CRIMINAL CHOICE

THE ECONOMIC THEORY OF CRIME

CRIME

AND ITS IMPLICATIONS FOR CRIME CONTROL

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AND ITS IMPLICATIONS FOR CRIME CONTROL

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Foreword

Efficiency and justice through markets requires efficiency and equity in law. A fundamental tenet of libertarian economics is that the proper function of the state is to provide a legal structure governing property rights. This is essential if the creation and operation of markets is to result in an efficient allocation of resources. It is also the case that for libertarian philosophy, such as that of Robert Nozick, distributive justice is that which derives from the property relations of a minimal state, i.e. a state devoted to the narrow functions of protection against force, theft and fraud, and the enforcement of contracts.

It is a weakness of libertarian studies in Australia that the detailed analysis of the operation of the legal system has been much neglected. Fortunately, there is now a fertile and growing field of study of law and economics emanating from North America. The US approach goes well beyond an older tradition of analysis of areas where there is an obvious intersection of law and economics, such as anti-trust, regulation, and tax. It examines fundamental legal institutions and processes where the economic aspects are far less evident, such as tort, public law, contract, and judicial procedure.

This field, which began with the property-rights economics of the 1960s and flowered into the comprehensive economic analysis of law associated with Richard Posner and others, is an exciting and rich one. It is also fundamental; and getting the fundamentals right should be a priority for libertarian scholarship. The challenge is a paradoxical one, since it involves overcoming collective failure in this sphere in order to avoid resort to undesirable state intervention in other spheres. But if collective failure is inherent or merely highly likely, how can the integrity of state-based law be assured?

The primary function of the system of law is to define the position of each individual with respect to the utilisation of scarce resources, including human capital as well the physical variety. It should do so in a way that ensures that all resources are owned, ownership is exclusive to the owner's use, and ownership rights are voluntarily transferable. With such universality, exclusivity and transferability, an efficient system of exchange can operate. But for definition and enforcement to be effective, efficient property, contract, criminal and tort law is required.

Criminal law, then, is as central to the property-based market system as it is to the more obvious need for protection of the individual person from coercion and violence. To take a simple illustration: exclusivity of ownership means little if it is not well defined and enforced. Otherwise, certainty over the use and disposition of resources disappears, incentives for efficient production fall away, and massive diversion of individual

resources to protection against predation follows. Without such law, and its public-good characteristics, a prosperous liberal order becomes impossible.

Having established a proper basis for the role of law (demand), the next step is to analyse the supply of offences against the law. This is where the present work by Cathy Buchanan and Peter Hartley makes its distinctive and welcome contribution. The task of their monograph is to help us understand, in a positivist sense, the supply of criminal offences, by drawing on the interesting literature that has emerged since the pioneering work of Gary Becker.

The authors themselves argue that this economic theory of crime and punishment does not depend on any normative position, and so should be of interest to readers of any or no normative persuasion. This is a strong recommendation for this volume's appeal to a wide readership.

Scholars outside North America have contributed relatively little to the new field of economic analysis of law. It is important, therefore, that the authors of this study have developed their exposition fully for the Australian case. They show that here the economic approach to understanding crime has much to offer, particularly when examined against the alternative approaches that have dominated criminology and thereby pervasively influenced Australian criminal law and its policy and administration.

This is not to say that the economic approach is the only source of insight. Far from it. But its insights must not be neglected. Our authors are clear that the economic theory of crime refers to marginal responses. It says nothing about most criminals or 'average' criminals, beyond requiring that their behaviour is not perverse with respect to economic incentives. Even random or idiosyncratic behaviour by many is not inconsistent with the economist's model. All that is required for it to be useful is a responsive margin. A range of other 'non-economic' influences upon crime is quite compatible with the economic theory.

Of course, for some crimes, such as homicide or rape, the responsive margin may be almost non-existent. But for others, like fraud, forgery or false pretences, it may be very substantial. The point is to establish such results by standard methods of empirical analysis and not to be guided only by prejudicial views of monocausal explanations of crime. The economist's approach is fully compatible with this, if properly interpreted. It also has the advantage of allowing for the behaviour of non-criminals (thus including the effect of deterrence), as well as analysing the behaviour of the criminals who are so much more exclusively the subject matter of other approaches.

Once the responsive margin is established as reasonable, the economist's behavioural and policy insights follow. It is here that our authors help us both with understanding the causes of variations in crime rates and with mapping out efficient ways to improve crime prevention. They stress how

much more use could be made, even in this most basic of state activities, of social-market or pseudo-market instruments. But, equally, even where the pseudo-market reach is ultimately limited, the basic analytics for transparently relating costs to effect are provided. This simple linkage is sadly lacking in current public-sector resource allocation in the field of law and order in Australia.

In this way Cathy Buchanan and Peter Hartley have contributed most usefully to the task of understanding the configuration of an efficient legal system. No doubt the content of this can be fleshed out further. But the remaining basic task for others is now that of public-choice analysis of how to ensure that the optimal configuration is adopted by the state, in this and in other areas of law. Here is a research agenda of transcending importance awaiting attention. It embraces both normative issues and more of the positive economic analysis. It also embraces the issue of achieving respect for law, and the promulgation of the ethical conduct that nurtures good law. This raises another conundrum: how to chastise bad government while fostering respect for good government, even for the minimal state. Interesting times lie ahead for thinkers in the return to such fundamentals.

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Acknowledgements

About the Authors

Cathy Buchanan obtained her PhD in philosophy from the University of Chicago. After leaving Chicago she was visiting scholar at the Massachusetts Institute of Technology and Princeton University. She also visited the Centre of Policy Studies at Monash University, where she organised a conference on health care; with Elizabeth Prior she coedited the proceedings of the conference under the title *Medical Care and Markets: Conflicts between efficiency and justice* (1985). Also with Elizabeth Prior she coauthored 'Bureaucrats and Babies: Government Regulation of the Supply of Genetic Material', *The Economic Record* (1985). She has taught courses in the history of philosophy, ethics, and the philosophy of language.

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Preface

In the past 20 years, crime has increased dramatically in Australia. Burglary rates are higher here than in the United States. Serious assault has more than quadrupled since 1973. Australia is rapidly losing its status as one of the safest countries in the developed world. Although homicide rates continue to be low, other violent crimes and crimes against property are relatively high.

Many theories have been advanced to explain recent increases in crime. Some theories assert that the breakdown of the traditional family has caused individuals to turn to crime. Other theories suggest that certain genetic traits and psychological illnesses are predisposing people to become criminals. High unemployment, poor education and inadequate social welfare are also cited as causes of recent increases in crime. We consider several of these psychological and sociological explanations of crime in Chapter 5.

Our principal concern is to present (in Chapters 2, 3 and 4) a theory of crime based on modern economic reasoning. We hope to shed light on the problem of increasing crime by suggesting that a substantial number of criminals are rational agents who are responding to the expected costs and benefits of committing crimes. Crime can be explained using a 'supply and demand' framework analogous to that used to analyse labour markets and the markets for other goods and services. We postulate a 'market' for crime in which criminals 'supply' a certain amount of crime. Other citizens will 'demand' a certain amount of protection from crime in the form of police services, an efficient criminal-justice system, and private security measures such as locks and burglar alarms. The amount and type of crime in a given location is a function of the 'price' of crime where the price is determined by the benefits (both monetary and non-monetary) a criminal can expect to receive and by the expected costs of being caught, convicted and punished.

An important insight of the economic theory of crime is that expected penalties deter **marginal** criminal acts. This means that the expected costs and benefits of committing a crime need not be the only, or even the most important, reason why many people commit crimes. If a substantial fraction of crimes are barely worth committing, however, a small increase in expected costs, or decrease in benefits, can eliminate all of those crimes. Increases in expected penalties can have a large deterrent effect even if many crimes are committed for the reasons given by other criminologists, and the criminals involved are unresponsive to changes in expected penalties.

Crime has increased in Australia largely because the expected penalties imposed by the judicial system have fallen. The expected penalty a criminal faces is determined by the probability of conviction multiplied by the punishment following conviction. It is interesting to note that homicide, which is relatively rare in Australia, has a relatively high imprisonment rate. A person committing homicide in Australia has a roughly two out of three chance of being imprisoned. In contrast, a person committing the offence of serious assault (including rape, but also some cases of family violence that are not prosecuted) has a roughly one out of five chance of being imprisoned.

The average time served in prison for crime and serious assault also varies markedly. Criminals convicted of murder serve an average of eleven years and eight months. Criminals convicted of other homicide serve an average of 18 months, while those convicted of other violent crimes serve an average of 8.2 months (Walker, 1989:3).

In Chapter 6, we consider several ways in which the economic theory of crime might help us reverse the trend towards high crime rates in Australia. Increasing the probability of capture and conviction of offenders will reduce the amount of crime. We can increase the probability of capture by using our police forces more effectively, utilising private police and security services more extensively, and encouraging the use of alarms and neighbourhood-watch associations. The probability of convicting criminals could be increased by improvements in forensic technology, and, more controversially, by changing police and court procedures. The latter may, however, also increase the number of false convictions and infringe on individual liberty in other ways. Individuals can also reduce the expected benefits of crime by installing anti-theft devices and altering aspects of their lifestyles that make them easy targets for criminals.

We can also reduce crime by increasing monetary penalties for convicted offenders. The economic theory of crime suggests that fines should be used whenever possible. Prison sentences are expensive forms of punishment for several reasons. First, a person in prison is unable to contribute productive employment to society. Second, prisons are expensive to build and run. Third, prisons are 'schools' where criminals learn new ways of plying their trade.

Imprisonment may be the most suitable form of punishment, however, for violent and recidivist offenders or for criminals who are unwilling or unable to pay fines. In order to retain the deterrence value of a prison sentence, prisons should be austere without being inhumane. Prisons run on a private-contract basis have been shown

to be as effective and humane as those run by the government, although they are run at lower cost.

We also note that crime could be reduced by legalising and regulating 'victimless' crimes such as drug use and prostitution. While we do not advocate a totally free market for drugs or prostitution, we believe that a legal and highly regulated one would be preferable to the current system and would lead to a significant reduction in crime.

In conclusion, the economic theory of crime provides useful insights into both the causes of crime and the solutions to it. The economic theory of crime does not purport to identify the only, or even the most important, factors motivating people to commit crimes. Thus, the economic theory is not necessarily in conflict with other theories advanced by modern criminologists. Rather, an implication of the economic theory is that **changes** in expected penalties will have a significant effect on **changing** the level of crime. In particular, increases in expected penalties deter the marginal criminal from committing the marginal crime.

Executive Summary

1.

The economic approach to crime assumes that most criminals are rational agents who would be deterred from committing additional crimes by an increase in the punishment they expect to receive. The expected punishment is determined by the probability of capture and conviction and by the size of the penalty.

2.

Many types of crime are increasing in Australia. Economists believe this is related to the fact that expected penalties have been lowered in recent decades through falls both in the probability of capture and conviction and in the average penalty imposed on convicted offenders.

3.

Using economic principles to study crime is not a new idea. In the 18th and 19th centuries, the philosophers Cesare Beccaria and Jeremy Bentham anticipated the most important conclusions drawn from theoretical and empirical studies of crime undertaken by 20th-century economists.

4.

Most criminologists focus on causes of crime that are beyond the control of the criminal, such as genetics, poor upbringing, low intelligence and mental illness. They argue that punishment for the sake of deterrence or retribution is a mistaken response, since criminals are allegedly not deterred by expected penalties and are not responsible for their own behaviour. They therefore consider rehabilitation and incapacitation to be the appropriate responses to crime.

5.

Economists explain the correlation between crime and such factors as genetics, poor upbringing, low intelligence and mental illness by arguing that many of these factors make the individuals concerned more suited to a life of crime than to alternative legitimate careers.

6.

Most of the evidence cited in support of the notion that penalties do not deter is based on poor statistical analyses. Simple correlations between a few variables are often reported when the true relationship probably involves many variables. Often penalties alone are investigated when the probability of capture and conviction is also relevant. Yet areas with high crime rates, such as large cities, are likely to have more police precisely because people believe higher rates of capture and conviction deter crime. The positive correlation between crime and numbers of police does not support the notion that expected penalties do not deter.

7.

The crime rate in Australia can be reduced by increasing the probability of capture and conviction of offenders. Increased use of private police forces and security services, encouraging the use of alarms and neighbourhood-watch associations, and employing improved forensic technologies, will make it more likely that criminals are caught and convicted.

8.

We can also reduce crime by increasing penalties. But prisons are often not the best form of punishment, since they are costly, make the prisoner less suited to pursuing a legitimate career upon release, and provide criminals with the opportunity to improve their criminal skills. Instead, fines should be used whenever possible. Alternative forms of punishment, such as restrictions on movement through the use of electronic surveillance, are also preferable to prison sentences for non-violent offenders.

9.

Penalties need to range in severity from mild punishment for criminals committing less serious crimes (or criminals who are more likely to be punished) to severe punishment for those committing more serious crimes (or criminals who are less likely to be punished). A range of penalties is necessary in order to deter criminals from committing more serious crimes than they might originally intend. If, for example, the penalties for rape and murder were the same, many rapists would murder their victims in order to reduce the probability of being caught and convicted.

10.

Judges and prison authorities who are responsible for determining sentences, remissions of sentences, and parole, should take greater consideration of the reduced deterrent effect upon potential criminals of lower expected penalties. Generally, however, inflexible sentences mandated by law are inadvisable.

11.

Increased addiction to illegal drugs may have increased certain crimes and led to increased police corruption. Following the example of legalised gambling in Australia, 'victimless' crimes such as drug use and prostitution should be legalised and regulated.

12.

Public policies not directly concerned with crime reduction may have an incidental but significant effect on the amount of crime committed. For example, minimum-wage laws and poor monetary and fiscal policies lead to high unemployment among unskilled youths who form a high proportion of offenders. Again, welfare programs that expend large sums on the middle class reduce the funds available for those genuinely in need and may encourage the poor to turn to crime.

13.

Poor education may also contribute to an increase in crime. Poor reading, writing and mathematical skills make it difficult for students to find legitimate employment. Extension of the voucher system, whereby government funds for schools depend on the number of students they attract, would provide greater competition among schools and would increase the incentives of schools to teach useful skills.

14.

Prisons built and operated by private companies in Australia and elsewhere have proven that the private sector can lower the costs of incarceration while providing facilities at a standard comparable to public prisons. Private operators have also introduced some improvements to prison practices such as programs to provide prisoners with better job skills.
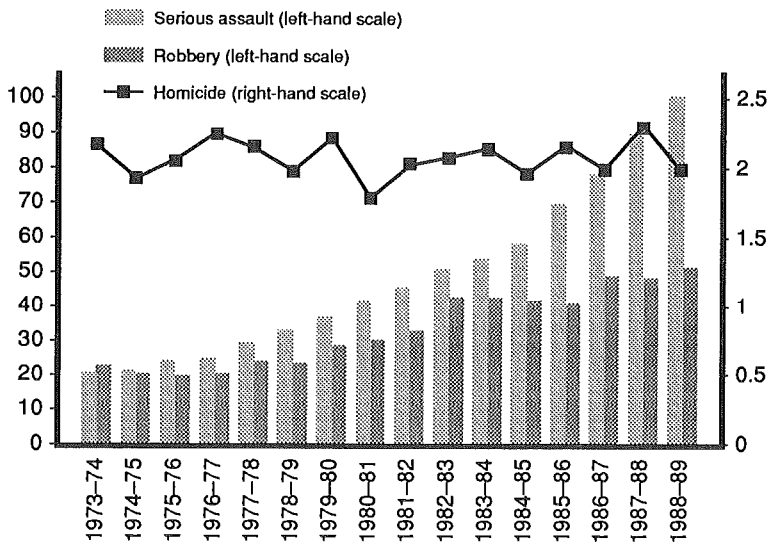
Chapter 1

Criminology and the Problem of Crime

C rime is increasing in Australia. A recent study by the Australian Institute of Criminology shows that, except for murder, the rate of growth of crime has greatly exceeded the rate of growth of the population in recent decades. Between 1973 and 1989, the annual number of serious assaults increased from 2822 to 16186. This represents an increase from 20.75 per 100000 of population to 99.92 per 100000. Similarly alarming increases occurred in other categories of serious crime, such as rape, robbery, stealing, motor vehicle theft and fraud (Mukherjee & Dagger, 1990:15–24; Bowen, 1987; Lewis, 1987). Recent growth in the major categories of serious crime in Australia is illustrated in Figures 1.1 and 1.2, which are based on Mukherjee and Dagger (1990).

Figures 1.1 and 1.2 are based on crimes reported to the police. Not all crimes committed, however, are reported to the authorities. An alternative way of gauging the extent of crime in Australia is to use a household survey. One such survey, the Crime Victims Survey, was conducted by the Australian Bureau of Statistics between February 1983 and January 1984 (cited in Mukherjee & Dagger, 1990:51–66). Individuals were asked to report all criminal incidents that occurred in their households in the twelve months prior to the interview. The sample included all residents aged 15 years and over in about 18000 private dwellings. The survey therefore covered about 0.33 per cent of the population of Australia. Figure 1.3 indicates the percentage of households or persons reporting they had experienced one or more instances of the type of crime included in the figure. We can interpret these percentages as an estimate of the probability, over the period 1982–83, that a household or individual selected at random would have experienced one or more instances of the crime in the previous year.

When compared with some other Western countries, Australia has relatively low rates of homicide and robbery. Australia has, however, a higher burglary rate than the United States or Canada (Mukherjee & Dagger, 1990:26–8). As in other Western nations, a disproportionate number of criminals in Australia are juvenile males. Young men are disproportionately represented among those convicted of serious assault, rape, robbery, breaking, entering and stealing, and motor vehicle theft (Mukherjee & Dagger, 1990:70–94).

We shall examine how criminologists have attempted to address the problem of reducing crime in Australia. We shall also consider an alternative approach to understanding crime that has been suggested by economists. For the purposes of our study, we shall use the term 'crime' to

1

Figure 1.1

**Crimes reported to the Australian police
per 100 000 population**

- ▓ Serious assault (left-hand scale)
- ▓ Robbery (left-hand scale)
- ▪ Homicide (right-hand scale)

Figure 1.2

**Crimes reported to the Australian police
per 100 000 population**

- ▓ Break, enter & steal (dwelling) (left-hand scale)
- ▓ Motor vehicle theft (left-hand scale)
- ▪ Stealing (right-hand scale)
- ▫ Break, enter & steal (total) (right-hand scale)
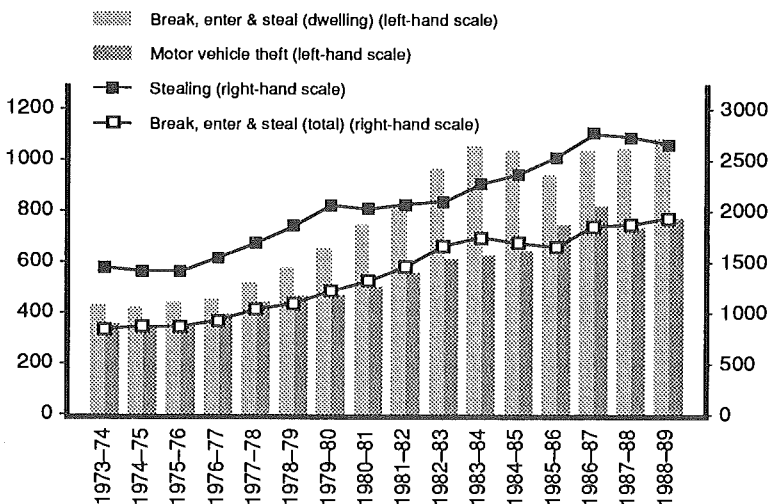
Source: Mukherjee & Dagger, 1990

refer to acts that are in violation of the laws in the jurisdiction in which they are committed. There are important moral issues concerning which acts ought to be illegal. However, we do not consider these issues in this study apart from a brief discussion of 'victimless' crimes in Chapter 6.

The Challenge of Criminology

In the 20th century, academic criminologists have exerted a great influence on the criminal justice system. The common law, reflecting centuries of individuals' intuitions about crime, treats criminals as rational agents who will be deterred by the possibility of punishment. Many modern criminologists, however, have attempted to demonstrate that criminals are not rational and are not greatly deterred by the possibility that they will be caught and penalised.

As noted by Isaac Ehrlich (1981), modern criminological thought has focused on the rehabilitation and incapacitation of convicted offenders. By 'incapacitation' Ehrlich means that convicted offenders are prevented from committing further crimes against the general public while they are incarcerated. While modern criminologists admit that imprisonment has this deterrent effect, they question whether other penalties, such as fines, have a significant deterrent effect. They also question whether imprisonment significantly deters criminals not currently in prison. Ehrlich suggests that the focus on rehabilitation has resulted from the interest of criminologists in individual character traits. He goes on:

> The promise of successful rehabilitation and control of known offenders, many of whom are poor and uneducated, has a strong humanitarian and moral appeal . . . The restraining, retraining, counselling, and direct guidance offered to convicted offenders have been viewed as forms of social engineering aimed at effecting a reallocation of human resources away from crime towards socially more useful endeavours. (Ehrlich, 1981:307)

The modern criminologists' attitude towards offenders, as described by Ehrlich, first gained popularity in the 19th century. Beginning around 1850, criminologists such as Cesare Lombroso began studying prison populations to determine why people turned to crime. Many conflicting theories were advanced. Some studies suggested that criminals had different shaped skulls. Others found physical deformities and certain physiques to be disproportionately represented among prisoners. Twentieth-century studies have associated criminality with genetic traits, socio-economic status, low income, low IQ, poor achievement in school, poor maternal bonding, absent fathers, child abuse, personality defects, television viewing, drug addiction, and more.

