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Crime As a Social Cost of Poverty and Inequality: A Review Focusing on Developing Countries

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When rural life was still dominant in today's industrial countries, villagers often saw cities as the domain of evil and the realm of corruption and violence. At the time, the process of accelerated urbanization and economic development was seen as being inherently wicked. The widely publicized criminality and violence observed today in several metropolises in both industrial and developing economies seems in hindsight to justify this bucolic bias. The alarming surge of crime and violence in Mexico City, Rio de Janeiro, or São Paulo during the last 20 years may indeed be the result of the excessively rapid growth of these megacities. Similarly, the increasing minor criminality experienced today in many large cities' suburbs in industrial countries might be the delayed consequences of an urbanization process that was too quick and insufficiently controlled.

Yet all experiences are not alike. Big cities exist where crime and violence rates are at tolerable levels and have shown no sign of increasing in line with the cities' geographic or demographic size. These cities may have other problems like pollution or congestion, but they show that urbanization is not necessarily an evil and that economic development does not necessarily bring with it crime, violence, and, more generally, the erosion of social capital. Other conditions must be present for such an adverse evolution to take place. Identifying these conditions is important for minimizing the negative social externalities of economically profitable urbanization and development.

Many explanations exist for differences in criminality across countries or cities and its evolution over time. The most important causes are probably sociological or cultural. In this chapter we focus on causes that may be directly related to economic phenomena and, in particular, on two variables that have been repeatedly considered potentially powerful determinants of crime and violence: poverty and inequality. The economic motivation behind crime is essentially the appropriation of somebody else's property. Another motivation is the pursuit of illegal activity even at the risk of being caught and punished. Therefore, criminal offenders are likely to be found among those who have relatively more to gain from these activities and relatively little to lose in case they are caught. Individuals such as these presumably belong to the neediest groups in society, their number being greater and their motivation being stronger the more unequal the distribution of resources in society. If this is the case, then important questions to ask about the possible negative social externalities of urbanization are why this process may generate in some instances more poverty and inequality and how this may be remedied.

By focusing on the possible economic causes of urban crime and violence, we do not want to imply that other determinants are less important. Again, the major causes for differences in crime rates among countries or cities are probably found in cultural and political alienation, ethnic conflicts, media violence, inappropriate role models, and other related phenomena. Even though economists may have something to say, their views on all these issues are likely to be of secondary importance compared with those of criminologists and sociologists. Therefore, the main question we address in this chapter is whether economic conditions, and, in particular, the extent of absolute and relative poverty, may be considered

significant determinants of crime, together and possibly in connection with the preceding social factors. We will also address the independent issue of the economic cost of crime.

Even though the economic determinants of crime and violence may be considered essentially empirical, we also look at the issue of economic determinants from a theoretical perspective. The need for some theoretical analysis arises from the fact that the relationships among poverty, inequality, and criminality are not as simple as the preceding argument would suggest. In particular, keeping in mind that crime deterrence and protection expenditures are endogenous is important. As these factors may depend on the degree of inequality, the effect of inequality on crime is, on balance, not clear. Another concern that justifies some theoretical analysis is that casual observation suggests that property crime, which corresponds to the simple economic model alluded to earlier, is neither the only type of urban criminality nor the only cause of urban violence. Deadly gang wars across poor neighborhoods and murders and crimes caused by or linked to alcohol, drug consumption, and drug dealing are in many large cities of the developing and industrial world the everyday expression of urban criminality and violence. Can some economic model explain the appearance of these phenomena and their deleterious effects on the communities and neighborhoods where these types of activity take place? Or, again, is the explanation to be mostly found elsewhere?

The need for theoretical reasoning also arises because of the paucity of relevant data measuring the importance of these various phenomena and how they relate to various economic and social factors. As we shall see, data on crime and violence are scarce and often not comparable across countries. This difficulty is even greater in developing countries. Interpreting the little evidence that is available thus requires greater reliance on deductive arguments and hypotheses borne out from simple economic analysis than would be the case if a more data-intensive statistical analysis were possible.

This being said, available evidence, even though it is limited, suggests that inequality and poverty may indeed have a significant positive effect on criminality. Cross-country differences are not inconsistent with such a view, but they may be contaminated by various fixed effects and may not be convincing. Pooled, cross-sectional time series data provide stronger evidence that changes in poverty or inequality are generally accompanied by changes in criminality and that this effect exhibits some persistence. Evidence also indicates that the social cost of crimes may be considerable in countries with a higher than average level of criminality. Rough estimates suggest, for instance, that the cost of crime may be larger than 7 percent of gross domestic product (GDP) in Latin America, in comparison with 4 percent in the United States and 2 percent or less in European countries and many Asian countries. Still higher figures would be obtained in the case of Latin America if focusing exclusively in urban areas were possible.

These various pieces of evidence taken together suggest that the social cost of any increase in inequality and poverty that occurs through the channel of higher criminality may be substantial. Under these conditions, making sure that economic development, and, in particular, the urbanization process, which is more closely related to the evolution of crime, takes place evenly and equitably is an important requirement for its overall efficiency. Alternatively, if one believes that other, noneconomic determinants of crime are more important than poverty or inequality, the preceding figures suggest that the benefit of any policy aimed at reducing the effect of these noneconomic determinants may in some cases be large.

Crime and Crime Trends: International Comparisons of Orders of Magnitude

This section must start with an important warning. Data on criminality are generally of rather bad quality. The most common source consists of police reports. However, this source is biased in that far from all crimes are reported to the police. Various reasons for this bias exist. Victims may not want to report crimes to the police because they are not easily accessible, or because they prefer to rely on their community's internal justice. Sometimes victims will not report crimes because they know that the police are powerless to apprehend criminals and obtain reparation. Sometimes they do not want others to know what happened to them. Police reports are therefore likely to yield an underestimation of criminality and to unevenly cover

different areas and different types of crimes. It may also be in the interest of the police to report inaccurate figures. In particular, under-reporting will occur if there is a need to hide inefficient performance. Victimization surveys, in which a representative sample of individuals is asked whether they have been victims of a crime, at what cost, and under what circumstances, are more reliable data sources. They also show that police reports are indeed biased. Although such surveys are currently available only in a limited number of countries and often at a single point in time, their number is increasing.

As a result of these surveys' scarcity, international comparisons must rely primarily on police report data. Because of the nature of the biases just mentioned, these data may be considered better for serious crimes, such as homicides and major robberies. They are certainly decreasingly reliable as one goes down in the hierarchy of crimes. This may be readily observed in the database maintained by the United Nations, the United Nations World Crime Surveys of Crime Trends and Operations of Criminal Trust. Series for homicides are available for a rather large number of countries, at least for some subperiods. They are apparently consistent in the sense that no abnormal change in orders of magnitude occurs in the series. Yet these series are unavailable for various countries or available for periods that are too short or too distant to be of much interest. Series for robberies are available for still fewer countries and often show inconsistencies suggesting radical changes of definition or coverage. Yet identifying a subsample where data are approximately consistent is still possible. Series for crimes of less gravity—major thefts, thefts, burglaries, fraud, and so on—are still worse and practically unusable, except for those of a few industrial countries.

We discuss here some summary statistics obtained from the homicide and the robbery series of the United Nations database. As discussed, the homicide series is likely to be the most reliable.¹ Moreover, it can be expected to correlate somewhat with the actual, as opposed to the observed, robbery rate. This is the case, for instance, if a more or less constant proportion of robberies led to the death of a victim. In effect, the correlation between both sets of series in the United Nations database is rather high. The rank correlation computed for all series after pooling all countries is 0.40.

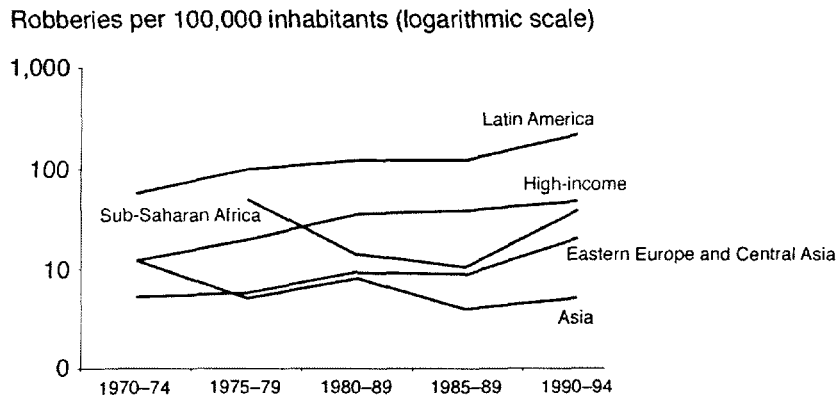
Figures 10.1 and 10.2 show the evolution of five-year average crime rates for large regions of the world, as roughly estimated using figures from the United Nations database (Fajnzylber, Lederman, and Loayza 1998). These figures refer to the median of five-year country averages in each region. Note that (a) the sample of countries may change from one period to another, and (b) the number of years for which averages are computed differs across countries and subperiods. However, as the time variation of crime rates in contiguous years is not important, the major potential source of bias is due to the changes that take place in the sample of countries. Computations made on samples comprising too few countries have been eliminated, which is the reason the Middle East and North Africa region does not appear in figure 10.1. However, some observations are of little significance. This is, in particular, the case for the 1985–89 drop in African crime rates. Following Fajnzylber, Lederman, and Loayza (1998), the median may be considered more reliable than the mean, because it is insensitive to potentially inconsistent extreme values. However, the overall picture is not that different whether one uses the median or the mean.

