

REDUCING OPPORTUNITY TO COMMIT CRIME:
CRIME AND HOUSING VALUES IN MINNEAPOLIS

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INTRODUCTION

Crime imposes substantial costs upon individual members of society, as well as, upon society as a whole. Personal injury, property loss, and attempts by society to curtail such injury and loss are all costs of crime.

There is another less obvious, but very real cost to society--the decline of neighborhoods due to fear of crime. If crime and the fear of crime results in less demand for housing in those areas, then landowners will suffer a relative, and perhaps absolute, loss of wealth.¹

If fear of victimization causes people to move out of high crime areas and demand for housing in those areas consequently decreases, public tax revenues from those areas will also decrease. Since municipal governments are financed largely by property tax revenues, a decline in land values due to crime requires increasing assessments or rates for the entire city to maintain given service levels. At the same time, declining neighborhoods contribute to the need for increased services.

CRIME AND HOUSING VALUES

Previous research has shown that neighborhood housing values are related to such factors as:

- mean neighborhood income
- distance to the central business district

¹Economists D. J. Bogue (1968), D. M. Brown (1974), and D. W. Rasmussen (1973) have suggested that crime does affect urban housing values. See Appendix III for details of their work, and that of other economists regarding determinants of housing cost.

- general condition of housing in the neighborhood
- stability of residents in neighborhood
- home ownership rates in the neighborhood
- home occupancy rates in the neighborhood

But as yet, research has not indicated the relationship of crime to housing value. This research determines the relationship which crime has, independent of these other factors. To look at the impact of crime, a multiple linear regression approach was used. This approach controls for the factors above, while estimating the dollar cost of crime on value of owner-occupied housing and rental cost.¹

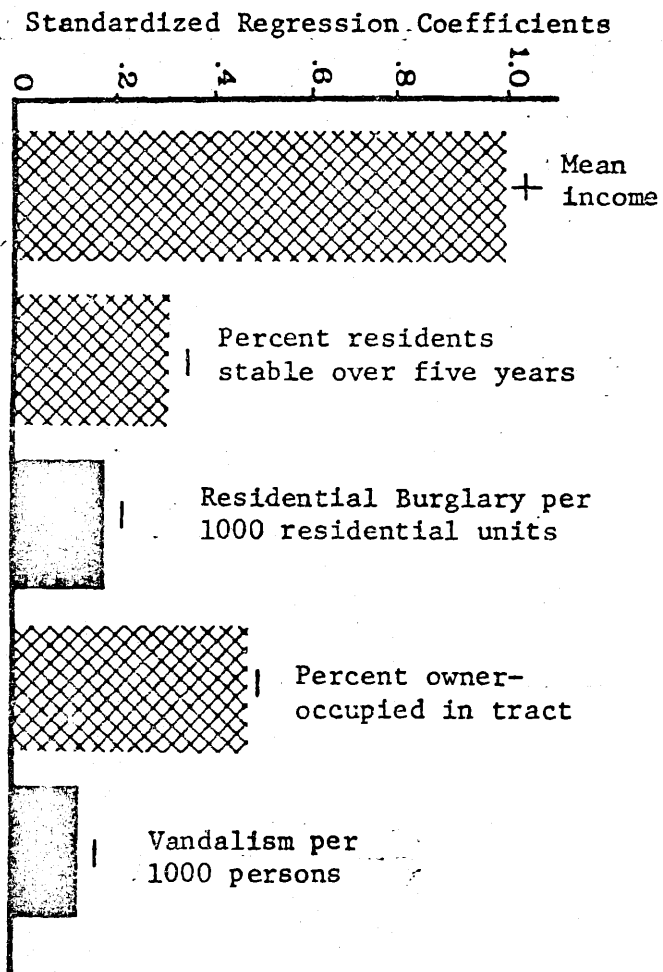
Figure 1 indicates that in addition to some of the recognized determinants of housing values, two types of crime also have an impact on the value of owner-occupied residents. These two crimes are residential burglary and vandalism. Conversion of the data in Figure 1 to housing values indicates that every residential burglary per 1,000 opportunities² reduces housing values in a census tract by \$37.61 per owner-occupied dwelling unit. Likewise, every incident of vandalism, per 1,000 population, decreases the value of each owner-occupied unit by an average of \$116.92.