Sociological studies of the causes of crime seem to reflect popular interests at the time the studies are conducted. For example, in the 1950s, a famous study of juvenile delinquent boys (Glueck & Glueck, 1950)

3

Figure 1.3

Probability of being a victim in Australia, 1982—83
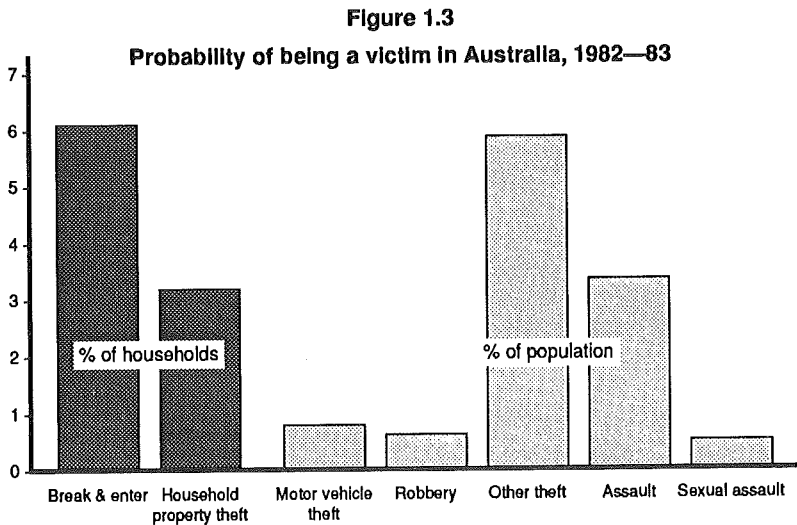
Source: Mukherjee & Dagger, 1990

suggested that criminality was caused by poor parental discipline, a view popular at the time. In the 1960s, Travis Hirschi argued that juvenile delinquency was caused by poor parental and social bonding (Hirschi, 1969). In the 1970s, radical criminologists suggested that criminal behaviour was caused by a power struggle between the haves and the have-nots. Criminals do not feel they are committing crimes when they violate the law, according to radical criminologists; modern criminals are alienated from the society in which they live, and crime is a political act (Taylor et al., 1973). Most of these theories suggest that criminals are not freely choosing to commit crimes. Rather, forces outside of criminals' control are driving them to do so.

New theories are often proposed and then abandoned in criminology because of the improper design and execution of the empirical studies that purport to support them. Many studies of criminal behaviour are flawed by sample-selection bias and the use of subjective and unreliable data. Outdated statistical techniques yield misleading results, and conclusions about causality are often drawn from simple statistical correlations (Fishbein, 1990; Wilson & Herrnstein, 1985).

In spite of the questionable quality of much criminological research, criminologists have had an important influence on the criminal justice system in Australia and the developed world. Prisons have become more comfortable and provide educational opportunities, psychological therapy, conjugal visits, television and other recreational opportunities. While criminologists have argued that these prison reforms help rehabilitate the criminal, such reforms also lower the expected cost of a prison sentence

and reduce the deterrent effect of prison.

Crime is a serious problem in Australia, and modern methods of reducing it have not been effective. It may be useful, therefore, to look back to theories of crime that were popular before the rise of the view that criminals are predestined to lead criminal lives. Older views of criminal behaviour, particularly those formulated in the late 18th century, were based on the notion that most criminals freely choose to commit crimes.

Intellectual Origins of the Economic Theory of Crime

The economic theory of crime is based on the hypothesis that criminals are primarily motivated by rational self-interest and that they respond to the expected costs and benefits of criminal behaviour. When Gary Becker (1968, 1974), Isaac Ehrlich (1973, 1975) and others began to apply economics to the study of crime, many economists thought that such an application was a radical and improper departure from the traditional domain of economics, and many criminologists thought it was an improper intrusion into their field. In fact, however, Becker and his contemporaries were continuing a tradition that began when Enlightenment philosophers such as Cesare Beccaria and Jeremy Bentham attempted to analyse crime using scientific methods. Crime was one of the first areas of human behaviour to be analysed using the principles of economics elaborated by writers such as Adam Smith and David Hume.

We shall look briefly at these intellectual origins of the economic theory of crime in order to ascertain the extent to which modern economics is a reaffirmation of enlightenment views about the rationality of criminals and the possibility of studying crime in a scientific way. The economic approach to crime is neither radical economics nor radical criminology. Our main thesis is that many modern sociological theories of crime are departures from traditional and common-sense approaches to the problem. The departure from traditional approaches to crime was a mistake and is partially responsible for the recent increase in crime in Western countries after a long period of decline.

Beccaria and the Revolution in Criminology

In 1764, Cesare Beccaria published *On Crimes and Punishments*, a work that affirms the notion that criminals are rational, as well as many other ideas resurrected by 20th-century economists. Beccaria's work was highly influential throughout Europe and in the American colonies. It was praised by Hume and by eminent writers such as Voltaire, d'Alembert, Helvetius, Buffon and d'Holbach. Beccaria influenced monarchs such as Frederick II of Prussia, Maria Teresa of Austria and Catherine the Great of Russia (Beccaria, 1963:*x–xi*). Beccaria's most important influence, from our point of view, was on the young English legal philosopher Jeremy Bentham. Bentham brought widespread popularity to the notion that men are

governed by pleasures and pains, and that, in principle, one could calculate these pleasures and pains and use them to determine the 'utility' of various acts. The idea of 'utility' is central to modern economics, although Bentham's notion does not correspond exactly to the axiomatic or more mathematical formulations presented in modern economic theory.

Beccaria is said to have been the source of Bentham's general principle of utility, that is, the principle that approves of actions according to their tendency to promote the greatest happiness of the community. (This principle was not original to Beccaria, however.) As Beccaria wrote:

> If we glance at the pages of history, we will find that laws, which surely are, or ought to be, compacts of free men, have been, for the most part, a mere tool of the passions of some, or have arisen from an accidental and temporary need. Never have they been dictated by a dispassionate student of human nature who might, by bringing the actions of the multitude of men into focus, consider them from this single point of view: the **greatest happiness shared by the greatest number**. (Beccaria, 1963:8)

In *On Crimes and Punishments*, Beccaria argued that the amount of crime in European societies could be reduced through reform of their legal systems. He attacked many specific legal practices common in 18th-century Europe, such as torture, delayed punishment, excessive punishment and use of the death penalty. Of particular interest to us, however, is Beccaria's method of argumentation. He appealed to the use of 'geometric analysis' in studying crime and advocated applying scientific methods to understanding human behaviour. He discussed the 'calculus' of pleasures and pains that individuals implicitly use when contemplating the commission of a crime.

Beccaria asserted that individuals are motivated by self-interest: 'that force, similar to gravity, which impels us to seek our own well-being is restrained in its operation only to the extent that obstacles are set up against it' (p.63). People obey laws because they fear the consequences of disobedience. If sanctions for crimes are reduced or eliminated, individuals will commit more of them. As Beccaria wrote,

> Not eloquence, nor declamations, not even the most sublime truths have sufficed, for any considerable length of time, to curb the passions excited by vivid impressions of present objects. (p.12)

The economic theory of crime is similarly predicated on the notion that individuals are interested in making themselves as well off as possible. Each person is said to 'maximise his expected utility'. Individuals are governed by the expectation of pleasures and pains, according to Beccaria. They rationally calculate the expected benefit of committing crimes before doing so. In discussing the advantages of lifelong penal servitude as a

punishment, Beccaria noted that

> the person does not exist who, reflecting upon it, could choose for
> himself total and perpetual loss of personal liberty, no matter how
> advantageous a crime might seem to be. (p.48)

The main purpose of punishment, according to Beccaria, is to deter potential criminals. We should be able to use mathematics to determine which punishments will have the greatest deterrent effect at the least cost to the criminal. Modern economic theory substitutes the terms 'costs' and 'benefits' for 'pleasures' and 'pains,' but the meaning is similar.

Beccaria noted that a given punishment will deter a given crime only if the expected penalty exceeds the expected benefit of committing the crime. Beccaria also argued that there should be a scale of punishments proportional to the gravity of different crimes. He wrote,

> If an equal punishment be ordained for two crimes that do not
> equally injure society, men will not be any more deterred from
> committing the greater crime, if they find a greater advantage
> associated with it. (p.63)

Beccaria believed that swift and certain punishment will have a greater deterrent effect than delayed punishment. He also claimed that criminals are more concerned with the probability of being caught and punished than they are with the size of the penalty they will receive. Throughout his work, Beccaria argued for milder punishments delivered more quickly and with more certainty. He believed that thefts that were not accompanied by violence should be punished with fines. These views have been advocated by modern economists such as Becker and Ehrlich.

Beccaria's Influence on Bentham

As we noted earlier, Beccaria was an important influence on Jeremy Bentham. Bentham took many of the ideas expressed in Beccaria's book and attempted to give them a more rigorous and scientific interpretation. Bentham began his *An Introduction to the Principles of Morals and Legislation*, first published in 1789, with the following famous words:

> Nature has placed mankind under the governance of two sover-
> eign masters, *pain* and *pleasure*. It is for them alone to point out
> what we ought to do, as well as to determine what we shall do.
> On the one hand the standard of right and wrong, on the other the
> chain of causes and effects, are fastened to their throne. They
> govern us in all we do, in all we say, in all we think: every effort
> we can make to throw off our subjection, will serve but to
> demonstrate and confirm it. In words a man may pretend to
> abjure their empire: but in reality he will remain subject to it all
> the while. (Bentham, 1970:11)

This statement by Bentham expresses the basic position of Becker, Ehrlich

and other modern economists investigating crime. However, the modern theory improves on the basic idea in several ways, as we shall see in Chapter 2. The concepts of 'uncertainty' and 'expectations' are introduced. The modern theory emphasises that individuals may not respond to changes in the sizes of penalties and the probabilities of capture and conviction in the same way. Nevertheless, it retains the key assumption that a person decides whether to commit a crime or not by weighing the expected benefits of the crime (including money, thrills, revenge, etc.) against the expected costs (including guilt, the possibility of apprehension by the police, possible loss of one's job or social standing).

Bentham's lifelong ambition was to develop a new penal code written in clear, exact language. The code was to help eliminate the expense and delays in justice caused by common law and by old, complicated statutory law. Although Bentham never completed his penal code, he did have a great influence on the development of the English judicial and penal systems, and on the movement to reduce the severity of punishment while increasing its certainty.

Bentham believed, as Beccaria did, that criminal behaviour was amenable to scientific study. He made popular the notion that pains and pleasures could be quantified and compared. Bentham's arguments in favour of assigning utilities to human behaviour had a significant influence on modern economic theories of crime, although many modern economists reject his claim that interpersonal comparisons of utility can be made. Bentham argued that a criminal weighs the costs and benefits of committing a crime before deciding whether to do so. The only argument in favour of punishment, according to Bentham, was that it deterred people from committing crimes, and thus produced a balance of pleasures over pains. He therefore argued in favour of publicising punishment.

Bentham considered the costs and benefits of imprisonment. He noted that imprisoning a person has the deleterious effect of keeping him from productive employment. He pointed out that prisons in the late 18th century were so unhealthy that a prison sentence was the equivalent of capital punishment. Bentham remarked on the bad effects of prisoners commingling, and questioned gaolers' charging fees. He pointed out that wealthy people could buy such good service that they found prison tolerable, thus reducing the deterrence value of prison. He also advocated the use of prison labour to help pay the expenses of running prisons. Many of Bentham's ideas on imprisonment are similar to those advanced by modern economists such as Becker and Ehrlich.

Criminologists in the 18th century were aware that a trade off could be made between increasing the probability of capture and increasing the size of the penalty as two alternative means of deterring crime. As Bentham wrote,

Unless men are hurried on by outrageous passion, they do not engage in the career of crime without the hope of impunity. If a punishment were to consist only in taking from an offender the fruit of his crime, and this punishment were infallible, there would be no more such crimes committed; for what man would be so insensate as to take the trouble of committing a crime with the certainty of not enjoying its fruits, and the shame of having attempted it? But as there are always some chances of escape, it is necessary to increase the value of the punishment, to counterbalance these chances of impunity.

It is therefore true, that the more the certainty of punishment can be augmented, the more it may be diminished in amount. This is one advantage resulting from simplicity of legislation, and of excellence of legal procedure.

For the same reason, it is necessary that the punishment should be as near, in point of time, to the crime, as possible; because its impression upon the minds of men is weakened by distance; and because this distance adds to the uncertainty of its infliction, by affording fresh chances of escape. (Bentham, 1838:402)

As we shall note in Chapter 2, a central issue in the modern economic approach to crime is the trade offs that can be made between the size of a penalty and the probability of capture and conviction for a crime. Both Beccaria and Bentham used the tenets of classical economic reasoning in their analysis of crime. Many of the conclusions they drew have been reaffirmed by modern economic theories of crime.

Many aspects of the theory of crime advocated by Beccaria and Bentham are more compatible with the notions that ordinary citizens have about crime prevention than are the approaches of modern criminologists. When we consider how to reduce traffic offences, few would argue that fines and suspended sentences do deter most people from committing traffic crimes. Similarly, libraries impose fines for late return of books, children are punished for misbehaviour, and treatment for various other types of petty crimes is based on the notion that punishment deters. The economic approach to crime is not a radical new one but an old common-sense one.

The Economics of Crime

Becker, Ehrlich and other modern economists have argued that most criminals are rational agents who act deliberately when they commit crimes. We shall examine the economic theory of crime in detail in Chapter 2. Criminals are in the 'business' of crime, and they pursue both monetary and non-monetary (e.g. sexual pleasures, thrills) rewards from their labour. People move in and out of the business of crime depending

on their available alternative occupations. If a person can get a job that pays him more (including both monetary and non-monetary remuneration) than he can earn as a criminal, he will quit being a criminal and take up ordinary employment. If the costs of committing crimes go up (for example, through increases in the probability of capture and conviction or through increases in penalties), then fewer crimes will be committed.

Criminologists note that there is a continuum in human behaviour between actions that are the result of free will and those that are determined by biology, psychology or the environment (Fishbein, 1990). Economists such as Becker and Ehrlich generally reject the idea that anyone is predestined to become a criminal. They do not, for example, believe that most criminals are genetically defective. If criminals were genetically destined to pursue a life of crime, it would be hard to explain why the original criminal population of Australia did not beget a nation of criminals.

Economists also reject the idea that criminal behaviour is directly caused by low IQ, poor upbringing, low socio-economic status, poor maternal bonding, social alienation, and the other causes mentioned above. Instead, they argue that these characteristics of criminals may make criminals unable to obtain legitimate employment that is more attractive than criminal employment. Furthermore, many of the penalties for committing crimes are imposed through social ostracism. People from dysfunctional families may already be ostracised, as are some people with physical deformities and low intellect. These people have already incurred the cost of ostracism, so the relative cost of committing crimes is lower than it would be for a person who had not yet been ostracised.

The economics of crime postulates a 'market' for crime. Criminals 'supply' a certain amount of crime in every society, and the amount and type of crime they supply depends on the 'return' from various crimes. As the level of crime rises, citizens take measures to protect themselves and this tends to reduce the return to crime. Criminals will tend to exploit first those opportunities for crime that can be expected to have the highest payoff. This too will tend to reduce the return to additional crimes, as the level of crime increases.

Citizens will 'demand' a certain amount of punishment for criminals and a certain size police force to detect and apprehend them. Citizens will also 'demand' a judicial court system to mete out punishments and enforce them.

The level of crime of various types, the return to criminal behaviour, private investment in defence against criminal attacks, the size of penalties and the probability of capture and conviction will all be jointly determined in equilibrium by other 'exogenous' factors. These factors include population density, the extent of inequality in income and wealth, the effectiveness of technology for defending oneself against criminal attacks, the technology available to the police and courts, other 'legitimate' employment opportunities available to criminals, and so on.

Methodological Issues in Criminology

Some important methodological issues need to be considered in assessing alternative theories of crime. First, we note that many studies of criminal behaviour are based on data that may be unreliable. Sociologists have conducted longitudinal studies in order to determine the causes of delinquency and adult criminality. Some data from the studies are gathered through personal interviews by social workers. The data are, therefore, filtered first through the person being interviewed and then through the interviewer. This allows a great deal of subjectivity to enter into the research.

Criminologists have noted that examining official crime statistics and incarcerated criminals gives a biased picture of crime. Many crimes go unreported. For example, we can use the Crimes Victims Survey conducted by the Australian Bureau of Statistics in February 1983 and January 1984 (cited in Mukherjee & Dagger, 1990:51–66) to obtain an estimate of the extent to which crimes are reported to the police. Individuals included in the survey were asked whether they reported to the police the last incident in which they were the victims of a crime. The percentages reporting the last incident are shown for seven categories of crime in Figure 1.4. Evidently, there is considerable under-reporting of many categories of crime in Australia.

One problem with comparing statistics across jurisdictions is that crimes may be defined differently in different locations. In addition, many criminals escape detection, prosecution and incarceration.

In order to remedy the limitations of official criminal records, criminologists use self-report data and victim surveys. Self-report data are gathered by asking members of a selected population (such as juvenile males) how many criminal acts they have committed. Victim surveys, such as the one discussed above, ask people in a sample population how many times they have been the victim of certain crimes. Economists point out several problems with this type of data; the person being interviewed may not remember the truth, or may exaggerate the truth to suit some other end. Nevertheless, surveys may be useful in giving us some measure of the level of criminal activity as distinct from the number of crimes reported to the police.

Limitations of the Economic Theory of Crime

The economic theory of crime is consistent with many different systems of justice, some of which are attractive and others of which are not. A major implication of the economic theory of crime is that expected punishments deter crime. It does not follow, however, that we are morally justified in imposing all types of punishment or in punishing innocent people. The economic theory of crime is a positive theory of human behaviour. The theory implies that if society wants to reduce crime by such-and-such an

Figure 1.4

Percentage of crimes reported to the police in Australia
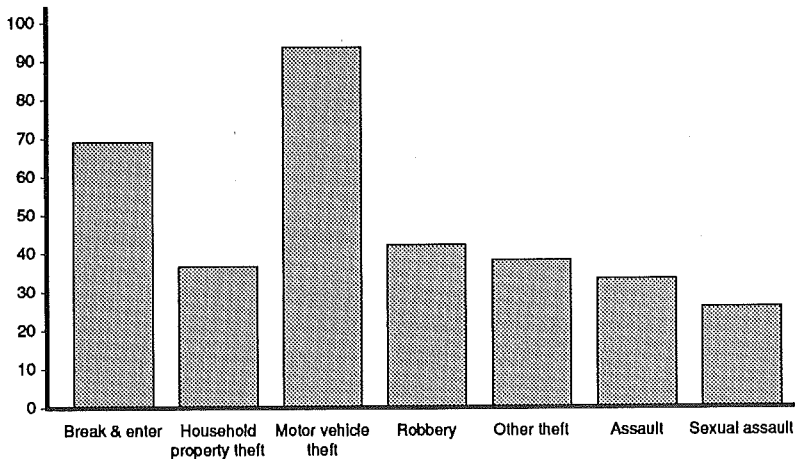
Source: Mukherjee & Dagger, 1990

amount, then certain measures will help to achieve that end. The economic theory does not shed light on the morality of either the means of reducing crime or the goal of reducing it.

Evidence from scientific studies, as well as our everyday experience, suggests that punishment does deter some crimes. Various types of punishments are used in all walks of life to get people to do what we want them to do or to refrain from doing what we do not want them to do.

Suppose we accept that some punishments deter some crimes. It does not follow that we are morally justified in punishing people. The fact that punishment deters crime does not imply that we ought to punish people who commit crimes. We need further justification for punishment that is derived from ethical principles.

Suppose we were to claim that the deterrence value of punishment is a sufficient condition for punishing people. We would then be justified in punishing innocent people, as long as the fact of their innocence could be kept secret. If we punished a few innocent people, in addition to the guilty ones, the deterrence value of the punishment might increase and the amount of crime in society decrease.

A major ethical problem confronts the economist who wishes to derive policy implications from the economic theory of crime. The state's right to punish criminals must be derived from ethical principles that are not solely based on the deterrence value of punishment. These ethical principles must include some notion of fairness. While space does not permit us to

examine the ethical principles that underlie the policy recommendations in Chapter 6, it should be noted that these suggestions are derived from a combination of the economic theory of crime and the authors' own ethical beliefs.