Before examining these figures, it may be useful to keep some orders of magnitude in mind for further reference. Because data are more reliable in high-income countries, it seems natural to use these countries as a basis for comparison. Among them, the United States stands at the upper extreme with a frequency of robbery ranging from 170 to 260 per 100,000 inhabitants in 1970–94, and a homicide rate ranging from 6.5 to 10 per 100,000 inhabitants. Criminality is roughly 30 percent lower in Europe. The United Kingdom is at the lower end of the range for large countries with a robbery rate around 60 per 100,000 inhabitants and a homicide rate below 2 per 100,000 inhabitants in 1970–94. In figure 10.1, we can see that these numbers roughly correspond to median rates of the whole group of high-income countries.

¹ To test this reliability, it is also possible to compare these series with data from the World Health Organization on causes of death, one of which is homicide. An informal calculation based on mean homicide rates from the period 1970–84 or subperiods led to a rank correlation between the two sources equal to 0.60. This is not too bad, but far from satisfactory for both sides of the comparison.

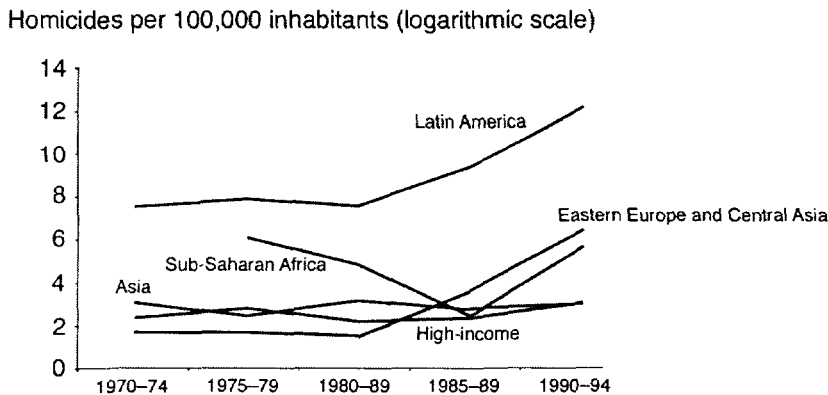
However, it must be kept in mind that all the preceding figures are national averages. Criminality would be higher if only major metropolitan areas were considered. For instance, the homicide rate in New York City is approximately twice the national average, or 20 per 100,000 inhabitants compared with the national average of 10 homicides per 100,000 inhabitants.

Figure 10.1. Evolution of Robbery Rates: Regional Median 1970–94



Source: Fajnzylber, Lederman, and Loayza (1998).

Figure 10.2. Evolution of Homicide Rates: Regional Median 1970–94



Source: Fajnzylber, Lederman, and Loayza (1998).

When looking at the different regions, the most salient feature of figure 10.1 is without doubt the extremely high level of criminality in Latin American and Caribbean countries. The level, compared with the other regions of the world, is striking. The reported robbery rates are almost uniformly comparable among Latin American and Caribbean countries to what the reported robbery rate is in the United States, that is, around 200 per 100,000 inhabitants. It is often higher, even in countries such as Costa Rica or Uruguay that one would have considered rather peaceful or nonviolent in view of their relatively

developed social services systems. The same is true of homicide rates, which probably are more directly comparable across countries. Homicide rates are close to 5 per 100,000 inhabitants in Argentina, 7 per 100,000 inhabitants in Costa Rica, 14 per 100,000 inhabitants in Venezuela, 18 per 100,000 inhabitants in Mexico, and 20 per 100,000 inhabitants in Brazil. A somewhat exceptional case is Colombia with its homicide rate of 80 per 100,000 inhabitants.

Again, these figures are severe underestimates of what is going on in cities. In 1995, the homicide rate was 80 per 100,000 inhabitants in Rio de Janeiro and 52 per 100,000 inhabitants in Caracas, as opposed to 20 per 100,000 inhabitants and 14 per 100,000 inhabitants for national figures (Londoño and Guerrero 1998). The same tendency to underestimate is probably true for robbery. Although the following figures are not comparable with robbery rates appearing in the United Nations database, Londoño and Guerrero (1998) report the results of victimization surveys where the proportion of adults who have been the victims of armed robbery in the preceding 12 months reached 9 percent in Rio de Janeiro and 17 percent in Caracas. These figures are more than ten times those of the highest police-reported robbery rates in the region. However, it is likely that the definitions of crime used in these various sources are not fully consistent with each other.

Criminality is much less of a factor in other regions of the world and, with the exception of Africa for homicide rates, more comparable with what may be observed in high-income countries. However, a serious underreporting bias for robberies in many of these countries may exist compared with high-income countries. In addition, a lot of diversity may be present behind the median rates shown in figure 10.1. For instance, the figures for Asia do not mean that criminality is uniformly lower there than in the rest of the world. The homicide rate in Thailand, 20 per 100,000 inhabitants, is one of the highest in the world and that of India is comparable with the homicide rate in the United States.

Given the lack of comparability of crime rates across countries, the time dimension in figure 10.1 may be more relevant than the cross-sectional dimension. From this point of view a clear upward trend seems to be present in various regions either throughout the period, or at least over the last 5 to 10 years. This is most noticeable for Latin America and Caribbean and the Eastern Europe and Central Asia regions, for both homicide and robbery rates. The robbery rate in high-income countries also seems to be experiencing an upward trend.

Unfortunately, considering longer historical trends in these regions with the same degree of precision is not possible. Some evidence indicates that, overall, crime and violence has been falling since the beginning of the 19th century (see Chesnais 1981). However, this process may not be continuous. For instance, the evolution of homicide rates in industrial Western societies may have followed a J curve, the bottom of the curve having been reached around 1930 (Tonry (1997, introduction).

On the whole, the few aggregate data reviewed in this section suggest that at all levels of development considerable heterogeneity is present in all countries with respect to the extent of criminality. This does not hold true when countries are grouped by regions, because of the concentration of most Latin American and Caribbean countries at the upper end of the criminality range. However, a considerable heterogeneity remains within practically all regions. The significant change in crime rates in various countries at different levels of development over the last 10 years shows that criminality is not a purely structural characteristic of society that can only change slowly and ineluctably in time with the process of economic, social, and cultural development. It is therefore important to examine the possible determinants of that evolution. The rest of this paper provides a review of existing economic theories of crime and an examination of the empirical relationship between criminality and its possible determinants.

Crime, Poverty, and Inequality: What Economic Theory Has to Say

Becker first developed the canonical theoretical model of the economics of crime in 1968, and Ehrlich (1973) subsequently gave it some empirical content. We briefly summarize the basic argument behind this model with a simple general framework that will be used throughout this chapter. Then we will discuss

the implications of the canonical model and consider various possible extensions likely to modify these implications. (A more systematic review of theoretical models of crime is available in Bourguignon 1998.)

