THE DETERMINANTS OF CRIME IN SOUTH AFRICA

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"FEW PEOPLE WOULD DENY that crime has reached critical proportions in South Africa" (Glanz 1994: xiii). According to the Nedcor report (1996:70) “there is the historical dynamic, manifested in a long build up of rates of crime and violence, going back to at least the beginning of the 1980s”. The statistics reveal that crime has been escalating at an alarming rate, even by international standards (Nedcor 1996: 4, South Africa Foundation 1996: 30-33).

Rising crime may be typical in countries undergoing transition as democracy tends to compound crime by weakening the overbearing controls put in place by oppressive governments, while some citizens, who were

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opposed to the previous government, continue their lawless
and confrontational behaviour. Even relatively affluent citizens have an incentive to participate in crime when controls are weakened (Nedcor 1996: 70). “There are two additional aggravating circumstances [in South Africa], namely the relatively free access to firearms, and the appearance of hundreds of crime syndicates, many of which are international” (South Africa Foundation 1996: 29).

The credibility and perhaps even the survival of the new democracy in South Africa is being threatened by high crime rates. On a macro level crime influences international economic relations adversely and on a micro level it constitutes a direct attack on public order and safety. Crime is a universal problem which has a negative impact on the functioning and stability of society. In South Africa it is often cited as the cause of poor economic growth (Barker 1995, Johns 1994, Nedcor 1996) and in particular, the inability to attract foreign capital and tourists (Barker 1995).

Crime affects South African victims directly. According to the victimisation studies conducted (Glanz 1994:14, Nedcor 1996: 7-8), approximately a quarter of the households surveyed had experienced crime. Business is the largest organised group suffering from crime and violence, though the public sector also experiences high levels of fraud and corruption (Nedcor 1996: 62). Official crime statistics, however, do not reveal the true situation as “[i]t is estimated that under reporting of crime in South Africa could be as high as 50%” (Nedcor Executive Summary 1996: 2).

Besides the direct effects on victims, crime has additional secondary effects related to the fear of crime that all potential victims experience. This is significant as it imposes psychological costs on potential victims that result in changes of personal habits and attitudes, that is life styles, in order to avoid crime. Business operations are also altered in order to reduce victimisation and thereby allay the
fear and insecurity related to crime. Given the high crime rates in South Africa, it is therefore not surprising that “[o]verall, 46 per cent of the population rated crime as the most serious national problem, with a range of 44% in the black community to 58% in the white community” (Nedcor 1996:72). This is a relatively new phenomenon as “[i]n earlier surveys of public opinion using the same or similar questions, issues such as unemployment, housing, education and incomes were consistently most predominant, except among whites, who have for some time been concerned about crime” (Nedcor 1996: 8).

It is evident that the implications of crime in South Africa can never be dismissed as trivial. However in order to appreciate fully the effect of crime, the costs that it imposes on South Africans must be considered. According to the Nedcor National Crime Survey (Nedcor 1996: 73), the costs of crime to households and business in South Africa amounted to R31,3 billion in 1995. It should also be noted that “[m]any respondents could not estimate ... their losses - hence the figures emerging are somewhat of an underestimate” (Nedcor 1996: 9). The expenditure of the entire criminal justice system for 1995/6 was just under R14 billion (Department of Finance 1999: 163, 182 and 194). Thus the total cost of crime in South Africa in 1995 is estimated at just under R45,3 billion.

“These costs are completely unsustainable in a developing economy” (Nedcor 1996: 73). Yet it is obvious that in South Africa with crime escalating at a considerable rate, public expenditure on crime prevention will not decrease in the foreseeable future. “[T]he private security industry is booming and now employs over 450 000 people” (Nedcor 1996: 74), and “is now larger than the SAPS” (Nedcor 1996: 56).

The aim of this study is to consider various theories of
crime, in order to reveal some of the possible causes of the high crime rate in South Africa. Once a greater understanding of the causes of crime has been acquired, it should be possible to assess whether continued increases in government expenditure on the criminal justice system will be most effective in preventing crime.

1. THE CONVENTIONAL ECONOMIC THEORY OF CRIME

World-wide the overwhelming majority of countries, including South Africa, rely almost solely on the criminal justice system for crime prevention. Therefore in order to conduct any study concerning crime, a systematic approach is needed which is able to weight all the influences of the criminal justice system on the crime rate in South Africa. In terms of the multidisciplinary perspective which is taken in this study, the approach adopted must also be able to weigh all additional influences on the crime rate over and above those related to the operations of the criminal justice system. The economic theory of crime is such an approach. Crime and crime prevention are relatively new fields of research within economics, although the framework of analysis is conventional neoclassical theory and welfare economics.

