

**THE
ECONOMICS OF
CRIME AND LAW
ENFORCEMENT**

DAVID J. PYLE



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First published 1983 by
THE MACMILLAN PRESS LTD
London and Basingstoke
Companies and representatives
throughout the world

ISBN 0 333 28200 0

Printed in Hong Kong

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Crime rates are rising rapidly throughout the world. At the same time expenditures on the police and other law enforcement agencies are being increased substantially. As a result, crime and its control absorbs an ever-increasing share of the national product.

The interest of economists in questions of crime and law enforcement stems very largely from Gary Becker's article 'Crime and Punishment: an Economic Approach', which appeared as recently as 1968. However, since then economists have devoted considerable research effort to the study of crime. This effort has been channelled into two broad areas. First, the modelling of criminal behaviour using the utility theoretic framework. Here, criminals are viewed as rational economic agents who decide to 'supply' crimes according to the relative benefits and costs associated with criminal activity and legitimate employment opportunities. Second, economists have examined questions of resource allocation by law enforcement agencies. Work in this field has concentrated on the 'production function' and its dual, the 'cost function'. The objective being to see whether, for example, there are economies of scale in the production of outputs, such as crime prevention and detection.

This book offers the first full-scale attempt to survey and evaluate the contributions that economists have made to the study of crime and its control. Chapter 2 examines a number of theoretical models of the decision to supply crimes. Chapter 3 surveys the empirical literature on the supply of offences function, focusing particularly on the questions of deterrence and the impact of changes in employment opportunities. Chapter 4 examines the specific crime of murder and asks whether murderers respond to 'incentives', both positive and negative. Chapter 5 looks at the economist's approach to the choice of punishment. In particular it examines the case for the greater use of fines. Chapter 6 looks at the theoretical literature on the provision of police services and asks how they should be produced and allocated. Chapter 7 reviews the empirical literature on the police production function, and Chapter 8 surveys the empirical work on both the cost function for police services and the demand for police expenditures. Chapter 9 briefly explores how cost-effectiveness analysis has been applied to the study of police expenditures.

David J. Pyle is a Lecturer in Economics at the University of Leicester. He was born in Manchester in 1947, and read economics at the University of York, graduating in 1968. He then obtained an M.Sc. in economics from the University of Bristol, before returning to York as a Teaching Fellow. In 1970 he was appointed to his present position. During 1976 and 1977 he was seconded to the Home Office as an Economic Adviser.

He has published a number of journal articles on the economics of education and the economics of crime.

To Aileen

Preface

The economics of crime is a relatively new branch of applied microeconomics. Most economists would date its inception from the appearance of Gary Becker's seminal article 'Crime and Punishment: an Economic Approach', which was published in the *Journal of Political Economy* in 1968. Since then interest in the subject has mushroomed. In fact, a recent selective bibliography on the subject contained more than 250 articles and books (Pyle, 1979).

The purpose of this book is to survey and comment upon this literature. So far this task has not been attempted and whilst the subject is still growing and changing rapidly, it seems important to begin the task of evaluating the progress so far achieved. However, given the constraint on overall length, it has been necessary to omit discussion of some parts of the subject. For example, there is virtually no discussion of the economics of prisons and other 'treatment' agencies. Neither is there any discussion of the application of the techniques of systems analysis to the criminal justice system.

This book concentrates on two main issues: (i) the modelling of individuals' decisions to 'supply' crimes, and (ii) the analysis of police resource allocation. However, it is true to say that these two areas represent the majority of research by economists into questions of crime and law enforcement.

My own interest in the economics of crime began when I was seconded to the Home Office as an Economic Adviser at the beginning of 1976. My responsibility, during the two years I spent there, was to offer advice on the resource implications of various criminal justice policies. My immediate superior at the Home Office was Gordon Wasserman, who had been influential in encouraging the Home Office to experiment with programme budgeting techniques. My stay at the Home Office proved an invaluable experience and I am grateful for Gordon's encouragement and interest. It was he, more than anyone, who encouraged me to write about the subject.

On my return to the University of Leicester, Professor Peter Jackson

suggested that I write a book surveying the literature. However, it was not until the summer of 1979 that I was actually able to get down to work. Like many authors I am only too aware of the imperfections of the finished product, but I hope that students and colleagues will find it a useful introduction to the subject.