Let us assume that society is divided into three classes: the poor (p), the middle (m), and the rich (r), with resources or wealth (w), such that $w_p < w_m < w_r$. Let also n_p, n_m , and n_r be the demographic weights of these three classes in society. Assume that the utility function of wealth is logarithmic and let crime activity be represented in the following simple manner. Crime pays a benefit (x) with probability $(1-q)$ or crime results in sanction or fine (F) with probability q ; q is the probability of being caught. We do not specify how much the fine, F , is, but assuming that it is proportional to the wealth of the individual (i), w_i , makes things simpler. Criminal activity is an all or nothing decision. In each class, an individual i with wealth w_i will opt for criminal activity if:

$$(10.1) \quad (1-q) \cdot \text{Log}(w_i + x) + q \cdot \text{Log}(w_i - F) > \text{Log} w_i + h_i$$

The variable h_i describes the degree of honesty of the individual. It is assumed that this variable is independent of the level of income and that it is distributed uniformly throughout the population over the interval $[0, H]$, where H is a characteristic of the whole population. Where F is proportional to wealth, it can be seen that rich people for whom x is small in proportion to their initial wealth, w_r , will never find crime an attractive option. To simplify, let us go further and assume that for individuals in the middle and rich classes engaging in criminal activities is never an optimal choice, even if their degree of honesty is low. In other words, condition (10.1) is never satisfied for people in classes m and r even when $h_i = 0$. However, we assume that it is satisfied when $h_i = 0$ in class p , but not when $h_i = H$. This means that a proportion of people is always present in the poor class, p , who will engage in crime. Finally, suppose that the benefit from crime x is a proportion b of the mean income or wealth in the population: $x = b\bar{w}$. This would be the case, for instance, if crimes consisted of robberies and thefts the victims of which are randomly selected from the population. When comparing different societies, this assumption is also a way of representing the fact that, loosely speaking, the benefit of crime is related to the average level of affluence in society.

Given these assumptions, the following equation gives the crime rate, or percentage c of criminals in the whole population. The following rate is simply the product of the proportion of poor in society times the proportion of individuals among the poor with h satisfying condition (10.1):

$$(10.2) \quad c = \frac{n_p}{H} \cdot \left[\text{Log} \frac{w_p + bw}{w_p} - q \cdot \text{Log} \frac{w_p + bw}{w_p - F} \right] = C(n_p, \frac{\bar{w}}{w_p}, \frac{F}{w_p}, q, H)$$

According to the canonical model, the crime rate thus depends positively on the extent of poverty and income inequality, as measured by the proportion of poor, n_p , and the ratio w/w_p , and negatively on crime-deterrent variables. The latter variables consist of the probability of being caught, q , and the size of the penalty, F , relative to initial income. In addition, the crime rate depends negatively on the cultural or sociological attitude toward crime or the extent of honesty within society, as represented by H .

Although urbanization does not appear anywhere in the preceding argument, it is implicit in the preceding model. In comparison with small villages and rural areas, cities guarantee anonymity and therefore diminish the probability q of being caught after a crime. Starting from a small city size, one may expect that, other things being equal, the crime rate increases with the increasing size of the city.

The probability of crime detection cannot be taken as given and independent of the crime rate. What is more likely to be exogenous is the amount that the urban community is spending on crime prevention and detection, or, roughly speaking, on police. Assume P to be the corresponding amount of public and private expenditure on crime prevention per inhabitant, for example, police expenditure per capita. It is natural to assume that:

$$(10.3) \quad q = G(P, c)$$

where $G(\cdot)$ is a kind of production function of police activity. The probability q of being caught is assumed to increase—at a decreasing rate—with P and decrease—at an increasing rate—with the crime rate c . Substituting in (10.2) and solving with respect to c yields a new reduced form crime function:

$$(10.4) \quad c = C^*(n_p, \frac{\bar{w}}{w_p}, \frac{F}{w_p}, P, H)$$

where the argument corresponding to the probability of being caught, q , has simply been replaced with police expenditures per inhabitant. Therefore, the statement that the crime rate increases with city size, at least to some extent, implicitly assumes that police expenditures do not increase with city size. This raises the question of what determines the importance of police expenditures, which we will discuss in more detail later.

To complete this simple theoretical framework, we now evaluate the social loss due to crime. This loss is made of three components: (a) the direct cost of crime, that is, the physical and psychological pain of the victims, (b) the cost of crime prevention P and the cost of the judicial system, (c) the implicit cost F of sanctions to convicted criminals, typically foregone earnings, due to imprisonment, which justifies F being proportional to w_p . Assuming that the cost of pain is a proportion s of the economic cost of crime, $x = b\bar{w}$, the social loss L per capita associated with a crime rate c amounts to

$$(10.5) \quad L = c.m.s.(b\bar{w}) + P + c.q.[j] + c.q.F$$

where q and c are given by (10.3) and (10.4), m is the number of crimes committed by each criminal, and j is the average cost of criminal justice per criminal. Note that the direct economic cost of crime, $x = b\bar{w}$, does not appear in that expression. This is because crime is actually equivalent to a transfer from victims to criminals and therefore cannot be considered a social loss. Sala-i-Martin (1996) proposes an analysis of the effects of crime on growth that follows these lines.

Despite its obvious simplicity, the preceding model has several interesting and important implications for the analysis of crime. To understand them better, however, it is important to define more precisely the kind of criminality that is the basis of this model. It must be clear, that the preceding economic argument better fits crimes concerning property that offer some economic gain, than crimes against persons. It cannot be denied that homicides, intentional or not, are more frequent among poor and less educated people and in areas where the police presence is small. The homicide rate in a given area may thus be determined much by the same variables as the rate of property crime. However, given the exceptional character of this type of crime—when it is not directly linked to property crime as in some robberies—the relationship among these variables is most likely to be weaker than it is for property crime. In particular, one expects the urban bias in criminality to be much less pronounced for homicide than it is for property crimes. This being said, the argument leading to the crime rate function (10.4) also applies to any illegal activity in which somebody else's property is criminally confiscated. Drug dealing, illegal gambling, and prostitution also fit the basic representation (10.1) that gives the likelihood for an individual to undertake some form of criminal activity. However, the reward of the latter activities need not be related to the average affluence of victims. For that kind of crime $b\bar{w}$ in (10.4) should be replaced by some arbitrary value x , which may still depend to some extent on the affluence of society. The relationship between crime and inequality or poverty would then be somewhat modified.

From the point of view of economic policy, the first arguments in the general crime function (4) are the most interesting. They suggest that a process of economic development, or in the present context, a process of urbanization, accompanied by an increase in the rate of poverty or in the degree of inequality should lead, other things being equal, to an increase in the rate of crime. Rigorously speaking, the additional income generated in the process of urbanization should thus be reduced by the social loss of

crime appearing in equation (5) and the rate of economic growth corrected accordingly. We shall soon see that this cutback may be substantial.

This in turn raises the question of what type of urbanization to encourage. The distinction between push and pull factors in internal migrations is relevant here. On the one hand, urbanization proceeding mostly from factors that push rural population toward cities without any dynamic process of job creation in place will most probably contribute to an increase in urban poverty and inequality, and therefore in criminality. On the other hand, urbanization driven by a fast process of accumulation that results in a rapid expansion of the demand for labor should contribute to an increase in urban incomes and therefore a drop in the rate of crime and illegal activity. In practice, the migration process lies somewhere between these two extremes and may be directly influenced by policy. This is true in particular when migrants have a foreign origin, which may add an additional sociological dimension to the original model.

The preceding argument, or hypothesis, has a long-term orientation. In the shorter term, according to the general crime function $C^*(\cdot)$, any increase in the extent of poverty, either through an increase in the term n_p , or through a drop in w_p , is likely to increase the crime rate. This is reinforced by the natural inertia in the other arguments of the function. Under these conditions, a surge in criminality can be expected to accompany violent economic recessions. In addition, if there is some hysteresis in this process, for instance, through progressive erosion of the honesty variable h in times of higher criminality, then the volatility of economic activity may be considered a factor that aggravates crime.² According to these hypotheses, the social cost of macroeconomic adjustment—which often falls disproportionately on the urban sector—must be measured not only in terms of increased urban poverty, but also in terms of increased present and future criminality.

The third and fourth arguments of the general crime function, $C^*(\cdot)$, refer to the direct control that policymakers may have on crime through the sanctions decided by the judicial system and the probability of crime detection, which is determined by expenditures on the police force. The proposition that sanctions must be as tough as possible to deter crime for the lowest possible social cost has been well known since Becker's (1968) article. At the limit, an infinite penalty F would altogether deter crime and would make police almost unnecessary. However, some constraints naturally prevent this from happening. These constraints include concerns about the moral and constitutional rights of criminals, which prevents implementation of sanctions that are too severe and the necessary graduation of severity in relation to the severity of crime. Another constraint is the cost of administering sanctions (incarceration) or, more generally, the administrative capacity of the judicial system and possibly the social cost of sanctions, for example, days of work lost in imprisonment. An important part of the theoretical literature in this area focuses on the case where part of the sanction is a fine with negligible implementation costs (Garoupa 1997 provides a complete survey of this literature). Naturally, payment cannot be obtained from convicted criminals who have no economic resources, which is probably most frequently the case in most developing countries. This means that incarceration is the main type of sanction, at least in countries adhering to human rights and thus excluding archaic physical sanctions such as cutting off thieves' hands as in the law of some countries. To summarize these last points, much like expenditures on police, the severity of sanctions and the capacity of the judicial system to administer them often result from budgetary decisions, and therefore tradeoffs among various uses of public money.