Essentially economists consider the theory of criminal activity as a variant of the microeconomic theory of occupational choice (Reynolds 1980: 27-69). The assumptions of the model are the following. Firstly, individuals have certain preferences regarding their choice of occupation. These are influenced by their predisposition to criminal activities or what is commonly referred to as their “morals”. Secondly, individuals have a specific endowment of resources. The limit to their resources is a constraint on their occupational choice. Thirdly, it is assumed that
individuals strive to maximise their well-being in their choice of occupation and therefore their choice is optimising given the information that they possess. That is, it is assumed that the individual acts rationally, even when choosing to pursue criminal activity - as this would be the most profitable occupation for the individual. The implication is that criminal activity will be undertaken by an individual as long as the perceived profit from such activity exceeds that of other occupational activities. It is important to note that this model is capable of explaining, not only the choice to participate in criminal activity, but also the frequency of participation in such activity. It is possible for an individual to undertake any combination of illegitimate and legitimate activities.

In order to decide whether criminal activity will be an optimal occupational choice, a cost-benefit analysis is undertaken by the individual. The benefit of committing a property crime is easily calculated if it is assumed to be the market value of the goods taken, even if this does not correctly approximate the value to the criminal. In the case of crimes that inflict bodily harm on the victim, however, there is no easy calculation of the benefits that the criminal derives as they are essentially subjective and non-monetary in nature. Bowles (1982: 55) suggests that these benefits can be gauged from either the amount of money that must be

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1 This assumption of rationality has been challenged by sociologists. In many of their theories it is argued that criminal activity does not arise out of freedom of choice but that criminals pursue such activity as a result of a predisposition to crime beyond their control. Economists, however, argue that criminal activity which appears to be irrational in this sense can be explained by the fact that these criminals perceive the costs and benefits of criminal activity slightly differently from most people. However, these criminals are acting rationally. According to Reynolds (1980: 34), “I have found that even highly irascible people who, in a rage, seem to lose all control of their actions, still refrain from smashing really valuable objects, preferring cheaper crockery”.

273
paid to persuade the criminal not to commit the crime, or from the effect that a change in the criminal’s costs of committing the crime has on the occurrence of the crime.

The costs of criminal activity must also be considered. Firstly, there is a direct cost involved in committing a crime, which relates to the skills, equipment and contacts that must be acquired. Secondly, there is a punishment cost if the individual is caught. As there is also the possibility that the criminal will not be caught, this introduces uncertainty into the decision-making process. The expected punishment costs therefore depend, not only on the nature and size of the punishment, but also on the probability of being punished. It is assumed that the individual’s personal perception of the expected punishment costs varies with changes in the probability of punishment and the size and nature of punishment. Thirdly, there is an opportunity cost to the individual when deciding to pursue criminal activity - the forgone net earnings from legitimate employment. The potential earnings from legitimate employment may approximate zero in countries which have high unemployment and underemployment levels. Fourthly, although economists do not usually consider the moral cost to the individual of committing a crime, they do acknowledge its existence. The individual thus weighs up the expected costs and benefits of criminal activity and will commit crime as long as the net benefit from such activity is positive, or the marginal benefit exceeds the marginal cost.

Traditionally economists have argued that in order to prevent crime the costs of criminal activity to the individual must be targeted for manipulation as the benefits of criminal activity are too obscure for this purpose. A decision must be made regarding which of the costs is best suited for this purpose: the direct cost, punishment cost or opportunity cost. Increasing the direct cost of criminal activity is
ultimately believed to constitute an unproductive use of economic resources as taxes imposed on the equipment used by criminals will most likely also have an impact on other consumers who use this equipment for legitimate purposes. Increasing the opportunity cost of criminal activity is typically believed to entail rehabilitation, training and, ultimately, the creation of new job opportunities. A third alternative is to target the punishment cost; that is, promote deterrence (Becker 1976, Ehrlich 1981, Reynolds 1980; 1990). In order to decrease the crime rate, the probability of punishment and/or the cost of the median sentence should be increased; where the cost of the median sentence is a function of the nature and size of the punishment. Studies by Ehrlich (1981) and others (Becker 1976: 53) indicate that individuals are more responsive to changes in the probability of punishment than to the cost of the median sentence, and because of such findings it has been suggested that crime prevention strategies focus even more narrowly on increasing the probability of punishment. Traditionally economists have ignored the timeliness of imposing the punishment cost, although criminologists and legal professionals emphasise the need for swift legal action. The time dimension is important as the present value of a given sentence is greater and therefore more costly to criminals, the sooner it is imposed. Unfortunately the criminal justice system in South Africa does not collect information regarding time delays, and we shall not therefore consider this issue here.