(Insert Figure 1)

The data certainly indicate that crime has a strong impact on the demand for housing in neighborhoods. There is, however, some uncertainty regarding the exact dollar amount, mainly because the data were drawn from two different time periods. The crime data was based on the 1974-75 figures

¹Details of the regression models are contained in Appendix I.

²An opportunity is defined as one-owner occupied dwelling.



THE IMPACT OF CRIME ON HOUSING VALUES

Figure 1

while housing data are based on 1970 figures.¹

In the period from 1970 to 1975, patterns of housing value may have altered somewhat. If so, this would cause the coefficient to change. In addition, since average housing prices in Minneapolis rose 47.1 percent from 1970 to 1975, the coefficient should be adjusted upward by this factor. This yields an impact of \$55.32 and \$171.99 for burglary and vandalism, respectively.

High crime rates affects not only owner-occupied property but rental property as well. Renter occupied units suffer loss in value due to crime, just as owner-occupied units do. However, the types of crimes which affect rental property are different from those which affect owner-occupied property.

Street robbery reduces average monthly rent of a unit by approximately \$0.99 per occurrence per opportunity. Commercial burglary diminishes rent by \$0.025 and vandalism, approximately \$0.36. Put another way, ten street robberies per 1,000 population will diminish annual rent nearly \$120.00 per year to the owner.

Again, the same caution must be applied to rental impact as to housing price impact. Rental patterns may have changed in the 1970-75 period, and average rents did rise during that period, so that the above rental figures are expressed in 1970 dollars.

PUBLIC REVENUE LOSS DUE TO CRIME

One cost to the city of Minneapolis of crime is lost property tax revenue

¹Crime data is based on Minneapolis Police Department figures for the year 1974-75. Housing value data was obtained from 1970 census figures.

A rough estimate of selected components of such loss is presented here. Estimates are derived by multiplying the estimated loss in property value times the sales ratio, assessed value ratio, and mill rate. The result is not intended to be precise but is rather indicative of order of magnitude.¹

The loss of property tax revenue from owner-occupied housing units due to reported incidents of vandalism is approximately \$7 million. That is, all other things being equal, if there was no vandalism, property values would not have declined yielding the estimated loss of \$7 million in public revenue.

Using the same approach for determining the impact of residential burglary yields a tax revenue loss in the neighborhood of \$6 million. Thus, these two specific crimes, which were found to have a significant impact on the value of owner-occupied housing units, generate a total estimated tax revenue loss of about \$13 million.

Given this figure, a reduction in the residential burglary rate and vandalism rate by just ten percent, would correspond to an increase in city property tax revenues of about \$1.3 million.

Clearly, the revitalization of an already declining community is a complicated undertaking involving a far more complex process than simply the reduction of crime rates. Yet, the estimates above give some indication of not only potential gain from reducing crime, but the potential savings available to the public treasury from crime prevention programs designed to stem the further decline of high crime areas of the city.

¹The methodology for estimating tax revenue loss due to crime is in Appendix II.

CONCLUSION

It is evident from this analysis that crime imposes a cost upon homeowners by reducing the value of their property, and consequently, causes a loss in public revenue from property taxes. This analysis has allowed an estimation of the actual and potential dollar costs of crime in terms of property value and public revenue loss, as well as, some indication of potential gain from crime reduction programs for the city of Minneapolis.

A P P E N D I X I

R E G R E S S I O N A N A L Y S I S R E S U L T S

Table 1: Variables and Definitions

MEANY	Mean family and related income
DISCBD	Miles from tract center to IDS tower
HSAGE	Percent residences built before 1940
STABLE	Stability of residents, 1965-1970
PCTOCC	Percent housing units occupied
PCTOWN	Percent housing units owner occupied
RSPOPD	Residential population density (people/acre)
STROB	Street robbery per 1000 opportunities
RESBUR	Residential burglary per 1000 opportunities
COMBUR	Commercial burglary per 1000 opportunities
VANDAL	Vandalism per 1000 opportunities
PERCRM	Factor representing personal crime
PROCRM	Factor representing property crime

