffany and Ketchel (1978) suggested some psychological deterrents that might affect the selection of a

banking office as a victim. They concluded, like Camp, that small offices which offer a variety of escape routes were especially vulnerable. In addition, they suggested that limited visibility, both from the exterior and within the office, contributed to the probability of robbery. They also noted that some percentage of robberies are impulsive, and therefore, less likely to be affected by subtle visible characteristics. In contrast, it might be suggested that this latter type of robbery is likely to be affected more by visibility, convenience, or physical proximity.

Another study reviewed the relationship between robbery and office characteristics (Saylor and Janus, 1981). For this project the Office of Research for the Federal Bureau of Prisons sent a questionnaire to every banking office in the Washington, D.C. metropolitan area. Their analysis revealed size and ease of access to be most closely related to the probability of robbery during a ten year period. More specifically savings and loans, offices with more entrances, direct entry from the outside, and more teller stations were more likely to be robbed. The finding that large offices were more likely to be robbed is in apparent conflict with the earlier research (Camp; Tiffany and Ketchel) which indicated small offices as more likely targets.

More recently Wise and Wise (1984) completed a study of the impact of interior design features on robbery. They found that some features such as offices with small lobbies, square lobbies and broad interteller distances were generally related to the probability of being robbed. However, more importantly, they suggested that there is a subtle process of interaction between the type of robbery and relevant interior design characteristics. For example, they found that armed robbers seem to prefer offices with only one entrance while "note passers" preferred offices with more than one

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entrance. The different types of robbery appeared to require different settings.

OVERVIEW OF THE STUDY

The present study was designed to provide additional information in several areas. First, although the Bank Protection Act specifies minimum standards for bank security, there is very little documented information about how the financial community secures its offices. The Bank Protection Act requires an alarm in almost all offices, bait money, bullet resistant glass in drive-up and walk-up windows, a designated security officer, and a security program. We would expect general conformity to these requirements, but what about the use of other security devices and how detailed is the security program? Both the use of security devices and security procedures were reviewed along with some of the major variations which occur in their deployment.

The second focus was on the robbery incident. There is considerable street wisdom about bank robberies, but very little documented information. Both the street wisdom and research (eg., Wise and Wise, 1984) agree that there are distinct types of robberies which have differing consequences for the institution and the people who happen to be there at the time. A typology of offenses was presented, each type described, and variations in dollars lost, violence and employee and law enforcement responses were reviewed.

The predictive work conducted by Camp, (1968); Saylor and Janus (1981); Tiffany and Ketchel (1978); and Wise and Wise (1984) was also extended. These studies have suggested that there is an identifiable pattern to the

victimization of financial institutions. They have focused attention on size, access, visibility, certain security procedures, and interior design. For this project these factors were grouped into two general areas: visible office characteristics and the immediate context of the office. In the first category several measures were taken of size, visibility both into and out of the office, personnel training and security devices. Considerable attention was also focused on the immediate context of the office. Various measures of access were taken, as well as, information about the social characteristics of the area, amount of crime in the area (perceived by respondent), and visible signs of security. A major hypothesis was that bank robbery may be part of a more general crime problem. In this sense "access" or "location" revealed by earlier research (Camp, 1968; Saylor and Janus, 1981) may be defined more precisely as "proximity to potential offenders" in the sense suggested by Cohen and Felson (1979).

The final issue to be addressed was incident disposition. The correlates of two case dispositions were reviewed: solution and sentence length. Some information is available on both topics (B.J.S., 1984; Administrative Office of the United States Courts, 1984) but is extremely limited. The major paths to solving a case were identified and the factors contributing to longer sentences discussed.

RESEARCH METHODS

The project employed a retrospective epidemiological design often used in medical research. In this type of design the researcher first identifies and selects a sample of cases which possess the trait being studied; next a sample of cases which do not possess the trait is selected. Background

characteristics are then identified and compared between the groups. The principal advantage of this design is the efficiency of data collection when the subgroup of interest can be identified.

The sampling frame was developed from information provided by three sources. The Indiana Bankers Association and the Indiana League of Savings Institutions helped identify the population of offices. Each group provided their membership lists and a corresponding listing of nonmember offices. Together this procedure identified all but the most recently opened offices in the state. The F.B.I. provided incident reports which were then utilized to identify the "victim" offices. For the purposes of this study, "victim" offices were defined as those offices in the state of Indiana which had experienced a robbery during the two and one-half year period, January 1, 1982 through June 30, 1984.

The actual selection of cases required two steps. First the victim offices were removed from the population of offices. This involved 223 robberies committed in 163 offices. Next, for the comparison group, a random sample of 200 of the remaining offices was drawn. The result was an 18 percent sample of the 1,968 financial offices in the state of Indiana.

In order to encourage participation the researchers developed a field protocol which relied heavily on the F.B.I. and the appropriate association. Initial contact was made by means of two letters sent to the President or Chief Executive Officer of each financial institution selected for the study. The first letter, from the applicable association, indicated strong support for the study; encouraged participation; and offered to verify the legitimacy of the study through the association. The second letter, from the researchers, described the study; listed the office(s) of the institution

which were selected; and encouraged those with reservations about participation to contact their regional F.B.I. office.