For the purpose of this study, a distinction must be made between an individual level study and an aggregate level study of crime. The economic model of the market for

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2 For this to be the case, criminals must have a preference for crime. The moral preferences of individuals are discussed when an interdisciplinary theory of crime is developed.
offences can be used in an aggregate level study whereas the model of the individual’s decision-making regarding participation in criminal activities can be used in an individual level study. As the focus of this study is on crime causation in South Africa, the economic theory of crime based on the model of the market for offences is the relevant perspective to be taken. Trumbull (1989: 423-424) emphasises that these two approaches, whilst obviously related, are not substitutes for each other as individual level studies focus on the determinants of criminality and the issue of specific deterrence, whereas aggregate level studies focus on the determinants of crime and thus general deterrence. Individual level studies are most often recidivism studies aimed directly at reducing the criminal activity of existing or identified potential criminals. It should also be noted that Trumbull does not consider the results of recidivism studies to be as consistent as those of aggregate level studies as they generally use vastly different measures of variables and rely on limited official data. Importantly Ehrlich (1981) emphasised that even if success is achieved at the individual level and many criminals are rehabilitated, which is unlikely to be the case according to evidence, the supply of offences in the market may not decrease if new and existing criminals perpetrate more crime than before.

When considering the market for offences, the supply of offences and the demand for offences must be regarded in turn. With respect to the supply of offences the focus is on the criminal behaviour of individuals in society. The supply of offences is a positive function of the net expected benefit derived from criminal activity. The net benefit is simply the difference between the expected benefit from criminal activities and the corresponding direct cost, the expected
punishment cost and the opportunity cost.³

In addition, the impact of the behaviour of potential victims on the expected return from criminal activity must be included. Potential victims may provide for their own protection and/ or insure themselves against the effects of crime. As they purchase more protection it becomes increasingly difficult for the criminal to commit the offence because this results in an increase in the costs of committing crime and/ or a reduction in the size of the expected taking. As potential victims purchase more insurance it becomes less costly for the criminal to commit the offence due to morally hazardous behaviour on the part of the insured. Ultimately the relationship between the expected return from criminal activity and the protection and insurance costs of potential victims depends on the relative size of the costs of protection and insurance. Generally, the market supply curve of offences reflects a positive relationship between the expected return from criminal activity and the number of offences.⁴

Formally the market supply function can be defined as follows:

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³ As was mentioned above, the moral cost to individuals of committing crime is traditionally ignored by economists. If, however, it is considered, the assumption must be made that individuals are indifferent between legal and illegal activities or a continuous distribution of moral preferences must be assumed. If indifference is assumed, effectively the moral cost to individuals of committing the crime is zero and the number of offences supplied will increase in proportion to increases in the expected return from criminal activity. When assuming a continuous distribution of preferences, higher and higher returns from criminal activity will attract more and more individuals as the returns exceed their “reservation wage”.
⁴ Friedman (1986: 459-463) deserves special mention for his analysis of the supply of offences, in which he showed how the shape of the supply curve changes when considering different combinations of marginal and talented criminals. His insights are, however, not central to the present discussion and will not be included.
\[ S = s(r) = j(w_i, w_l, C) - pf \]
with \[ S_r = 0; j_{w_i} > 0; j_{w_l} < 0; j_C < or > 0 \]  

where
- \( S \) is the supply of offences;
- \( r \) is the net expected return from criminal activity;
- \( w_i \) is expected earnings from illegitimate activities net of direct costs;
- \( w_l \) is earnings from legitimate activities net of costs;
- \( C \) is the cost of protection and insurance of potential victims;
- \( p \) is the probability of punishment;
- \( f \) is cost of the median sentence;

The demand for offences must also be considered. When regarding the demand for offences the focus is on the behaviour of all individuals in society, particularly the extent to which such behaviour either encourages or discourages criminal activity. The demand for offences is implicit and is largely derived from the demand for safety. An increase in the expected return to crime will increase the demand for safety and conversely, reduce the demand for offences. Therefore the demand for offences is a negative function of the expected return to crime. The demand for offences is made up of three components: the private demand, the public demand and the demand of the buyers of illegal goods and services. The private demand by potential victims for offences is derived from their demand for safety which indicates the extent to which they disallow criminal activity. As the number of offences increase, potential victims are more vulnerable to crime and therefore demand more safety and less crime. To this end they increase the amount of protection and insurance which they
purchase and these costs increase. Ultimately when the expected return from criminal activity increases, the implicit private demand by potential victims for offences decreases as the cost of protection and insurance increases.

The implicit public demand for offences is also negatively related to the expected return from criminal activity. As the expected return to crime increases, the public will demand more safety. In response to this demand the state usually raises the expected punishment cost of committing crime, indicating the extent to which criminal activity is disallowed, or conversely allowed. The demand by the buyers of illegal goods and services varies inversely with the corresponding price, which is in turn directly related to the net expected return to crime.

The market demand curve for offences reflects a negative relationship between the expected return from criminal activity and the number of offences. Mathematically the market demand function can be represented as follows:

$$D = d(r) = h_1 + h_2 - pf \quad \text{with} \quad D_r = 0 \quad (2)$$

where

- $D$ is the demand for offences
- $r$ is the expected return from criminal activity
- $h_1$ is the demand by buyers of illegal goods and services
- $h_2$ is the private demand by potential victims
- $pf$ is the expected punishment cost of committing crime and represents the public demand for offences

The equilibrium number of offences and the equilibrium expected return from criminal activity are determined where the supply of offences equals the demand for offences. The
negative impact of crime on society is a direct function of the number of offences and it can be stated that:

\[ O = o(S, D) \]  

and therefore \[ O = o(w_i, w_l, C, p, f, h_i) \]  

Accordingly, an increase in the number of offences could be caused by any combination of the following: an increase in \( w_i \), a decrease in \( w_l \), a decrease in \( C \) (equivalent to an increase in \( h_l \)), a decrease in \( p \), a decrease in \( f \) and an increase in \( h_i \).