In view of this, two lines of analysis may be developed. From a policy point of view, one may examine what would be the most efficient allocation of public funds between criminal justice and police systems on one hand and all alternative uses on the other. This allocation depends on existing technology in the field of crime deterrence and punishment and requires determining with some precision the marginal social costs and benefits of existing instruments. This is a rather delicate task. Some work has been done on whether

² One channel hysteresis goes through is the anticipation of the probability q of being caught by would-be criminals. In times of recession, the rate of criminality increases as a result of the first arguments of function (4), whereas police expenditures remain the same. It follows that the rate of crime increases and the rate of detection falls. When returning to normal times, criminals' anticipation of the probability of crime detection and therefore the rate of crime may fail to adjust to their initial level. For such an expectational model of crime, see Sah (1991).

"prisons pay" in the United States (Piehl and DiIulio 1995). The desirability of anticrime policies such as "zero tolerance", "three strikes and you're out," "fixing broken windows," which have been debated extensively in the United States, would also need to be analyzed within such a framework (Kelling and Colis 1996; Massing 1998). However, in most countries, and particularly in developing countries, the database necessary to make the corresponding calculations is not generally available.

Public expenditures on criminal justice and police lead to an analysis of crime and its evolution that is partly based on the public decisionmaking process behind these expenditures. In times of rapid urban expansion, all public infrastructure, including that linked to crime prevention and sanction, tends to lag behind the needs of the population. This implies an increase in criminality, if all other things are the same. In turn, civil society expresses an increased demand for crime deterrence, part of which will be effectively met. How much depends on public spending decision mechanisms, and possibly on the social structure of urban society. Through the political economy mechanisms that determine spending on crime deterrence, economic and social inequality may in effect play an indirect role on crime, in addition to the direct incentives economic and social inequality represent for criminals. It is not clear, however, whether more inequality should lead to a larger anticrime budget or whether the opposite is true. Not only the structure of society and the political weight of the various classes is important here, but also the social geography of the city and the technology available for crime prevention. One may well imagine instances where the public decision mechanism concerning spending on crime deterrence leads to rich neighborhoods and business districts being heavily protected and relatively little being spent on poor neighborhoods and more general crime disincentives. Such a mechanism may explain why, in many societies, not only criminals, but also victims, are found predominantly among disadvantaged social groups.

Another point to take into account is the ability of part of the population to buy private protection in the form of more or less sophisticated alarm systems, private guards, and strict residential segregation, which improves the capacity to spot intruders and would-be criminals. If the social class that can afford this type of security has some control over political decisions, one may well imagine a situation where nothing substantial is done to increase public security outside these residential areas despite mounting criminality overall.

An important implication of private protection against crime is that it may drastically modify the relationships among poverty, inequality, and crime. In effect, self-insurance against crime minimizes the relationship between the crime rate and poverty. This works because potential victims anticipate the increased poverty and inequality that is associated with an unbalanced process of urbanization to increase crime risks and buy additional protection, which reduces the actual change in criminality. However, the marginal social cost of poverty and inequality going directly or indirectly through crime remains the same. Expression (5) illustrates this loss; the effect of a marginal increase in the rate of crime c at constant police expenditures P is simply replaced with a change in the private protection part of P .

The last argument of the general crime function (4) is certainly the most difficult to discuss for an economist. For the sake of simplicity, it was referred to as an honesty parameter. However, one should actually include in it all the variables that may explain that given specific cost-benefit ratios of crime and some other characteristics of the justice and police systems, the degree of crime may vary drastically from city to city or from country to country. These variables include ethnicity, religion, family structures, residential segregation, and so on. Some of these factors may clearly be related to economic phenomena. The increase in the numbers of lone mothers in urban areas is probably not unrelated to the conditions of the labor market (see, for instance, Burtless and Karoly 1995 for the case of the United States). Large numbers of lone mothers are also often singled out as a powerful sociological factor of violence (Akerlof 1998; diIulio 1996). Likewise, residential segregation has been analyzed as a mechanism for reproducing existing economic inequalities (see, for instance, Benabou 1994). The parameter H in the general crime function (4) thus provides a third channel through which economic cycles or the equalizing or unequalizing nature of the urbanization process may affect crime and violence. The first channel is through the direct benefit and cost of crime, and the second goes through public decisionmaking in

matters of crime deterrence, while this third one goes through the influence of economic conditions on some sociological factors behind the propensity of individuals to commit crime. For a general analysis of these factors with a framework similar to the one presented here, see Hagan (1994).

In any case, the main economic mechanism directly linked to the honesty variable is probably the way social capital may be eroded durably due to an increase in the crime rate whose causes lie in the economic sphere. In the presence of more crime that results from the adverse effects on poverty and equality of a long and severe economic recession, moral and social structures are likely to be weakened, which in turn may increase the prevalence of crime and violence (Akerlof and Yellen 1994).

A possible objection to this and most of the preceding arguments is that they take too much an economist's view of criminal behavior and they may therefore be misleading for policy. For instance, many observers insist that violence in big metropolitan areas of industrial and developing countries is often not directed toward the property of others, but takes place internally within specific segments of society located in the poorest districts (Moser 1998). An obvious example of this is the violence involved in conflicts that relate to the control of illicit activities like drug dealing, drug trafficking, gambling, and prostitution. In many violent parts of today's metropolises this type of activity, rather than more conventional property crimes like burglary or robbery, seems to be the single dominant cause for the development of violence and the surge in homicides. Another departure from the canonical model might lie in the low probability of crime detection and sanction noted in many crime and violence studies in marginalized urban areas of developing countries. Typically, the probability of being arrested and incarcerated for a murder is estimated to be lower than 10 percent in many Latin American cities. A rate of 8 percent is reported for El Salvador in Londoño and Guerrero (1998). In Cali, this figure was lower than 6 percent in 1983 and probably of the same order of magnitude in other metropolitan areas in Colombia. Moreover, this situation most certainly has worsened since then (Guerrero 1998).

Are these stylized facts consistent with the previous general model? If this is not the case, how do they modify the model's predictions, in particular, with respect to the economic determinants of crime and violence? If we consider the extreme case where a market of a given size exists for illicit activities and where those engaged in these activities run no great risk of being arrested and prosecuted, then the issue becomes one of industrial organization and occupational choice. The main difference with other economic sectors and occupational choices is that there is likely to be no market rule in the control or production of illegal activities. As a result, individuals operating in these sorts of illegal activities rely solely on their capacity to physically neutralize or eliminate potential competitors. At some stages of the organizational development of this sector in a given environment, nonmarket competition is strong and is responsible for a high level of violence among persons or gangs. At another stage or in a different environment, the sector may be fully controlled by organized crime resulting, paradoxically, in a drop in the level of violence. Therefore the analysis of crime and violence linked to illegal activities becomes the study of the conditions under which some types of organizations in this particular sector will predominate over others (Fiorentini and Peltzman 1995).

If a high degree of nonmarket competition in the illegal activities sector is responsible for the violence and criminality observed in some parts of metropolitan areas in developing countries, are the causes and possible remedies identified before still valid? This analysis of causes of violence does not significantly alter the nature of the initial crime model. As noted previously, it simply makes the benefit, x , gained from getting involved in illegal activity exogenous, rather than more or less loosely related to the mean income of the whole urban population. In addition, it modifies the nature of the risk, q , involved and the penalty F incurred. Public expenditures on crime deterrence no longer determine the level of risk involved. These public expenditures are too small for deterrence to be effective. Risk now depends on the organization of the illegal sector itself. For instance, risk may be determined by the probability of being killed by a competitor who wishes to control a given territory for drug dealing. However, the main economic factor pushing people toward crime is the income they may gain if they stay in legal activities compared with the expected utility of illegal activity. In the present framework, as in the original model,

any reduction in the level of people's income, that is, any increase in urban poverty, increases the incentives to switch to illegal activities. Unlike what is seen in the canonical model, however, it is not clear what influence inequality in society has on crime and violence. Levels of crime and violence essentially depend on the way the illegal sector is organized and, of course, on the size of that sector (Bourguignon 1998).

Transforming the original model to account for the fact that crime and violence often develop within poor districts of metropolitan areas in connection with illegal activity, rather than property crime, and extremely low apprehension probabilities does not radically modify the initial analysis. It remains true that an increase in urban poverty should, other things being equal, result in an increase in violence. It is also still the case that increasing effective crime deterrence should reduce the extent of violence. However, a new determinant of the general level of crime and violence exists, and it is the importance of the market for illegal activity and the way demand for its services, such as initial drug consumption, depends on the characteristics of the city or the urbanization process.