Practical Implications of the Economic Theory of Crime

In the following chapters we consider the economic theory of crime and alternative theories of crime derived from other disciplines. Our investigations suggest that the current crime wave in Australia and the developed world is caused by several factors. First, reductions in the expected penalties (both legal and social penalties) for committing crimes have encouraged more people to become criminals and more criminals to commit more crimes. Second, many government programs designed to help disadvantaged people actually contribute to their becoming criminals. In particular, minimum-wage laws make it difficult for young, unskilled workers to obtain legitimate employment. In Australia, the apprenticeship system has been virtually destroyed by laws requiring that full wages be paid to apprentices. The lack of apprenticeship schemes has reduced the opportunities for young people to invest in marketable skills. A large proportion of all crime is committed by men under the age of 21 (Wolfgang et al., 1987; Wilson & Hermstein, 1985).

There is a lack of competition among schools in Australia for all but the wealthiest segment of the population. Wealthier people can send their children to private schools or they can afford to live in expensive neighbourhoods that have good state schools. This means that children from lower-income families often suffer from poor educational opportunities. As we note in Chapter 6, there is a significant correlation between poor education and criminal behaviour. A more extensive school voucher program should be created with means-tested payments made to families rather than schools. Such a program would give lower-income families a wider choice of schools and greater control over their children's education. We believe that parents have a greater incentive than anyone else to find the best schools for their children. Higher educational achievement for all children would give them greater job opportunities and render a life of crime less attractive.

Our study further suggests that we should return to the idea that, other things being equal, government interference in individuals' lives should be avoided. Government meddling in the affairs of individuals through the prosecution of 'victimless' crimes such as drug use, gambling and prostitution leads to corruption in the police force and the waste of police resources that could be spent detecting and prosecuting crimes in which individuals are harmed by others. A large portion of crime in Australia and the Western world is associated with the black market in drugs. These and other policy issues associated with the economics of crime are discussed in Chapter 6.

Conclusion

We conclude by suggesting that the economic theory of crime, while limited in its own ways, may offer a practical alternative to many modern theories of criminology. If we want to reduce crime in Australia, the economic theory of crime suggests that we need to increase the probability of capture and conviction of criminals, or to increase the penalties criminals will face if convicted, or both. Elimination of the inflexible award wage system would offer alternative employment opportunities to unskilled people considering crime as an occupation. Legalisation of drugs would eliminate crime associated with drug trafficking, just as legalisation of alcohol in the United States after Prohibition eliminated crime associated with black market alcohol. Improving the education system is likely to make legitimate careers more attractive than criminal ones.

An economic theory of crime cannot answer all our questions concerning the causes of crime. It cannot tell us why any particular individual turns to a life of crime. It cannot explain the criminal behaviour of insane people, children and others who may be irrational. The economic theory of crime can, however, help predict and explain trends in crimes that are committed by the majority of criminals, those who are both rational and deliberate in their actions.

Chapter 2

The Economic Theory of Crime

Most people consider a life of crime to be unattractive. Consequently, many theories of crime are based on the underlying assumption that criminals do not choose to violate the law. This assumption may be less plausible than it first seems, however. Many people would also consider such 'legitimate' jobs as being a garbage collector or sewage worker unattractive, yet few would argue that people who take such jobs are irrational, or are compelled to do them by forces such as genetics, physiology or upbringing.

The classical and the more modern economic theories of crime are based on the hypothesis that both criminals and their potential victims are motivated by rational self-interest. Both criminals and potential victims can consciously choose to modify their behaviour in response to changes in the expected costs and benefits of pursuing their respective goals: that is, the goals of committing crime and of preventing it. (For some of the influential original articles, see Becker and Landes, 1974. A good summary treatment of this burgeoning literature, along with the application of economics to other related issues such as corporate law, property law and so forth, is provided in the textbook by Posner, 1988.)

The Modern versus the Classical Economic Analysis of Crime

We noted in Chapter 1 that both Beccaria and Bentham employed the tenets of classical economic reasoning in their analyses of crime. Many of the conclusions they drew have been reaffirmed by modern economic theories of crime. The main advance in the analyses by modern economists involves the greater precision obtainable with the use of explicit mathematical theories and statistical techniques.

The role of risk. Since capture and conviction involve many chance elements, criminal activity is very risky. The development, in the middle of the 20th century, of the expected-utility approach to choices involving uncertainty provided economists with a simple analytical tool to model choices made by criminals.

While the expected-utility approach is undoubtedly an oversimplification of many individuals' attitudes to choices involving uncertainty, it appears to be sufficiently accurate to capture the broad aspects of such choices. In particular, the key aspect of choices involving uncertainty is that individuals differ in their attitudes to risk. More risk-averse individuals are willing to forgo greater consumption if they can thereby avoid variation in their consumption levels. The key insight of the expected-utility approach, discussed in more detail below, is that risk aversion can be modelled in a very simple way.

In its application to criminal behaviour, the expected-utility approach has enabled economists to be more precise about the trade off between on the one hand the deterrent effects of variations in the probability of capture and conviction and on the other hand the size of the penalty once the criminal has been caught and convicted. We present a simple graphical analysis of this central idea later in the chapter.

Mathematical modelling. The algebraic formulation of the economic approach to crime makes it more amenable to statistical testing than the classical theory. At the same time, much more statistical data relating to criminal activity has been collected and published. The quality of the available data has also improved greatly. Much effort has been put into making the statistics from different police forces and court systems more comparable. The definitions of various crimes and outcomes of investigations, court proceedings and sentences have been made more consistent across jurisdictions.

The widespread availability of computers with multiple linear-regression packages has also been of crucial importance. These standard software packages enable investigators to undertake quite sophisticated statistical analyses. They can measure the independent effects of the numerous variables that appear to influence criminal behaviour.

The most sophisticated analyses also account for the simultaneous determination of criminal activity and the levels and types of punishments imposed. This so-called 'market model' of criminal behaviour will be explained in more detail below. It represents another major advance of the modern economic approach to criminal behaviour over the earlier classical analysis. It has been a crucial element in enabling the economic theory to account for more of the evidence on the variation in crime rates between jurisdictions and over time.

Supply and demand. Another conceptual difference between the modern and classical approaches to the economic analysis of criminal behaviour reflects a key difference between classical and modern economics. The classical economists believed that demand had little to do with the determination of the values of different goods and services. One expression of this point of view was the so-called water/diamond paradox. We observe that the value of diamonds generally exceeds the value of water (we shall note some interesting exceptions below). However, people cannot live without water, whereas they can clearly live without diamonds. If demand has something to do with market values, then, how can the price of something so valuable as water be so far below the price of something like diamonds, which are of much less total utility?

The classical economists suggested that diamonds were expensive not because they provided great utility but because they were so hard to find,

process, mount into jewellery, and so on. On the other hand, water was so commonplace, particularly in Western Europe, that little effort needed to be expended to obtain supplies sufficient to satisfy most demands.

The solution to the diamond/water paradox offered by Alfred Marshall, and taken up by modern economists, involved recognition of the difference between **total** utility and **marginal** utility. Thus the price or value of a good or service represents the value to consumers of an **additional unit** of that good or service.

In the case of water and diamonds, while water consumption gives greater total utility, most people are already consuming sufficient water, so that an additional amount is of little additional value. The 'consumption' of diamonds, on the other hand, is so small for most people that an additional diamond has much greater additional value. Indeed, in cases where water is very scarce, its marginal value to consumers increases and they are willing to exchange items that would ordinarily be of much greater value in order to obtain additional fresh water. For example, many Vietnamese people stranded on the ocean in small boats with little fresh water reportedly exchanged considerable amounts of gold in order to obtain drinking water from passing boats.

In modern economic theory, the quantity of a good or service being traded, and its relative value, are modelled as both being determined by the interaction of the factors determining supply and marginal value (or demand). Entrepreneurs should be happy to supply more of a good or service so long as the cost of producing an additional unit, the so-called **marginal cost**, fell short of the price they can obtain for that additional unit of production. Consumers would be willing to pay a certain price for an additional unit of a good or service so long as the price they had to pay fell below the value to them of that additional unit, or its **marginal value**.

Application to criminal behaviour. In the application of economic analysis to understanding criminal behaviour, the modern approach has a key advantage. It is commonly believed that criminals, particularly those committing violent crimes such as murder and robbery, are motivated by highly idiosyncratic factors. Many murder victims have a close personal relationship with their murderers. 'Mass killers' are often psychologically disturbed. Violent robbers are often desperate for money to pay for their drug addictions or other needs. For many of these sorts of criminals, calculations of expected costs of capture, conviction and sentencing are likely to be a small factor in their decision of whether or not to commit a crime.

It does not follow, however, that there are no crimes 'on the margin' that are responsive to changes in expected penalties. For the economic theory to be relevant, it does not have to be the case that **all** criminals are likely to respond dramatically to changes in expected penalties. Only some

criminals need to be barely indifferent between committing the crime and not committing it. A small change in expected penalties is then sufficient to tip the balance for these crimes so that they are no longer worth doing.

To put the same point in another way, evidence on the sorts of factors that are important 'on average' for explaining criminal behaviour do not necessarily tell us very much about the factors that will have a strong influence in bringing about changes in that behaviour. Consider, for example, people who speed on the highway. There are many reasons why people speed. Some speeders have compulsive personalities, while others are travelling to hospitals or important appointments. Some are young people rebelling against authority. Suppose the fine for speeding were $50. The expected cost of speeding (that is, the probability of capture and conviction times $50) may not be the major factor influencing whether or not someone speeds. However, at least some speeders will alter their behaviour if we raise the fine from $50 to $100. These individuals are responding to an increase in the marginal penalty.

An Overview of the Modern Economic Approach

A central hypothesis of the economic theory of crime is that both criminals and their potential victims modify their behaviour in order to further their rational self-interest. This hypothesis enables us to describe the level of crime in a given location or time period as an equilibrium outcome of a balance of forces that are similar to market processes. In the following discussion, we shall focus initially on the 'economic' factors governing individual behaviour. Later we shall show how the 'non-economic' considerations emphasised in many other theories of criminal behaviour can be incorporated into the economic theory.

The key elements of the economic theory can be summarised as follows. Criminals will 'supply' crimes as long as the rewards they get offset the costs of committing the crimes. The major part of the cost is the value to the criminals of uses of their time, energy, skills and other resources under their control in alternative 'legitimate' occupations.

As the level of crime increases, countervailing action from potential victims has the effect of reducing the net return to criminal activity. Victims, and potential victims, will take precautions to reduce their exposure to criminal acts. They will also 'demand' increased police protection and an increased chance of criminals suffering severe punishment.

The amount of crime, and the return criminals can expect to receive from criminal activity, are determined by a balance of these forces. We can use Figure 2.1 to illustrate the economic theory of crime. In this diagram, the (vertical) y-axis represents the expected return to the criminal from committing an additional crime, or the expected costs the criminal incurs in committing an additional crime. This corresponds to the 'price', or 'marginal value' in a conventional market. The (horizontal) x-axis in Figure 2.1

represents the number of crimes committed. The curves in this figure represent the expected marginal costs and benefits of criminal activity in a particular location from the point of view of the criminals. Equilibrium occurs where the expected marginal cost of crime for each criminal matches his expected marginal benefits.

The benefits a criminal gets out of committing a crime need not be monetary. For example, a person who gets pleasure out of using illegal drugs is getting a non-monetary return from committing a crime. Vandals are also said to get enjoyment out of destroying other people's property.

We should also note that Figure 2.1 is a simplified representation of the determinants of crime and the expected returns to criminal activity. For example, there are many different types of crime. Each of these is likely to respond differently to changes in expected returns. Furthermore, crime is distributed geographically across regions that offer different opportunities for criminal activity or alternative legitimate employments. While a more complete analysis would disaggregate criminal behaviour into different categories, or focus on local regions, different types of crime or criminal activity in neighbouring locations will tend to be related. Thus, we should really be considering a multi-dimensional surface with different types of crime in different locations each represented along separate 'x-axes'. Shifts in the level of one type of crime in one location will in general alter the marginal costs and benefits of other types of crime in other locations. We cannot represent these types of interactions using simple one-dimensional diagrams. While diagrams like Figure 2.1 gloss over some important issues about the relationships between different types of crime, or the levels of criminal activities in different locations, they enable us to illustrate the basic issues.

Figure 2.1
The economic theory of crime
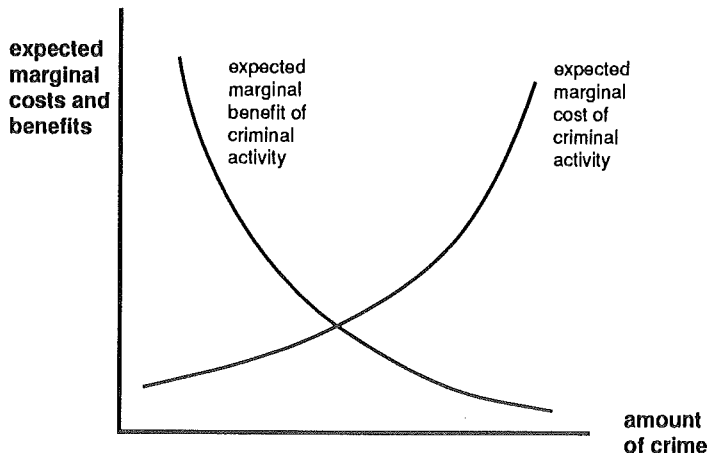
The marginal-cost curve. The marginal-cost curve can be thought of as a supply curve of criminal activity. It represents the marginal value of the alternative consumption the criminals could have experienced if they had been involved in legitimate employment instead of crime. As noted above, the supply curve represents the value of alternative uses of the criminal's time, energy and other resources. As in more conventional markets, the supply curve therefore represents the marginal cost of undertaking the activity under consideration. Factors affecting the incentive to commit crime apart from the expected return will **shift** the supply curve.

The marginal-benefit curve. The downward-sloping curve reflects the marginal benefit to the criminal of committing an additional crime in the location under consideration. As the level of crime in a given neighbourhood rises, the return to criminal activity is likely to fall for several reasons. The most rewarding opportunities for criminal activity will be exploited first. In addition, other things being equal, the higher the level of crime, the more actions people will take to protect themselves. For example, they will install locks and alarms, carry guns and learn how to use them, attend self-defence classes, carry less cash, cease taking public transport alone and late at night, change their place of residence or work, and form neighbourhood-watch associations. Social penalties, such as ostracism, may also increase with the level of criminal activity and reduce the marginal return to crime for some individuals.

High crime rates also increase the demand for public protective measures, such as more police patrols or increased prison sentences. Since we want to discuss public protective measures separately, however, we do not include their effects in the slope of the marginal-benefit curve. In other words, the slope of the marginal-benefit curve represents the tendency of the return to crime to fall as the amount of criminal activity rises for reasons **other** than the tendency to increase public protective measures. The latter will be illustrated instead by a **shift** of the marginal-benefits curve. This response can be represented as in Figure 2.2.

By analogy with more conventional markets in economics, we shall refer to the marginal-benefits curve as the 'demand' curve. This terminology may, however, be somewhat misleading. What is actually being 'demanded' is the **absence** of crime, or protection from crime, rather than the amount of crime as graphed on the horizontal axis.

In the succeeding two sections, we shall consider the supply and demand curves in detail and discuss the factors influencing their slopes and causing them to shift.

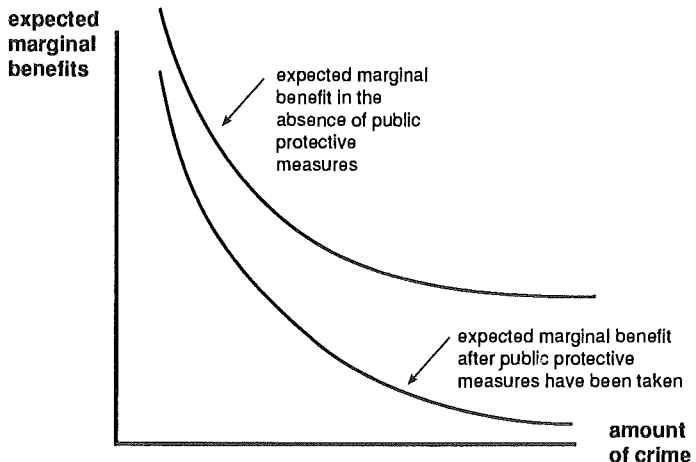## A Detailed Analysis of the Supply Curve

The supply of crime has been drawn in Figure 2.1 as upward sloping so that, as the amount of crime rises, the marginal value of alternative uses of the criminals' time and energy increases. There are two different reasons for the upward slope.

Each individual criminal chooses how much time and effort to devote to crime and other activities such as sleeping, eating, entertainment and perhaps 'legitimate' employment. He will give up less valuable alternative activities first. Hence, as more time and effort are devoted to criminal activity, the marginal value of the forgone activities also rises. The marginal 'psychic' cost of crime might also rise with the level of criminal activity. In more conventional markets, an increase in supply by an individual entrepreneur or firm is called an increase on the 'intensive margin'.

The second reason the supply curve slopes up is that, as more individuals become involved in criminal activity, newer entrants to the business will be less suited than the earlier entrants. More marginal entrants will have a higher marginal value of alternative activities, or a higher marginal cost. Early entrants to the crime business will have less valuable alternative uses for their time and other resources, or will suffer fewer pangs of conscience from committing crimes. In more conventional markets, an increase in supply as a result of new entrants to the business is called an increase on the 'extensive margin'.

Economists such as Becker and Ehrlich think that there is no fixed group of people who are criminals. Rather, people move into and out of the business of crime depending on the return to crime, other job opportunities, and other non-market uses for their time and energy. Nevertheless, certain types of individuals might be more suited to crime, just as some individuals might be more suited to other occupations. The supply of crime in a particular location and at a particular time depends on the expected return to crime. By altering the expected return, public policy can influence the amount of crime.

Figure 2.2
Impact of public protection

expected
marginal
benefits

expected marginal
benefit in the
absence of public
protective
measures

expected marginal benefit
after public protective
measures have been taken

amount
of crime

An important implication of the economic conception of criminal activity is that incapacitation of individual criminals by imprisonment will encourage other individuals to enter the criminal business. A reduction in criminal activity as more individuals are incarcerated will tend to raise the equilibrium return to crime. Other individuals who are indifferent between engaging in legitimate employment and criminal activity will be encouraged to turn to crime. Other criminals who were already committing crimes will be encouraged by the higher returns to commit further offences and increase their risk of capture, conviction and severe punishment.

Ehrlich (1981) argues that many criminologists vastly overstate the incapacitation effects of incarceration on net criminal activity. Because these criminologists tend to think of criminals as a relatively fixed group of people, they believe that if the existing group of criminals were placed behind bars and rehabilitated, the overall crime rate could thereby be greatly reduced. By taking into account what may be termed the 'replacement effect', however, Ehrlich estimates that, if the deterrent effect is excluded, a 1 per cent increase in the probability or the period of incarceration is unlikely to reduce the overall crime rate by more than 0.1 per cent. By contrast, Ehrlich's best estimate of the deterrent effect is that a 1 per cent increase in the probability or the period of incarceration is likely to reduce the overall crime rate by about 1 per cent. This is an effect about ten times greater than the effect emphasised by many criminologists.

As we noted above, the key issue when considering penalties is not their average effect on behaviour relative to other factors but rather their effect on incentives at the margin. This is measured by the slope of the supply curve, or the **elasticity of supply** of criminal activity with respect to changes in the expected return.

Factors that affect the expected marginal cost of crime apart from the level of criminal activity will shift the supply curve. For example, if a person is religious, he may feel guilty and anxious about breaking the law. A change in attitudes that lowers the guilt associated with criminal activity will shift the supply curve to the right.

As another example, the supply of crime will also be influenced by the alternative sorts of occupations available to prospective criminals. Thus, when alternative employment opportunities are diminished, the value of forgone consumption corresponding to a given level of crime will fall and the supply curve will again shift to the right.

To be useful, the economic theory of crime requires a substantial fraction of criminals to choose rationally between allocating resources to crime and allocating them to alternative 'legitimate' ways of increasing their well-being (or decreasing their misery). If most criminals paid no attention to these alternative uses of their resources, the supply curve would be close

to vertical. The non-economic factors causing the supply curve to shift would be more important determinants of the level of crime than the economic factors underlying the upward slope of the supply curve.

'Organised Crime'

It is instructive to compare crime to the fishing industry. If we were considering fishing, the vertical axis would represent the marginal benefit of fishing (the price of fish), or the marginal cost of the time, energy and other resources involved in the fishing industry. The horizontal axis would represent the amount of fish caught. The marginal cost, or supply curve, again would be upward sloping for two reasons: each individual fisherman would give up less valuable alternative activities, and, as the fishing industry expanded, newer entrants to the industry would be less suited in the sense that they would have higher marginal costs. We can think of the potential victims of criminals as analogous to 'fish' and the criminals as analogous to 'fishermen.'

Economists have long observed that 'common property' resources such as fish give rise to an 'externality'. In terms of Figure 2.1, as additional fishermen enter the industry, it takes more time and other resources for any one fisherman to make a catch of any given size. The marginal-cost curves of the existing fishermen shift upward vertically.

When deciding on how much fishing to do, each fisherman does not take account of the increased time it takes his fellow fishermen to make a catch. He merely matches his own marginal costs to the marginal benefits of extra fishing. The result is too much fishing. Since the fish resource is not owned it tends to be over-exploited. If property rights to the fish were defined and enforced, there would be less fishing and the owner of the fish would earn a rent on his scarce resource.