As stated above, economists have tended to concentrate on the influence that law enforcement variables, such as the probability of punishment and the cost of the median sentence, can have on the number of offences and, to a lesser extent, on economic variables such as median income and the unemployment rate. They advocated deterrence as the means of crime prevention, as is customary in the classical theories of crime.\(^5\) In so doing, the economic theory of crime was severely limited in explaining the causes of crime. They focussed almost exclusively on the expected punishment cost of committing a crime, and therefore the activities of the criminal justice system, as the determinant of the rate of crime. Effectively, the number of offences was considered to be a function only of the probability of punishment and the cost of the median sentence, that is \[ O = o(p, f, u) \] where \( u \) is a portmanteau variable representing all other influences (Becker 1976: 47). In order to decrease the crime rate, the supply of and demand for offences should be decreased by increasing the probability of punishment and/or the cost of the median sentence. Classical theories of crime argued that crime

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\(^5\) It should be noted that although the economic theory of crime is associated with the neoclassical school in economics, it is associated with the classical criminology paradigm.
prevention using the criminal justice system will always be more efficient than crime prevention involving the manipulation of the other costs of criminal activity. This is because expenditure on criminal justice was understood to impact solely on the crime rate, whereas other types of public expenditure were understood to impact crime indirectly (via their influence on other variables), effecting all individuals and not only potential criminals. Sedgwick (1984) pointed out that other types of public expenditure, therefore, should rather be manipulated for efficiency and political reasons.

2. THE CRIMINAL JUSTICE SYSTEM AND THE DETERRENCE OF CRIME

"Throughout most of the twentieth century, our primary response to the problem of crime has been to expand police and court resources ... Crime has not gone away ... leaving society with the worst of both worlds: high crime rates and huge prison populations" (Forst 1993: 3). Reynolds (1990: 262) specifically considered the relationship between the crime rate and the expected punishment for all serious crimes from 1950 to 1988 and found that from 1974 onwards the expected negative relationship between these variables could not be confirmed. This indicates that the law enforcement activities of the criminal justice system are not effective in deterring crime.

In South Africa there are many factors which hinder the efficient and effective enforcement of the law. A detailed discussion regarding the specific problems which plague each of the departments within the South African criminal justice system can be found in Brown (1998). The public debate concerning crime prevention in South Africa has largely focussed on efficiency improvements required in these departments. Another major criticism of the criminal
justice system, is that there are inefficiencies in the functioning of the system as an integrated entity. Effective law enforcement requires not only the efficient operation of the departments of safety and security, justice and correctional services, but also cooperation and coordination between them. The Nedcor Report (1996: 76) concludes that “the present criminal justice system is not functioning at a level where it constitutes a credible deterrent to criminals”. Therefore in South Africa it is possible to argue that the law enforcement activities of the criminal justice system are not deterring crime because the system is inefficient; and not because deterrence is inappropriate as a crime prevention policy.

However, according to Morris (1993: 309), “The criminal justice system ... [will] have a deterrent effect on the commission of crime, but, and it is a massive “but”, marginal changes in any of those [sub]systems will not have a measurable effect on crime rates”. Contemporary criminologists agree that the major determinants of crime “lie outside the realm of penal policy, in the wider social, political and economic context” (Roshier 1989: 115). Although no aggregate level empirical research has been undertaken in South Africa focussing on crime causation and appropriate crime prevention policy, in the research which does exist relating to public opinion on crime causation (Barker 1995: 36, Glanz 1994: 13) respondents indicated that the most important reasons for the increase in crime were of an economic nature and not related to the operations of the criminal justice system. Essentially the argument is that law enforcement variables are less significant in influencing the crime rate than economic and socio-economic variables - a conclusion which will affect the choice of the types of public expenditure used to prevent crime.

Therefore the traditional focus of the economic theory
of crime on the operations of the criminal justice system is not only severely limiting in terms of crime causation theory, but also limiting in the practical application of crime prevention policy. The current public policy debate in South Africa primarily concerns improvements needed in the criminal justice system in order to deter crime effectively. This is true in other countries as well. Nationally and internationally a shift in the public and academic debate concerning crime causation is essential if effective crime prevention policies are to be implemented. In order to include all the factors thought to be important influences on the crime rate, an integrated theory of crime causation must be considered. Essentially an interdisciplinary theory of crime must replace the conventional economic theory of crime, which is not sophisticated enough to manage the present challenges of crime prevention policy.

