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

F. Bourguignon**

Introduction

When rural life was still dominant in nowadays industrialized countries, cities were often seen by villagers as the domain of evil, the realm of corruption and violence. The process of accelerated urbanization and economic development was then seen as inherently wicked. The widely publicized criminality and violence observed today in several metropolises of both the developed and developing world would seem to justify a posteriori this bucolic bias. The alarming surge of crime and violence in Mexico, Rio or Sao Paulo during the last 20 years or so might indeed be the result of an excessively rapid growth of these 'gigapolises'. Likewise, the increasing minor criminality experienced today in many large cities' suburbs in developed countries might be the delayed consequences of an urbanization process which was too quick and insufficiently controlled.

Yet, all experiences are not alike. There are big cities in the world where crime and violence rates are at a tolerable level and have shown no sign of increasing with their geographical or demographic size. They may have other problems like pollution or congestion, but they show that urbanization is not necessarily that evil and that economic development

* I thank Pablo Fajnzylber, Daniel Lederman and Norman Loayza for allowing me to extensively use their data base and regression results. I also thank Juan Luis Londoño and David Guerrero for making available an early version of their forthcoming book on violence in Latin America. The revised version of this paper benefited from useful remarks and comments by Anjum Altaf and Shahid Yusuf.

** Profesor e investigador en la Escuela Normal Superior, Delta, París.

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 them is important to minimize the negative social externalities of economically profitable urbanization and development.

Many causes may be invoked to explain differences in criminality across countries or cities and its evolution over time. The most important ones probably are sociological or cultural. In this paper we focus on causes that may be directly related to economic phenomena and, in particular, on two variables which have been repeatedly hypothesized as possibly powerful determinants of crime and violence: poverty and inequality. The economic motivation behind crime is essentially the appropriation of the property of somebody else or the pursuit of illegal activity at the risk of being caught and punished. Therefore, it is natural to expect that crime offenders be found among those who have relatively more to gain from these activities and relatively little to lose in case of being caught. These presumably belong to the neediest groups in society, their number being larger and their motivation being stronger the more unequal the distribution of resources in society. If this were ascertained, then an important question to be asked about the possible negative social externalities of urbanization would really be why this process may generate in some instances more poverty and inequality and how this may be remedied.

It must be clear that by focusing here on the possible economic causes of urban crime and violence, we do not want to imply that other determinants are less important. Again, it is most likely that major causes for differences in crime rates among countries or cities are to be found in cultural and political alienation, ethnic conflicts, media violence, inappropriate role models, and other related phenomena or evolution. Even though economists may have something to say, their views on all these issues are likely to be of secondary importance in comparison to that of criminologists and sociologists. Therefore, the main question we address in this paper is whether economic conditions, and, in particular, the extent of absolute and relative poverty, may be considered as a significant determinant of crime, along and possibly in connection with the preceding social factors. We also address the independent issue of the economic cost of crime.

Even though the issue of the importance of the economic determinants of crime and violence may be thought as essentially empirical, we also look

at it from a theoretical perspective. The need for some theoretical analysis arises from the fact that the relationship between poverty, inequality and criminality is not as simple as the preceding argument would suggest. In particular it is important to keep in mind that crime deterrence and protection expenditures are endogenous. As they may depend themselves on the degree of inequality, it is not clear what the effect of inequality on crime is on balance. Another concern that justifies some theoretical analysis is that casual observation suggests that property crime, which correspond to the simple economic model alluded to above, is not the only type of urban criminality and the only cause of urban violence. Deadly gang wars across poor neighborhoods, murders and crimes caused by or linked to alcohol, drug consumption, and drug dealing are in many large cities of the developing and the developed world the everyday expression of urban criminality and violence. Can we think of some economic model to explain the appearance of these phenomena and their deleterious effects on the communities and neighborhoods where they 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 to measure the importance of these various phenomena and how they may relate to various economic and social factors. As we shall see, data on crime and violence are very scarce and often not comparable across countries. The problem is still worse in developing countries. Interpreting the little evidence that is available thus requires more reliance on a priori arguments and hypotheses borne out from simple economic analysis than it would be the case if a more data intensive statistical analysis were possible.

This being said, it turns out that 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 very convincing. Pooled cross-section time-series data give stronger evidence that changes in poverty or inequality are generally accompanied by changes in criminality and that this effect exhibits some persistence. There is also evidence that the social cost of crimes in countries with a higher than average level of criminality may be considerable. Rough estimates suggest, for instance, that the cost of crime may be larger than 7 per cent of GDP in Latin America, in comparison with 4 per cent in the

the homicide series is likely to be the most reliable[4]. Moreover, it may be expected to be somewhat correlated with the actual, as opposed to observed robbery rate. This would be the case, for instance, if a more or less constant proportion of robberies were leading to the death of a victim. In effect, the correlation between both sets of series in the UN data base is rather high. The rank correlation computed on all series after pooling all countries together is 0.40.