The Limited Available Evidence on the Relationships among Inequality, Poverty, and Crime

The main conclusion of the preceding inductive analysis is that urban inequality and poverty are the main economic determinants of crime and violence. Through this crime and violence, urban inequality and poverty can inflict serious losses to society. This relationship can be direct, as in the case of more inequality and poverty making crime more profitable at a given level of crime deterrence. It may also be indirect and go through the amount that a society is willing to spend on crime deterrence. The questions we ask in this section are (a) whether evidence exists that shows such a relationship between crime and inequality or poverty, and (b) how important is the negative effect of inequality on the total urban income going through the criminal sector. We also briefly address the issue of the possible influence of inequality on crime deterrence.

Answering the preceding questions is extremely difficult. Two main sets of reasons explain this. First, a host of sociological factors could be responsible for the degree of violence observed in a society, but controlling for them in a statistical analysis of crime is practically impossible. Even though there is little doubt that economic disadvantages have always been an important and necessary cause of criminality, they certainly do not represent a sufficient condition of high crime rates in a given social group. This is particularly clear in all studies of the ethnic dimension of crime and violence. While minority groups in industrial countries with high crime rates are characterized by high levels of social and economic disadvantage, the converse is not necessarily true. In England, Indian migrants are as discriminated against as Caribbeans and Africans; however, crime and imprisonment rates are much higher in the second group. The same relationship holds true between Moroccans and Turks in the Netherlands, or between Southeast Asian and Latin American immigrants in the United States (Tonry 1997).

The second difficulty is purely statistical. We have previously seen how difficult it is to get reliable series and data on crime and violence across countries or cities, and even across time in a given country or city. It is still more difficult to gather evidence of the relationship between these series and data on international or intertemporal differences in poverty and inequality. Even though we are more interested in developing countries, we shall begin by briefly reviewing the case of the United States, because it is undoubtedly the country where crime data are the least scarce. We shall then move to cross-country comparisons involving both industrial and developing countries.

Before doing so, one may wonder whether historical trends are in agreement with the hypothesis that, all other things being equal, more inequality in terms of relative poverty should cause more crime. However, the condition that all things be equal is extremely demanding in this case. For instance, it is well known that inequality in the United Kingdom rose throughout the 19th century, leveled off at the turn of the century, and then went down quite substantially until it started rising again in the early 1980s. Likewise, inequality in the United States is thought to have peaked around 1930 and then fallen sharply until the

1950s. After the 1950s, inequality remained stable before starting to increase again at the end of the 1970s. According to the simple hypothesis we stated previously, we should have seen criminality increase in the 19th century and decrease during most of the 20th in the United Kingdom. The same changes should have been observed in the United States with crime peaking around 1930, or possibly later, allowing for some delay in the sequence of effects (Lindert 1998). However, too many deep sociological changes happened at the same time to really hope that such a relationship could be observed. As mentioned before, the general change that has taken place since the beginning of the 19th century is one of declining violence, which does not fit well with the evolution of inequality in the United Kingdom. The rise in violence observed in the 1930s in the United States may not be inconsistent with a peak of inequality around 1930, but this is weak evidence indeed. Similarly inconclusive evidence can be gathered for continental Europe. Clearly, more rigorous analysis controlling for other factors that may influence the evolution of violence and crime is necessary, but all the data needed for such a long-term time series analysis are not available. A lack of necessary data already characterizes the study of more recent periods.

Crime and Inequality in the United States in the Recent Past

Ever since the pioneering work of Ehrlich (1973), and in contrast with the preceding long-run historical perspective, cross-state or cross-city analyses at given points in time suggest that income inequality is indeed positively and significantly associated with crime rates. This is true of both property crime—robbery, burglaries, and the like—and homicides (Freeman 1996). In addition, the elasticity of the crime rate with respect to inequality appears to be substantial. Ehrlich's original estimates indicated that, in 1960, a 1 percent increase in relative poverty, measured by the number of people with less than half of the median income in one state increased the property crime rate by approximately 2 percent. Using more recent data, Lee (1993, cited by Freeman 1996, p. 33) found that when observations for various states at different times were pooled together, the increase in inequality that occurred in the 1980s may have caused an estimated 10 percent increase in crime rates. Interestingly enough, this order of magnitude turns out not to differ much from Ehrlich's estimates.

Time series analyses do not seem to lead to such clear conclusions. Freeman (1996), still reporting Lee's results, notes that changes in crime rates in U.S. metropolitan areas in the 1980s were not significantly correlated with changes in inequality. Allen (1996) found no significant effect of inequality—and a negative effect of absolute poverty—on the aggregate crime rate during the last 30 years. Allen also reported insignificant effects of poverty and inequality in other time series analyses. A possible explanation of the positive results obtained with cross-sectional data is simply that in some states crime and inequality are either higher or lower than average because of a third unobserved factor that holds more or less constant over time. Cross-sectional analysis thus simply picks up the effect of these factors and concludes a positive relationship between crime and inequality, even though there may not be any causal relationship between the variables.

Freeman (1996) proposed an important correction to time series analysis of crime in view of the substantial increase in the number of incarcerated people observed during the period of greatest increase in inequality. This number doubled between 1980 and 1990 from 0.5 to 1.1 million (DiIulio 1996). Freeman's point was that if the frequency of crimes had remained the same, this increase in the incarceration rate should have produced a drop in the aggregate crime rate. However, no such drop occurred, so one must conclude either that the frequency of criminal activity increased among nonincarcerated criminals or that the number of criminals increased in relation to the population. Transforming observed crime rates into propensities to commit crime by the non-incarcerated population leads to a series that increases quite substantially in the 1980s, a few years after relative poverty and inequality of both individual earnings and household income started to rise (Juhn, Murphy, and Pierce 1993). There is little doubt that this correction would significantly modify the results obtained in time series regressions of criminality on inequality. However, the fact that only one big change took place in the distribution of earnings in the last 30 years

probably makes these results statistically inconclusive, even though the economic change clearly preceded an increase in the propensity to commit crime. Combined with cross-sectional evidence, this argument nevertheless supports the hypothesis that criminality is positively and significantly associated with the degree of inequality and relative poverty in the United States.

The recent evolution of criminality in the United States does not invalidate the preceding argument about the role of incarceration and crime prevention. Each year since 1992, the crime rate has declined in the United States. This evolution was so dramatic that public attention has been drawn to a few police chiefs and criminologists thought to be responsible for it. Instead of explaining this change with new crime prevention and law enforcement policy, some observers link it to the end of the war for control of crack cocaine distribution. But others note that as in the 1980s, incarceration rates have increased substantially in recent years. Indeed, the total number of people in prisons rose from 1.1 million in 1990 to 1.7 million in 1997, the same absolute increase as the one observed during the 1980s (Massing 1998). Also, expenditure on crime prevention and law enforcement increased substantially. That the propensity to commit crime may not have changed radically despite the drop in crime rates since 1992 is a hypothesis that cannot be discarded.

A systematic investigation of the evolution of crime in all countries where substantial changes took place in income distribution during the last 10 or 20 years to see whether a simultaneous increase occurred in crime rates would be interesting. According to United Nations statistics, the robbery rate increased in the United Kingdom in the first half of the 1980s at the same time that inequality increased quite substantially. Unfortunately, a break occurs in the series between 1985 and 1989. When the series resumes, the robbery rate is at a much higher level, which favors the hypothesis that more inequality leads to more crime. However, this increase may also be due to a change in definitions. The United Kingdom and the United States are practically the only industrial countries where drastic changes in inequality took place in the last 20 or so years. Both countries also show evidence of concomitant increases in criminality. Inequality has also increased significantly in Sweden and in the Netherlands since the mid-1980s (Gottschalk and Smeeding 1998). But crime rates apparently did not change much. However, inequality in both countries increased more because of changes at the top, rather than at the bottom of the distribution. According to the theoretical arguments, the latter is supposed to matter for the evolution of crime.

Crime and Inequality: Cross-Sectional Evidence

As it is impossible to find other countries with reasonably good time series on both crime and inequality that have experienced substantial changes in inequality, additional evidence on the relationship between crime and inequality can only be found in cross-sectional studies. Probably the most comprehensive study of this type is that of Fajnzylber, Lederman, and Loayza (1998), which is based on United Nations data for a few countries complemented with homicide rate series obtained from cause of death statistics compiled by the World Health Organization. As discussed before, the United Nations database is imperfect, but it is unfortunately the only one available on a sufficiently large scale. An interesting feature, though, is that it is both cross-sectional and longitudinal. To some extent, this permits minimizing the effect of cross-sectional measurement errors that are likely to be the most serious source of bias. Inequality data are taken from Deininger and Squire (1996) and are not themselves free from problems. In particular, they are not available for all countries and all points of time, which further reduces the data sample Fajnzylber, Lederman, and Loayza (1998) used.