Overall, cooperation was excellent. The researchers were unable to obtain a response for only five of the 363 selected offices. All of the 163 victim offices cooperated while 195 of the 200 nonvictim offices did so. Of the five nonresponsive offices, three were caused by the sampling frame: one had been closed and two did not exist. In one case it was simply not possible to arrange an appointment with the appropriate respondent. Only one of the 363 offices declined to participate.

Data collection occurred in two stages. For the primary data collection one of the researchers visited each of the 358 offices in the final sample. At each office, a respondent was interviewed about the office and field observations recorded. For the victim offices an incident report was completed for each robbery. The second stage utilized F.B.I. and local law enforcement records to establish the disposition of each robbery incident. In this way detailed information was obtained about both the robberies and characteristics of financial institutions.

RESULTS

Security Programs

A bank's security program covers two primary areas: security devices and security procedures. A security device is equipment such as an alarm or camera system. Security procedures concern the operational procedures a bank follows before, during and after the robbery, for example, employee opening and closing activities, conduct during the robbery and equipment inspection. A thorough security program must include procedures to protect the bank

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against several crimes including bank robbery, burglary, larceny, embezzlement and check fraud. Due to the nature of the study, only those components of security programs designed for protection against bank robberies will be discussed.

The Bank Protection Act requires each bank to assign one person to be responsible for the installation, maintenance and operation of security devices and also the design and operation of a security program. This person, the security officer, maintains a direct line of responsibility to the bank's board of directors who are ultimately charged with his or her supervision. The security officer is responsible for the protection of bank employees, customers while on the premises, cash securities, other valuables and all remaining bank property (Bank Administration Institute, 1981:7). The security officer shall determine the bank's need for security devices but must provide for an alarm system at each bank in which police can normally arrive within five minutes after the alarm has been activated. All other offices must have some device in place to notify the police as a robbery occurs. Alarm systems are the only devices that are actually required. In addition, the alarm system must be able to be activated at all teller stations that are not protected by a bullet resistant barrier and should be safeguarded against accidental activation.

Other security devices are to be installed as deemed appropriate by the security officer and other bank officials. The appropriate equipment is to be determined by such considerations as: incidence of crime in the area surrounding the bank; cost; physical characteristics of the banking office; size and amount of currency within bank and the distance from the bank to the nearest law enforcement office.

There are generally five protective devices that financial offices use
to protect themselves against bank robbery: alarm systems, surveillance
systems, guards, dyepacks and bullet resistant barriers. Table 1 shows the
estimated percentage of banking offices which employ the various security
devices. These descriptive statistics were derived from the sample weighted
to reflect the true proportion of robbed offices.

It was estimated that 94.8 percent of the offices have alarm systems.
Of the offices which have alarm systems, the most common place for the alarm
to sound is in the police station (76%) followed by private security (13.4%),
bank security (7.6%) and finally at the facility (2%). Of these alarm
systems 77 percent are connected to a camera system.

Although camera systems are not required, approximately 78 percent of
the financial institutions in Indiana have such systems. Of those having
camera systems, 51 percent have one live camera, 38.3 percent have two live
cameras and 10 percent have more than two. There are 11.4 percent of the
banking institutions which have their cameras on an automatic photographic
schedule. The majority of the cameras cover interior teller stations and the
lobby, with approximately half of the cameras covering exits.

While the majority of banks have camera systems, much fewer have bullet
resistant barriers, guards or dyepacks. Only 7.1 percent have bullet
resistant barriers; 7.9 percent have a guard and only 7.5 percent have
dyepacks.

Security procedures include such strategies as testing of security
devices, robbery procedures and currency requirements. The Bank Protection
Act specifies that: ". . . each bank shall develop and provide for the
administration of a security program to protect . . . from robberies . . .
and to assist in the identification and apprehension of persons who commit

Table 1

Estimated Percentages of Banking Offices Having Security Devices

1.	Alarm System	94.8%
	Of those having alarms:	
	Where alarm system sounds:	
	Police Station	76.0%
	Private Security	13.4%
	Bank Security	7.6%
	At facility	2.0%
	Alarm activation:	
	Hand button	27.3%
	Money Clip	14.0%
	Hand squeeze clip	8.0%
	Foot Rail	3.0%
	Multiple	47.3%
2.	Camera System:	78.5%
	Of those offices having cameras	
	One camera system	
	One live camera	51.0%
	Two live cameras	38.3%
	More than two live cameras	10.0%
	Dummy cameras	5.0%
	Camera system covers:	
	Interior teller station	97.9%
	Lobby	80.2%
	Exits	53.4%
	Vaults	19.9%
	Drive-up stations	4.1%
	Automatic Photographic	
	Schedule	11.4%
	Two camera systems	1.7%
	Camera system attached to alarm system	90.6%
3.	Bullet Resistant Barriers	7.1%
4.	Guards	7.9%
	Of those having guards:	
	Uniformed	93.0%
	Armed	99.0%
5.	Dye/Teargas Packs	7.5%

such acts. The security program shall be reduced to writing, approved by the banks board of directors, and retained by the bank in such form as will readily permit determination of its adequacy and effectiveness" (Federal Register, 1969:1).

Table 2 reviews the reported extent of staff preparation and training. Almost all offices had a designated employee or had someone the central office responsible for employee training (94%) and a similar proportion trained new employees as they are hired (95%). The most common form of training is verbal instructions (94%). Another aspect of training programs for the majority of banks is to allow their employees to practice activation of the alarm systems (71%). While this is not required by the Bank Protection Act Regulations, it is a very worthwhile exercise for banks to include in their training programs. Equally as worthwhile are robbery drills which only 12 percent of the banks practice.