Figures 1a and 1b report the evolution of five-year average crime rates for the great regions of the world, as it may be very roughly estimated with the UN data base[5]. These figures refer to the median of five-year country averages in each region. It must be kept in mind that: (a) the sample of countries may change from one period to another, and (b) the number of years on which averages are computed differs across countries and sub-periods. However, as the time variation of crime rates in contiguous years is not very important, the major potential source of bias is due to (a). Computations made on samples comprising too few countries have been eliminated –this being the reason the Middle-East and North Africa region does not appear in Figure 1–. Some observations are still, however, of little significance. This is, in particular, the case for the 1985-89 drop in African crime rates. Following FLL it may be thought that the median is more reliable than the mean because it is insensitive to possibly inconsistent extreme values. But in fact, the overall picture is not that different whether one uses the median or the mean.

Before examining these figures, it may be useful having in mind some orders of magnitude for further reference. Because data are more reliable there, it seems natural to take high-income 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 for 100,000 inhabitants (/hti) during the 1970-1994 period and a homicide rate ranging

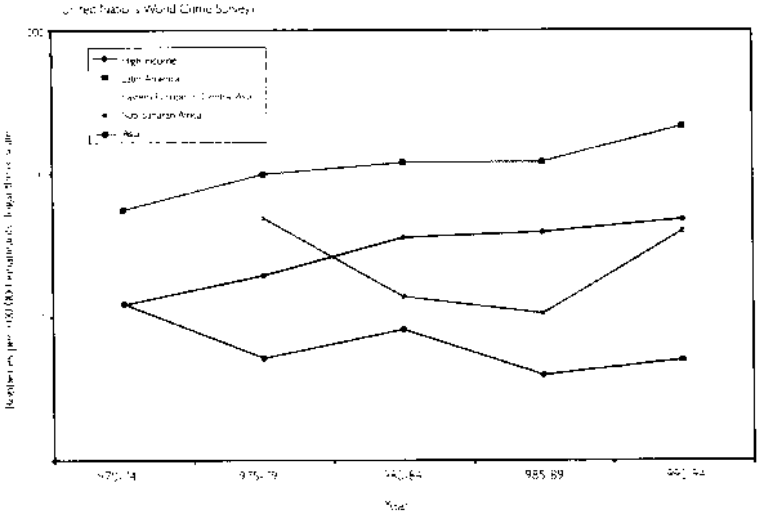
[redacted]

4 To test this reliability, it is also possible to compare these series with data from the World Health Organization on death causes, one of which is homicide. An informal calculation based on mean homicide rates from 1970-1984 or sub-periods 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.

5 Figure 1a also appears in FLL.

from 6.5/hti to 10/hti[6]. Criminality is roughly 30 per cent lower in Europe. The UK is probably at the lower end of the range for big countries with a robbery rate around 60/hti and a homicide rate below 2/hti for the 1970-1994 period. It may be seen in Figure 1a and 1b that these roughly correspond to median rates of the whole group of high-income countries. 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 twofold the national average, i.e., 20/hti vs. 10/hti.

Figure 1a. Evolution of Robbery Rates: Regional Median, 1970-1994

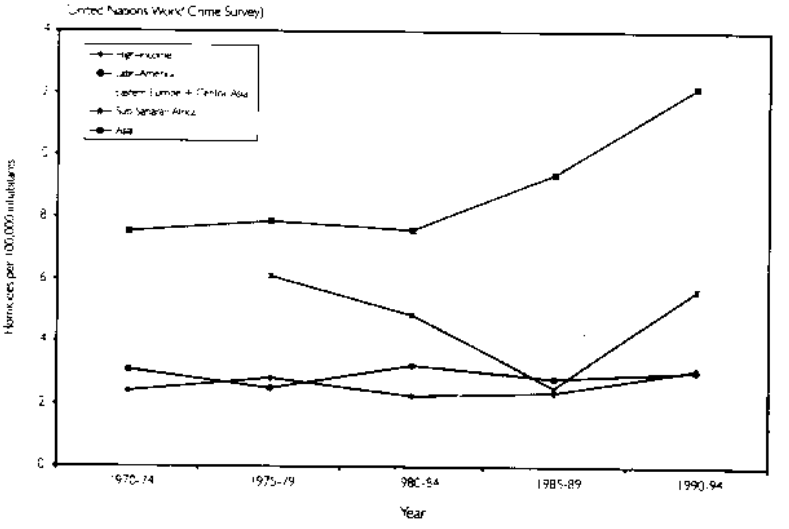


The most salient feature of Figure 1 when looking at other regions is without any doubt the extremely high level of criminality in Latin American and Caribbean (LAC) countries. The difference with the other regions of the world is striking. The (reported) robbery rate is almost uniformly comparable among LAC countries to what it is in the US, i.e., around 200/hti, and often higher, even in countries one would have considered as rather peaceful or not very violent in view of their relatively developed system of social services –e.g., Costa Rica or Uruguay–. The same is true