Standard cross-sectional analysis on mean robbery and homicide rates for 1970–94 is based on samples of 50 to 60 countries depending on the explanatory variables being used. The core independent variables are gross national product per capita, the Gini index for the distribution of income, average education, urbanization rate, and variables controlling for the importance of drug consumption. Among them, the only variable that is more or less consistently significant turns out to be the Gini index which, as expected, shows that the distribution of income has a positive effect on crime. Moreover, this effect is

sizable. All other things being equal, a 5 percent point change in the Gini index, which corresponds roughly to the increase in household income inequality observed during the 1980s in the United States and in the United Kingdom, would produce, on average, an increase of approximately 15 percent in the homicide rate and two or three times this figure for the robbery rate.

However, it is worrisome that, in the case of homicides, the corresponding coefficient becomes insignificant when one controls for regions. This is particularly true for Latin America when a dummy variable is used as an explanatory variable. In view of the regional orders of magnitude of crime rates reviewed before, this is not really surprising. This result suggests that inequality's significance as a determinant of crime in a cross-section of countries may be due to unobserved factors simultaneously affecting inequality and crime, rather than to some causal relationship between these two variables. Results obtained with robbery rates are more robust. In this case, the coefficient of the Gini index remains significant even when dummy variables controlling for regions or other groupings of countries are introduced. This means that inequality appears to have a significant association with the crime rate within these various groups of countries, rather than across them. Somehow, this is reassuring because it fits the idea that the economic determinants of crime are likely to have a stronger association with property rather than other crimes.

Other variables do not reveal significant correlations. This is not surprising for gross national product per capita because most of the economic explanation of crime refers to relative, rather than absolute, income factors. The average educational level of the population at working age, drug consumption, and the urbanization rate are factors that seem less likely to turn out to be insignificant. Measurement errors may affect the first two variables. The average level of education should refer to younger generations rather than to the whole population, which may make a big difference in developing countries. Drug consumption is proxied by the drug possession crime rate, which most likely is badly recorded or badly approximated in some countries. The urbanization rate does not have these problems. Interestingly enough, its effect is positive and not far from statistical significance for robberies, whereas it is close to zero and far from significance for homicides. Simple theory suggests a similar conclusion.

As recalled earlier, the ambiguity of pure cross-sectional estimates is well known. One way of eliminating this ambiguity is to use panel data and to control for country fixed effects. This is what Fajnzylber, Lederman, and Loayza's (1998) study does. However, the study also takes into account the hysteresis effect of criminality by explicitly allowing the crime rate of a given year to depend on that of the previous year. This rules out standard fixed effect estimation and requires estimating an autoregressive model based on first differences. Fajnzylber, Lederman, and Loayza do so on smaller samples of countries defined by the availability of all variables of interest after taking first differences and lags. They also use as instruments the lagged values of the model's explanatory variables so as to avoid endogeneity problems. The resulting estimates are reproduced in table 10.1.

These estimates, which are essentially based on the longitudinal dimension of the data, confirm the results of the cross-sectional analysis and show additional effects. However, the comparison is not totally valid because the samples of countries used in each case differ due to distinct data requirements. Nevertheless, such a coincidence between cross-sectional and longitudinal estimates is remarkable and suggests that the phenomena revealed by these regressions are robust.

This seems to be true, first of all, for the effect of income inequality upon criminality. This effect is significant and substantial for both homicides and robberies. In the short-run, a 1 percent point increase in the Gini coefficient would produce, on average, a 3.6 percent increase in the homicide rate and a 1.1 percent increase in the robbery rate in the countries included in the sample. However, this effect is much stronger in the long run because of the compounding effect of hysteresis on crime rates. The coefficients of the lagged crime rate are such that the effect of inequality would be multiplied by three for homicides and by seven for robberies. These multiplicative factors are simply the inverse of $1 - \lambda$, where λ is the coefficient of the lagged crime rate in table 10.1. If one keeps in mind major changes in inequality like those observed recently in the 1980s in the United Kingdom, the United States, and several Latin American countries, increases of 3 or 5

percentage points in the Gini coefficients are not unreasonable orders of magnitude for periods extending over five years or more (Atkinson, Rainwater, and Smeeding 1995; Gottschalk and Smeeding (1998); Morley (1995). Other things being equal, this corresponds with an increase in crime rates from 40 to 60 percent with a horizon of 10 to 15 years, a rather frightening order of magnitude. This long-run effect may be somewhat biased, because the data sample does not include national time series long enough for a complete and satisfactory representation of the dynamic processes governing crime rates.

Table 10.1. *Panel Regressions of Crime Rates: First Difference Auto-Regressive Models*
(p-values in italics)

<i>Explanatory variables</i>	<i>Homicide rate (growth rate)</i>	<i>Robbery rate (growth rate)</i>
Gini coefficient ^a	0.036 <i>0.000</i>	0.011 <i>0.009</i>
Urbanization rate	0.004 <i>0.063</i>	0.011 <i>0.000</i>
GDP per capita (log)	-0.207 <i>0.000</i>	-0.045 <i>0.035</i>
GDP growth rate ^a	-0.036 <i>0.001</i>	-0.072 <i>0.000</i>
Drug possession crime rate	0.001 <i>0.047</i>	0.001 <i>0.019</i>
Secondary enrollment rate	0.009 <i>0.000</i>	0.002 <i>0.191</i>
Lagged homicide rate	0.640 <i>0.000</i>	0.839 <i>0.000</i>
Number of observations (countries)	58(20)	50 (17)

Note: Generalized method of moments estimates. Second lags and third lags of dependent and independent variables are used as instruments with the exception of the lagged crime rate, for which the third lag is used as an instrument.

a. Strictly exogeneous.

Source: Fajnzylber, Lederman, and Loayza (1998).

A second effect discussed in connection with the cross-sectional model is that of the urbanization rate. It still fails to show a sizable and significant correlation with homicides, but it does have a strong correlation with robberies. In the latter case, an increase in the urbanization rate by 1 percent produces in the long run an increase in the nationwide crime rate that is equal to 8 percent. Although the model imperfectly represents the full dynamics of this process, the increase in the crime rate becomes still larger when the continuity of the urbanization process is taken into account. For instance, in a country where the urbanization rate is increasing by 0.5 percentage points per year, a reasonable estimate in view of the experience of many developing countries over the last two or three decades, the nationwide robbery rate would increase by approximately 60 percent in 20 years. If nothing else changed, this figure would essentially reflect urban-rural differences in crime rates. However, other variables affecting crime are likely to change simultaneously with the urbanization process. In particular, the estimates reported in table 10.1 suggest that economic growth tends to offset the adverse effects of urbanization. In other words, only if urbanization proceeded without sufficiently rapid economic growth would crime develop as suggested by the preceding figure. This is in agreement with the theoretical argument of the push and pull factors of urbanization. Overall, Fajnzylber, Lederman, and Loayza's (1998) results thus describe a rather complex combination of forces that together contributes to possible changes in crime rates or, alternatively, enable keeping it steady in the course of development.

Another interesting feature of the preceding equations is the substantial hysteresis they suggest is occurring in the evolution of criminality. Here again, as could be expected, it is more pronounced for robberies than for homicides. In the case of robberies, a simple calculation made on the basis of the coefficients shown in table 10.1 suggests that a major recession leading to a sudden 5 percent drop in GDP would produce an instantaneous 50 percent increase in the robbery rate. However, the hysteresis effect is such that the crime rate would still be 10 percent above its prerecession level seven years after the economy resumed normal growth. (Because of the symmetry built into the model, this effect would disappear if the drop in GDP were fully reversed by faster growth in the following years.) Again, these orders of magnitude are only indicative. However, such recessions are not uncommon in developing countries, and the preceding figures show that the lasting rise in crime caused by a temporary surge in poverty may add much to the social cost of recessions.

Given that the preceding results are based on a restricted number of observations and countries, they may be thought to not be truly representative. It turns out that fixed effects are less of a problem in the case of homicides than in the case of robberies, so that alternative specifications may be estimated on larger samples. The results reported by Fajnzylber, Lederman, and Loayza lead to the same general conclusions concerning the link between recessions and increases in crime rates related before. In addition, they confirm that crime deterrence variables, essentially police and conviction rates, have a significant negative influence on homicides.