The majority of banks have retraining procedures with half (56%) of the banks reviewing robbery procedures on a regular basis. However, it is estimated that almost one-half (44%) do so on an irregular basis; usually after a local robbery. In general, the majority of the officials felt their employees are well prepared for a bank robbery.

As mentioned earlier, bait money and currency requirements are also part of required security procedures. These data estimated that less than one percent (0.5%) of the offices did not maintain bait money. It is interesting to note that 19.3 percent of the banks reported no limits on the amount of cash kept in teller's drawers on a normal business day. While the regulations do not specify a currency limit they do ask that currency be kept at a "reasonable minimum."

Table 2

Percentage of Banks Estimated Employing
Specified Security Procedures

Security Procedures	Percentage
New employees receive special training	95.0%
Form of training:	
Verbal instructions	94.5%
Book	38.5%
Training sessions	35.2%
Film	22.9%
Review Robbery Procedures	
Regularly	56.5%
Irregularly	43.5%
Employees taught to recognize suspicious	
behavior	78.5%
Practice alarm activation	70.8%
Robbery Drills	12.2%
Trained to take special action if robbed	90.7%
Alert other employees	27.0%
Activate camera system	20.6%
Activate alarm system	4.6%
Other	2.4%
Multiple	45.5%
Dyepacks	7.5%
Bait money	99.5%
Currency Limits on tellers drawers	80.7%

Several conclusions may be offered about these programs. First, a general compliance with the requirements of the Bank Protection Act was observed. It was estimated that around 95 percent of the offices are in compliance with minimum standards.

Second, except for alarm and camera systems, financial institutions do not invest heavily in security devices. Of course, the former is required by the Bank Protection Act and the latter strongly encouraged by the F.B.I. It was estimated that no other security device--guards, dye packs, bullet resistant barriers--was being employed by more than 8 percent of the financial offices.

Third, there is wide variation in the extent and type of security training given to new employees. For most offices security training was minimal and consisted of verbal instructions presented on the job. However, some financial institutions were very security conscious and devoted considerable time to security training for employees.

Fourth, the training provided to most banking employees does not prepare them very well for a robbery. Beyond some general instructions to cooperate with the offender and to notify the police as soon as it is safe, many tellers simply do not know what to expect or what to do. This is crucial, as all of the security equipment in the world is useless if the employees do not or will not use it during a robbery.

Robbery Incidents

While innumerable conclusions about the incidents themselves could be offered, the discussion here is limited to several major findings. First, a productive typology of offenses was constructed from the cross classification

of the number of offenders visible in the office (one or more) and whether a
weapon was actually observed. This results in four possible types of
offense, however, only three were observed in this study.

The first type of robbery (34% of the offenses) was committed by a
single offender who did not show a weapon. While this type of offender did
not display a weapon, 86 percent claimed in their note or verbal demand to
have one. This type of offender was referred to as the Unarmed Lone Bandit.
These offenders attempted to blend in with other customers by standing in
line, making a quiet demand (96% of the time), and usually, passing a note to
the teller (73%). These offenses were also more likely to occur in busy
offices. As a result of these characteristics, the offender was usually able
to exit the office without being noticed by customers or other employees
(73%). No violence was recorded for any of these offenses. Table 3
indicates that they averaged the lowest losses per robbery ($1,637 median)
and the highest percent of the money recovered (28%). Ultimately, 78 percent
of these offenses were solved.

The second type of offense (44% of the sample) involved one offender
who showed or actively displayed a weapon. These offenders were described as
the Armed Lone Bandits. The weapon was most often a handgun (80%). This
type of offense was quite heterogeneous varying from quiet "note jobs" to
noisy one man "takeovers". However, these offenders most often made a verbal
demand (84%) in an office with two or less customers (63%). These
characteristics allowed others in the office to notice that a robbery was
taking place before the offender left (70%). The median loss for this type
of offense was $3,589 with 22 percent of the money recovered. The Armed Lone
Bandits were involved in two of the three incidents of violence recorded in
the study. In one case, a shootout resulted in the injury of a guard and the

Table 3

AMOUNT TAKEN AND AMOUNT RECOVERED BY TYPE OF ROBBERY

TYPOLOGY	N	LOSS AVG.	LOSS MEDIAN	LOSS TOTAL AMOUNT	AMOUNT RECOVERED	PERCENT RECOVERED	LOSS MAX.	N 0 LOSSES	N NO RECOVERY	PERCENT NO RECOVERY
All Robberies	223	6,214	2,800	1,385,714	205,656	15	113,216	13	164	73.5
Unarmed Lone Bandit	76	2,278	1,637	173,158	47,985	27.7	12,942	4	53	69.7
Armed Lone Bandit	99	5,163	3,589	511,219	110,305	21.6	29,700	6	74	75.0
Armed Team	48	14,688	6,486	705,024	48,366	6.86	113,216	3	37	77.0

death of an offender. The other case involved the sexual assault of a bank employee at a small office. Seventy-eight percent of these offenses were solved.