3. AN INTERDISCIPLINARY THEORY OF CRIME

Forst (1993: 13) states clearly that the breadth and nature of the issues relating to crime require research “that transcends narrow academic disciplines” and Opp (1989: 405-406), a sociologist, argues for the integration of economic and sociological theories of crime. Neither of these authors, however, systematically attempt the task. The South Africa Foundation and Nedcor studies are the most up-to-date South African research and provide broad analyses of crime in South Africa. Yet although the South Africa Foundation (1996: 29-40) and the Nedcor Project (Nedcor 1996: 11-13) both identify social and political, economic and law enforcement variables which are important in determining crime in South Africa, they do not link these variables in terms of an interdisciplinary theory of crime causation.

In developing an interdisciplinary approach to the
analysis of crime causation in this study, theories and perspectives from both sociology and political science will be considered. Political theories focusing on power relations and inequalities in society will be included in the discussion below. Sociological structure theories will also be included but sociological process theories, which attempt to explain the process by which people become criminals, will be excluded as they depend on information concerning personal characteristics. More generally, physiological and psychological theories have to be excluded as there is no information on the relevant variables at an aggregate level. This study will necessarily be limited to theories that lend themselves to manipulation for public policy-making purposes.

In order to appreciate the value added to the theory of crime without being overwhelmed by the details relating to each of these theories, only the socio-economic variables introduced in these theories will be mentioned below. A useful point of departure is Reynolds’ (1980: 35) attempt to identify some of the factors influencing the net earnings from legitimate activities in terms of the neoclassical theory of crime. These include median income, the unemployment rate, educational achievement, age, race and gender.

According to the sociological and political theories of crime the collective effect of these socio-economic variables on the earnings from legitimate activities can be seen as a general indicator of “socio-economic status” or “access to conventional opportunities”. Essentially lower median incomes, higher unemployment rates, lower average

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6 Brown (1998) provides a more extensive review of the theories included in the analysis.

7 Brown (1998) can be consulted for a fuller explanation of each of the theories, which will provide a better understanding of why the specific variables that are regarded as significant in explaining the causes of crime in terms of a particular theory are considered to be so important.
educational achievement, lower median age, greater presence of minority groups and greater presence of women are seen to reflect more restricted access to conventional opportunities and lower socio-economic status. This, in turn, results in lower earnings from legitimate activities and therefore an increased tendency to commit crime. It is also important to note that some theories, like Miller’s subculture theory and the radical criminology theories, consider the extent of inequality displayed by the variables as opposed to the level of the variables when regarding their relevance in explaining crime (Curran and Renzetti 1994, Reid 1988).

Another factor that merits attention, as it is very important in political and sociological theories, is the moral cost of committing crime. Individuals belonging to groups with values and norms which condemn deviant behaviour experience a moral cost associated with guilt when pursuing crime. The moral cost of committing crime is an additional cost which decreases the net earnings from illegitimate activities and therefore makes criminal activity less appealing. However, the lower the moral cost of crime, the greater the net earnings from illegitimate activities and therefore the rate of crime.

Besides the impact of socio-economic variables on earnings from legitimate activities, many of these variables are also identified in the non-economic theories of crime. They are believed to lower the moral cost of committing crime and increase the net earnings from illegitimate activities, resulting in a higher crime rate. According to differential opportunity theory and the subculture theories, age and gender both also affect the moral cost of crime (Curran and Renzetti 1994, Reid 1988). The greater the proportion of males and young people in the community, the greater the proportion of the population that attaches a
lower moral cost to pursuing crime and is therefore encouraged to do so. In addition increases in the following variables have been said to cause a lower moral cost attached to committing crime: industrialisation, family instability, deviant subcultures, criminal associations, population density and powerful groups in society.8

The above discussion has focussed on the effect that the numerous economic and socio-economic variables, emphasised in the sociological structure and radical criminology theories, have on the rate of crime. The direction of change in these variables which causes crime to increase was stressed. Two major mechanisms of influence were outlined. First, there is the impact of variables on the expected return from legitimate activities. Then, there is the effect of these variables on the expected earnings from illegitimate activities. It is important to note that a particular variable may influence crime in contradictory ways through these two mechanisms. Therefore, the net impact is ambiguous.

A way must be found to synthesise and order this discussion and develop an interdisciplinary theory of crime causation. The economic model of the market for offences will be used as the relevant paradigm as it is arguably the most comprehensive framework currently available (Sedgwick 1984). The non-economic theories considered in this study can all be incorporated into this paradigm. Opp (1989: 406) is also of this opinion as he contends that: “a common misunderstanding amongst sociologists is that the economic theory of crime is [only] concerned with the influence of economic factors on crime”. He argues that the application of the economic approach to sociological theory,

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8 These variables are identified when the ecological, anomie, subculture, differential opportunity and radical criminology theories are considered (Curran and Renzetti 1994, Reid 1988, Roshier 1989).
which he feels is often implicit, conditionalises the sociological hypothesis, making it precise and empirically testable. According to Sedgwick (1984) the economic approach has a theoretical advantage over any other approach as it allows for successful crime prevention policy.9