Londoño and Guerreo (1998) reported convergent findings. They ran fixed effect regressions on homicides in a panel sample of 17 Latin American countries between 1970 and 1995. The specification that they chose to estimate is not as complete as that of Fajnzylber, Lederman, and Loayza, so a detailed comparison is not possible. However, Londoño and Guerrero (1998) found that poverty and inequality produce sizable effects on homicide also. According to their figures, a 1 percent point increase in the population of poor people would produce, on average, an instantaneous 2.5 percent increase in the number of homicides. This does not differ much from the orders of magnitude seen before. It would certainly be worthwhile to obtain estimates based on this sample that are comparable to those Fajnzylber, Lederman, and Loayza give.

Having said this, the preceding estimates must be viewed with much care. We have already insisted on the natural limitations of pure cross-sectional exercises. The introduction of fixed effects in samples where observations of different countries at different points of time are pooled together should certainly lead to more satisfactory conclusions. In the present case, however, in both the Fajnzylber, Lederman, and Loayza study and that of Londoño and Guerrero the corresponding samples of observations are limited. As a result, the relevant effects may be estimated on the basis of few observations, which points to the need for better and more consistent data collection on crime and victimization, both across and within countries over time.

The Social Cost of Crime and Inequality: Rough Estimates

Given the preceding evidence of likely positive associations among crime, poverty, and inequality, we now seek to measure the social cost of crime and then that part of the social cost of inequality that goes through crime. This should give some idea of the scope of policies aimed at controlling and reducing the extent of inequality and poverty in urban areas. Although we can rely only on rough estimates, we shall see that controlling and reducing the extent of inequality and poverty in urban areas is surprisingly important.

Table 10.2 puts together some crude estimates of the various components of the cost of crime in the United States and in Latin America as a proportion of GDP, that draw on Freeman (1996) and Londoño and Guerrero (1998). As a first approximation, estimates for other countries or regions may be obtained by scaling these estimates up or down depending on observed crime rates.

Table 10.2. *Estimates of the Cost of Crime in the United States and in Latin America, Around 1995*
(percentage of GDP)

	<i>United States</i>	<i>Latin America</i>
"Transfers" = monetary amount of property crime	(0.5)	(1.5)
Monetary cost (medical expenses, opportunity cost of time, and so on)	0.2	0.6
Nonmonetary cost (cost of pain)	0.7	2.1
Human capital loss (homicides)	0.3	1.7
Opportunity cost of incarceration	0.6	0.1
Criminal justice	1.3	1.6
Private crime prevention	0.6	1.4
Total	3.7	7.5

Source: Freeman (1996); Londoño and Guerrero (1998), and author calculations.

The first row of the table is a straight estimate of the total monetary value of property crime, that is, the income from robberies, thefts, burglaries, frauds, embezzlements, and so on. For the United States' estimate, the figure is taken from Freeman (1996). For Latin America, it is based on special surveys taken in Brazil, Colombia, El Salvador, Mexico, Peru, and Venezuela as part of a research project organized by the Inter-American Development Bank—see Londoño and Guerrero (1998). Assuming that the average amount involved in property crimes is proportional to income per capita, the figures appearing in this row of table 10.2 suggest that the rate of property crime in Latin America is three times that observed in the United States, which seems a reasonable order of magnitude (note that these same proportions hold for homicides). Notice that this top row is entitled transfers and is not included in the social cost of crime. Such a view corresponds to the theoretical model described previously in equation (5) where property crime appears as a simple transfer of wealth or income from the victim to the criminal. However, part of this wealth may be destroyed in the transfer. This part appears in the second line of table 10.2 as the monetary cost of crime. This item also includes the actual costs incurred by victims in addition to what they lost, for example, medical expenses in the case of violent robbery, repair of property in the case of a burglary, time spent dealing with the police or justice personnel, and so on. No direct estimate of that cost is made in the Latin American case.³ The figure appearing in table 10.2 is obtained by assuming the same proportionality factor as in the United States. The monetary costs of property crime are rather moderate. They amount to only 0.2 percent of GDP in the United States and 0.6 in Latin America.

To these monetary costs, we now add nonmonetary costs corresponding to the cost of the pain and suffering in case of property crime and to the disappearance of human capital in case of homicides. The first figure is based on jury estimates of the cost of pain in cases of U.S. property crimes, and it is approximately equal to the material cost of crime appearing in the first two rows of table 10.2, that is, 0.7 percent of GDP. The same proportionality factor with respect to the total amount of property crime is applied to Latin American figures leading to a cost of 2.1 percent of GDP. Actually Londoño and Guerrero give a much larger estimate for that component, 5.3 percent of GDP, based on reported willingness to pay for safety. However, the figure they derive from the surveys at their disposal seems artificially high compared with the U.S. figure. In terms of human capital loss in Latin America, they base their computations on the average life expectancy of homicide victims and on wage rates for unskilled laborers. The resulting cost is substantial, amounting to 1.7 percent of GDP. The figure for the United States is in proportion with the homicide rate, that is, approximately a 1:4 ratio between the U.S. figure and that of Latin America.

³ Londoño and Guerrero (1998) report a mere 0.2 percent for medical expenses and a much greater amount for productivity losses, which we do not take into account in table 10.2.

Crime prevention and punishment incur other costs. Freeman (1996) estimated the opportunity cost of the time incarcerated individuals spend in the United States to be 0.6 percent of GDP. In Latin America, assuming this cost is proportional to the number of incarcerated people per inhabitant leads to a figure of 0.1 percent of GDP. The incarceration rate, that is, the number of incarcerated persons per inhabitant, is a little more than five times higher in the United States than in Latin America. The extent to which this difference in incarceration rates is related to observed disparities in crime rates is not clear, however. Incarceration rates in European countries are comparable to those observed in Latin America. However, crime rates there are much lower than in both Latin American countries and in the United States. Expenditures on criminal justice and police may compensate somewhat for this difference as these expenditures amount to 1.6 percent of GDP in Latin America and only 1.3 percent in the United States. More is also spent on private crime prevention through security guards, alarm systems, armored cars, and the like in Latin America. As a result, total expenditures on crime prevention and sanction amount to a higher proportion of GDP in Latin American countries than they do in the United States, although the ratio between these two figures differs from the ratio of crime rates.

Summing up all these components yields a sizable total cost of crime equal to 3.7 percent of GDP in the United States and a high 7.5 percent in Latin America. Of course, both figures are rough. However, it is not difficult to believe that their orders of magnitude are about right. By world standards, the countries covered by the preceding analysis have levels of criminality far above average. The same calculation would be likely to lead to figures lower than 2 percent of GDP in most Asian and European countries.

When taken together, the various estimates discussed in this section lead to a strikingly high order of magnitude for that part of the social cost of poverty and inequality that goes through crime and violence in Latin American countries. Consider, for instance, the elasticities of crime rates with respect to inequality and poverty suggested by the Gini coefficient reported in table 10.1. According to these elasticities, a 5 percent point increase in the Gini coefficient in a given country may, after some delay, produce an increase in the crime rate of the order of 50 percent. The same kind of effect may be expected from a major recession leading to a 5 percent or greater drop in GDP. That part of the social cost that goes through crime may be inferred from the figures appearing in table 10.2. If nothing is done to increase crime deterrence, then the numbers in the bottom half of the table will not change. However, the top half is likely to increase in proportion with the crime rate. In a country with a medium level of crime as in the United States, this would entail a social cost of about 0.6 percent of GDP. In high crime countries like many Latin American countries, the cost would be greater than 2 percent of GDP. Moreover, if one takes into account that the increase in criminality is likely to be concentrated in large metropolitan areas, then the local social cost in these areas should be much larger. These are not minor effects. In addition, they are likely to be magnified by hysteresis.

If governments were to implement active crime deterrence policies, the cost of unequal development or recessions might be reduced. In this case, the lower half of table 10.2 would be modified. The extent of modification depends on the efficiency of crime deterrence. However, little may be gained from active deterrence as the situation in the United State in the 1980s illustrates. As the dramatic fall in the real income of low-skilled workers could have indicated, the potential increase in criminality was likely to have been offset by a drastic increase in the incarceration rate, which more than doubled starting in 1980. If this was the case, then approximately half the opportunity cost of incarceration and that part of the budget of criminal justice covering the direct cost of that policy, that is, the cost of prisons, must be considered the price that society had to pay for increasing inequalities. As the table shows, the resulting figure is not far from the hypothetical 0.6 percent that would have been observed if crime had been allowed to continue increasing.