The third type of robbery was committed by Armed Teams (22%). The robberies committed by these offenders fit the image of the classic "takeover". The offenders were immediately recognizable as robbers (79%) and usually ordered employees and customers to the floor (60%) during the offense. They generally showed evidence of planning and organization with one controlling the office and acting as a lookout while the other(s) moved behind the counter to collect the money. These offenses resulted in the largest median loss ($6,486) and the lowest percent of the money recovered (7%). This type of offense accounted for the other incident of violence encountered in the sample. A shootout between a guard and four armed robbers resulted in the injury of a customer in the office. These offenses were the most traumatic for the bank employees with 38 percent of the victim tellers reporting that they were "very" affected by the robbery. This compares with 31 and 22 percent respectively for the Armed and Unarmed Lone Bandits. At the conclusion of the study period 79 percent of the Armed Team robberies were solved.

The reported race of the robbers in the sample was 58 percent Black, 41 percent White, and one percent unknown. The Armed Lone Bandits were observed to be 57 percent White, 42 percent Black, and 2 percent unknown. The Armed Teams were reported to be Black 90 percent of the time and White ten percent of the time. The Unarmed Lone Bandits were reported as Black 58 percent, White 40 percent and there was one racially unknown robber. Black offenders clearly dominated the Armed Team robberies with whites constituting the majority of Armed Lone Bandits.

Nearly all of the bank robberies in the sample (97%) were committed by males. There was one female Armed Lone Bandit, two female Unarmed Lone Bandits, and two female-male armed teams. These two "mixed" Armed Team robberies netted only $0 and $760 respectively and brought down the overall Armed Team average "take".

The age of the robbers is presented in Table 4. They ranged from 17 to 69 with 59 percent between 21 and 30 years of age. If known, the actual age of the offender was used; if not an estimate made of the robber's age by the respondent was employed. The oldest offender was 69 years old, and was later arrested for another bank robbery in a nearby state. He was also believed to have been involved in several other bank robberies. The next oldest offender was 67 and robbed the same branch twice for relatively small amounts (less than $1,000). He was caught soon after the second robbery. Seven percent of the robberies involved robbers believed to be over 45 years of age. The age of the robbers did not vary significantly between the three different types of robberies.

A weapon was threatened in 95 percent of the robberies. The threat might include actively brandishing one, simply displaying it, saying they had one (verbally or in writing), or intimating a weapon by gesture (hand in pocket, etc.). However, a weapon was actually seen by victims in only 64 percent of the cases. The threatened or displayed weapons of choice were handguns (76%). Other weapons included shoulder weapons (6%), bombs (4%), and four cases involving knives (2%). Six percent of the offenses involved multiple weapons. As often as weapons were threatened and actually seen there were only six (3%) robbery incidents which involved a weapon actually being "used".

Table 4

Age Distribution of Robbers

Age of Robbers	Number in Each Age Group	Percentage of Total
17-20	13	5.8
21-25	75	33.6
26-30	57	25.6
31-35	39	17.5
36-40	19	8.5
41-45	4	1.8
46-50	5	2.2
51-55	2	.9
56-60	2	.9
61-65	1	.4
66-70	3	1.3
Couldn't tell	3	1.3
Totals	223	99.8

Several other observations were made about bank robberies. First, violence during a robbery is rare. In this sense the financial community has made bank robbery a "safe" crime for bank employees, customers, and the offender. However, given a robbery, a guard appears to increase the probability of serious violence. From the 223 incidents only three cases of serious violence were recorded and two of these involved a security guard. The remaining case involved the sexual assault of a female teller by a lone gunman.

Second, although approximately 18 percent of the offenses are solved in the same day, the potential exists to apprehend considerably more offenders immediately following the offense. This is important because an offender who has time to spend or dispose of the money considers the offense a success. It was concluded that the police were "just missing" many offenders. This was due in part to a reluctance of the victim teller or other employees to activate the silent alarm until the offender turned to or actually did exit the office. Again, better training and preparation could help reduce this reluctance.

Third, the active participation of the F.B.I. in bank robbery investigations is critical. Although the F.B.I. was not solely responsible for solving even a majority of the robberies, their resources and training are very helpful for this type of offense. As a federal agency, they can identify and link the serial offenses committed by one person (or a team) across state or local jurisdictions more easily than other law enforcement agencies. In addition, they possess considerably more resources, expertise and experience in investigating robberies than most local jurisdictions.

Patterns of Victimization

In this section the focus shifts to an exploration of the correlates of robbery. As other authors had observed, some financial offices seem to be robbed more often than others (cf, Tiffany and Ketchel, 1978); however, documentation of such a pattern is very limited. The goal of this phase of the research was to verify the existence of any pattern of robbery and to explore the reasons why some offices are robbed so much more frequently than others.

As was indicated above, the research design for this study was not a simple random sample. First, all offices in the state of Indiana which had been robbed in the two and one-half year period (January 1982-June 1984) prior to the study were selected; then a random sample of the remaining offices was drawn. This retrospective design is very efficient from the standpoint of data collection, but does create special analytic problems for both descriptive and explanatory analyses. In particular, neither the distribution of the dependent variable (whether or not the office was robbed), nor the distribution of the independent variables (the various factors affecting victimization) are representative of the respective distributions in the population.

The usual solution to the this problem is to weight the sample. That is, some cases are multiplied by a factor greater than one and/or others are multiplied by a factor less than one. The result is a sample which resembles the natural distribution in the population. Unfortunately such a weighting procedure would produce a sample in which only 8.0 percent of the banking

offices were robbed and many analytic techniques are also sensitive to highly skewed distributions (see Hanushek and Jackson, 1977).