Criminals face a similar 'problem' in that the pool of victims constitutes a 'common property resource' from the criminals' point of view. Perhaps organised crime can be viewed as an attempt to capture gains from controlling a negative externality. The 'crime bosses' in effect define and allocate property rights to victims, reduce criminal activity (in the non-criminal population), and raise the returns to criminals, by limiting entry to the criminal business.

Eighteenth-century London provides an interesting example of the idea that organised crime is a solution to the 'over-fishing' problem. Jonathan Wild ran a notorious organised-crime racket in London in the mid- to late-1700s, while he also gained fame as a private detective or 'thief taker'. At that time, substantial rewards were offered for the capture of criminals. Wild managed a group of thieves who sold stolen merchandise to him. Wild would write letters to the victims of the thefts he organised. He would offer to return the stolen goods in exchange for a reward worth more than the value of the goods on the second-hand market. The victim

would have to promise not to prosecute. If a thief tried to operate outside Wild's gang, Wild would don his 'thief taker's' hat and turn the competitor in to the police for a reward. Wild was thus in the business of creating crimes so that he could collect the rewards (Pringle, 1958:32–5). He was also protecting members of his gang from outside competition.

Attitudes toward Risk

From the point of view of public policy, an important shift variable for the supply curve is the amount of risk associated with criminal activity. The crime industry tends to be very risky relative to most alternative legitimate occupations. Almost all studies of choice behaviour in a risky environment suggest that individuals are concerned about how hazardous their activities are. For example, individuals trading in financial markets demand compensation in the form of higher average returns for assets with a more variable income stream or market value.

If criminals are risk averse, an increase in the risk of criminal activity will shift the supply curve to the left. For any given level of crime, the expected marginal costs will be higher. On the other hand, if criminals are risk-loving, an increase in risk will shift the supply curve to the right.

Attitudes to risk are important for policy because the expected return to crime can be reduced by increasing either the size of the penalties or the probability of capture and conviction, and these alternative measures have different implications for the risk associated with criminal activity. As we noted in Chapter 1, both Beccaria and Bentham believed that the probability of capture and conviction was a more important factor in deterring crime than was the size of penalties imposed.

A 'compensated' increase in the probability of capture and conviction is an increase in probability with a simultaneous decrease in the size of the penalty in an amount to keep the expected, or average, penalty constant. We shall show that, if criminals are risk averse, a 'compensated' increase in the probability of capture and conviction will tend to increase the level of crime committed (other things being equal). Conversely, if criminals are risk loving, a 'compensated' increase in the probability of capture and conviction will tend to decrease the level of crime. First, we need to discuss how we measure attitudes to risk.

Measuring attitudes to risk. A convenient approach to thinking about choice when individuals care about risk is called the expected-utility approach to decision-making under uncertainty. In the expected-utility approach, we imagine individuals ranking outcomes by assigning a 'utility' level to each. The overall attractiveness of a risky opportunity is then determined by the expected value of the utility obtainable from the opportunity.

For example, consider a choice over a lottery offering monetary amounts $0 and $100 giving the individual utility U(0) and U(100) respec-

tively. Let the probability of receiving $0 be 0.9, and the probability of receiving $100 be 0.1. The expected, or average, value of the lottery is then

$$EL = 0.9 \times 0 + 0.1 \times 100 = \$10$$

The expected utility of the lottery is

$$EU(L) = 0.9 \times U(0) + 0.1 \times U(100)$$

If an individual is risk averse he would find the lottery less valuable than $10. In the above example, his utility function U would need to be such that $EU(L) < U(10)$. More generally, the expected utility theory of choices over random alternatives says that we can find a utility function U such that the individual will prefer a risky choice c_1 to a risky choice c_2 if and only if $EU(c_1) > EU(c_2)$. As we shall show below, the curvature of U determines the individual's attitude to risk.

There is considerable evidence from both laboratory experiments and observed choice behaviour in economic contexts that the expected utility approach is at best a rough approximation to the way individuals choose between risky alternatives. However, it is a reasonable first approximation and useful for establishing basic ideas. Some detailed conclusions from expected utility analysis might need to be modified, however, to accommodate deviations between actual choice behaviour and the expected utility approach. A more recent variant of the expected-utility approach models individuals as behaving according to an expected-utility model for small changes in probabilities and payoffs, but behaving according to a modified model for large changes (Machina, 1982, 1987).

We can use Figure 2.3 to represent the attitudes of an expected utility

Figure 2.3
Risk-averse individual
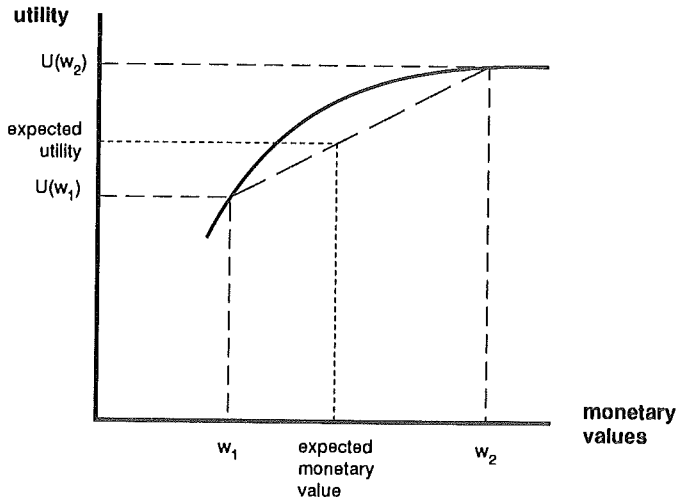
maximiser to the risk inherent in a simple lottery similar to the one discussed above. Let the monetary amounts involved in the lottery be w_1 and w_2 with the probabilities of receiving these amounts being p and $1-p$ respectively. The expected value of the lottery is the weighted average of the two values w_1 and w_2 with weights p and $1-p$:

$$EL = pw_1 + (1-p)w_2.$$

The higher the probability, p, of getting w_1, the closer the average value will be to w_1. The expected utility, or attractiveness, of the gamble is the weighted average of the two utilities $U(w_1)$ and $U(w_2)$

$$EU(L) = pU(w_1) + (1-p)U(w_2)$$

with the same weights p and $1-p$.

In the situation as drawn, the expected utility of the gamble is less than the utility of the expected value of the gamble, were that to be made available for sure (that is, with probability 1). The individual is risk averse. The degree of risk aversion is measured by the concavity (curvature) of the utility function. The higher the degree of concavity, the greater the degree of risk aversion.

By contrast, in Figure 2.4, the expected utility of the gamble exceeds the utility of the expected value of the gamble. The individual is said to be risk loving. Again the degree to which the individual is risk loving is measured by the curvature of the utility function. In this case, however, the utility function is convex rather than concave.

Figure 2.4
Risk-loving individual
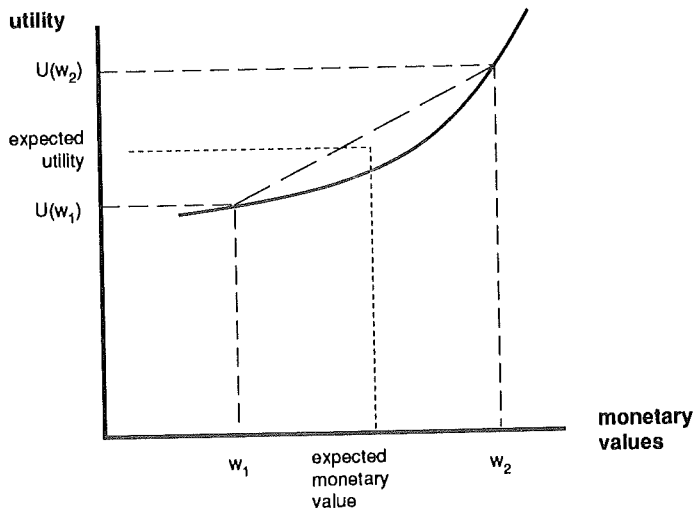
Size of penalties vs probability of capture and conviction. We can use this apparatus to demonstrate the relative effect of penalties as opposed to capture and conviction probabilities on the incentives to commit a crime. Let the two utility opportunities represent the return to a criminal in the two states, state 1 where he is caught and state 2 where he is free. The utility in state 1 will be lower, among other things because of the penalty imposed by the law.

Consider two regimes yielding the same expected value of outcome but with different expected utilities depending on the attitudes to risk of the potential criminal. In one regime, the difference between utility in the convicted state and utility in the free state is large because penalties are high. However, the probability of punishment is relatively low. In the other regime, the probability of punishment is high but the difference between the utilities in the two states is not high because penalties are relatively low. For a risk-averse individual we can represent these two alternative regimes as in Figure 2.5.

In one regime the monetary equivalents of getting away and being punished are (w_1, w_2) while in the other regime they are (w^*, w_2). To keep the expected value of the penalties the same despite the higher penalty in the second regime, the probability of punishment needs to be lower in the second regime. From the diagram, it is clear that the more risk averse the individual is, the less he will prefer an increase in penalties compensated by a reduction in punishment probability.

Figure 2.5
Risk-averse individual deterred by penalties

utility

monetary values

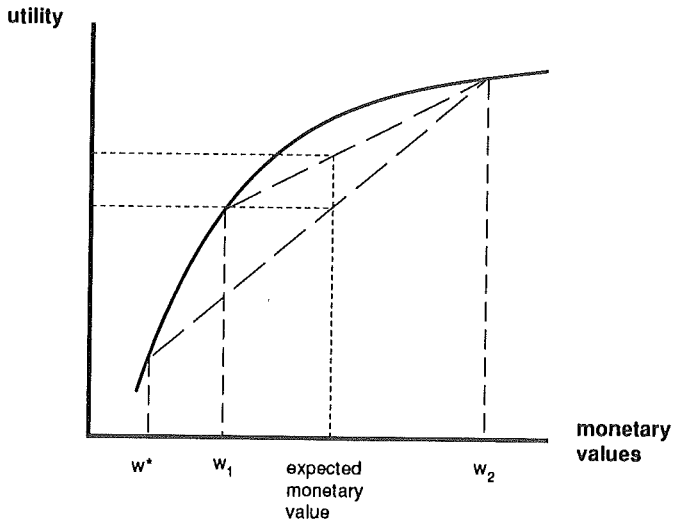w^* w_1 expected monetary value w_2

Figure 2.6 represents the value to the criminal of the same alternatives if the criminal is risk loving instead of risk averse. From the diagram, we can see that risk-loving individuals will be deterred more by increases in the probability of punishment than compensating increases in penalties. There is some interest, therefore, in determining whether criminals are risk averse or risk loving. Several considerations suggest that criminals might be more risk loving than most other members of society.

Risk aversion among criminals. Since crime is a risky occupation, risk-loving and less risk-averse individuals will tend to find it a more satisfactory employment. With free entry into the crime business, whether or not 'crime pays' (in the sense that its expected return will be lower than that in alternative careers) will depend on attitudes to risk. The return to crime will have to be such as to compensate the last criminal willing to enter the activity as much as he could obtain in his next best alternative employment. If this marginal criminal is risk averse, and crime is more risky than his next best alternative employment, then the expected return to crime will exceed the expected return in this next best employment. Conversely, crime will 'not pay' if the marginal criminal is risk loving.

The common assertion that 'crime does not pay' therefore suggests that criminals are risk loving. In that case, a compensated increase in probabilities of capture and conviction will have a greater deterrent effect than a compensated increase in penalties. This need not imply that penalties should be reduced and probabilities of capture and conviction increased, however, since the costs of imposing penalties as opposed to

Figure 2.6
Risk-loving individual deterred by probability of punishment
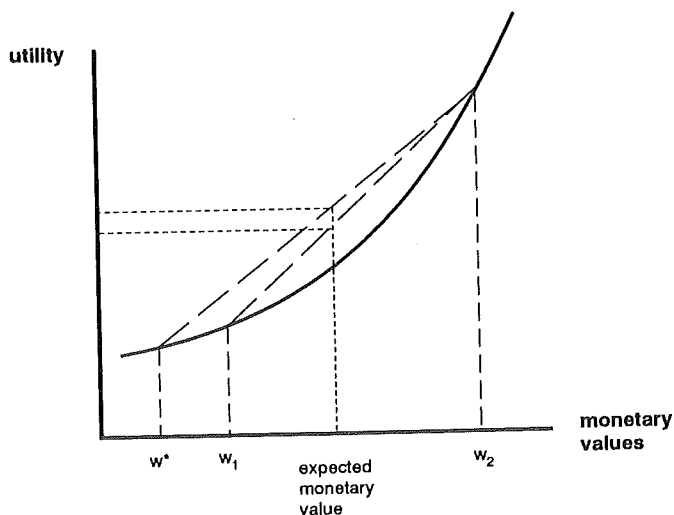
increasing probabilities would also need to be taken into account.

Risk-loving criminals still attempt to avoid capture. Viewed from the perspective of the expected-utility model, we can also think of crime as 'negative insurance'. Insurance decreases the variability of income or wealth across alternative 'states of nature'. For example, consider fire insurance on a house. At any point in time we can imagine two possible, mutually exclusive, 'states of the world': one in which the house is burned down and one in which it is not. Fire insurance reduces the difference of wealth in these two states. Household wealth will be lower in the event the fire does not occur since it costs something to buy the insurance. It will be higher in the event the fire does occur since the insurance company will make a payment to defray the costs of re-building.

In addition to buying market insurance, households can 'self-insure'. For example, installing an automatic sprinkler system costs something to install but is likely to reduce the extent of loss should a fire occur. It therefore reduces the difference in wealth between the two states just as does market insurance.

The decision to engage in crime then can be thought of as 'negative self-insurance': the criminal **increases** the differences in utility between the two states 'caught' and 'not caught'. Like a gambler, he deliberately exposes himself to added risks. Looked at from this perspective, it would also appear that criminals are likely to be risk lovers: a risk-averse individual would want to redistribute income between states so as to reduce, not increase, the variability of utility across alternative states.

Another way an individual can insure himself is by spending resources to reduce the **probability** of an adverse event occurring. This is known as self-protection. For example, in the case of house fires, the individual can build his house out of more expensive but less combustible materials, or he can install fire extinguishers and keep them in good order.

Criminals also engage in self-protection in so far as they take precautions to reduce the probability of being captured and convicted. Since we see criminals taking considerable effort to avoid being caught, we can conclude that they find it maximising to 'purchase' this type of insurance. It might be thought that this contradicts the claim that criminals are risk averse. However, it can be shown that risk aversion is neither a necessary nor a sufficient condition for a person to have an incentive to self-protect. (For a proof of this proposition, see Ehrlich & Becker, 1972.) The fact that the economic theory of crime is able to account for these apparently contradictory observations on criminal attitudes to self-insurance and self-protection is, we believe, evidence of its explanatory power.

Marginal Penalties

An important insight of the economic approach to crime is that marginal penalties should be set to deter marginal crimes. For example, if the

penalties for robbery and murder were the same, every thief would have a strong incentive to murder his victim. By murdering the victim, a thief can reduce the probability of his capture and conviction with no increase in the size of the penalty. Therefore, having the death penalty for all crimes for example might, paradoxically, increase the number of murders. This actually happened in 17th century London when capital punishment was applied to many petty crimes.

It has also been suggested that recent increases in many Australian States in the penalties for driving under the influence of alcohol may have increased the number of instances of individuals leaving the scene of an automobile accident. Increases in the penalties for driving while intoxicated have reduced the difference from the penalties associated with leaving the scene of an accident. Leaving the scene of the accident brings the advantage that it reduces the **probability** of capture and conviction both for causing the accident and for drink-driving. Thus, if the **additional** penalty is insufficient to deter the **additional** crime the economic theory would predict a rise in the latter.

Prison Sentences versus Fines

The economic theory of crime suggests that expected penalties deter crime. While many other social scientists admit that fines have a deterrent effect on traffic offences and tax evasion, they often question the efficacy of prison sentences or the death penalty for more heinous crimes. Prison terms may make prison inmates more effective at committing crimes and avoiding capture upon their release, since prison is an ideal school for crime. However, while prison may have a deleterious effect on current prisoners, it will still have the beneficial effect of deterring people contemplating committing a crime. The economic theory also suggests that remissions and other forms of early release, parole in lieu of time spent in jail, conjugal visits and other humanitarian features of modern prison life, reduce the deterrent effect of punishment by making prison sentences more tolerable (for an application of the economic theory to decisions influencing the length of sentences, see Lewis, 1983).

It does not follow, however, that economists generally favour long, harsh prison sentences. Rather, economists have argued that fines should be used whenever possible to deter crime. Prisons are expensive to build and run. They also prevent prisoners from holding legitimate jobs and provide an opportunity, as we mentioned before, for learning the tricks of the criminal trade.

On the other hand, Ehrlich (1981) notes that the incapacitation effect of prison sentences — that is, the fact that a criminal cannot commit a crime against anyone except guards and other prisoners while in prison — raises their attractiveness relative to fines. He notes that if the elasticity of supply of criminal offences is low, incarceration of a given offender leads to few

new crimes being committed by other criminals. As well, if the proportion of criminals apprehended and convicted is high, and the average length of sentences is quite large, a large fraction of the existing criminal population is in jail at any given time. Under these conditions, imprisonment may have a greater deterrent effect than fines of equivalent monetary value since the latter leave the criminal in a position to commit further crimes. One factor Ehrlich ignores, however, is the possible effect of prison in 'educating' the criminal into more effective methods of committing crimes and introducing him to other criminals who might help him in future criminal activity after release.

It should also be noted that prison sentences and fines are not the only methods of punishment available, although they are currently the most popular. Community-based alternatives to imprisonment have become increasingly popular. New South Wales and Victoria, in recent years, have imposed a required term of community service for minor offences or an unwillingness to pay fines. In the United Sates, many jurisdictions are experimenting with various forms of electronic surveillance that severely restrict the freedom of movement of convicted offenders, but still allow them to work at productive jobs and maintain personal relationships. Most of these offenders are also required to report to the police periodically to ensure the devices are still in place and working correctly.

The Demand Curve

The demand curve represents forces tending to reduce criminal activity as its level rises. The return from crime in a given locale will tend to decline as the 'obvious victims' or the 'best' criminal opportunities are exploited first. Again, this assumes that criminals are rational in the sense that they will exploit easy opportunities for crime, or engage in crimes with the highest expected return, before they turn to crimes which are likely to yield a lower payoff.

High crime rates also increase the incentive for individuals to protect themselves, and this will tend to reduce the returns to crime. For example, as private home owners use safe deposit boxes, install burglar alarms and deadbolt locks, and form neighbourhood-watch associations (that is, self-insure and self-protect in various ways) the expected return from each burglary attempt goes down.

There will also be calls for increases in police activity and increased penalties as the level of crime rises. These public responses will tend to reduce the returns to crime. Recall, however, that for expositional purposes we are taking the response of increased public protection as the level of crime increases as a **shift** variable for the demand curve, and not a factor contributing to its downward slope.

Another shift variable in the demand curve is the nature of the neighbourhood. Cities provide many more opportunities for most types

of crime than do less populated areas. On the other hand, while wealthier neighbourhoods in cities are likely to provide more profitable opportunities for thieves and house breakers, houses in such neighbourhoods are also more likely to have alarms, locks and guards. The transport costs of getting to and from wealthy neighbourhoods are also likely to be high, since most criminals live in another part of town. In fact, it was reported in 1990 that residents of wealthy suburbs in Atlanta, Georgia opposed the extension of public transport to their area on the grounds that it would bring more criminals into the area.

Intersection of the Supply and Demand Curves

According to the economic theory, the amount of crime and the return to criminal activity in any location at a particular time is determined by the intersection of the supply and demand curves. Any factor that shifts either or both the supply and demand curves will alter both the observed level of crime and the return to criminal activity. We provide two examples that illustrate this point.

Example 1. People who live in cities have greater anonymity than people who live in villages. Anonymity reduces the social and psychic costs of committing a crime, since these costs are most effectively imposed by friends and relatives. This is illustrated in Figure 2.7 as the supply curve shifting to the right. As noted above, the demand curve is also likely to be further to the right in the city since there are more opportunities for criminal activity.

The result is that, in cities, crime will be higher. The return to crime, however, can be higher or lower. The greater opportunities for committing crime will tend to raise the return to crime. Increases in private protective activities, however, will tend to reduce the return.

**Figure 2.7
Urban versus rural crime**
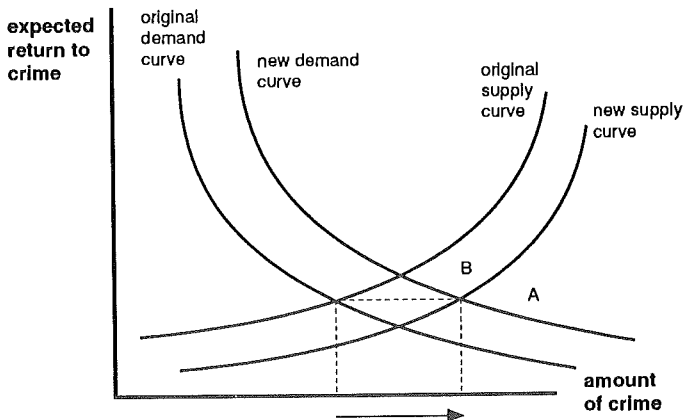
The shift along the new demand curve from point A to point B represents the endogenous **private** response to higher crime in the city. There will also tend to be a **political** response as city dwellers demand greater police protection and possibly higher penalties for criminals. This will appear on the diagram as a leftward shift in the demand curve, which will tend to reduce the amount of crime and the return to crime in the cities. The result is that cities could have both higher penalties and conviction rates for crime **and** higher crime rates. We cannot conclude from the observed correlation between high crime rates and high penalties that higher penalties do not deter. On the contrary, penalties will be higher in a large city precisely because they do deter and have been supported in an attempt to reduce the otherwise unacceptable level of crime. This would seem to constitute a serious criticism of some criminologists in the United States who have argued the death penalty does not deter murder since Iowa, for example, had fewer murders than Illinois when Illinois had the death penalty and Iowa did not (Sellin, 1980; Ehrlich, 1977).