Table 2: Determinants of Mean Value of Owner-Occupied Housing^a

	<u>A</u>	<u>B</u>
CONSTANT	12903.939 (7.967)	9770.393 (7.239)
MEANY	2.293 (12.264)	2.281 (11.937)
STABLE	-116.603 (2.451)	-136.194 (3.230)
PCTOWN	-92.402 (3.127)	-70.877 (2.664)
RESBUR	-37.614 (2.970)	
VANDAL	-116.917 (1.980)	
PROCRM		-1664.633 (4.161)
R ²	.672	.659
F	44.269	52.660

^at-values are in parentheses

Table 3: Determinants of Mean Rent^a

	A	B
CONSTANT	-.604 (.013)	-16.800 (.344)
MEANY	.005 (7.139)	.005 (6.709)
DISCBD	5.019 (3.013)	6.856 (4.046)
HSAGE	-.215 (3.605)	-.185 (2.991)
STABLE	-.680 (5.611)	-.725 (5.589)
PCTOCC	1.320 (2.661)	
RSPOPD	-.014 (2.261)	
STROB	-.987 (2.566)	
COMBURG	-.025 (3.525)	
VANDAL	-.364 (1.946)	
PERCRM		-16.743 (3.354)
R ²	.805	.782
F	47.643	47.142

^at-values are in parentheses

APPENDIX II

CALCULATION OF
PROPERTY TAX REVENUE LOSS
FROM CRIME

CALCULATION OF PUBLIC REVENUE LOSS

The methodology employed here is detailed in a Citizen League report,¹ and reflects the taxing system used in Minneapolis. For the case of vandalism, the following procedure is used:

1. Number of owner-occupied units is multiplied by average loss of the property value per owner-occupied unit for each incident of vandalism adjusted per 1,000 population. ($78,000 \times 171.99 = \$13,415,220.00$). This yields total property value loss of vandalism adjusted for opportunity.
2. Total value loss of vandalism adjusted for opportunity is multiplied by vandalism adjusted for population (citywide) ($13,415,220.00 \times 11.16 = \$149,713,855.20$). This yields total loss in property value citywide.
3. Loss in property value is multiplied by the sales ratio to yield the loss in assessor's limited market value ($149,713,855.20 \times .878 = \$131,448,764.90$).
4. Assessor's limited value is multiplied by the assessed value rate to derive the loss in assessed valuation ($131,448,764.90 \times .40 = 52,579,505.96$).
5. The loss in assessed value is multiplied by the mill rate to obtain revenue loss ($52,579,505.96 \times .13602 = 7,151,864.40$).

¹Citizen's League, Public Life, Volume 1 #6, (Minneapolis: June 25, 1976), p. 4.

INFORMATION USED IN THE CALCULATION
OF PUBLIC REVENUE LOSS

Census Tracts - 127

Owner-occupied units (1970) = 78,000

Residential units (1970) = 167,179

Number of vandalism (1974-75) = 4,848

Number of residential burglary (1974-75) = 7,559

Percent of change in housing prices (1970-75) = 47 percent

Sales ratio = 87.8 percent

Assess value rate (Balance of housing price above \$12,000 (1975) = 40 percent

Mill rate (1975) = 136.02

APPENDIX III

PREVIOUS RESEARCH
AND BIBLIOGRAPHY

The issue of whether crime does in fact have an impact on land or housing values, is in the domain of economics; growing realization of this fact has led to the increased involvement of economists in the analysis of crime and its impact (Becker, 1968; Sullivan, 1973).

Taking an urban perspective, "clearly, crime not only involves a major cost to urban society but also affects the level and spatial distribution of growth and development in our 'central cities'" (Brown, 1974:283). This sentiment is echoed by Rasmussen (1973:73): "The higher risk of being victimized by crime in the central city is apt to cause some people to seek residence in the more wealthy and suburban enclaves." Bogue (1968:417) alludes to a specific impact: "...the impact of crime and delinquency in lowering land values and hastening the exodus of people from neighborhoods ...needs to be appreciated and given a place in economic analysis."

THE NATURE OF HOUSING DEMAND

The price of housing can be considered the outcome of a market process, i.e., the interaction of supply and demand factors.¹ Furthermore, the price is that of a flow of services, rather than the price of an asset (Muth, 1969: 18). These services include shelter, safety, convenience, and privacy, which in turn are determined by a house's location, size, etc.