The analytic technique employed in this section, logistic regression, avoids the need to re-weight the data while producing estimates of the association between independent and dependent variables that are _identical_ to those obtained under alternate (including natural) weighting schemes. The major interpretive difference between logistic and ordinary least squares regression stems from the fact that under the logistic model the dependent variable is the _relative odds_ of being in one category (versus the other) of the dependent variable. For a more detailed discussion see Fienberg (1980).

The coefficients produced by this technique are also easy to interpret, thereby facilitating the presentation of results. Although these coefficients may be presented in several ways, we have elected to present them as odds ratios. Substantively they are conditional odds which range from zero to infinity with a value of 1.0 representing no relationship. For example, if an odds ratio of 6.88 was obtained for the effect of type of office (branch versus main) on robbery, the interpretation would be that branch offices are 6.88 times more likely to be robbed than main offices. For ease of interpretation in the analysis which follows all independent variables have been dichotomized and coded such that their effect is one of increasing the odds of getting robbed.

The bivariate odds ratios for the variables that were significantly related to the measure of robbery are presented in Table 5. Each variable has the effect category listed. For example, the number of doors to the office has been inverted so the effect is of having only one door to the office. The proper interpretation of the associated coefficient would be

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Table 5   Odds Ratios for Variables Related to Robbery

	2	3	4	5	6	7	8	9	10	11	12	13	14[A]
1. Robbery Status	3.06*	6.88*	2.26*	1.90#	3.98*	18.11*	2.09*	2.35*	2.22*	7.46*	4.53*	3.13*	20.49'
2. Number of Doors (one)		18.05*	2.75*	0.69	2.78*	2.10#	2.49*	2.30*	1.79#	3.39*	1.54	2.28*	0.64
3. Type of Office (branches)			127.38*	0.41*	14.02*	2.65#	3.67*	8.08*	3.34*	5.08*	2.83*	3.69*	0.82
4. Number of Male Employees (0-1)				0.41	2.28*	1.87*	1.32	2.17*	1.50	1.60#	1.49	1.29	0.62
5. Visibility around Entrance (little or none)					1.28	1.04	1.18	1.17	1.40	1.18	2.08#	1.32	2.69
6. Office Location (commercial strip)						2.43#	2.52*	12.00*	7.03*	4.46*	2.72*	2.34*	2.25
7. Robbery History (robberies 3 years prior to study)							2.48*	2.42*	2.87*	7.28*	3.56*	2.44*	5.76*
8. Street Width (>2 lanes)								2.71*	7.74*	5.73*	2.56*	1.91*	2.47
9. Traffic Speed (>25)									3.78*	1.70#	1.73#	1.36	0.70
10. Traffic volume (>16 per minute)										4.08*	1.82#	2.53*	1.20
11. City Size (>25,000)											6.73*	3.92*	
12. Fear (any)												2.83*	2.89#
13. Robbery of other businesses													2.28

\ Visible security on businesses in area
* p∠.01
# p∠.05

that offices with only one door were three times more likely to be robbed during the 2 1/2 year study period than offices with more than one door.

Multivariate results are presented in Table 6. As might be expected, only a subset of the variables in Table 5 survived the multivariate analysis. The multivariate odds ratios for each variable are presented in the left column. These are interpreted simply as the conditional odds of being robbed, with the remaining variables held constant. Also presented are the regression analog coefficients which are similar to standardized beta coefficients.

Of the office characteristics only type of office--branch versus main--was related to robbery in a multivariate fashion. Branch offices were 2.64 times more likely to be robbed during the study period regardless of prior robbery history, city size, security measures taken by other businesses or reported fear. Although this finding is not characteristic of prior research, given the nature of the robberies and characteristics of branch offices it is not surprising. In the previous section it was noted that approximately two-thirds (147) of the robberies were committed by either teams or Armed Lone Bandits. Both types of robbery require a belief by the offenders that the office can be controlled during the few minutes of the robbery. For the most part branch offices present an environment which allows such control. They are considerably more likely to have only one entrance and much more likely to have one or no male employees (see Table 5). Both factors may be perceived to increase control of the situation. In addition, branch offices are more likely to be located in commercial strips where traffic is moving faster. This would allow anticipation of a more successful getaway. In summary, the greater control and escape possibilities

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Table 6   Logistic Regression of Robbery Status
on Five Independent Variables (N=352)

Effect of:	Odds Ratios[A]	Regression Analog[B]
Type of Office (branches)	2.642*	0.9716*
City Size ($>$25,000)	1.785*	0.5795*
Robbery History (robbed during prior 3 years)	3.239*	1.1753*
Visible Security on other Businesses	3.884*	1.3568*
Fear of Personal Victimization	1.516*	0.4162*
Constant[C]	0.262	-1.339

* $p < .01$

[A] Coefficients fit a multiplicative model where the dependent variable is the odds of being robbed during the study period.

[B] Coefficients fit a standard additive model where the dependent variable is the log odds of being robbed during the study period.

[C] In a retrospective sampling design the constants are not interpretable.

offered by branch offices increase the odds of being robbed--especially an armed robbery.

In addition, offices which were robbed during the three years preceding the study period were three times more likely to be robbed in the subsequent two and one-half years than those which were not. This holds regardless of type of office, size of city, or reported fear of crime. In one sense this is simply confirmation of the hypothesized pattern to robbery, but in another sense it can be effectively used to anticipate probable future incidents. When an office is robbed, bank officers should seriously expect additional future incidents. Robberies are in part due to the type of office, access, and availability to potential offenders but also appear to be related to prior robberies. An additional mechanism may be the publicity about prior robberies mentioned by the offenders in Camp's study (1968).