More subtly, many researchers have attempted to test alternative theories of criminal behaviour, and in particular whether penalties deter crime, using simple regression techniques. The above analysis makes it clear that 'simultaneous equations' techniques need to be used. The level of penalties is not determined independently of the level of crime, and therefore cannot be used as a simple right-hand-side variable 'explaining' the level of crime. The coefficient on the expected penalty variable in a simple regression could just as well reflect reverse causation from the level of crime to the level

Figure 2.8
Improvements in policing
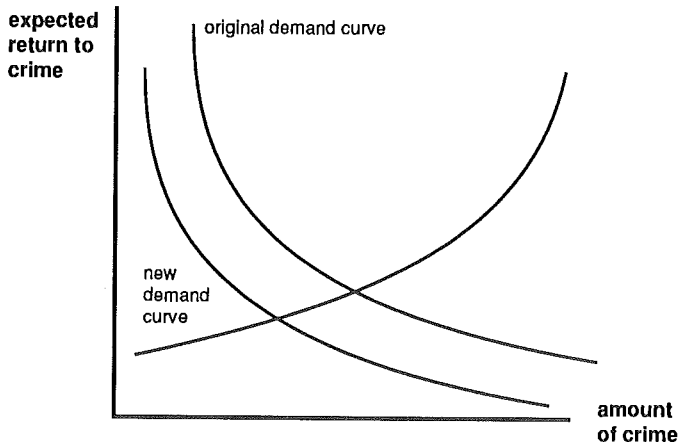
of penalties as it could a deterrent effect of expected punishment. The levels of public and private deterrence measures and the level of crime will be simultaneously determined as functions of the true underlying exogenous variables such as the degree of urbanisation, the availability of alternative 'legitimate' careers, the religious attitudes of the populace, and so on.

Example 2. Suppose a new fingerprinting system is developed that makes it easier to capture criminals. The change in technology will have two effects. For a given level of crime, the expected return will be lower since the probability of capture and conviction will be higher. This is represented by a shift in the demand curve to the left (see Figure 2.8). Observed crime falls and the expected return to crime also falls. The second effect is that there will be a substitution away from private protection and towards public protection as the latter becomes relatively more efficient.

Chapter 3

Statistical Tests of the
Economic Theory of Crime

A major implication of the economic theory of crime is that the crime rate should rise as the expected penalty decreases. This would appear to agree with popular opinion that crime in Australia has increased at the same time as the probability of getting caught and convicted has declined, as has the average severity of sentences.

The Size of Penalties

The severity of sentences appears to have declined in recent decades for a number of reasons. Perhaps the most important has been the increase in probation and parole. Lewis (1987:196) notes that 'on July 1, 1984, for example, the Australian probation rate was 155.6 per 100,000 population and the parole rate was 35.7'. This compares with an imprisonment rate in October 1983 of 61.7 per 100 000 population of which 8.8 per cent were remandees. Lewis notes that 'amongst all offenders under sanction in 1984, 20.9% were in prison, 3.5% were on remand from prison, 14.1% were on parole and most, 61.5%, were on probation'. Furthermore, the popular impression is that original sentences imposed by judges have also tended to decline in severity.

Walker (1989) provides estimates of the average time served by sentenced prisoners in Australia in 1987/88 categorised by most serious offence, age and sex of the prisoner, by whether the prisoner had been in prison on a prior occasion and by whether the individual was an aborigine. He points out that the annual prison census on the length of sentences served by current prison inmates is not a good indicator of the average length of sentences served by all prisoners. Many of the prisoners serving sentences of less than one year in duration will be absent from the annual census. Long-term prisoners will therefore be over-represented in a census relative to the total flow of prisoners into and out of the prison system over the course of the year. By combining data on the sentenced prisoners received into Australian prisons with the census data, however, Walker is able to derive estimates of average sentences served by all prisoners. Some data from his paper on average sentences served in various Australian States (in months) is reproduced as Table 1. Unfortunately, we have these estimates for only a single year. To be very useful for testing the deterrent effect of longer sentences on the supply of crime, we would need several years of such data.

Table 1
Estimated average time served by sentenced prisoners during 1987/88, by jurisdiction and most serious offence (months)

Offence	NSW	Vic	Qld	WA	SA
Murder	143.9	119.1	156.2	152.9	156.2
Other homicide	10.3	15.8	35.2	19.6	24.5
Other violence	7.9	9.0	12.1	6.0	6.3
Robbery/extortion	23.4	17.8	30.4	20.8	27.5
Property offences	6.3	6.8	6.4	4.6	7.8
Justice/security	4.7	7.7	2.2	3.2	3.2
Other good order	4.8	4.0	0.5	0.7	0.5
Possession drugs	4.3	5.6	4.4	1.7	0.5
Trafficking drugs	6.6	10.9	9.3	12.1	12.5
Motoring offences	2.6	2.4	2.0	1.6	0.5

Source: Walker, 1989.

Walker notes that

> convicted murderers appear to serve on average between ten and twelve years in prison prior to parole or licence supervision. Other violent offenders, such as those convicted of rape or robbery serve an average of about two years in prison, while the average for other assaults is around three to six months. (Walker, 1989:5)

The figures Walker gives for rape or other assaults do not appear to correspond to the figures for 'other violence' reported in Table 1, but he may have available a more detailed categorisation of the data than is reported in the table. Nevertheless, we suspect that many people in Australia would be surprised to learn that prisoners convicted of 'other violence' offences including, presumably, rape and serious assault, served an average prison sentence of less than nine months in 1987/88. We should note, however, that the average might not be a good 'representative' figure in this case. There could be many individuals in prison for a short periods for less serious violence, and fewer individuals serving longer terms for more life-threatening violent acts. The categorisation might be too coarse to give us a good picture of the true situation.

The probability of conviction. The severity of prison sentences is one component of the expected cost of engaging in criminal behaviour. The other component is the probability of being charged by the police and convicted by the courts. Mukherjee and Dagger (1990) provide some data that give an indication of how the probability of being caught by the police has varied in recent years. They report clearance rates for major categories of offences. They note that a crime is cleared in a number of ways:

- someone is charged with committing the offence, or warned instead of being charged;
- it is discovered upon investigation that no offence was committed;
- the offender is below the age of criminal responsibility and is not charged;
- the offender has been committed to a psychiatric hospital before a charge could be laid, or he is already serving a sentence.

They note, however, that most cases are cleared by an offender being charged. Figures 3.1 and 3.2 graph the clearance rates for major categories of crime in Australia as reported in Mukherjee and Dagger. The dashed lines are the trends in these clearance rates over time. In all cases, the trends show a decline in the probability of being caught by the police. For robbery, stealing and burglary the trend rate of decline in clearance rates has been quite large.

It is important to note that clearance rates do not represent the probability of being punished. We can gain some idea of the probability of serving a prison term by combining the data from Mukherjee and Dagger with data from Walker (1989) referred to above. Since lesser offences may not be punished by prison terms, we shall restrict the presentation to the categories 'homicide', 'serious assault' and 'robbery' in Mukherjee and Dagger, and 'murder' plus 'other homicide', 'other violence' and 'robbery/ extortion' in Walker. Note that the data in Walker cover imprisonments in 1987/88. They therefore reflect crimes committed and cleared in earlier years in addition to 1987/88, while some offenders convicted for crimes reported in 1987/88 will only be imprisoned in later years. Nevertheless, these statistics can give some idea of the relative magnitudes of crimes reported to the police, crimes cleared and punishments inflicted on convicted offenders.

Figure 3.3 shows the number of homicides reported to police in the five largest States of Australia in 1987/88 along with the number of homicides cleared in that year and the number of offenders entering prisons for committing homicide in that same year. For homicides, clearance rates might represent a small over-estimate of the probability of being punished. We would expect a smaller number of imprisonments because not all 'clearances' lead to a successful conviction. The large difference between clearances and imprisonments in Victoria no doubt reflects the fact that the number of reported homicides in Victoria in 1987/88, at 109, was unusually large relative to 79 in 1984/85, 71 in 1985/86, and 77 in 1986/87.

For other violent offences, clearance rates appear to be a much greater underestimate of the probability of being punished (Figure 3.4). The number of imprisonments in New South Wales, South Australia and Queensland is about 20 per cent of the number of instances of violent

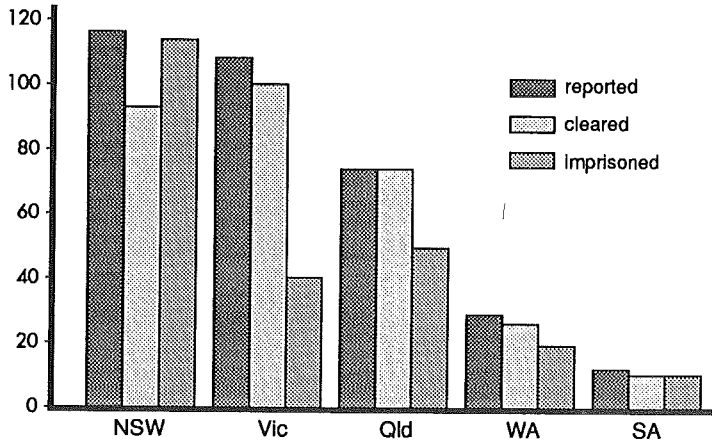**Figure 3.1**

Clearance rates for major crime categories
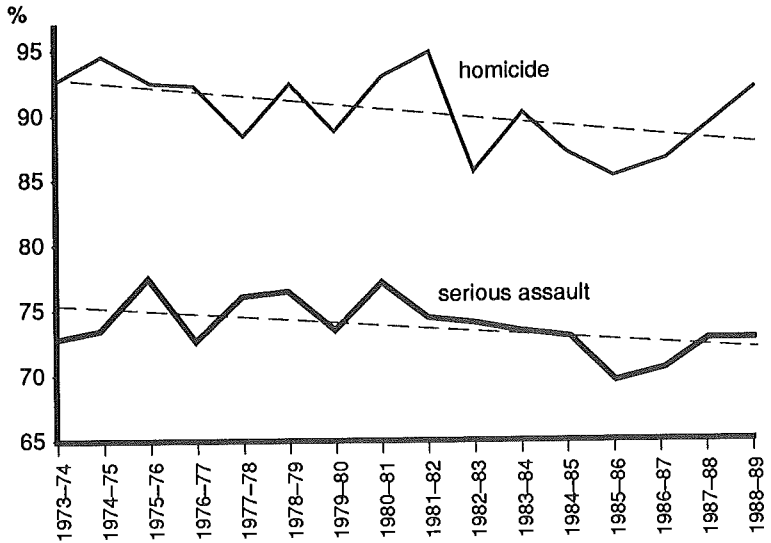
Figure 3.2

Clearance rates for major crime categories
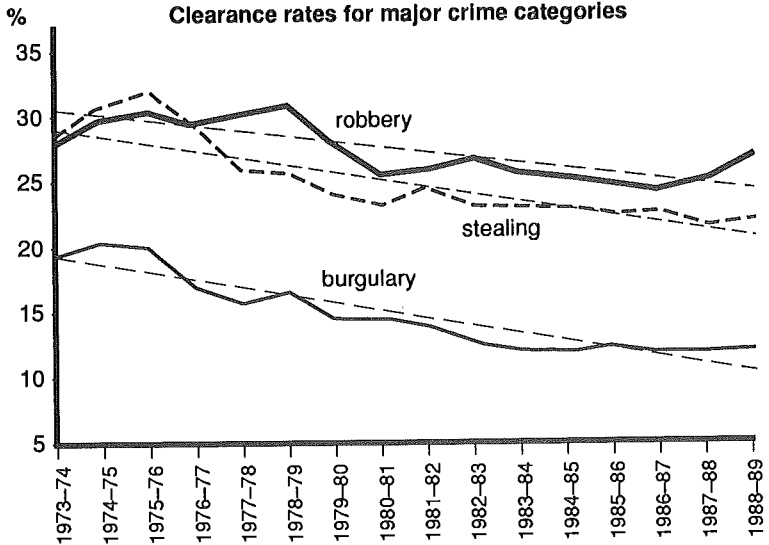
Source: Mukherjee & Dagger, 1990

Figure 3.3

Homicide numbers 1987/88

offences reported to the police. In Western Australia, imprisonments were 32 per cent of other violent offences reported to the police, while in Victoria they were only 7 per cent. When these low probabilities of conviction are combined with the low average penalties apparently pertaining to other violent offences, the expected penalty of committing such crimes would appear to be very low.

Imprisonments for robbery as a percent of robberies reported to the police in 1987/88 were about 6 per cent in New South Wales, Victoria and South Australia, and about 15 per cent in Queensland and Western Australia (Figure 3.5). Again, these small probabilities of serving a prison sentence for the crime imply that the expected penalties are very low.

More Sophisticated Statistical Analyses

While there seems to be a correlation between increasing crime and decreasing expected penalties in Australia, we must be very careful about drawing conclusions based on such simple correlations. One of the key advances in the modern as opposed to the classical economic theory of crime is that the more precise algebraic formulation in the modern theory has facilitated the use of sophisticated statistical techniques to test the theory. Economists have used time-series data of crime statistics from a given jurisdiction covering a number of years, cross-sectional data from a number of jurisdictions in the same year, and pooled time series and cross sections covering both different jurisdictions and different years to test out the economic theory of crime.

The most interesting aspect of these studies is the slope, or elasticity, of the supply curve. The magnitude of this slope determines the extent of

Figure 3.4

cases

Other violence 1987–88
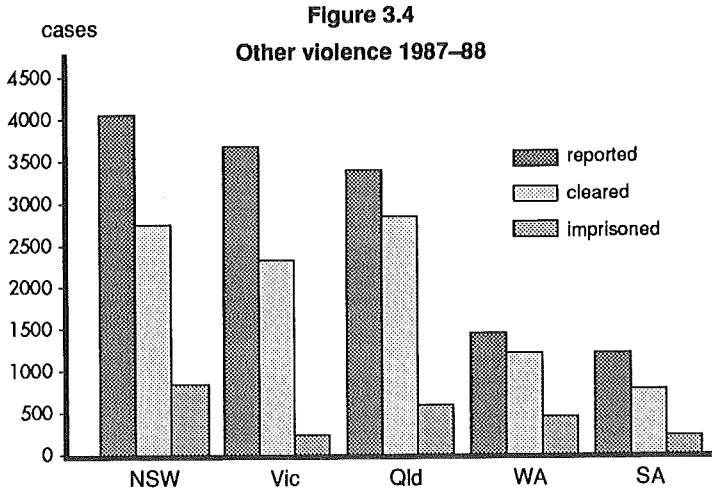
the deterrent effect of punishment. That is, it tells us how much crime would fall if the expected return to criminal behaviour could be reduced by increasing the probabilities of capture and conviction or increasing the severity of the sentence passed on convicted criminals.

The slope of the supply curve also tells us the extent of the 'replacement effect' accompanying incarceration. Recall that the replacement effect refers to the tendency for new criminals to enter the market for crime, or for existing criminals to commit more crimes, as convicted criminals are sent to prison. Thus, the elasticity of the supply curve is a key determinant of the

Figure 3.5

cases

Robbery 1987–88
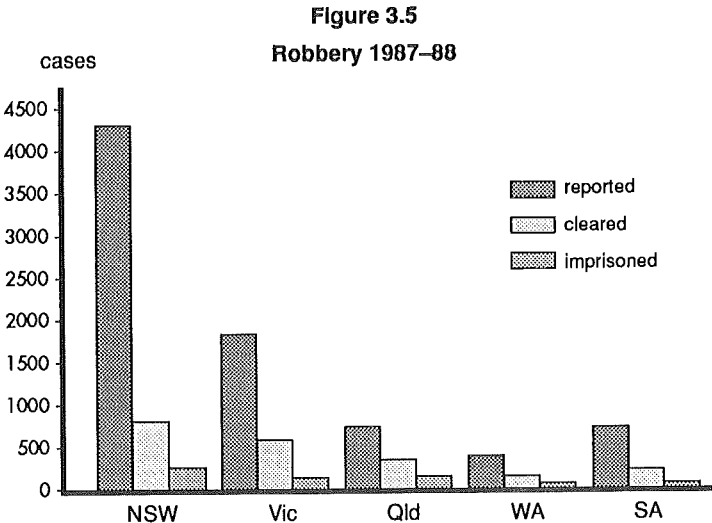
relative efficacy of using prisons rather than fines as a method of deterring further criminal acts.

Economists are also interested in factors thought likely to **shift** the supply curve. If the alternative shift variables are much more important determinants of criminal behaviour than expected penalties, it may be more important to devote resources to modify the causes of shifts in the supply curve of crime than to increase expected penalties.

The economic theory of crime assumes that criminals rationally choose between crime and alternative occupations. Some crimes are committed by people who are either temporarily or permanently insane, acting in a fit of passion or under the influence of drugs. Some criminals, such as mass murderers, appear not to be deterred by any punishments, including death, although they might be deterred by torture were it considered morally acceptable. Crimes of passion, such as murdering a spouse, may also be less responsive to changes in penalties. Social factors such as poverty, unemployment, the level of education, the extent of violence on television and in movies, and the ethnic composition of the population have also been cited as causes of crime. The statistical analysis allows biological, psycho-logical or social factors to influence the level of crime by shifting the supply curve. Multiple regression analysis allows a simultaneous test of the relative importance of each of these factors in explaining crime.

Many alternative statistical analyses of crime data by non-economists tend to focus on simple pairwise correlations between crime and other potential causative variables. Such simple analyses will in general lead to extremely misleading conclusions if in fact several variables explain the pattern of crime across jurisdictions and over time, and these variables are correlated.

The other key component in most analyses of crime data by econo-mists is that the level of crime and the expected returns to criminal behaviour are assumed to be determined by the **intersection** of the supply and demand curves. This implies that special procedures need to be used to obtain an unbiased estimate of the effects of changes in the expected cost variables on the crime rate.

It seems plausible to suggest that since higher crime rates also tend to bring forth more police activity and higher penalties (the demand curve shifts more as the crime rate increases), there will be a tendency for more crime to be associated with higher penalties. We need to 'identify' the supply and demand curves by looking for variables that shift one of these curves while leaving the other curve fixed. Thus, if changes in alternative employment prospects for criminals, for example, shift the supply curve but leave the demand curve fixed, the observed crime levels and expected returns to crime would lie on the demand curve. Alternatively, changes in private-security technology such as locks or alarms would shift the demand curve but leave the supply curve fixed; the observed crime levels and

expected returns to crime would then lie on the supply curve. Finally, changes in forensic technology will shift the 'public response' curve but leave the other curves fixed.

The overwhelming majority of empirical studies by economists show a consistent negative effect of expected penalties on crime rates — or a positively sloped supply curve. Lewis (1986) contains a good summary of many studies of the deterrent effect of longer sentences. Glenn Withers (1984) used combined cross-sectional and time-series data from Australia to estimate a supply curve of criminal behaviour. He reports that he started with the *a priori* belief that deterrence variables such as the probability of capture and conviction or the severity of sentences were likely to be less important in explaining crime rates than poverty, unemployment, education, the content of television programs and various demographic variables. To his surprise, he found that 'the major reliable determinants of crime rates were found to be committal and imprisonment rates' (Withers, 1984:182).

Criticisms of the Statistical Studies

Elliott Currie (1985) argues that the economic theory of crime has not been supported by empirical evidence. In particular, Currie notes that in the 1970s the US had the highest incarceration rate in the developed world while also having a high crime rate. He writes

> It is hard to maintain that our high rates of crime are caused by insufficient punishment when our penal system is one of the most punitive in the developed world . . . At the beginning of the eighties, the incarceration rate in the United States was about 217 per 100,000. At the opposite extreme, the Dutch rate was about 21 per 100,000. In between lay most of the rest of the world's industrial societies, many clustered toward the lower end of the scale: Japan's rate was 44 per 100,000, Norway's 45, Sweden's 55, West Germany's 60, Denmark's 63. (Currie, 1985:28)

Currie asserts that if the economic theory of crime were correct, then increasing the number of people in prison should decrease the incidence of crime in the community. His data suggest otherwise. One problem with Currie's objection is that he cites the number of people in prison as evidence of the expected cost of committing a crime. In fact, these numbers may be totally unrelated. As we noted above, the expected cost of committing a crime is determined by multiplying the probability of capture and conviction by the actual sentence a criminal can expect to serve for a given crime. As Currie himself points out, the probability of capture and conviction for serious crimes is lower in the US than in other developed countries with low crime rates. He does not discuss the relative severity of sentences in the US (including early release and parole decisions) compared with other countries. He also does not discuss

probable differences in other costs of criminal behaviour in different countries. For example, there are high 'social sanctions' against crime in more homogeneous societies such as Japan or Sweden. If we take all these factors into account, the expected cost of committing a crime in the US seems likely to be much lower than in other developed countries. The number of prisoners per head of population does not provide evidence for or against the economic theory of crime.