Previous research has contributed to an understanding of selected determinants of the demand for housing.² For example, housing value is positively related to income (Reid, 1962; Muth, 1969; Winger, 1968; Probst and Wrighton,

¹ Supply is here treated as perfectly inelastic in the short run, so that price is wholly demand-determined.

² A good survey is provided by Ball (1973).

1973-74). This is not surprising since housing is usually considered a desirable commodity. Furthermore, the same studies indicate that the income elasticity of demand for housing is less than unity, suggesting that housing expenditures grow less rapidly than income.

Housing prices have been found to be negatively related to distance of the property from the central business district (CBD), indicating that a trade-off is involved between housing and travel time to work (Muth, 1969; Wieand and Muth, 1972).

The view of housing as a flow of services is reflected in several studies that have sought to determine the impact of selected neighborhood amenities on the value of housing. Gautrin (1975) found that airport noise reduces the desirability of neighborhoods and dampens housing values. The cost of pollution was investigated by several researchers, with results that were uncertain (Anderson and Crocker, 1971; Ridker and Henning, 1968; Polinsky and Shavell, 1975; Smith and Deyak, 1975; Freeman, 1971; and Wieand, 1973). One unambiguous result of this research was a theoretical model that will be utilized in this paper.

Numerous studies have explored the impact of race on housing values with somewhat mixed results. Lapham (1971) found no evidence of housing price differences in black versus white housing areas in Dallas; Baily (1966) similarly found no such evidence in his study of housing in Chicago. Muth (1969) and Kain and Quigley (1970) uncovered possible race discrimination effects, as did King and Mieszkowski (1973). This has special interest for the project at hand if race is considered by housing consumers as a proxy for crime or safety. Only Kain and Quigley explicitly included a crime index variable and it was not important.

Other studies have been more directly concerned with public amenities. In a cross-section study of urban communities, Oates found a significant positive relationship between public school expenditures and property values, and a significant negative relationship between property values and effective tax rates. Clotfelter (1975) discovered an adverse impact of school desegregation on housing prices.

- Anderson, R. J., Jr. and T. D. Crocker. (1971) "Air Pollution and Residential Property Values." Urban Studies, 8
- Bailey, M. J. (1966) "Effects of Race and Other Demographic Factors on the Value of Single Family Homes." Land Economics, 42 (May)
- Ball, M. (1973) "Recent Empirical Work on the Determinants of Relative Housing Prices." Urban Studies, 10
- Becker, G. (1968) "Crime and Punishment: An Economic Approach." Journal of Economy, 76 (March/April)
- Bogue, D. J. (1968) "Discussion," in Perloff and Wingo
- Brobst, R. W. and F. M. Wrighton. (1973-74) "The Income Elasticity of Housing: A Cross Sectional Analysis of New Orleans," Mississippi Valley Journal of Business and Economics 9 (Winter)
- Brown, D. M. (1974) Introduction to Urban Economics. New York: Academic Press
- Clotfelter, C. T. (1975) "The Effect of School Desegregation on Housing Prices." Review of Economics and Statistics, 57 (November)
- Freeman, A. (1971) "On Pollution and Property Values: A Methodological Comment," Review of Economics and Statistics, 53
- Gautrin, J. F. (1975) "An Evaluation of the Impact of Aircraft Noise on Property Values with a Simple Model of Urban Land Rent." Land Economics, 51 (February)
- Kain, J. F. and J. N. Quigley. (1970) "Measuring the Value of Housing Quality," Journal of the American Statistical Association, (June)
- King, A. T. and P. Mieszkowski. (1973) "Racial Discrimination, Segregation, and the Price of Housing," Journal of Political Economy, 81 (May/June)
- Lapham, (1971) "Do Blacks Pay More for Housing?" Journal of Political Economy, 79 (November/December)
- Muth, R. F. (1969) Cities and Housing. Chicago: University of Chicago Press
- Oates, W. E. (1973) "The Effects of Property Taxes and Local Public Spending on Property Values: An Empirical Study of Tax Capitalization and the Tiebout Hypothesis," Journal of Political Economy, 77
- Perloff, H. S. and L. Wingo, Jr. eds. (1968) "The Air Pollution and Property Value Debate," Review of Economics and Statistics, 57 (February)
- Rasmussen, D. W. (1973) Urban Economics. New York: Harper and Row
- Reid, M. G. (1962) Housing and Income. Chicago: University of Chicago Press