The third variable in this analysis was city size. Offices in cities with a population over 25,000 were 1.78 times more likely to be robbed after the other four variables were considered. This is a common finding in criminological research. Even when other variables have been accounted for, the level of crime is consistently higher in larger cities.

The fourth variable presented in Table 6 concerned the presence of visible signs of security at other businesses in the area. These primarily included bars on windows or burglar gates. Offices in areas where such security measures were visible were almost four times more likely to be robbed than were offices in other areas. Security hardware like a burglar gate indicates a belief that the threat of forced entry is great enough to merit such extreme measures. Businesses do not usually install such devices until after several incidents. These visible security measures appear to be fairly good indicators of the presence of potential offenders. The lesson to

be learned is that banking offices are not immune to attack; when other businesses in an area take rather extreme physical measures to protect their merchandise the bank management should take appropriate actions.

Finally, the office respondent was asked how afraid he or she would be of walking alone in the vicinity of the office at night. For those respondents who reported any fear (somewhat, quite or very afraid) the office was 1.5 times more likely to be robbed. It is possible that this effect has two components. First, it may represent a recognition of the presence of criminal predators in the area. This is partially supported by the relationship of this variable to the other crime related environmental items. Second, it may also be a consequence of the prior robberies. That is, the prior robberies caused the respondent to redefine the area as dangerous. Whatever the ultimate source of this relationship the affective reactions of employees to the area surrounding the office are reasonably good predictors of robbery.

The odds ratios presented in Table 6 can also be combined to produce a composite effect simply by multiplying the coefficients. When this is done a value of 89.95 is obtained. This means that branch offices in cities over 25,000 which have been robbed and are in fear evoking neighborhoods where other businesses employ visible security measures are approximately 90 times more likely to be robbed than are offices not possessing these traits. Such offices are at a considerably higher risk of robbery and should receive special security attention. These results indicate that the overall pattern of bank robbery is similar to that for other crimes, but considerably more predictable.

No variable interactions were found to be significant. This means, for example, that branch offices in larger cities are not disproportionately at

risk. Branches and offices in larger cities are more likely to be robbed but there is no unique combination of the two variables that changes significantly the odds of being robbed. .

Incident Disposition

The study also reviewed the cases which were solved and the factors which contributed to the solution. It should be noted that a case was considered solved when it was "cleared" by the F.B.I. through an arrest, confession, clearance statement or some other means. The term "solution" is used here rather than "clearance" to emphasize that the numbers reported all refer to the same offenses. Clearance rates are normally the number of crimes cleared in a given time period expressed as a percent of the crimes committed during that period--the cases included in the two numbers overlap but are not necessarily the same. What is analyzed here is the percentage of the 223 offenses considered to be solved. Of course, the closure of the time period at one to three years underestimates this rate to an unknown degree.

The status of the investigation is reported in Table 7. Overall 78.5 percent of the cases had been solved. This is somewhat higher than the 69 percent reported by the F.B.I. for 1978-1979, but very similar to the 83 percent reported by the GAO (Bureau of Justice Statistics, 1984). Haran and Martin (1977) cite an F.B.I. solution rate of 80 percent. Thus, it appears that about four out of five of all bank robberies are solved.

Table 7 also presents the researchers' judgment of the agency primarily responsible for solving the case. The extensive cooperation between the F.B.I. and local law enforcement agencies is demonstrated by the fact that 54.9 percent of the solved cases were the product of multiple agencies

Table 7

Status of Investigation

Status	Percent	N	Percent of Solved Cases
Solved by City Police	22.0	49	28.0
Solved by County Sheriff	2.7	6	3.4
Solved by State Police	2.2	5	2.9
Solved by F.B.I.	6.3	14	8.0
Solved--Multiple Agencies	43.0	96	54.9
Solved by Other Means[A]	2.2	5	2.9
Unsolved--Active Investigation	3.1	7	-----
Unsolved--No Active Investigation	18.4	41	-----
Totals	99.9	223	100.0

[A]One Each: citizens and employees, bank security, retired policeman, off-duty policeman, and offender's counselor.

cooperation. Following that, 31.4 percent of the cases were solved primarily by city or county agencies.

When compared to other forms of robbery the solution rate for bank robbery is exceptionally high. For example, the F.B.I. (1984) reports that the clearance rate for all robberies was 26 percent in 1983. In fact, this rate even exceeds the reported clearance rate for murder (76%), the crime usually thought of as having the highest clearance rate. For these reasons the factors which were primarily responsible for solving the cases were also recorded. For each case the researcher recorded the factors which in his judgment were important in solving the case.

These results are presented in Table 8. The most frequently occurring category was "other" which included confessions, clearance statements, auto accidents and the shooting death of an offender. As will be noted later, most of the cases in this category were also included in the next most frequently occurring category "arrested on another charge." Following these, the next most frequently recorded factors were employee reactions, informants, witness reaction, police response, and pictures taken by the surveillance cameras. Worthy of note is the finding that bait money was primarily responsible for the solution in only three percent of the cases. Also the offenders, through incompetence, contributed to solution in 14 percent of the incidents.