Furthermore, in order for the economic theory of crime to be useful, the expected cost of committing crimes need not be the only or even the major factor that determines the number of crimes committed. The economic theory of crime implies only that criminals are responsive to penalties at the margin. The average sentence imposed, the number of crimes committed or the number of people incarcerated do not provide information about the elasticity of supply of criminal behaviour.

Although the statistical evidence pointing to a deterrent effect of expected punishment is quite impressive, it is by no means conclusive. Indeed, it is doubtful that such statistical evidence could ever be conclusive. Because we cannot carry out closely controlled experiments, errors can lead us to draw spurious conclusions. We gain greater confidence in the results when they are repeatedly found in different jurisdictions and different time periods.

The issue is complicated, however, by the fact that crimes and punishments are defined differently in different jurisdictions. The extent of under-reporting also varies across the data sets. This is one reason why quite a lot of attention has been focused on murder. Murder tends to be defined uniformly across jurisdictions, and it has by far the least amount of under-reporting. Many would expect murderers to be less deterred by expected punishment than those committing other crimes, since murder is often a crime of passion. Economic studies have nevertheless found quite a strong deterrent effect.

Although the statistics on murder are admitted to be more accurate, another statistical criticism has been levelled at the conclusion that murderers are deterred by expected punishment. In order to derive their estimate of the deterrent effect, economists need to identify variables that shift the 'murder market' demand curve but not the supply curve. Many critics of the statistical analysis of the deterrent effect of expected punishment on murder have claimed that the 'shift variables' used by economists have not enabled the supply curve to be estimated.

In summary, the statistical results are not strong enough to change the mind of someone who strongly believes that expected punishment does not deter. However, as the statistical evidence consistent with 'common sense' and most people's beliefs about the efficacy of deterrence in more mundane matters continues to mount, it is becoming more difficult to explain all of the evidence as spurious or the result of errors.

Chapter 4

Inefficiency in Government Law Enforcement

A problem with many economic and statistical analyses of the market for crime is that they assume governments act to maximise 'efficiency' when they choose penalties or manage the police, prisons or the court system. We need some theory of the way public deterrence shifts the demand curve in order to obtain statistical estimates of the key parameters underlying the theory. Many economists working on the economics of crime have implicitly assumed a 'nirvana' view of democratically elected governments — they perform all and only those actions that bring about a net increase in 'general community welfare' as measured more explicitly by the economists' notion of efficiency, or more accurately Pareto optimality.

The Efficiency View of Government

An allocation of resources is said to be Pareto optimal if the same resources cannot be reallocated to make someone better off without making anyone else worse off. An allocation that is not Pareto optimal in a sense involves 'waste' since we are forgoing an opportunity to increase the well-being of someone without making anyone else worse off. The 'nirvana' view of government identifies various types of 'market failures' where it can be argued quite persuasively that free markets are unlikely to achieve a Pareto-optimal allocation of resources. These economists then suggest that government intervention is motivated by the altruistic, and perhaps paternalistic, desire to 'correct' market failures and ensure that resource allocations are Pareto optimal, or at least only inefficient to the degree that some optimal compromise of that goal is warranted in order to achieve a better income distribution.

The Public-Choice Theory of Government

We believe, on the contrary, that the public-choice theory seems much more consistent with the broad range of evidence on government behaviour. This theory argues that politicians and bureaucrats are primarily motivated by the pursuit of enlightened self-interest. Politicians presumably gain benefits from the ability to implement some of their philosophy of 'good government', from the feeling that they have an opportunity to influence the lives of others, and probably also more mundane 'perks' of being in power.

The necessity to obtain a majority of votes at an election **constrains** politicians to reflect the desires of the voters to some extent. More specifically, an inefficient allocation of resources provides an opportunity

for an opposition to beat a government. By definition, if an allocation of resources is not Pareto optimal, an opposition could propose a reallocation that makes at least one voter better off and leaves other voters indifferent. However, economists working on foreign-trade policy, the regulation of industries, government owned and managed enterprises, tax policy, welfare spending, policies toward health care and education and many other government endeavours have mounted a formidable body of evidence that democratically elected governments do not appear to be motivated to achieve greater economic efficiency.

Public-choice theorists have provided several explanations of 'political failure'. The information costs of explaining policies to voters are large. The individual voter realises that his vote is most unlikely to be decisive in an election and therefore has little incentive to be informed. The number of candidates in an election falls far short of the number of issues at stake, so not every possible combination of policy choices can be made available at each election. Voters also vote infrequently, so although the politicians have an incentive to listen to the voters at election time they also can pay much less attention to voter preferences between elections. Finally, a well-known result in voting theory, called the Arrow impossibility theorem, shows that majority voting can easily result in an inconclusive outcome even if each voter is rational, perfectly informed of the issues, and has a well-defined ordering of preferences. This happens when each possible option supported by a majority can be beaten by another option supported by another majority, leading to the phenomenon of 'circular majorities'.

Bureaucrats also have personal goals they wish to pursue. Politicians do monitor bureaucrats on behalf of the voters. However, politicians do not have the same personal interest in the efficiency with which the government is run as do shareholders in the management of a corporation. Inefficient government imposes some costs on politicians in that greater tax revenue is required to achieve the same output of government-supplied goods and services. But since voters have a greater interest in their role as the recipient of government benefits than their role as a taxpayer, politicians will tend to worry less about the cost than about the quality of the service provided by government bureaus. Since many government bureaus are statutory monopolies, they do not face competition from other actual or potential suppliers to spur them on to control costs or serve their customers more effectively. Politicians and voters also are often placed at a severe disadvantage when it comes to dealing with a bureaucracy in that they do not have access to much detailed information about bureau operations, costs and so forth.

Public-Choice Theory and Policies toward Crime

Applying this general body of economic research to the economic analysis of crime, we believe that it is most unlikely that governments choose

penalties or probabilities of capture or conviction to maximise efficiency as much of the economics of crime literature implicitly assumes. We also believe that it is most likely that government operations such as the public police force are relatively inefficient in comparison with private-sector organisations such as private-security companies. We shall briefly discuss in Chapter 6 some of the potential benefits and problems of harnessing competitive market processes to help control crime.

The Punishment Dilemma

A particular problem with choosing criminal penalties by majority vote has been discussed by Buchanan (1975). He notes that most individuals find punishment distasteful. For example, most of us would prefer not to carry out threats to punish aberrant behaviour in our children. We have an incentive to promise harsh punishment in the hope that undesirable behaviour can thereby be deterred. Once the deterrent has proved ineffective, however, we would prefer not to carry out the promised punishment. The cost of not doing so is, of course, an erosion of the deterrent effect of future threatened punishments. This cost, however, may be borne only in the relatively distant future, and, if we are lucky, it may not eventuate at all. The cost of punishment, on the other hand, is certain and occurs immediately.

In the case of punishments for criminal acts, we have the additional problem that some individuals might have been wrongly convicted of an offence and this strengthens the case for leniency. Perhaps even more to the point, we know that even if we intend to be law abiding there is a small chance we could be wrongly accused of committing a future offence, and that too encourages us to treat current offenders more lightly.

Buchanan (1975:142–6) notes some additional problems accompanying attempts to choose the structure of penalties within an on-going democratic political process. Each of us individually has a difficult job weighing up the costs and benefits of restricting our freedom to tamper with penalties ex-post. These difficulties are compounded by the attempt to arrive at a set of penalties preferred by a majority of voters. As Buchanan observes

> The rules for punishment that might emerge from a deliberative process may not reflect careful weighing of alternatives. The outcome may seem almost arbitrary, which, in turn, offers the temptation for tampering with the rules in a post-constitutional response setting. (p.145)

He concludes,

> The punishment institutions . . . will tend to reflect individuals' current motivations of retribution, justice, and compassion, rather than their rationally chosen long-term interests as embodied in quasi-permanent rules. (p.146)

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We would add, however, that quasi-permanent rules might also be quite unsatisfactory. In particular, changes in factors affecting the supply and demand curves for crime, and changes in forensic technology, for example, that affect the probability of capture and conviction are likely to change the 'rationally chosen' levels of punishments. The levels of punishments observed at any given time are extremely unlikely to correspond to rationally chosen efficient levels.

We have looked briefly at the economic approach to understanding crime. In Chapter 5 we shall examine how the economic theory compares with explanations of crime that have been advanced by modern criminologists. The final chapter discusses some policy issues, using many of the insights of the economic approach.

Chapter 5

Alternative Theories of Crime

As we mentioned in Chapter 1, one goal of criminology is to determine the causes of crime. There are two major groups of theories about the causes of crime: those theories based on the idea that many criminals are rational decision makers, and those based on the belief that criminals are not rational and are driven to commit crimes by influences outside of their control. The second group of theories is our principal interest in this chapter. Criminologists have suggested many causes of crime that are outside the control of the criminal. Crime has been associated with certain medical and psychological conditions, and genetic, intellectual, and physical defects. Other theories suggest that crime is caused by social conditions and upbringing. Crime has been associated with poor parental bonding, low socio-economic status, poor school performance, lack of parental discipline, association with gangs, and alienation from the values of society.

We shall consider some of the best-known of these theories and compare them with the economic theory of crime. We hope to show that, although crime may be associated with many of the conditions mentioned in criminological studies, it does not follow that criminals cannot be deterred by increases in expected penalties. Economists can explain some of the correlations between crime and social conditions or biological conditions without concluding that criminals are irrational, and hence not responsible for their behaviour or able to modify it in response to changes in incentives.

Criminal Behaviour is a Medical Condition or Disease

Theories of the biological basis of crime can be divided into three groups, claiming that crime is caused by genetic defects, by one's physiology, or by psychological factors.

Criminals are defective from birth. One group of theories suggests that being a criminal is a genetic trait. In the 18th and 19th centuries in England, there was said to be a 'criminal class' (Elmsley, 1987:58–72). Members of the criminal class had 'bad blood' and passed on their criminal tendencies to their children. A second group of theories associated congenital tendencies to certain skull shapes and body types with the commission of crimes. In the 'Forty-Ninth Annual Report of the Board of Inspectors of the Eastern State Penitentiary of Pennsylvania, 1879', it was noted:

> Again, there is an inherited trait or taint in many, which may possibly lead to the commission of crimes, a motor, as it were, that unconsciously impels those who suffer from this hereditary taint,

to become criminals, and consort with the wicked class. Children born of parents who are of the criminal class, or who are associates in vices, or in connection with the depraved class, a large and growing population, especially in cities, are predisposed to, if they do not inherit, the moral defects of character that tend to crime. (Fink, 1962:153)

In the 20th century, investigations have been undertaken to determine whether there is a genetic component to criminal behaviour. Scientists have studied twins to see whether the occurrence of criminal behaviour in one twin is correlated with the occurrence of criminal behaviour in the other. Both fraternal (dizygotic) and identical (monozygotic) twins have been examined. There is a high degree of correlation between the criminal tendencies of identical twins. The correlation is much weaker between fraternal twins (Wilson & Herrnstein, 1985:90–4). One difficulty with twin studies is that twins are usually raised in the same environment. A recent critic noted,

First, MZ (monozygotic) twins are selected more frequently due to their visibility, and study group sizes thus become disproportionate. Second, sampling techniques may favour the selection of MZ pairs in relevant behavioural traits, which biases the results. Third, MZ twins tend to share more similar environments than do DZ twins because of their similar appearance (DZ twins look no more alike than regular siblings). Because environmental assessments are not commonly conducted, such similarities cannot be estimated to determine their relative influence. (Fishbein, 1990:44)

Thus, the correlation in criminal behaviour might not be statistically significant once we have accounted for the biases. Even if it is statistically significant, it could be related to the twins' upbringing rather than to genetics.

In order to control for the influence of the environment, investigators in Scandinavia studied adopted children who were separated from their biological parents shortly after birth. The crime rate of adopted boys whose biological parents were criminals was compared with that of those whose biological parents were law-abiding. Twenty per cent of boys whose biological parents were criminals, but whose adoptive parents were not, were convicted of at least one crime. When both the biological and adoptive parents were criminals, the figure rose to 24 per cent. In the case of a child whose biological parents were not criminals, but whose adoptive parents were, the crime rate was 14 per cent; whereas in cases where neither set of parents included criminals, the figure was 13 per cent (Wilson & Herrnstein, 1985:95–100).

Adoption studies also have serious defects due to small sample sizes.

One criminologist recently criticised adoption studies on the following grounds:

> First, due to difficulties in locating subjects, sample sizes tend to be small, which reduces the power of the results. Second, selection bias may be introduced in the adoption process because assignment of adoptive parents may not be random with respect to biological parent characteristics. Third, a primary criticism of a majority of adoption studies on criminality is the inadequacy and inconsistency of the methods used to operationalize and measure the dependent variable. Fourth, researchers should ensure that the duration and type of biological parenting is similar among all subjects to avoid contamination. Ideally, infants should have been adopted within a few weeks of birth so that the age of adoption does not relate to subsequent criminal behaviour. (Fishbein, 1990:45)

Neither the twin studies nor the adoption studies have conclusively shown that criminal behaviour is inherited.

Chromosomal abnormalities. Several further studies have suggested that some criminals are more likely than non-criminals to have a particular chromosomal abnormality. These investigations have attempted to show that males having an extra Y chromosome in their genetic make-up are at increased risk of being criminals. The defect occurs at the time of conception and is not an inherited trait.

An investigation in Scotland showed that these so-called XYY males occur in about one in 1000 males, but are 1–2 per cent of the prison population. Thus, a man who has an extra Y chromosome seems to be at increased risk of becoming a criminal. A Danish study confirmed the association between criminal behaviour and males having an extra Y chromosome (Wilson & Herrnstein, 1985:101–03). It is important to note that having an extra Y chromosome is a trait of only a small percentage of criminals, and therefore cannot be considered a major cause of crime. Furthermore, many men who have an extra Y chromosome do not become criminals, so the presence of an extra Y chromosome is not sufficient to lead to criminal behaviour. We might find, for example, that a man with an extra Y chromosome has some other traits, such as personality or intellectual deficiencies, that reduce his legitimate employment opportunities. He would then find a criminal career relatively more attractive, but, depending on his other circumstances, he may nevertheless choose not to become a criminal. This economic interpretation has testable implications. Any purported genetic influences on criminal behaviour would have to alter the returns to crime relative to alternative careers.

Physiology and criminal behaviour. In the mid-1800s, doctors began to look for the causes of crime in the health or physiological characteristics of criminals. One theory attempted to explain criminal behaviour by showing

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that certain skull types were associated with crime. The reasoning behind this theory was that the brain is the seat of intelligence and conscience. The skull is shaped to fit the brain. Therefore, the shape of the skull was presumed to tell a trained physician something about the contents of the brain. The science of phrenology was used extensively to determine whether there was a typical 'criminal' head.

> Professional phrenologists from time to time reported on the examination of prisoners' skulls. Among the first of these reports was that upon the examination of the skull of Le Blanc, who had committed a murder in Morristown, New Jersey. The phrenologist making the examination after execution declared, without knowing the criminal, that he was a thief who would murder for money. Le Blanc's skull was described as having a large posterior lobe, while the middle lobe in which were situated the organs of destructiveness, secretiveness, and acquisitiveness was very large. (Fink, 1962:13)

In 1876, Cesare Lombroso published *L'Uomo delinquente* ('The Criminal Man'). Lombroso was a physician who studied the physical characteristics of Italian prisoners. He claimed to have found similarities in criminals' faces and body types depending on the kinds of crime committed. He also claimed that criminals differ markedly from the non-criminal population.

There have been many other investigations into the typical mien and body type of criminals. In an attempt to determine which children were likely to become criminals, studies were made in the late 1890s of children in homes for juvenile delinquents. These children were shown to be underweight, of lower than average intelligence, to have weaker muscles, and to be more likely to have physical deformities and to suffer from diseases such as tuberculosis. One physician did a study of adolescent male delinquents and claimed to find the following characterization:

> The prison physician at Elmira Reformatory, Hamilton D. Wey, early made this distinction [between the prisoner and the nonprisoner] with respect to skin pallor and heart inhibition. At the same time he described the offenders at Elmira as having, at the period of adolescence, large prominent nipples surrounded by aureolae that were pigmented beyond what was usually seen in the male, and also as having mammary glands as large as a hickory nut, generally lateral, occasionally bilateral. Also 'The genitals of this class were developed to a degree not altogether warranted by their years, but in accordance with the physiological law that use is a factor in structural amplification.' (Fink, 1962:135)

Although the research of Lombroso and his contemporaries has been discredited due to poor statistical methods, their search for a physiological cause of crime continues.

Some modern studies attempt to show that criminal behaviour is related to body type, suggesting that the average criminal is likely to be more muscular and fatter than the average non-criminal. Thin, physically weak people are not widely represented among criminals.

> In 1952 Epps and Parnell compared the physiques of 177 female delinquents to those of 123 Oxford undergraduates and found the delinquents to be shorter and heavier in build, more muscular and fat; in other words more mesomorphic and endomorphic. In a larger study of male delinquency, Sheldon and Eleanor Glueck compared five hundred teen-age delinquents with five hundred nondelinquents matched for age, IQ, race, ethnic background, and socioeconomic status (SES). Delinquents were found to be significantly more mesomorphic [muscular] and less ectomorphic [thin] than nondelinquents. (Wilson & Herrnstein, 1985:87–8)

An economist's response to studies showing that criminals have certain body types is to hypothesise that such physiques make criminals relatively better suited for the job of committing crimes. Having a certain body type does not cause a person to become a criminal. It lowers the cost of committing certain crimes (that is, those that require physical strength or agility) to certain people, or it raises the cost of engaging in alternative legitimate careers.

In summary, many theories have attempted to show that criminals are born to a life of crime and do not rationally choose to be criminals. Some of these theories claim that being a criminal is an inherited genetic trait or a genetic defect. Other theories are based on the notion that having a certain body or skull type predisposes a person to becoming a criminal. Some theories claim that a poor physical condition and physical deformities cause people to commit crimes. Economists are sceptical of genetic causes of crime. They argue, instead, that certain inherited traits, such as a muscular build, make a criminal career more attractive than other available careers.

Psychological Causes of Crime

In addition to physiological causes of crime, there have been many attempts to show that criminals are psychologically different from other people. Some studies suggest that criminals have low IQs, while others suggest that they suffer from mental illness or personality disorders.

Low intelligence as a cause of crime. In the late 1800s, the first intelligence tests were developed. Criminals were among the first groups of people to be tested, along with army recruits and other people who could be tested conveniently. Early tests suggested that criminals were mentally impaired. As H. H. Goddard wrote in 1914, '25–50% of the people

in our prisons are mentally defective and incapable of managing their affairs with ordinary prudence' (Wilson & Herrnstein, 1985:152).

As IQ tests became more sophisticated, it became more difficult to interpret results as to the intelligence of criminals. Some studies suggested that criminals were of normal or higher intelligence. The majority suggested that criminals were about ten points below the average on standard IQ tests.

A new IQ test was devised that has a series of subtests to evaluate different sorts of intelligence. This test, called the Wechler-Bellevue, gave interesting results when applied to criminals. Criminals were of normal intelligence in subtests requiring nonverbal reasoning. Their scores on verbal reasoning were below average. Evidence seems to suggest that deficits in verbal reasoning drag down the IQ scores of criminals, and that their average non-verbal reasoning abilities are not significantly below the average for the population as a whole.

When incarcerated criminals are tested, IQ scores differ greatly depending on the type of crime committed. Violent criminals engaged in risky crime such as murder, aggravated assault and rape score lowest on IQ tests. Common thieves score lower than automobile thieves. Forgers, embezzlers, securities violators and those committing bribery have higher IQs.

There are many difficulties with drawing conclusions about the intelligence of criminals from IQ tests given to people in prisons. The most obvious objection is that the smarter criminals are less likely to be caught, convicted and sentenced to prison. Thus, they will be excluded from the sample of criminals who are tested in prisons.

Other problems with IQ tests include the fact that such tests may not reflect innate intelligence, but socio-economic status, upbringing and education. Some studies have tried to control for these factors by comparing delinquents and non-delinquents controlling for socio-economic status and education. Some evidence suggests that delinquents score lower than non-delinquents on these tests (Wilson & Herrnstein, 1985:165–6).

Criminals suffer from personality defects. In the early 20th century, psychological explanations of crime became popular. Prison physicians first attempted to separate psychiatric cases from criminal cases using psychology. Psychoanalysis was later used in an attempt to prevent crime and to treat criminal personalities (Rock, 1988:7).