My colleagues Peter Jackson and Derek Deadman each read several of the chapters in draft form. I am grateful to them both for comments and suggestions that have probably greatly improved the final version. Naturally (though unfortunately) I cannot blame them for any remaining errors. I am also grateful to numerous secretaries at Leicester who typed different versions of the manuscript. However, particular thanks are due to Mrs Barbara Beckham and Mrs Janet Wimperis who typed the final draft with great care. I am also grateful to Mr T. M. Farmiloe of the Macmillan Press Ltd for showing great patience when it appeared as though the final typescript would not arrive by its deadline.

Finally, this book is dedicated to my wife Aileen, without whose encouragement and support it would never have been completed on time. I only hope she feels that her 'investment' was worthwhile.

Leicester

D.J.P.

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1 Introduction to the Economics of Crime

They don't understand, for example, why thieves will spend so much time and energy devising and executing a crime (with all its attendant risks) when that same amount of time and energy devoted to a legal pursuit would probably net larger returns in the long run. It was the belief of every detective on the 87th Squad that the *real* motive behind half the crimes being committed in the city was *enjoyment*, plain and simple – the fun of playing Cops and Robbers. Forget gain or profit as motivation, forget passion, forget hostility or rebellion, it all came down to Cops and Robbers.

(Ed McBain, *Jigsaw*, p. 149)

1.1 THE GROWTH OF CRIME

Throughout the world crime is on the increase. Of course, international comparisons of crime are fraught with difficulties, because of differences in definitions and measurement of what is regarded as criminal. We need to examine each country separately. However, when that is done it is clear that in every country for which we have reliable information, the number of recorded crimes has grown dramatically over the period since the end of the Second World War. What is more, the rate of growth of crime seems to be increasing. A few examples will suffice to illustrate this phenomenon.

In the USA between 1972 and 1976 the total number of FBI Index offences increased by 37 per cent (property crimes increased by 39 per cent). In Canada between 1970 and 1974 the total number of recorded crimes rose by 31 per cent, whilst in England and Wales between 1974 and 1978 the total number of crimes recorded by the police went up by just over 30 per cent. In France between 1960 and 1969 the number of

reported crimes more than doubled. Substantial increases in crime were also to be seen in Sweden, the Netherlands, West Germany, Denmark, Austria and Italy (for more detailed information see Schneider, 1979; Radzinowicz and King, 1977).

Another feature of the growth in recorded crime is that property crimes have tended to increase rather more rapidly than crimes of violence, including sexual crimes. It is a challenge to social scientists to explain why recorded crimes have risen so rapidly in recent years and why reported property crimes should have risen more rapidly than all crimes. Part of this book will examine the contribution of economists to the explanation of crime levels.

Of course, recorded crimes may be a poor indicator of the real number of crimes taking place. Victimisation studies, for example, show that the actual number of crimes may be very considerably in excess of the number that are reported or recorded.

Schneider, in his survey of crime and criminal policy in Western Europe and North America, reported the results of various victimisation studies. In the USA the 'true' crime rate was more than three times the recorded rate, whilst in England and Wales it was nearer ten times. Similar studies in Canada indicate a 'true' crime rate more than five times the reported level. The 'dark figure' of crime, as it has been called, is clearly extremely large. The reasons for under-reporting of crime are numerous and need not detain us here. What is important, however, is that any attempt to explain the increase in recorded crime must consider whether a part of that increase has been caused by an increase in the proportion of crimes that are reported.

Simultaneously with the considerable increase in the number of recorded crimes have come substantial increases in manpower and expenditure allocated to law enforcement in all countries. For example, between 1970-1 and 1972-3 in the USA expenditure on criminal justice services (police, corrections, judicial and legal services etc.) increased by over 23 per cent (Schneider, 1979). Similarly, in England and Wales criminal justice expenditure increased by approximately 20 per cent in real terms between 1972-3 and 1975-6 (Home Office, 1977). Similar increases were observed in other countries.

Increases in crime levels and law enforcement expenditures are, of course, linked. Society's response to increases in crime rates is likely to be an increased demand for police protection and for increased expenditure on the rest of the criminal justice system. Another link between expenditure and crime is through the deterrent effect, if any, that increased resources for law enforcement may exert upon the

crime rate. Both of these issues are discussed later in this book.

Only part of any increase in expenditures, however, takes the form of increases in the output of law enforcement services. Some of the increase is due to the rising cost of inputs. Bradford, Malt and Oates (1969) argued that most of the increase in expenditure on police protection was due to rising unit costs rather than to increased output. A major input into policing is manpower. Baumol (1967) argued that in services such as police protection increases in productivity were difficult to achieve, because it was difficult to substitute capital for labour in the production process. Accordingly, it might be difficult to offset wage increases (which are, for various reasons, in line with wage increases in other sectors of the economy) by introducing labour-saving innovations. The result is that unit costs of police protection rise relatively rapidly.