Of course, the factors listed in Table 8 are not independent of each other but the product of several alternative types of solution. The correlation coefficients presented in Table 9 help identify those routes. The first includes a quick recognition and reaction by either an employee or bystander. The central factor here is the police, who are notified by an employee through the alarm or a bystander who contacts them, usually by

Table 8

Factors Contributing to Solution
of Solved Cases*

Factor	Percent Yes	Number Yes
Surveillance Picture	23.5	40
Arrested on Another Charge	37.9	66
Employee Reaction	31.4	54
Bystander Reaction	26.5	45
Law Enforcement Response	25.1	43
Informant	35.3	60
Incompetence of Offender	13.7	23
Fingerprints	7.0	12
Robbery Alarm	6.4	11
Dye Pack	4.0	7
Bait Money	3.4	6
Offender Surrendered	2.3	4
Crime Stoppers Program	2.3	4
Luck	0.6	1
Other Factors**	48.6	85

*   All that applied checked for each case.

**   This category is primarily confessions while in custody for another offense.

telephone. It will be noted in Table 9 that all four of these variables are significantly related except that the bystander reaction has very little to do with whether the alarm contributed to the solution of the case.

The second means of solution involves primarily an arrest for another offense and a confession or clearance statement (the "other factor" category). It has often been noted that bank robbers tend to be repeat offenders; this behavior contributes to their eventual apprehension. Each offense carries a relatively high probability of identification and/or apprehension and these probabilities increase with each subsequent robbery. The result is eventual apprehension and recognition of involvement in a series of robberies.

The third means of solution includes information obtained from individuals who know about the offender or the offense. Informants play an important role in law enforcement and it appears that bank robbery is no exception.

The data support an interpretation of these first three methods of solution as alternative means. The significant negative correlation coefficients between sets show that when one set of factors was involved in solving the crime the others were not. More specifically, if the offender is not caught immediately by the police as a result of quick and appropriate actions of an employee or bystander, the solution of the case depends on either an informant or a subsequent arrest (which very well may be the result of employee reaction).

The final two forms of solution are through pictures taken by surveillance cameras or the incompetence of the offender. The independence of these two factors from the others suggests that they are not alternative paths to the solution of cases, but rather, combine with other things in

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Table 9 Correlation Matrix of Major Factors
Contributing to Solution

	Alarm Activation	Police Response	Witness Reaction	Informant	Arrest On Other Charge	Other Factors	Picture Of Offender	Offender Inept
1. Employee Reaction	.278**	.537**	.343**	-.191*	-.388**	-.284**	-.087	.144
2. Alarm Activation		.323**	-.122	-.159*	-.174*	-.021	-.039	.195*
3. Police Response			.576**	-.400**	-.410**	-.249**	-.140	.155
4. Witness Reaction				-.166*	-.335**	-.332**	-.117	.052
5. Informant					-.184*	-.221**	.100	-.080
6. Arrested on Other Charge						.557**	-.014	-.230**
7. Other Factors							.024	-.098
8. Photograph of Offender								-.015

*p ∠.05
**p ∠.01

order to lead to a clearance. For example, a picture is usually the result of employee activation of the cameras but its utility depends on identification of the individual. Similarly, incompetence itself does not lead to an apprehension, but usually relies on the action of an employee, bystander, or police officer.

In summary, five routes to the solution of bank robberies were identified. Two of these are a direct result of employee reactions. Both the "employee--police" and "picture" types of solution depend on the victim teller or another employee. It might be noted, that tellers play a crucial role in attempted or aborted robberies too. In this sense financial institutions should invest considerably more time in the preparation of their employees for these incidents.

In this section sentence length was also reviewed rather than arrest or conviction as the final disposition of a case. While the other two dispositions may be of interest, they pose distinct analytic problems. First, the serial nature of the behavior of many offenders who rob financial institutions means that they eventually get caught, but the reasons for an arrest for another offense has very little to do with the current one. Second, given an arrest and prosecution, a conviction was virtually assured in the cases studied here: only two resulted in an acquittal. Thus, below we look at length of sentence for the 106 cases which had terminated in a guilty verdict.

Sentence length in months is presented in Table 10. The sentences ranged from three to over 1,000 months with a median sentence of 96 months (8 years). Over one-half (54%) of the sentences were between five and ten years. On first review these figures appear to be considerably lower than the average of 157 months reported by the Administrative offices of the U.S.

Table 10

Sentence Length in Months

Month	Percent	N
3	0.9	1
6	0.9	1
12	0.9	1
24	2.8	3
36	5.7	6
48	0.9	1
60	17.9	19
72	14.2	15
96	6.6	7
120	15.1	16
144	4.7	5
156	2.8	3
180	8.5	9
240	5.7	6
288	0.9	1
300	0.9	1
384	0.9	1
420	1.9	2
432	1.9	2
480	0.9	1
600	1.9	2
Over 1,000 Months	2.8	3
Totals	99.7	106

Mean= 158.14
Median=96.0

Courts (1984:14-37). However, there are two explanations of this disparity. First, it is probable, although not specified, that the U.S. Court figure is an arithmetic mean rather than a median. If a mean is calculated for the data in Table 10, a value of 158.1 months is obtained! One is tempted to attribute some importance to this similarity, but the second explanation tempers this initial impulse. This other interpretation is that the figure obtained here represents something quite different. The U.S. Courts data include only federally prosecuted cases and excludes several types of sentence while the data reported here includes cases processed in both state and federal court. The figure reported here, then, represents the average (median) sentence for cases beginning as a bank robbery.[2]

Correlation coefficients for variables significantly related to length of sentence are presented in Table 11. The variable most strongly related to length of sentence, the presence of a plea arrangement, is also temporally closest to sentencing. Cases involving a plea arrangement result in lower sentences. This is not surprising since the most typical form of arrangement is an agreement to plead guilty to a lesser charge. For Indiana cases initially charged as robbery with a deadly weapon, the mandatory prison sentence is a powerful incentive to negotiate with the prosecutor.