More recently, psychologists have attempted to explain criminal behaviour by showing that criminals have certain personality types. A longitudinal study of juvenile delinquents was conducted by Conger and Miller using boys enrolled in public school in Denver in the 1950s. School reports suggest that the boys who later became criminals were character-

ised by their teachers through the years as being 'emotionally unstable, impulsive, suspicious, hostile, given to "petty expressions of pique," egocentric, and generally more unhappy, worried, and dissatisfied than their nondelinquent matches' (Wilson & Herrnstein, 1985:179). Deviant behaviour in juvenile delinquents was identifiable as early as the third grade. As the report noted,

> By the end of the third grade, future delinquents were already seen by their teachers as more poorly adapted than their classmates. They appeared to have less regard for the rights and feelings of their peers; less awareness of the need to accept responsibility for their obligations, both as individuals and as members of a group; and poorer attitudes toward authority, including failure to understand the need for rules and regulations in any well-ordered social group and the need for abiding by them. They both resented and rejected authority in the school situation. Their over-all social behaviour was simply less acceptable, not simply with teachers, but with peers, both in individual one-to-one contacts and in group situations, and were less willing or able to treat others courteously and tactfully, and less able to be fair in dealing with them. In return, they were less well-liked and accepted by their peers. They were significantly less likely than their nondelinquent matches to be viewed as dependable, friendly, pleasant, considerate, and fair. (Wilson & Herrnstein, 1985:180)

These studies therefore suggest that people who grow up to be criminals display antisocial behaviour at an early age. But it is difficult to interpret these results. Antisocial behaviour could cause subsequent criminal behaviour because antisocial individuals may be less suited to legitimate employment. They may also be less responsive to social pressure and ostracism, and they may therefore find a criminal career relatively more attractive.

Criminals have been assessed using the Minnesota Multiphasic Personality Inventory (MMPI). The MMPI presents the person being examined with a series of true or false questions. The questions are self-descriptive, such as 'Everything tastes the same' or 'I have never been in trouble with the law'. The test questions have been shown to differentiate well between people who are suffering from certain mental illnesses and normal people. Wilson and Herrnstein give the following description of how these tests are evaluated:

> Ten clinical populations were used to establish ten clinical scales of the MMPI. The clinical scales are identified with the populations used to construct them, and numbered and labeled as follows:

1. Hypochondriasis (Hs) — abnormal preoccupation with physical complaints.
2. Depression (D) — hopelessness and self-deprecation.
3. Hysteria (Hy) — stress avoidance by conversion into physical or mental symptoms.
4. Psychopathic deviate (Pd) — conflict with authority and shallow personal attachment.
5. Masculinity – femininity (Mf) — high scores represent opposite-sex attitudes and behaviours.
6. Paranoia (Pa) — undue defensiveness, suspiciousness, and sensitivity.
7. Psychoasthenia (Pt) — plagued by anxiety, indecision, fearfulness, and guilt.
8. Schizophrenia (Sc) — bizarre thought and affect, and withdrawal from personal contact.
9. Hypomania (Ma) — unproductive hyperactivity.
10. Social introversion — social insecurity and shyness.

What is known about these scales is that people diagnosed as having the named clinical conditions answer certain items of the inventory with a given pattern of trues and falses. (Wilson & Herrnstein, 1985:186–7)

When the MMPI was given to criminals, they were shown to deviate significantly from the normal population. The greatest deviance seems to be in the psychopathic, schizophrenic, hypomania and depression scales.

Psychological assessments of criminals have been criticised on many grounds. First, testing prisoners may not give an accurate picture of criminals' underlying personalities or intelligence. Incarceration has a psychological effect on prisoners that may influence test results. For example, it does not seem surprising that prisoners are more depressed than the average individual. More generally, as Fishbein notes,

Many forms of bias in selecting subjects are evident in some studies. For example, several studies focus on criminal offenders and ignore pervasive illegal behaviours in undetected samples. There is a strong possibility that apprehended or incarcerated subjects differ from those who avoid detection in terms of their characteristics and the impact of criminal justice procedures. (Fishbein, 1990:39)

As we noted in Chapter 2, economic theory suggests that criminals are less risk averse than non-criminals. Some psychological studies reveal a greater incidence of psychopathy among criminals. This finding is consistent with economic theory, since psychopathy causes a person to seek risks and

thrills. Thus, psychopaths may be better suited for the crime business that normal people. As Fishbein writes,

> Psychopaths are relatively unemotional, impulsive, immature, thrill-seeking, and 'unconditionable.' They have also been characterized as having low levels of perceptible anxiety and physiological responses during stressful events. (Fishbein, 1990:37)

Social Conditions Cause People to Commit Crimes

A large portion of the criminological literature has been devoted to showing how social conditions cause crime. We shall examine a few of the most widely-held theories in the sociology of crime.

Historical accounts. Many theories claim that honest people are driven to crime by economic conditions in the society in which they live. The class structure in England, it has been suggested, made it impossible for individuals raised in the slums of large cities to find honest work. The novelist Henry Fielding was active in the field of criminology, along with his step brother Sir John Fielding. Both Fieldings served as Bow Street magistrates. Henry Fielding believed that crime was associated with the lower classes to such an extent that they could be considered a criminal class.

Some historians claim that divisions between the classes in England in the 1800s were so great that certain 'crimes' were not really considered morally wrong by those committing them. An example is poaching off the manor owner's property. Members of the lower classes felt that poaching was a right, not a crime, according to certain historians.

> At the same time the great majority of men in rural England considered the game laws rank injustice. The conviction of middling men that an arbitrary property qualification was oppression was undoubtedly held also by the mass of labourers and cottagers. 'Every magistrate knows,' wrote Christian, 'that it is the common defense of a poacher, that it is very hard that he should be punished for taking what he had as good a right to as any other man.' But at the same time there were very strong communal sanctions against casual theft. Only the gentry lost by poaching, but loss by theft was a common occurrence at every social level. (Hay et al., 1975:207)

According to Hay's account, the division between the upper and lower classes in England caused lower-class individuals to commit the crime of poaching when they would not commit other types of theft against members of their own social class. The economic approach to crime, in contrast, would focus on the deterrent role of ostracism and other forms of peer pressure. Although the economic theory of crime does not consider 'class interests', the predictions of the economic and historical theories might not differ greatly.

Brutality in the criminal-justice system was also blamed for an increase in crime in the 1700s. Cesare Beccaria, whom we discussed in Chapter 1, believed that the cruel and inconsistent application of punishments made individuals abandon an implicit social contract and become criminals. As he wrote:

> In proportion as torments become more cruel, the spirits of men, which are like fluids that always rise to the level of surrounding objects, become callous, and the ever lively force of the passions brings it to pass that after a hundred years of cruel torments the wheel inspires no greater fear than imprisonment once did. The severity of punishment of itself emboldens men to commit the very wrongs it is supposed to prevent; they are driven to commit additional crimes to avoid the punishment for a single one. The countries and time most notorious for severity of penalties have always been those in which the bloodiest and most inhumane of deeds were committed, for the same spirit of ferocity that guided the hand of the legislators also ruled that of the parricide and assassin. On the throne it dictated iron laws for vicious-spirited slaves to obey, while in private, hiddenly, it instigated the slaughter of tyrants only to make room for new ones. (Beccaria, 1963:44)

Economists such as Becker and Ehrlich point out that there is a problem with reverse causation (or, in more technical terms, simultaneous equations bias) in Beccaria's observations. Punishment may have been more severe in those countries and times 'in which the bloodiest and most inhumane of deeds were committed' because high crime rates led people to demand higher punishments. Strictly speaking, economists argue that both the level of crime and the level of punishments are determined together as functions of other 'exogenous' variables. The level of crime and the level of punishments do not 'cause' each other. Rather, both of these variables are 'caused' by other variables exogenous to the system, such as changes in population density, the availability of suitable legitimate employments, the costs of finding and apprehending criminals and so on.

Supporters of Beccaria's theory noted that there were often riots at Tyburn in England when hangings were taking place. Picking pockets and other types of crime were common during 'hanging matches', as they were called. Witnesses to hangings were said to become animals and the psychological effect was said to increase rather than decrease crime (Hay et al., 1975).

Again we note that the opportunities for picking pockets are likely to be much greater at mass gatherings of people, such as when hangings were taking place. The likelihood of noticing that one's pocket is being picked is much lower when people are pressing against one other. Further, the

criminal can escape into the crowd before he is noticed. We would need evidence that picking pockets was greater at public hangings than at other mass gatherings around the same time to have much confidence in the hypothesis that brutality towards criminals encourages crime.

Some more recent statistical analyses have attempted to determine whether murders are more common immediately after executions in the US. These studies have not had large samples of data and have not used very sophisticated statistical techniques.   Generally, the results have been inconclusive.

Family life and education. There are many theories suggesting that poor family life and education are important causes of crime. Some theories are based on the premise that a bad upbringing will be associated with low intelligence and poor education. Lax morals associated with a bad upbringing are also said to contribute to crime, since amoral individuals are less likely to suffer guilt when they break the law. Family life may also contribute to individuals' developing criminal personalities. Some studies suggest that criminals have distinctive sets of personality traits, as we mentioned earlier.

There are many studies of the effect of family life on criminality. Criminals are likely to come from families with a low socio-economic status (SES) (Wilson & Herrnstein, 1985:98–9). It is not clear whether children raised in single-parent households are more likely to become criminals than those raised in traditional households. Some studies suggest that children from single-parent families are more likely to become criminals, while other studies show no effect of such family circumstances. Evidence concerning child abuse is also mixed. Studies do not clearly demonstrate that having been abused as a child contributes to the likelihood of becoming a criminal (Wilson & Herrnstein, 1985:246–58, 261).

There are several problems with studies of family life as a component in criminality. Many of these studies have examined the effects of different childrearing practices on a child's propensity to become a delinquent. One famous study by Sheldon and Eleanor Glueck was published in 1950. Boys from the Boston area were studied over a ten-year period. Social workers assessed the parents' child-rearing practices. The study concluded that unaffectionate parents who did not discipline their children consistently were more likely to have children who became delinquents. The Gluecks' study relies on the subjective assessments of the social workers involved, and these social workers knew which boys had committed delinquent acts and which had not. Thus, the data were highly subjective.

A more fundamental problem with child-rearing studies is that a child's own personality may affect how his parents treat him. Thus, a fussy child may receive less affection and consistent discipline from his parents than an easy-going child. The child's innate personality may cause his parents to rear him in a certain way, rather than the parents rearing the

child to have certain personality traits (Wilson & Herrnstein, 1985:213–19).

The appeal to family life as a cause of delinquency became unfashionable during the 1950s. Sociologists began to look outside the family and the biological make-up of criminals to find the causes of crime. Thus, studies using more objective techniques to assess the role of family life in criminality have not been undertaken.

The economic approach to crime is consistent with the idea that family life and education could influence the likelihood that an individual becomes a criminal. In particular, a poor education will reduce an individual's other employment opportunities, making crime a more attractive proposition. A different attitude to crime may also alter the costs of criminal behaviour. Economists such as Becker and Ehrlich would, however, resist the suggestion that individuals with a certain family background or education are **predestined** to become criminals. Rather, these variables are to be seen in the context of other factors influencing the costs and benefits of criminal behaviour, with the criminal still exercising a degree of choice as to how he wants to use his time, energy and abilities to best advantage.

Sociological Accounts

Sociologists appeal to a variety of theories to explain criminal behaviour. There are three main types of theories we shall examine: strain theory, a theory of cultural deviance, and control theory.

Strain theory. The strain theory of crime is based on the idea that human beings are basically moral and good. They want to conform rather than deviate from the expectations of others. Strain theorists, such as R.K. Merton, maintain that people deviate when they are struggling to attain legitimate goals. For example, a businessman may seek the legitimate goal of earning enough money to send his child to college. If he encounters problems achieving his goal, the pressure of his desires may lead him to embezzle funds from his company. Strain theorists believe that most crime results from strains that a criminal is under, not from a criminal's deliberate desire to deviate from the norms of society (Hirschi, 1969:4–6).

Strain theories have been criticised for several reasons. First, these theories often do not specify or measure the types of 'strains' that criminals are under. Strain theories claim that pressures arise from a conflict between aspirations and expectations. It is not clear how these variables can be measured. Second, many juvenile delinquents grow up to be law-abiding citizens. It is not clear how strain theory would account for this change in behaviour, or why strains are greater for juveniles than adults with many more responsibilities. Third, strain theorists claim that pressures towards criminality are caused by being in the lower classes. But there are criminals in every class (Hirschi, 1969:6–9).

The evidence for strain theory, such as it is, might also be explained using the economic approach. The variables on which strain theory focuses are among the factors that could influence the marginal benefit of committing a crime.

Theories of cultural deviance. Theories of cultural deviance are based on the notion that people cannot deviate from their own internal standards. Deviation is defined as acting against the moral standards of the middle class, as these standards are embodied in the laws. People become criminals when they fail to embrace the standards of the middle class and develop their own standards of behaviour.

Edwin Sutherland characterised his 'theory of differential association' (a cultural-deviance theory) in the following way: 'A person becomes delinquent because of an excess of definitions favourable to violations of the law over definitions unfavourable to violations of the law' (Sutherland, 1956:9). Sutherland was here expressing his belief that delinquents learn to deviate as they are growing up. They are exposed to various kinds of behaviours that are or are not reinforced by their parents or other care-givers. When the bad (i.e. non-middle class) influences or examples outweigh the good (i.e. middle class), then the child becomes a delinquent.

One obvious difficulty with cultural deviance theories is that they are hard to test. It is not clear how one can measure the number of 'definitions' about the law a child has been exposed to or, more important, how many he has taken on as part of his personal morality. The theory suffers from a vagueness that makes it difficult to evaluate empirically. We would speculate that a testable version of this theory would correspond to a testable version of the theory discussed above on the role of 'family background' and education on the tendency to become a criminal.

Control theory. In the late 1960s, Travis Hirschi proposed an explanation of delinquency that he calls a 'control' theory. He notes that 'control theories assume that delinquent acts result when an individual's bond to society is weak or broken' (Hirschi, 1969:16). Hirschi explains that an individual's bond to society is measured by attachments to people or institutions. For example, a child who is attached to his parents will come to accept his parents' norms. If the parents' norms are society's norms, the child will 'bond' to the society. Hirschi claims that control theory is an improvement over other sociological or psychological explanations of crime. Control theory can be tested, according to Hirschi, since we can measure the attachment of children to their parents, schools or other social institutions. We can see whether children with weak attachments are more likely to be delinquents.

Control theory differs from other psychological or sociological explanations of crime because the criminal is not assumed to be irrational. As Hirschi writes,

> In the sociological control theory, it can be and is generally assumed that the decision to commit a criminal act may well be rationally determined — that the actor's decision was not irrational given the risks and costs he faces. Of course, as Becker points out, if the actor is capable of in some sense calculating the costs of a line of action, he is also capable of calculational errors: ignorance and error return, in the control theory, as possible explanations of deviant behaviour. (Hirschi, 1969:20-1)

One problem with Hirschi's theory is that the methods of measuring attachment are imprecise. In order to determine degrees of attachment, Hirschi relies on interviews. He asks children in his study how many delinquent acts they have committed. He also asks them how much their mothers supervise them and their fathers communicate with them. Self-reported data are problematic for several reasons. First, the child may not remember accurately how many delinquent acts he has committed; he may exaggerate or underestimate them. Second, his assessment of his parental supervision and communication may not be accurate or may be coloured by his feelings about that supervision or communication. There are similar problems with Hirschi's measurement of attachments to school and peers.

In so far as 'calculational errors' are concerned, the economic theory of crime can also account for such mistakes. In thinking about errors in decision making, we need to distinguish between *ex ante* and *ex post* 'mistakes'. Presumably, the criminal who gets caught would say, *ex post*, that he made some mistakes, and his decisions were therefore not 'maximising'. Nevertheless, he could consistently claim that these same decisions were maximising in an *ex ante* sense. Given his limited information, he did what he thought would maximise his expected utility, or what he thought would be 'most likely' to make him the best off. If he were again to make the same choices, knowing the same things he knew then, he would choose to do the same thing. But if he could again make the same choices, knowing what he knows now, he would choose differently.

Violence in the Media

In the 19th century, many people complained that teaching young boys to read was contributing to an increase in crime. The boys were wasting time reading sensational novels filled with descriptions of horrible crimes and passionate liaisons. Increased novel reading was stirring up the boys' passions and causing them to commit more crimes.

> Increasingly, with the developments in printing and publishing, and with the growth of literacy in the second half of the nineteenth century, the availability and amount of this [sensational] literature became greater. Printers and publishers found an appreciative audience for both adventure stories and lurid tales of ''orrible murder'; all the better if they had a basis in fact. In 1868 a man could

defend his sons' behaviour before a court on the grounds that literature romanticising criminals has corrupted them. While in 1884 it was said of Ernest Castles, a nineteen-year old who shot a police constable in Oldham, that his 'mind has been corrupted by the reading of trashy literature'. The following year a London magistrate declared that: 'there is not a boy or a young lad in our Courts of Justice whose position there is not more or less due to the effect of this unwholesome literature upon his mind.' (Elmsley, 1987:7)

This idea has been echoed in recent times by the claim that violent television programs and movies have been a significant factor in promoting crime. Despite a considerable effort to discover such an effect, Withers (1984) was not very successful. In a statistical study of crime in Australia, Withers found that viewing violent television programs did have a positive effect on the per capita crime rate. The coefficient was small in magnitude and estimated very imprecisely, however. Withers concluded that the 'effect' he saw in his statistical analysis could have been the result of a sampling error.

Education

There is considerable evidence that students who do well in school are less likely than poor students to become delinquents. Children often begin their 'criminal' careers by misbehaving in school. Delinquents are much more likely than non-delinquents to drop out of school. They also have lower verbal IQs than non-delinquents (Wilson & Herrnstein, 1985:269–75).

The economic approach to crime, however, suggests that poor school performance and misbehaving in school may not be direct causes of criminal behaviour. Rather, these behaviours may be symptoms of low intelligence, poor socialisation, and other conduct disorders that may reduce a child's occupational alternatives. Performance in school requires many of the same traits required of performance on the job. Respecting authority, getting along with others, and concentrating for long periods of time are important both in school and on the job. More generally, a poor education may encourage a person to become a criminal insofar as it reduces the range of legitimate jobs he can obtain.

Conclusion

We have examined several theories of the causes of crime. Many of these theories have been criticised on the grounds that it is difficult to discover how well they explain the evidence on criminal behaviour. Other theories are questionable because, although the data may be consistent with them, the interpretation of the data is open to an economic explanation as well. We are not suggesting that economists have all the answers to the problem of explaining crime. Rather, we have argued that the economic approach to crime may be useful insofar as it incorporates evidence from other studies in a simple theory that may be more testable and give useful predictions.

Chapter 6

Policies Towards Crime

In the previous chapters, we have discussed the importance of deterrence in creating a good criminal-justice system. We noted that the type, severity and certainty of punishment are factors that influence individuals' decisions on whether to commit crimes. But deterrence is not the only or even the most important element in criminal justice. We need a system that aims to punish only guilty parties, and punishes them only to the extent they deserve. Economic theory cannot tell us how much punishment a criminal deserves for a given crime. Thus, the economic theory cannot address the moral issues involved in its application.

Despite this, and despite the fact that the economic theory cannot explain all instances of crime, it will nevertheless have useful implications for public policy even if it can explain only key influences on **changes** in crime across locations and over time. According to the economic theory of crime, a substantial fraction of criminals are rational agents. In this context, 'rational agents' are people who weigh up the expected costs and benefits of committing a crime. Thus, criminals deliberate before they engage in crime. They try to make themselves better off in the light of their individual preferences and their opportunities.

If a significant fraction of criminals are rational agents, as we believe they are, we can reduce crime by raising the expected costs of engaging in crime or reducing the expected benefits or both. Increasing the probability of capture and conviction or the severity of the penalty are alternative ways of raising the expected costs of crime. If criminals are risk loving, as they seem to be, raising the probability of capture and conviction while reducing the size of the penalty by an amount that keeps the expected penalty constant will increase the deterrent effect of punishment. But it may also be more expensive to increase the probabilities of capture and conviction, particularly when fines rather than prisons are used as the method of punishment.

We can reduce crime in our community by increasing the probabilities of capture and conviction and the severity of the penalties. It is almost certainly not efficient, however, to raise the expected costs to the point where there is no crime being committed. Enormous resources would be required for the police and the courts, and civil liberties are likely to be compromised as more innocent individuals are wrongly convicted. More severe punishment can also be costly unless it takes the form of higher fines. But fines cannot be used as the only method of punishment. We need some alternative methods of punishment for those criminals who cannot afford to, or choose not to, pay fines. Prison is not, however, the only alternative to fines.

In recent years, new penalties have been introduced for minor non-violent crimes, including required periods of community service, enforced restrictions on freedom of movement (through the use of electronic surveillance), and restitution payments to victims. These alternatives to prison have the advantage that the criminal is not removed from society and is not exposed to hardened or more violent prisoners.

Ethical Considerations are Essential to Policy Prescriptions

At this point we should note that there is a fundamental problem with some policy prescriptions based on the economic approach to understanding crime. Some economists base their policy recommendations solely on what is required to balance out the deterrence value of certain procedures with their costs. Other ethical concerns, including distributional issues, are often ignored.