Another cause of the rising expenditures on law enforcement has been the steady drift of population into industrialised/urban areas, where crime is heavily concentrated.

Crime and its control is big business. Indeed the Chief Constable of Greater Manchester recently described crime as 'the fastest growing enterprise in the World' (*The Times*, 26 April 1978). The President's Commission on Law Enforcement and the Administration of Justice estimated the cost of crime in the USA in 1965 at \$21 billion or approximately 4 per cent of the national income. However, as Becker (1968) has argued, that figure was probably an underestimate of the true cost of crime. It is an important activity (in resource terms), that is growing in importance. It is costly to control and becoming more costly to do so. Crime is a topic that touches us all in some respect. It seems, therefore, natural for economists to consider how resources should be used to control crime, and the nature of the cost and production functions for law enforcement, etc. Yet, until recently few economists had given these questions any serious thought.

1.2 ECONOMICS AND CRIME: AN HISTORICAL PERSPECTIVE

Whilst it is only recently that the economics of crime has become an accepted branch of applied microeconomics, economists have for a long time had an interest in questions of law and law enforcement.

For example, Adam Smith argued in *The Theory of Moral Sentiments* (Smith, 1759) that social harmony or order could only be obtained by the exertion of certain forms of control over some aspects of human

nature. Despite Smith's association with a ruggedly individualistic type of economics, he was not insensitive to the idea that an individual's pursuit of his own ends might bring him to act in ways that had harmful consequences for others. In such situations it was unrealistic to rely upon each individual's disposition to seek the approval of his fellows. General rules of justice and morality had to be constructed.

In *The Wealth of Nations* (Smith, 1776) Smith went further. He argued that one of the three functions of supreme importance which every State had to perform was 'the duty of protecting, as far as possible, every member of society from the injustice or oppression of every other member of it' (Bk iv, ch. ix, p. 51).

In his *Lectures on Justice, Police, Revenue and Arms* (Smith, 1763), he even briefly considered the relationship between crimes and economic circumstances. He argued: 'Nothing tends so much to corrupt mankind as dependency, while independency still increases the honesty of the people. The establishment of commerce and manufactures, which brings about this independency, is the best police for preventing crimes. The common people have better wages in this way than in any other, and in consequence of this a general probity of manners takes place through the whole country. Nobody will be so mad as to expose himself upon the highway, when he can make better bread in an honest and industrious manner' (pp. 155–6).

Of course, Smith was not the first author to advance the argument that crime and economic circumstances might be related. Bonger (1916) attributed the first 'scientific' exposition of the link to Thomas More. In *Utopia*, More wrote a swingeing attack upon the economic conditions prevailing in England. He also attacked the severity of the penalties for many crimes. Raphael Hythloday, More's narrator, argued: 'Neither is there any punishment so horrible, that it can keep them from stealing, which have no other craft whereby to get their living. . . . [G]reat and horrible punishments be appointed for thieves, whereas much rather provision should have been made, that there were some means, whereby they might get their living, so that no man should be driven to this extreme necessity, first to steal, and then to die' (More, 1551, p. 29).

Beccaria-Bonesana expressed a similar sentiment when he wrote '[robbery] is commonly the effect of misery and despair; the crime of that unhappy part of mankind, to whom the right of exclusive property . . . has left but a bare existence. Besides pecuniary punishments may increase the numbers of robbers, by increasing the number of poor' (Beccaria-Bonesana, 1767, p. 167).

Engels (1892) subscribed to the same view. He argued, in his book *The*

Condition of the Working Class in England, that 'A class which bears all the disadvantages of the social order without enjoying its advantages, one to which the social system appears in purely hostile aspects – who can demand that such a class respect this social order? . . . The contempt for the existing social order is most conspicuous in its extreme form – that of offences against the law' (pp. 129–30).

The authors mentioned above largely based their arguments on introspection. However, as Bonger (1916) showed, during the nineteenth century there were numerous attempts to explore the link between crime and economic circumstances by statistical means. He surveys and comments upon several attempts to examine this link. Many of these studies were carried out by French statisticians such as Guerry, Quetelet, Ducpetiaux and Moreau-Christophe. However, similar studies for other countries were undertaken by Mayr, Von Oettingen and others. Most of these studies found that changes in the economic circumstances of the working class and growing disparities in wealth between classes were associated with changes in the level of crime. However, later in the nineteenth century and the early part of the twentieth century, the idea that crimes were motivated by economic necessity was neglected, if not treated with scorn.