It is obvious, but very important to emphasise, that the narrow focus on deterrence as a determinant of crime, which is the traditional economic approach, must necessarily be abandoned within an interdisciplinary analysis. The economic model of the market for offences must be considered in its broadest sense in order to realise its full potential in explaining crime causation. As already implicit in the above discussion of socio-economic variables, this specifically implies that the net earnings from legitimate and illegitimate activities gain prominence - where they were previously mostly ignored. As mentioned above economists had recognised these influences, although they had not systematically included them in developing the economic theory of crime and had largely ignored them in their empirical work. Howsen and Jarre (1987) justifiably criticised economists for having considered most of the socio-economic factors as relating to criminal disposition or taste and therefore conventionally considering them as given in economic models. To consider the economic theory of crime in its broadest sense, the net earnings from legitimate and illegitimate activities must be formally included in the economic model of the market for offences in greater detail. This is achieved by incorporating an

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9 He, however, challenges the merits of using this paradigm for explaining crimes relating to immorality and the constitution of the political regime, such as victimless crimes or crimes of discrimination. In these cases society’s preferences in terms of enforcement may not be compatible with the aims of the law.
implicit equation for net earnings from legitimate activities and an implicit equation for net earnings from illegitimate activities into equation 1, which defines the supply of offences. The effect of income, the unemployment rate, educational achievement, age, race and gender on the net earnings from legitimate activities merits further attention within an interdisciplinary analysis. Regarding the net earnings from illegitimate activities, the effect of socio-economic variables on the moral cost of illegitimate activities is particularly important to consider.

In terms of this interdisciplinary theory of crime causation, the influence of law enforcement, economic and socio-economic variables on crime are considered. As a result of this interdisciplinary approach, considerably more insight is gained regarding the variables which can be manipulated in order to raise the net earnings from legitimate activities and/or reduce the net earnings from illegitimate activities in order to prevent crime. The focus is no longer solely on raising the expected punishment cost of committing crime via criminal justice system activities in order to lower the crime rate. Not only is this the focus of the traditional economic theory of crime, but it is also to a great extent the current practice in crime prevention worldwide. In terms of the interdisciplinary theory of crime causation, it is possible to assess the relative merits of both traditional practices and theories vis-a-vis alternative proposals. Essentially in terms of an interdisciplinary theory of crime the activities of all government agencies, not only the criminal justice system, must be considered regarding their ability and cost-effectiveness in crime prevention.

4. PRELIMINARY EMPIRICAL ANALYSIS

10 More formal descriptions of a mathematical nature can be found in Brown (1999).
The previous section developed an interdisciplinary theory of crime, which is able to accommodate the divergent foci in the debate concerning crime causation and prevention. Logically, the next step is to empirically assess the relative importance of the numerous variables which are believed to influence the crime rate in South Africa. In this initial investigation the correlation between various law enforcement, economic and socio-economic variables and the crime rate was considered.

Unfortunately the empirical analysis was limited in numerous ways. Primarily, it was limited in terms of the time period and geographical areas that could be considered. The last available statistics are for the year of 1994/1995 and no more data will be made available until a new information technology system has been installed. Given this constraint, a cross-sectional analysis could only be undertaken relating to crime committed in 1994. Bearing in mind that there is a time delay between the period in which crime is committed and the criminal justice system processing thereof, the crime statistics for 1994 were considered along with the 1994/1995 justice department statistics and the 1995 department of correctional services statistics. As mentioned in the section on the economic theory of crime, information regarding the average time taken to complete the different stages in the criminal justice process is not available and it should be noted that this approach constitutes a crude attempt to include the time dimension to some extent.

The crime information was combined with socio-economic information obtained from the 1994 October Household Survey. This survey provided the 1994

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11 Brown (1998) provides a detailed analysis of the crime data and the limitations of this data.
information per magisterial district concerning income earned, the unemployment rate, educational attainment, age, gender, mothers, degree of development, extent of family instability and population density. In order to conduct the empirical analysis, measures for each of these variables were derived. The 1995 Income and Expenditure Survey conducted by the then Central Statistical Service was also used to provide more reliable income information at magisterial district level, specifically in order to calculate the gini coefficient and poverty-gap index, albeit for 1995.

The results from the Pearson pairwise correlation between the crime rate and the other variables are presented in Table 1 below.

Table 1. The Pearson Pairwise Correlation between the Crime Rate and Important Variables.