For example, some economists are inclined to discount the transfers accompanying theft as being of little relevance to public policy since they do not represent a loss of total output, merely a redistribution of wealth. Only the precautionary measures taken by individuals to avoid accumulating or losing wealth and the forgone use of the criminals', police's, lawyers', and prison guards' time and energy represent a real loss in output. Others might support laws against theft, however, not primarily because they reduce the resources used in protecting against theft, or encourage thieves to engage in 'legitimate' occupations, but because individuals have a 'right' to retain property they have accumulated through their own efforts.

As another example, economists (Lott, 1985) have pointed out that a given period in prison imposes a greater loss on individuals with a higher wage rate. These economists have concluded that allowing the rich to reduce their probability of conviction through the purchase of better legal counsel and extensive appeals might compensate for the higher penalty. Others might object that this runs counter to the basic notion of equality before the law.

Increasing the Probability of Capture and Conviction

As we mentioned earlier, one way we can reduce the incidence of crime in Australia is to increase the probability of capture and conviction of criminals. We could probably capture more criminals if more police were employed, but this would add to the expense of the criminal-justice system. It is not clear how much citizens prefer a reduction in crime to an increase in their taxes to pay for a larger police force.

Some studies suggest that increasing the public police force, beyond some point, does not reduce crime very much (Wilson, 1983:151–2). On the other hand, J. K. Bowen (1987:8) cites some studies in the US and Victoria that do suggest that 'street crimes, such as robbery and assault, can be deterred by heavier than normal concentrations of highly visible, active

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Figure 6.1

**Australian per capita expenditure on police
adjusted for inflation**

1984 dollars
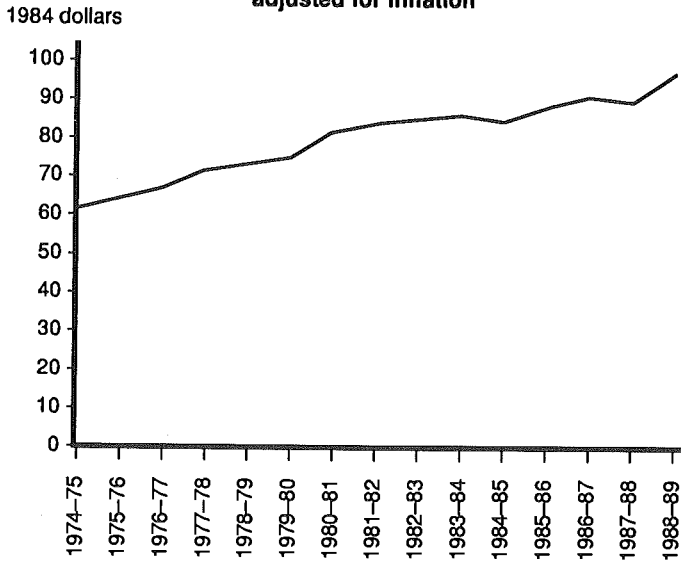
Source: Mukherjee & Dagger, 1990

uniformed police'. These studies might be less in conflict than at first thought. It is quite possible for additional police to be highly effective at reducing crime in some situations, yet their 'marginal product' could decline rapidly with increasing numbers.

Figure 6.1 graphs per capita expenditure on police in all Australian States expressed in real or inflation-adjusted dollars. (We have converted nominal expenditure to real dollars by dividing the deflator used by the Bureau of Statistics to convert Gross National Product to real dollars.) The figures for per capita expenditure on police are from Mukherjee and Dagger (1990:106). Clearly, Australian taxpayers have been spending more on their police forces even after we adjust for inflation. In fact, the average growth rate of real per capita expenditure has been about 3 per cent annually over the last 15 years. Despite this increased expenditure, crime rates per capita have continued to rise, as we demonstrated in Chapter 1. Also, the proportion of crimes reported to the police that are cleared has declined steadily, as we demonstrated in Chapter 2.

Legalising victimless crimes. The current police force would be more effective at capturing those who commit crimes against others if they spent less time pursuing offenders of victimless crime. We discuss the legalisation of victimless crimes, such as drug use and prostitution, below.

Changes to criminal procedures. The probability of conviction of criminals could be increased if we relaxed the protection accused people have during investigation and prosecution. For example, Bowen (1987:8) argues that 'Australian police forces have long been denied basic investigative powers routinely used by police forces in England and the United States'. He suggests that Australian police should have greater access to interception of telephone calls, a longer time period to question crime suspects, power to demand the name and address of a crime suspect, power to search a suspect for weapons and drugs, and the power to take fingerprints, photographs and body samples from suspects. He admits these changes in procedures would infringe the civil liberties of suspects, but he counters that the inability of the police to prosecute offenders leads to a violation of the rights of victims. Ultimately, a compromise must be reached between protecting the civil liberties of criminals and protecting the victims of crime.

Another potential problem with changes in investigative procedures is that they may increase the number of people incorrectly convicted of committing a crime. In this case, the punishment of innocent people might be an unintended result of changes in the protections afforded to those accused of crime. Although the overall crime rate might drop, this good effect may not justify the punishment of innocent people. Individuals differ in the relative values they place on increasing the conviction rate for criminals and avoiding mistaken convictions. Difficult empirical questions need to be answered before one could have a well-informed opinion. We need to know how changes in procedures are likely to affect the two possible types of errors that can be made.

Encouraging private protection. Another way of increasing the probability of capture and conviction of criminals is to encourage more private protection against crime. Neighbourhood-watch programs should be encouraged, along with the creation of community security associations with private police. Civil liberties might be protected by monitoring such private police forces to ensure that they conform with the law.

Burglar alarms and anti-theft devices are cheaper means of deterring criminals than are increases in the police force. The presence of public police, however, reduces private incentives to protect against crime by using such devices. We could encourage the use of private security devices by making them tax-free. While many economists cite all such tax preferences as inefficient, these preferences might be justified if they serve as substitutes for expenditures on a police force that is also funded by distorting taxes.

Contracting with private security services. The police force suffers from some of the same incentive problems that are faced by other government owned and operated businesses. As a monopoly, the police

force does not face competition in the marketplace. Competition would encourage more attention to consumer demands and cost containment. In any publicly owned body, managers do not face pressure from capital markets to maximise profits by reducing costs and meeting consumer demands. More specifically, the existing public police force does not have a strong interest in reducing crime, since police pay and promotions are only partly related to success in capturing criminals and solving crimes (Wilson, 1983:145–63).

A private agency in a competitive environment would have a greater incentive to prevent crime through increased surveillance. It would also have a greater incentive to reduce the costs of providing a given level of protection. For example, suppose a neighbourhood-security association hires a private security service, but crime in the neighbourhood increases significantly. The neighbourhood association would dismiss the existing security service and hire another one.

At first glance, one might think that a completely private police system would be better than a public one. A potential problem with such a system is caused by 'free riders'. Suppose a neighbourhood has a private security association. Everyone is expected to help pay for the private police. Suppose several neighbours refuse to pay their share of the costs. These neighbours still benefit from the police surveillance of the neighbourhood. We need the power of taxation to force people to pay for the benefits of police protection.

We can still benefit from private police protection, however, if the government contracts with private agencies to provide security services. These agencies could be paid according to the level of deterrence they maintain. If the crime level became too high, the existing agencies would lose their contracts. A system of private contracts for garbage collection, prison services and road construction currently operates successfully in parts of the US and Australia. Some cities in the US, such as parts of Houston, Texas, also have local security associations that provide police protection in addition to the city police. These 'private police' are actually county police officers and are paid for by voluntary subscriptions from households in the protected areas. The free-rider problem is addressed by the association publishing a list of contributors and relying on social pressure to encourage all households to contribute.

We already have a partially private system of police in Australia, since individuals can hire private detectives to solve particular crimes. We would not want to extend the private detective system to serve as the only police force, however. If we paid police officers according to the number of crimes **solved**, they would have an incentive to manufacture crimes in order to solve them. (We encountered this problem in Chapter 2 when we discussed the private 'thief takers' in 18th-century London.)

Increasing penalties. We could reduce the amount of crime in Australia by increasing the penalties for committing crime. The economic theory of crime, however, suggests that fines and other penalties not involving incarceration are, generally speaking, preferable to imprisonment.

Prisons sentences are often undesirable for several reasons. First, it is expensive to keep people in prison. Prisoners must be fed, sheltered and guarded. Their medical, educational and recreational expenses are paid by taxes. Second, society suffers a loss of productivity when a prisoner who could hold a legitimate job is incarcerated. Third, many criminals learn the tricks of the criminal trade from other prisoners.

Prisons are necessary for violent criminals and mentally disturbed criminals in order to prevent them engaging in further criminal activity. Some recidivist criminals cannot be relied upon to take up legitimate employment, regardless of the fines imposed upon them for committing crimes. Some researchers have argued that prison sentences reduce crime principally by keeping hardened criminals off the streets. The deterrence value of prison for nonrecidivist criminals is said to be less important. We presented arguments against this view in Chapter 2.

One promising trend in reducing the costs of prisons is the use of privately run prisons. Queensland currently contracts with Corrections Company of Australia Ltd to operate a 244-bed prison at Borallon, near Brisbane. According to Richard Harding (1992:6) the ACT government paid the NSW Corrective Services Commission $135 per inmate to accommodate prisoners in 1990. The same year, the comparable figure for Borallon was $92 (about 30 per cent lower). However, Harding notes that the costs of public prisons in Queensland are lower than in NSW, while costs in Borallon could be lower in part because the prison does not share in some of the overhead costs of running the system. Walker (1991) asserted that Borallon operating costs in 1991 were about $14 per prisoner per day less than similar State-operated prisons in Queensland. Furthermore, Harding notes that the recent reduction in costs in the State-operated prisons in Queensland could have resulted in part from potential and actual competition from private prison operators.

Harding also notes that in addition to reducing costs, Borallon had been innovative in introducing new programs to educate and develop the skills and work habits of inmates:

> A key concept is that of 'going to work' (whether in an industrial or an educational/skills program) for a full 'work-day'. At Borallon, one no longer sees, as in many public prisons, inmates lounging around in cells or shuffling around the yards during the day. (Harding, 1992:6)

On 9 March 1992 the Queensland government contracted with Australian Correctional Management Ltd (ACM) to manage the newly-constructed

Wacol Remand and Reception Centre in Brisbane. The annual contract managment fee will be $11.5 million as opposed to an estimated $18 million (a 36 per cent reduction) if it were run by the public sector (Harding, 1992:1).

ACM also has been contracted to design and construct a 600-bed prison in Junee in New South Wales. This prison is expected to become operational in March 1993. ACM has been awarded the operating contract for five years, with the expectation that the contract will be renewed for a further three years. The estimated cost of the Junee prison is $57 million and can be compared with a cost of $90 million for the 400-bed maximum-security prison Casuarina, opened in Western Australia in 1991 (Harding, 1992:6).

Even if prisons can be made less expensive, more rehabilitative and less of a 'school for crime', they are not the best form of punishment. Fines are better than prison sentences because they are cheaper to impose. In some cases (such as traffic tickets), fines raise a considerable amount of revenue for the government that can be used partially to defray the costs of maintaining the police and the legal system. Unfortunately, fines are not appropriate for all criminals.

Many criminals are so poor that they are unable to pay significant fines. Alternative penalties are necessary to deter these individuals from criminal activity. Advances in electronic technology have led to new alternatives to prisons and fines. Several states in the US are experimenting with devices attached to convicted criminals that allow the criminals' movements to be tracked. These individuals have their freedom of movement restricted as a form of punishment, but they can still work in a legitimate job and live at home. These criminals avoid the negative influences that result from associating with prisoners.

The Nature of Prisons

The economic theory has some implications for the nature of prisons. First, prisons need to be unpleasant enough to deter potential criminals. While this may seem obvious, modern prisons have many amenities that make them more attractive than prisons used to be. Modern prisons feature wholesome food, free medical care, recreational activities, family visits, heated quarters and educational opportunities.

Criminologists argue for improved conditions in prison in part because prisoners are easier to handle under such conditions. A better quality of life for prisoners may reduce the cost of guarding prisons, but it also reduces the penalty of incarceration.

Perhaps the major problem with increasing the severity of penalties, however, is that many people feel uncomfortable about it. The smallest penalty necessary to deter others and to redress the wrong seems to be most appropriate. For example, many people find the death penalty unjustifiable. Even if the death penalty does deter certain crimes, many people feel it should not be used. They argue that the death penalty is a cruel and

unusual punishment, and point out that a criminal wrongly given the death sentence could never be compensated for the mistake (Sellin, 1980). Others have observed that theft is uncommon in many Islamic countries where the punishment is cutting off the criminal's hand. Regardless of the deterrence achieved, this seems an excessively severe penalty for theft.

Even if we could arrive at a clear position on the appropriate penalties for different crimes, we would have difficulty getting our position implemented by the judiciary or government. In Chapter 4, we discussed some of the problems in choosing penalties on the basis of majority voting. These problems lead us to favour the use of an independent legal system, based on precedent, to determine penalties, rather than the direct determination of penalties by statute.

Effects of Other Government Policies on Criminal Activity

Government policies aimed at issues other than crime are also relevant to the level of crime in society. Although many of these policies are rightly to be judged on the basis of their implications for the primary issues they attempt to address, their effects on criminal activity could be significant and should form part of the evaluation of the policies.

Unemployment. The economic theory of crime suggests that unemployment accompanying government-imposed wage rates is partly responsible for encouraging crime in Australia. Young people, migrants, and others with less education and experience, or fewer skills, cannot find work because they are not worth the 'award wage'. Potential employers are not allowed to pay unskilled workers less than the award, so these workers have no job at all. Minimum award wages for youths have also eliminated apprenticeship and training schemes. These often require low wages during the training period if they are to be viable. Once the period of training is completed, the employee can take his skills to a new job. The initial employer can recoup the training costs only by 'charging' a training fee and then paying a competitive market wage once the individual has obtained his qualifications. With few legitimate employment opportunities available to them, less skilled individuals will find crime an attractive alternative occupation. While statistical studies in the US have found a connection between unemployment levels and crime, Australian studies have not found a strong positive relationship.

Inappropriate monetary and fiscal policies may also affect crime by increasing unemployment rates, while unemployment benefits and other social welfare payments may either increase or decrease crime. The marginal benefit of stealing, for example, is likely to fall if welfare payments cover the cost of food and shelter when an individual is temporarily in need. On the other hand, if welfare payments reduce the incentive to engage in legitimate long-term employment, they may encourage criminal activity as a part-time career.

Wage subsidies and compulsory training courses are preferable to unemployment benefits for young people. Wage subsidies provide an incentive for employers to hire those currently unemployed. Compulsory training courses impose a cost on those receiving welfare and also reduce the time available for criminal activities. These types of schemes could also be more expensive than current unemployment benefits, however. Employers might have an incentive to dismiss employees and then re-employ them, or their replacements, with a government subsidy.

Education. Poor public education may also contribute to an increase in crime. A lack of competition in the education sector means that schools have little incentive to produce students with marketable skills. Poor reading, writing and mathematical skills make it difficult for students to find legitimate employment. These students may turn to crime as a way to earn money.

The introduction of a voucher system of education would increase competition among the schools. The parents of each child would be given a voucher from the government equal to the amount currently spent to provide public education. Parents could take the voucher to the school of their choice. New schools would be formed in order to profit from the voucher plan. Schools that failed to educate students would soon find themselves without any students. In short, the voucher system would provide greater competition among schools and increase the incentives of schools to teach useful skills. (See Friedman, 1962, and West, 1989, for expositions of the voucher system for funding public education.)

Legalising Victimless Crimes

Illegal drug use is an example of a victimless crime. Both buyer and seller are voluntary parties to the transaction, so neither has an incentive to report the crime to the police.

Police corruption is common in the detection and prosecution of victimless crimes. Private traders are willing to bribe the police with a sum of money just short of the net gain parties expect to get from the trade. For example, suppose the net gain to a buyer and seller of drugs from not having to find an alternative pair of trading partners is $100. They would be willing to bribe a meddling policeman $99.98 to allow the trade to go ahead. In contrast, crimes like burglary, robbery, assault and homicide leave victims or their family members with a great incentive to ensure that the perpetrator is caught and punished.

Drugs. Many economists, including Marks (1990a, 1990b, 1991), have been at the forefront of those advocating the decriminalisation of drugs. They have pointed out that since the elasticity of demand for drugs appears to be very low, making drugs illegal has greatly raised the street price. In effect, the government has created a cartel in the drug-selling industry, greatly

raising the revenue accruing to drug sellers. The large incomes to be gained from the industry have attracted organised crime and provided a fertile source for corruption of the police force. Drug manufacturers and dealers resort to violent crime in order to avoid detection and prosecution by the police. The large amounts of money involved in the illegal drug trade make such risky activities worthwhile to drug suppliers.

The high street prices of illegal drugs, combined with the deleterious effect of drug addiction on employment opportunities, have also created a strong incentive for addicts to turn to crime to support their addiction. Some researchers have estimated that heroin addiction greatly increases the tendency of a person to commit crimes. The large increases in robbery and burglary in Australia in recent decades may be partly attributable to drug addicts' need for cash. It probably is not the case, however, that drug addiction turns many otherwise law-abiding citizens into criminals. Most addicts usually commit their first criminal offence many years before the age at which they try drugs. Drug addiction appears greatly to increase the numbers of offences a criminal commits. It does not appear to increase significantly the number of criminals.

Attempts to prevent the importation of drugs from overseas have done little to reduce use. The 'landed' price of drugs, that is, the price paid to smugglers at the dock or airport, is a very small part of the final street price. The street price of drugs is high because those involved in processing and distributing illegal drugs must be compensated for the risks of being caught by the police. Thus, even if the landed price of drugs rises significantly (due to reduced supply at airports and docks), the final street price of drugs will rise only a little. As long as the street price of drugs remains relatively stable, the amount of illegal drugs consumed will remain the same.

Many of the most serious social effects of drug use arise because drugs are illegal. The association of drug use with AIDS arises because people inject drugs. People inject drugs principally because drugs are very expensive. If drugs such as opiates were legal, their price would fall dramatically. One can obtain the same effects from opiates by ingesting or smoking them as one obtains by injecting them, although a larger amount of the drug is required. In fact, the most common way of taking opiates before they were made illegal was to drink them or smoke them. In countries where opiates are legal today, opiates are not usually consumed intravenously.

A program to legalise currently illegal drugs may have other beneficial effects. For example, legalising drugs would encourage drug manufacturers to enter the business and sell standardised products. Many drug overdoses result from impure drugs or drugs of radically different strengths being sold on the black market.

Many people object to a completely free market in drugs because of the externalities associated with drug addiction. Others view the police

force as an institution created to enforce a particular code of moral conduct that goes beyond protecting individuals and their property. Economists such as Gary Becker and Isaac Ehrlich take the view that the legal system should be principally concerned with actions that interfere with the freedom of other citizens.

Other arguments have been made against the decriminalisation of drugs. Given the current welfare system in Australia, it could be argued that legalised drugs would encourage more people to become drug addicts. These addicts could increase the number of people drawing unemployment benefits. Socialised medicine in Australia also means that drug addicts do not have to pay the medical costs associated with addiction. Drug addicts are more likely to bear defective children, and the taxpayers would assume responsibility for these children. Drug addicts may also be less likely to support any normal children they have (Taubman, 1990).

An alternative to complete legalisation would be to make drugs available to addicts on a doctor's prescription. Doctors could monitor the intake of the drugs to help prevent overdoses. Counselling could be provided to educate addicts about the ill effects of drug use. Addicts would be less likely to turn to crime to support their habit, since the cost of the drug would be much lower. Illegal supplies of drugs would diminish because legal drugs would be cheaper and easier to obtain. These types of programs exist in Europe and have resulted in a reduction in the illegal supply of drugs.

Some social scientists have recently advocated educational programs as a means of reducing the number of victimless crimes, such as drug use. Although many economists doubt the ability of educational programs to change people's tastes, they concede that education in general may have an important role to play in reducing crime if it can increase legitimate employment opportunities.

Prostitution. Prostitution is another area of crime that might benefit from legalisation. Government regulation of prostitution may reduce public health risks associated with it. Prostitutes could be required to ask their customers to use condoms and take other precautions against venereal disease and AIDS. Prostitutes could be checked frequently for disease and prohibited from working if they were infected. These measures would not eliminate the health risks associated with prostitution, but they would lower them. We are not advocating a completely free market in prostitution, but a legal, highly regulated one.

Conclusion

The economic theory of crime cannot explain all incidents of crime. It can be useful, however, in predicting and explaining the behaviour of a substantial fraction of criminals. The economic theory of crime leads us to

expect that the level of crime in society depends on the expected penalties and the expected benefits. The expected penalty is a function of the probability of capture and conviction and the size of the penalty. Our study leads us to conclude that individual citizens should be encouraged to do more to protect themselves against crime, rather than relying solely on the government police. Greater use of contract police services should also be encouraged.

There may also be greater scope for private police, although we probably would not want to privatise police activity completely. We also note that our current police force would be more effective if it spent less time pursuing victimless crimes.

Crime might be further reduced if we eliminated the award wage system and made education more competitive and therefore more effective. Welfare should be reformed so that young able-bodied adults are not supported on welfare with ample free time to pursue criminal activities. We suggested that fines might be more efficient than prison terms and should be used more extensively than at present.

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