[6] The notation hti in what follows indicates crime rates expressed per 100.000 inhabitants.

with homicide rates, which probably are more directly comparable across countries. The latter is close to 5/hti in Argentina, close to 7/hti in Costa Rica but 14/hti in Venezuela, 18/hti in Mexico, and 20/hti in Brazil, not to mention the somewhat exceptional case of Colombia with 80/hti. Here again, these figures give a severe underestimation of what is going on in cities. The homicide rate was 80/hti in Rio in 1995 and 52/hti in Caracas, as opposed to respectively 20/hti and 14/hti for national figures[7]. The same is probably true for robbery. Although the following figures are not comparable to the robbery rates appearing in the UN data base, 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 per cent in Rio and 17 per cent in Caracas, more than ten times the highest police-reported robbery rates in the region. It is most probable, however, that the definitions of crime used in these various sources are not fully consistent with each other.

Figure 1b. Evolution of Homicide Rates: Regional Median, 1970-1994



[7] Figures for Rio and Caracas are from Londoño and Guerrero (1998).

Criminality is much less important in the other regions of the world and, with the exception of Africa for homicide rates, more comparable to what may be observed in high-income countries. However, it must be kept in mind that there may be a serious underreporting bias for robberies in many of these countries in comparison with high-income countries. It must also recalled that there may a lot of diversity behind the median rates shown in Figure 1a and 1b. For instance, the figures for Asia certainly do not mean that criminality is uniformly lower there than in the rest of the world. The homicide rate in Thailand is one of the highest in the world –20/hti– and that of India is comparable to the homicide rate in the US.

Given the lack of comparability of crime rates across countries the time dimension in Figure 1 may be more relevant than the cross-sectional dimension. From that 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 the Eastern Europe and Central Asia region, for both homicide and robbery rates. There also seems to be an increasing trend in the robbery rate in high-income countries.

It is unfortunately not possible to consider longer historical trends in the preceding regions with the same degree of precision. There seems to be evidence that, overall, crime and violence has been falling since the beginning of the 19th century –see, for instance, Chesnais (1981)–. But this process may not be continuous. For instance the evolution of homicide rates in developed western societies may have followed a J curve, the bottom of the curve having been reached around 1930[8].

On the whole, the few aggregate data reviewed in this section suggests that at all levels of development there is a considerable heterogeneity of countries with respect to the extent of criminality. This is a little less so when countries are grouped by regions, especially because of the concentration of most LAC countries at the upper end of the criminality range. Yet there remains a considerable heterogeneity within practically all regions. That crime rates changed significantly in various countries and regions over the last 10 years at different levels of development shows

[8] An hypothesis due to the historian T. Gurr.

that criminality is not a purely structural characteristic of society which can change only very slowly and almost ineluctably with the process of economic, social and cultural development. It thus is important to examine the possible determinants of that evolution. This is what we do in the rest of this paper, first by reviewing existing economic theories of crime and then examining the empirical relationship between criminality and possible determinants of it.

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

The canonical theoretical model of the economics of crime goes back to Gary Becker in 1968. It was first given some empirical content by Ehrlich (1973). We briefly summarize the basic argument behind this model with a simple general framework to be used throughout this paper. We then discuss the implications of the canonical model and consider various possible extensions likely to modify them[9].

Let us assume that society is divided into three classes: the poor (p), the middle (m) and the rich (r), with resources w, say wealth, 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 the crime activity be represented in the following simple manner. Crime pays a benefit equal to x with probability $(1 - q)$ and $-F$ with probability $q-$. Thus, q is the probability of being caught, in which case a fine F is due. We do not specify how much it is, but assuming that it is proportional to wealth, w_i, makes things simpler. Criminal activity is an all or nothing decision. In each class, an individual i with wealth wi will opt for criminal activity if:

$$(1 - q) \cdot Log\ (w^i + x) + q \cdot Log\ (w_i - F) > Log\ w_i + h_i \qquad (1)$$

where h_i is a parameter describing the degree of 'honesty' of this individual. It is assumed that this variable is independent of the level of income and

[9] For a more systematic review of theoretical models of crime, see Bourguignon (1998).

that it is distributed uniformly in the population over the interval $[0, H]$. In the case where F is proportional to wealth, it may be seen that very rich people for whom x is small in proportion to their initial wealth, w_i, will never find it attractive to get into crime. To simplify, let us go further and assume that it is never optimal for individuals in the middle and rich classes to engage in criminal activities, even if their degree of honesty is minimum. In other words, condition (1) is never satisfied even with $h_i = 0$ for persons in classes m and r. On the contrary, we assume that it is satisfied for $h_i = 0$ in class p but not for $h_i = H$. This means that there always is a proportion of people in the poor class, p, who will engage in crime. Finally, we suppose that the crime premium x is proportional to the mean income or wealth in the population: $x = b\overline{w}$. This would be the case, for instance, if crimes consisted of robberies and thefts of which victims would be randomly taken in the population. When comparing different societies, it is also a way of representing the fact that, loosely speaking, the crime premium is related to the average level of affluence of society.