To some extent this neglect was caused by the rise of alternative schools of thought on the causes of criminality. Authors such as Lombroso, Ferri and others disputed the connection between economic conditions and crime. At the same time they claimed that the principal causes of crime were to be found in the physical and psychological make-up of individuals, including 'anomalies of the skull, brain, viscera, sensibility, reflex activity . . . intelligence and feeling, especially of the moral sense and the peculiarities of the criminal dialect and literature . . . race, age, sex . . . civil status, profession, residence, social class and education' (Ferri, 1893, pp. 150–1). Economic factors, as such, were argued to be relatively minor influences upon crime. Work of this kind took criminology off into entirely new areas. Lombroso, for example, was convinced that criminals were not variations from a norm, but a different sub-species of man, having distinct physical and mental characteristics, such as 'asymmetry of the face; excessive dimensions of the jaw and cheekbones . . . ears of unusual size . . . excessive length of arms' (quoted by M. E. Wolfgang, 1960, p. 186). We do not dwell upon the virtues or otherwise of such an approach, though most economists would no doubt agree that it was unfortunate that criminologists did not follow a line of thinking suggested sometime before by Bentham. Bentham argued that criminal behaviour was entirely rational.

Individuals pursued pleasure and avoided pain. If some individuals chose to perform criminal acts in the pursuance of pleasure, this must be because there was insufficient deterrence (or pain) attaching to those acts (Bentham, 1896).

It was not until the 1960s that economists once again began to discuss the causes of crime. Interest was sparked off by a number of articles written by Belton Fleisher (1963, 1966a, 1966b). In these studies Fleisher examined, by correlation techniques, the relationship between unemployment, income and delinquency. He found strong correlations between income and unemployment levels and the rate of delinquency, using data for the cities of Chicago, Boston and Cincinnati. However, Fleisher's work lacked a rigorous theoretical treatment of the decision to engage in crime. Becker (1968) provided the first such analysis based upon the economist's utility-maximising framework. This article can really be regarded as the launching pad for the study of the economics of crime. Since its appearance many further contributions have been made concerning either theoretical models of criminal behaviour or estimates of the determinants of crimes. Subsequently, economists have extended their concern to examinations of law enforcement agencies and the formulation of optimal criminal justice policies. All of these areas are examined in detail in this book.

1.3 PLAN OF THE BOOK

Following this chapter the book can be roughly divided into two parts. The first part (Chapters 2–5) examines economic theories of criminal participation and the results of empirical work on the determinants of crime. The second part (Chapters 6–9) examines the economics of providing police services. Chapter 2 reviews a number of theoretical models which treat criminals as rational utility-maximising agents. In these models criminals are argued to be no different from other individuals. It is, however, argued that their perceptions of the costs and benefits arising from criminal activity may be different from that of law-abiding individuals. Each of these models treats criminal activity as an aspect of labour supply and derives a supply function for offences. We follow a chronological sequence in presenting the models. We begin with Becker's original, highly simplified model, then consider Ehrlich's generalisation of it and then Block and Heineke's most general treatment of the problem. As a special case we examine Allingham and Sandmo's model of optimal income tax evasion.

Chapters 3 and 4 review and comment upon attempts to estimate supply of offences functions for different countries, time periods, etc. Chapter 3 deals with supply functions generally, whilst Chapter 4 examines the supply function for the specific crime of murder. In Chapter 4 we pay particular attention to the question of whether the death penalty is an effective deterrent to the act of murder.

In Chapter 5 we turn from the positive to the normative sphere of the economics of crime. The previous three chapters establish the theoretical and empirical arguments behind the notion of a supply of offences function. In Chapter 5 we use this concept to examine the choice of criminal justice policies so as to minimise the social losses arising from crime. We discuss the question of the optimal choice of certainty and severity of punishment.

In the second part of the book we look at the economic aspects of providing law-enforcement services, especially police services. In Chapter 6 we discuss how the optimal level of police protection might be determined. We also consider the police production function and some of the conceptual problems involved in estimating police production functions, e.g. the measurement of police 'output', the objectives pursued by police decision-makers, the identification of the production function and so on. In Chapter 7 we review and comment upon a number of attempts to estimate production functions for police services and in Chapter 8 we survey and discuss the literature on the 'cost' and demand functions for police services. A number of important questions will be examined in these two chapters, e.g. is the provision of police services subject to increasing or decreasing returns to scale, how are capital and labour services combined to produce output, is the demand for police services 'price'- and income-inelastic?. Finally in Chapter 9 we consider how the techniques of cost-effectiveness analysis (CEA) and cost-benefit analysis (CBA) might be and have been applied to an evaluation of various aspects of police expenditure.