Also related to length of sentence were several variables which are characteristic of the Armed Teams discussed in an earlier chapter. These were robberies in which the offender(s) announced the robbery upon entry, wore hats or ski masks, displayed weapons, and ordered the employees and customers to the floor. These robberies involve considerably more planning, preparation and deliberation, as well as, intimidation of the victims and potential for violence, than a simple note job. These data suggest that the result is a longer sentence for such offenders.

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Table 11   Correlation Matrix of Variables Related
to Sentence Length (N=86)

	Sentence Length	Plea Arrangement	Entered Office Like a Robber	Wore hat or Ski Mask	Displayed Weapon	Number of Offenders	Ordered People To Floor	Number of Charges
1. Plea arrangement	-.436*							
2. Entered Office Like Robber	.299*	-.039						
3. Cap or Ski Mask	.397*	-.056	.511*					
4. Displayed Weapon	.253**	-.004	.491*	.405*				
5. Number of Offenders	.402*	-.350*	.159	.203	.177			
6. Ordered People to Floor	.322*	-.104	.421*	.387*	.354*	.290*		
7. Number of Charges	.285*	-.040	.176	.199	.167	.124	.080	
8. Injury	.294*	-.116	.300*	-.006	.177	.297	.251**	-.006

*p∠.01
**p∠.05

The final three variables related to length of sentence were number of offenders, number of charges at conviction, and injuries resulting from the incident. Each of these variables was generally independent of the others considered here, although there is some tendency for injury to be increased by type of entry and the potential for a plea arrangement to be decreased for multiple offenders.

In order to sort out the multivariate effect of the above variables on sentence length a stepwise multiple regression analysis was performed. Table 12 presents these results. Four variables combined to increase sentence length. The presence of a plea arrangement continues to reduce the sentence independent of the other variables. Similarly the number of charges at conviction also increases the length of the sentence. Both of these findings are characteristic of the operation of the criminal justice system and are not unique to bank robbery. Quite simply, the penalty, within a broad range, depends as much on the cooperation of the offender as the characteristics of the offense.

The next two variables may be considered together. Robberies which involved attempts to conceal identity (hat or ski mask) and multiple offenders also resulted in longer sentences. Both of these variables indicate some measure of planning and preparation. In addition, as was note above, the attempt to conceal one's identity is generally representative of robberies which also offer a serious threat of violence (weapons, ordering employees to floor, announcing robbery upon entry). The courts understandably deal more harshly with offenders who plan and coordinate their activities, as well as intimidate and threaten the victims, independent of the number of charges or ability to plea bargain. Indeed, Table 11 indicated

Table 12

Multiple Regression of Sentence
Length on Incident Characteristics (N=86)

Variable	B	beta	t-test	p
1. Plea Arrangement	-168.55	-.3428	-3.81	<.01
2. Wore Hat or Ski Mask	124.40	.2945	3.36	<.01
3. Number of Charges at Conviction	36.77	.2227	2.58	<.05
4. Number of Offenders	54.48	.1938	2.10	<.05

Intercept   176.16

R=   .6465; R^2= .4179

that offenses involving multiple offenders were less likely to involve a plea arrangement.

RECOMMENDATIONS

In view of the conclusions, several recommendations were presented:

- Financial institutions should devote considerable more time and effort in the preparation of employees for robberies. This training should focus on the operation of security devices, security procedures, what to expect in a robbery, and the nature of the police response.

- The financial community and law enforcement agencies should work more closely on robbery response procedures. The office personnel need to be confident that the quick arrival of the police will not be accomplished in such a way as to precipitate violence against bank employees or customers. This is especially important for offices which match three or more of the risk factors.

- When repeated robberies at a specific office demonstrate a need for additional security, bullet resistant glass is preferable to an armed guard. The former is readily accepted by customers and reduces losses while the latter increases the chances of violence during a robbery attempt and in the long run is considerably more expensive.

- The financial community should routinely consider strategies for protecting small branches which are most vulnerable to _armed_ robbers.

As indicated by the risk factors, this would be most important in the higher crime areas of larger cities.

- Although this study did not include credit unions, as they attempt to expand their membership, increase visibility, and generally become more like banks and savings and loans, they should be aware of the increased risk of robbery and take appropriate protective measures.

Footnotes

[1] In this report the term "bank robbery" is used to refer generally to the robbery of financial institutions.

[2] Indiana does not specifically define bank robbery as a separate offense. The appropriate charge would be robbery or armed robbery. Indiana's determinate sentencing defines the penalty for the former as five years (plus or minus up to three years) and the latter ten years (plus up to 10 or minus as many as four years). If the offense results in serious bodily injury, the penalty is 30 years (plus up to 20 or minus as many as 10). The sentence is mandatory for armed robbery and robbery resulting in serious bodily injury.

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