Inequality and the Demand for Safety

Analyzing the determinants of crime deterrence measures with the same cross-sectional and longitudinal tools as crime itself would be an interesting exercise. It would permit providing evidence for the role played by social structures, inequality in particular, which is probably essential. Unfortunately the relevant data for such analysis are missing.

Pradhan and Ravallion (1998) provided interesting evidence for Brazil. Drawing on subjective evaluations of the importance of public safety collected in the 1996 Brazilian Living Standard Measurement Survey, these authors found that the current evaluation of public safety and the desire for improving increase with households' standard of living. The uneven evaluation of public safety is an important result that means crime and crime deterrence measures are another source of inequality in an urban environment. In other words, if crime is partly the consequence of existing economic inequalities, its uneven geographical distribution may contribute to a magnification of these inequalities. The second important point is not that the desire for public safety increases with income, but that it does so at a declining rate. This means that increasing inequality should lead to a lower aggregate demand of public safety. However, this is only partial evidence based on subjective evaluations and much more work is needed to get a better idea of the relationship between inequality and the social demand for safety.

Conclusion

This chapter shows that crime and violence are likely to be a socially costly byproduct of, among other factors, uneven or irregular economic development processes. Simple economic theory shows how property crime and, more generally, the violence associated with illegal activity may partly be the consequence of excessive inequality and poverty. The limited evidence available in this field suggests that an increase in the degree of relative poverty or income inequality in a country generally leads to a rise in criminality, be it in the crime rate itself or in the propensity to commit crime in the part of the population that is not confined to prison. Because they increase the extent of poverty, major recessions may have a comparable effect on crime. Moreover, hysteresis may considerably magnify these effects. It follows that, through crime and violence, the social cost of inequality and poverty may be large. In countries where the level of crime is already high, thinking that severe recessions or major increases in inequality measures could be responsible for social losses as high as 2 or 3 percent of GDP is not unreasonable. This order of magnitude would even be greater if urban areas alone were considered.

Observed aggregate regional differences in criminality are consistent with this analysis. Latin America is by far the region with the highest level of crime, and at the same time it is a region where the distribution of income is generally more unequal than elsewhere. Latin America is also an area where economic growth has been extremely volatile. The recent surge in criminality in some former socialist countries in Central Asia and Central Europe could probably be analyzed in the same way. These changes also raise the issue of the social control of crime. High levels of inequality or increases in poverty need not lead to a higher rate of crime if crime deterrence is simultaneously strengthened. However, this leads to two observations. First, in a political economy framework unequal levels of crime deterrence may themselves be the consequence of existing or increasing inequality, because a highly unequal society may have a low propensity to invest in safety infrastructure. Indirect evidence of this was shown in the case of Brazil. Second, even if increased crime deterrence measures may prevent concomitant increases in inequality and levels of crime, these measures are costly, and it is not clear that they are socially less costly than crime itself.

Through crime or through crime prevention, inequality and poverty may inflict sizable social losses to society. From a policy point of view, this clearly makes the need for controlling the distributional effects of economic development all the more important. This is especially the case in urban areas where propensities for crime are higher, as is the volatility of economic activity responsible for transitory acute poverty, with lasting consequences for crime and violence.

References

- Akerlof, G. 1998. "Men without Children." *The Economic Journal* 108(447): 287–309.
- Akerlof, G., and J. Yellen. 1994. "Gang Behavior, Law Enforcement, and Community Values." In H. Aaron and T. Mann, eds., *Values and Public Policy*. Washington D.C.: The Brookings Institution.
- Allen, Ralph C. 1996. "Socioeconomic Conditions and Property Crime: A Comprehensive Review and Test of the Professional Literature." *American Journal of Economics and Sociology* 55(3): 293–308.
- Atkinson, A., L. Rainwater, and T. Smeeding. 1995. "Income Distribution in OECD Countries: Evidence from Luxembourg Income Study." Paris: Organisation for Economic Co-operation and Development.
- Becker, G. 1968. "Crime and Punishment: An Economic Approach." *Journal of Political Economy*, 76(2) 169–217
- Benabou, R. 1994. "Education, Income Distribution, and Growth: The Local Connection." Discussion Paper no. 995. Centre for Economic Policy Research, London.
- Bourguignon, F. 1998. "Inefficient Inequalities: Notes on the Crime Connection." Mimeo, The World Bank
- Burtless, G., and L. Karoly. 1995. "Demographic Change, Rising Earnings Inequality, and the Distribution of Personal Well-Being, 1959–1989." *Demography* 32(3): 379–405.
- Chesnais, J.C. 1981. *Histoire de la Violence en Occident de 1800 à Nos Jours*. Paris: Laffont.
- Deininger, Klaus, and Lyn Squire. 1996. "A New Data Set Measuring Income Inequality." *World Bank Economic Review* 10(3): 565–91.
- DiIulio, J. 1996. "Help wanted: Economists, Crime, and Public Policy." *Journal of Economic Perspectives* 10(1): 3–24.
- Ehrlich, I. 1973. "Participation in Illegitimate Activities: A Theoretical and Empirical Investigation." *Journal of Political Economy* 81(3): 521–65.
- Fajnzylber, P., D. Lederman, and N. Loayza. 1998. "Determinants of Crime Rates in Latin America and the World." World Bank, Department of Latin American and Caribbean Studies, Washington, D.C.
- Fiorentini, G., and S. Peltzman, eds. 1995. *The Economics of Organised Crime*. Cambridge, U.K.: Cambridge University Press.
- Freeman, R. 1996. "Why Do So Many Young American Men Commit Crimes and What Might We Do About It?" *Journal of Economic Perspectives* 10(1): 25–42.
- Garoupa, N. 1997. "The Theory of Optimal Law Enforcement." *Journal of Economic Surveys* 11(3): 267–95.
- Gottschalk, P., and T. Smeeding. 2000. "Empirical Evidence on Income Inequality in Industrialized Countries." In Bourguignon, F. and A. Atkinson, eds., *Handbook of Income Distribution*, Elsevier, Amsterdam
- Guerrero, R. 1998. "Epidemiology of Violence in the Americas: The case of Colombia." In *Poverty and Inequality: Proceedings of the Annual World Bank Conference on Development in Latin America and the Caribbean*. Washington, D.C.: World Bank.
- Hagan, J. 1994. "Crime Inequality and Efficiency." In A. Glyn and D. Miliband, eds., *Paying for Inequality*. London, U.K.: Institute for Public Policy Research and Rivers Oran Press.

- Juhn, C., K. Murphy, and B. Pierce. 1993. "Wage Inequality and the Rise in Returns to Skill." *Journal of Political Economy* 101(3): 410–42.
- Kelling, G., and C. Colis. 1996. *Fixing Broken Windows*. New York: Touchstone.
- Lindert, P. 1998. "Three Centuries of Inequality in Britain and America." University of California, Davis, California.
- Londoño, J.L. 1998. "Violence, Psyche, and Social Capital." In *Poverty and Inequality: Proceedings of the Annual World Bank Conference on Development in Latin America and the Caribbean*. Washington, D.C.: World Bank.
- Londoño, J. L., and R. Guerrero. 1998. *Epidemiología y Costos de la Violencia en América Latina*. Washington, D.C.: Inter-American Development Bank.
- Massing, M. 1998. "The Blue Revolution." *The New York Review of Books*, 11(November) 1– 11
- Morley, S. 1995. *Poverty and Inequality in Latin America: The Impact of Adjustment and Recovery in the 1980s*. Baltimore, Maryland: The Johns Hopkins University Press.
- Moser, C. 1998. "Urban Poverty and Violence: Consolidation or Erosion of Social Capital." In *Poverty and Inequality: Proceedings of the Annual World Bank Conference on Development in Latin America and the Caribbean*. Washington, D.C.: World Bank.
- Piehl, A., and J. DiIulio. 1995. "Does Prison Pay? Revisited." *Brookings Review* 13(1): 21–25.
- Pradhan, M., and M. Ravallion. 1998. "Household Demand for Public Safety." Processed, The World Bank
- Sah, R. 1991. "Social Osmosis and Patterns of Crime." *Journal of Political Economy* 99(6): 1272–95.
- Sala-i-Martin, X. 1996. "Transfers, Social Safety Nets, and Economic Growth." International Monetary Fund Staff Papers. International Monetary Fund, Washington, D.C.
- Tonry, M. 1997. *Ethnicity, Crime, and Immigration*. Chicago, Illinois: University of Chicago Press.
- United Nations World Surveys on Crime Trends and Criminal Justice. Available at <http://www.icpsr.umich.edu/NACJD/SDA/un.html>.