<table>
<thead>
<tr>
<th>Variable Type</th>
<th>Variable Name</th>
<th>Expected Sign</th>
<th>Correlation Coefficient</th>
<th>Level of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Law Enforcement</td>
<td>Probability of Prosecution, given Crime</td>
<td>negative</td>
<td>-0.2599</td>
<td>0.0134**</td>
</tr>
<tr>
<td></td>
<td>Average Length of Prison Sentence</td>
<td>negative</td>
<td>-0.0430</td>
<td>0.6871</td>
</tr>
<tr>
<td>Economic</td>
<td>Poverty-gap Index</td>
<td>negative</td>
<td>-0.1091</td>
<td>0.3059</td>
</tr>
<tr>
<td></td>
<td>Median Income / Gini Coefficient</td>
<td>negative / positive</td>
<td>-0.0551 / -0.0791</td>
<td>0.6059 / 0.4583</td>
</tr>
<tr>
<td></td>
<td>Unemployment Rate (expanded definition)</td>
<td>negative / positive (business related)</td>
<td>-0.2402</td>
<td>0.0226**</td>
</tr>
<tr>
<td></td>
<td>Average Number of Years of Education</td>
<td>negative / positive (business related)</td>
<td>-0.2808</td>
<td>0.0074***</td>
</tr>
<tr>
<td></td>
<td>Standard Deviation in Education Years</td>
<td>positive</td>
<td>-0.2101</td>
<td>0.0468**</td>
</tr>
<tr>
<td>Average Age</td>
<td>Proportion of Population Younger than 15 Years</td>
<td>positive</td>
<td>0.1866</td>
<td>0.0782*</td>
</tr>
<tr>
<td></td>
<td>Female/ Male Gender Ratio</td>
<td>negative</td>
<td>-0.1151</td>
<td>0.2900</td>
</tr>
<tr>
<td></td>
<td>Female Median Income</td>
<td>positive</td>
<td>0.0508</td>
<td>0.6343</td>
</tr>
<tr>
<td></td>
<td>Female Average Income / Female Average Education Years</td>
<td>negative / positive (business related)</td>
<td>-0.0411 / -0.2370</td>
<td>0.7002 / 0.0245**</td>
</tr>
<tr>
<td></td>
<td>Female/ Male Ratio of Unemployment Rate</td>
<td>positive /</td>
<td>-0.1787</td>
<td>0.1359</td>
</tr>
<tr>
<td>Variable Type</td>
<td>Variable Name</td>
<td>Expected Sign</td>
<td>Correlation Coefficient</td>
<td>Level of Significance</td>
</tr>
<tr>
<td>---------------</td>
<td>--------------------------------------------------------------------------------</td>
<td>---------------</td>
<td>--------------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>(narrow definition)</td>
<td>Proportion of Mothers that Work</td>
<td>negative (business related)</td>
<td>-0.0648</td>
<td>0.5441</td>
</tr>
<tr>
<td>Socio - Economic</td>
<td>Ratio of Workers in Manufacturing to Service Industry Workers</td>
<td>negative</td>
<td>-0.2062</td>
<td>0.0801*</td>
</tr>
<tr>
<td></td>
<td>Proportion of Female Headed Households</td>
<td>positive</td>
<td>-0.1500</td>
<td>0.1582</td>
</tr>
<tr>
<td></td>
<td>Proportion of Population that Resides in Urban Area</td>
<td>positive</td>
<td>-0.2163</td>
<td>0.0406**</td>
</tr>
</tbody>
</table>

 level of confidence: * 90 per cent level  ** 95 per cent  *** 99 per cent

In order to meaningfully interpret these results, it is important to refer back to the previous section in which an interdisciplinary theory of crime causation was developed. In brief, the law enforcement variables, the probability of punishment and the cost of the sentence, affect both the supply and demand for offences. The effects are, however, not contradictory as in both cases greater deterrence shifts the curve leftward and therefore results in a reduction in the number of offences. Except for population density which also influences the probability of punishment, the other economic and socio-economic variables all influence only the supply of offences, via their effects on the net earnings from legitimate activities and on the net earnings from illegitimate activities. These effects are more often than not contradictory and therefore care must be taken in interpreting the results.

The law enforcement variables, probability of prosecution given crime and average length of prison sentence, are indeed negatively related to the overall crime rate in South Africa as predicted in the theory of crime. The unemployment rate measure, average age and the ratio of workers in manufacturing to service industry workers display negative signs on the correlation coefficients. This is in line with an interdisciplinary theory of crime. The ratio of workers in manufacturing to service industry workers
decreases as economic development occurs and the crime rate increases. All the unemployment rate variables, including the gender measures, are negatively related to crime. In terms of an interdisciplinary crime theory this appears to indicate that unemployment is important in determining business related crimes specifically.

Some variables display signs on the correlation coefficients which are puzzling in terms of an interdisciplinary theory of crime. The income Gini coefficient is most often thought to be positively related to the crime rate. This is also thought to be the case for the standard deviation in education years. Yet it appears that in South Africa the greater the inequality in income and educational attainment in an area, the lower the crime rate. Then, the proportion of mothers that work are expected to have a positive sign according to Hagen's theory (Curran and Renzetti 1994). This is not the case in South Africa and it is evident that the financial contributions of working women discourage crime, probably owing to the fact that average household income is raised. Finally, contrary to theoretical expectations, the proportion of female headed households is negatively related to crime in South Africa. However, the South African finding is not uncommon in comparative work (Lafree et al. 1992).

The proportion of the population residing in an urban area is negatively correlated with the crime rate. With regard to the international literature, Howsen and Jarrel (1987: 454-455) suggest that this relationship is non-linear and is first negative and then positive. Thus South Africa is still in the first phase in which the increased population density accompanying urbanisation results in increased official law enforcement capacity and familiarity among people. These factors increase the direct and moral costs of pursuing crime and also raise the probability of punishment and therefore
lowers the crime rate.

While median income is positively related to the crime rate, the income poverty-gap index is negatively related to crime. Wong (1995: 237) emphasises the importance of distinguishing income related variables which influence the expected returns from illegitimate activities from those that influence the returns from legitimate activities. Median income is related to the income earning population and therefore to the potential earnings from undertaking criminal activities which victimise this population, while the poverty-gap is related to the proportion of the population that is largely marginalised in terms of earnings from legitimate employment. This relationship between income variables and the crime rate remains evident when considering the gender variables, where average income is an indicator of potential earnings from legitimate employment.

The average number of years of education is a significant deterrent of crime. However, the level of education attained is important. Education is only a crime deterrent above the primary education level. In fact, the proportion of the population with primary education is positively related to the crime rate. All the education measures which involve gender comparisons are less significant but they show education as a deterrent at the lower levels. However, the comparative proportion of the population with tertiary education is positively related to the crime rate, which indicates business-related crime.

The correlation coefficient on the proportion of the population younger than 15 years is positive and significant. This implies that in South African terms, youths involved in crime are indeed very young. The female to male gender ratio is negatively related to crime, confirming the general belief that most crime is committed by men. However, the
female level of income and of education appear to indicate that female marginalisation is relevant to the South African situation as an explanation of crime causation.\textsuperscript{12}

The various law enforcement, economic and socio-economic variables can be ordered in terms of their relative importance as determinants of the crime rate by considering the level of significance in the table. It should be noted that the most important determinants of crime in South Africa appear to be the economic variables, with the education variables being the most significant of these. Three of the nine variables that are significant in determining South African crime rates are education variables. The age variables are also extremely significant crime determinants. Female average education is also a significant deterrent.

Law enforcement variables are also significant determinants of crime. The probability of prosecution is significant in determining crime. As predicted in neoclassical economic theory, the probability of prosecution is far more significant as a deterrent than the probability of a prison sentence, which is more deterring than the magnitude of punishment. The socio-economic variables, however, also appear to be more important determinants of crime than the law enforcement variables and need to be included when the model of the market for offences in South Africa is estimated. The ratio of workers in manufacturing to service industry workers and the proportion of the population residing in an urban area are significant crime determinants. Given this outcome, it is clear that an interdisciplinary approach to crime causation is superior to a narrow approach based on any specific theory.

\textsuperscript{12} Income and education inequality indicators relating to race also imply that the marginalisation of certain race groups in South Africa contributed towards crime. A discussion of racial inequalities has been excluded from this paper, owing to the limitation on space.
5. CONCLUSION

The aim of this study was to develop and present a general framework for the understanding of the possible causes of the high crime rate in South Africa. The conventional economic theory of crime was considered and it was determined that the main focus of economists has been on the influence of law enforcement variables on crime, although the economic model of the market for offences also suggests the importance of economic and socio-economic variables. In this study, however, the model of the market for offences was considered in its broadest sense as a paradigm for an interdisciplinary theory of crime.

The contribution of an interdisciplinary approach to crime causation should not be underestimated. In South Africa and worldwide increased public expenditure on the criminal justice system is not deterring crime. An interdisciplinary theory of crime provides a consistent and integrated framework to broaden the debate on crime causation and the accompanying debate on appropriate crime prevention policy. In particular, in this study an understanding is gained of the socio-economic variables which could be manipulated in order to raise the potential criminal's net earnings from legitimate activities and/or reduce their net earnings from illegitimate activities. The interdisciplinary theory allows for the assessment of the merits of competing theories in practical terms for the South African situation.

Within the context of an interdisciplinary theory of crime, a preliminary analysis of South African data was undertaken in order to assess the relative importance of various law enforcement, socio-economic and economic variables in determining the South African crime rate. From
the pairwise correlation results it is clear that no one
category of variables predominantly explains crime in South
Africa. The interdisciplinary approach to crime causation
adopted in this study is therefore appropriate as all the
theories concerning crime causation, both the economic and
non-economic, add important insights into the crime
problem. In terms of crime prevention policy, the current
narrow focus on the reform of the criminal justice system is
inappropriate in South Africa, especially given that
education variables, particularly, are such significant
determinants of crime. Alternative methods of crime
prevention that relate to the direct causes of crime must be
considered. Essentially the activities of all government
agencies, not only the criminal justice system, must be
considered regarding their ability and cost-effectiveness in
crime prevention if the government is to effectively address
the crime problem.

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