Under these assumptions, it may readily be calculated that the crime rate, or percentage c of criminals in the whole population is given by[10]:

$$c = \frac{n_p}{H}.\left\{Log\,\frac{w_p + b\overline{w}}{w_p} - q.\,Log\,\frac{w_p + b\overline{w}}{w_p - F}\right\} = C\left(n_p, \frac{\overline{w}}{w_p}, \frac{F}{w_p}, q, H\right) \qquad (2)$$

According to the canonical model the crime rate thus depends positively on the extent of poverty and income inequality as measured respectively by the proportion of poor, n_p, and the ratio w / w_p, and negatively on 'crime-deterrent' variables, that is the probability of being caught, q, as well as the size of the penalty, F, relative to initial income. In addition, it 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

[10] The following rate is simply the product of the proportion of poor in society times the proportion of individuals with h satisfying condition (1) among the poor.

size, one may thus expect that, other things being equal, the crime rate increases with the size of the city.

The probability of crime detection can hardly 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. Let P be the corresponding amount per inhabitant. It is natural to assume that:

$$q = G\,(P,\, c) \tag{3}$$

where $G(\quad)$ is a kind of production function of police activity. It is assumed to be increasing –at a decreasing rate– with P and decreasing –at an increasing rate– with c. Substituting in (2) and solving with respect to c yields a new 'reduced form' crime function:

$$c = C^*\left(n_p, \frac{\overline{w}}{w_p}, \frac{F}{w_p},\, P,\, H\right) \tag{4}$$

where the argument corresponding to the probability of being caught, q, has simply been replaced by police expenditures per inhabitant. Therefore, the statement that the crime rate should increase with city size, at least in some range, implicitly assumes that police expenditures do not increase with city size. If it does, this raises the question of what determines the importance of police expenditures. We shall return to that question below.

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[11]. Assuming that the cost of pain is a proportion s of the economic cost of crime, $x = b\overline{w}$, the social loss per capita associated to a crime rate c amounts to:

$$L = c \cdot m \cdot s \cdot (b\overline{w}) + P + c \cdot q \cdot [j] + c \cdot q \cdot F \tag{5}$$

[11] Which would indeed justify F being proportional to w_p.

where q and c are given by (3) and (4), m is the number of crimes committed by each criminal and j is the average cost of criminal justice by criminal. Note that the actual economic cost of crime, $x = b\overline{w}$, does not appear in that expression. This is because it is actually equivalent to a 'transfer' from victims to criminals and therefore cannot be considered as a social loss[12].

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 make more precise the kind of criminality that is behind this model. It must be clear, in particular, that the preceding economic argument better fits crimes against property, which therefore offer some economic gain, than crimes against persons. It certainly cannot be ruled out that homicides, intentional or not, are more frequent among poor and less educated people and in areas where the police is little present. The homicide rate in a given area may thus be determined very 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 with these variables is most likely to be weaker than for property crime. In particular, one expects the urban bias in criminality to be much less pronounced for homicide than property crimes. This being said, the argument leading to the crime rate function (4) applies as well to any illegal activity as to the criminal confiscation of somebody else's property. Drug dealing, illegal gambling, or prostitution also fit the basic representation (1) of the decision to undertake some criminal activity. The only thing is that the reward of that activity need not be related to the average affluence of victims. For that kind of crime in (4) should be replaced by some arbitrary value x, which may nevertheless still depend 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 indeed suggest that a process of economic development, or, more precisely, in the present context a process of urbanization, accompanied by an increase in the rate of poverty or in the degree of inequality[13], should lead, other things being

[12] An analysis of the effects of crime on growth along these lines is proposed by Sala-i-Martin (1996).

[13] To be really precise, it can be noted that, in the case where the penalty F is proportional to wealth, 'poverty' is actually defined by the proportion of people below some poverty line which is proportional

instruments. This is a rather delicate task. Some work has been done on whether 'prisons pay' in the US –*see* Piehl and diIulio (1995)–. The desirability of anti-crime policies like 'zero tolerance', 'three strikes and you're out', 'fixing broken windows', which have been very much debated in the US, would also have to be analyzed within such a framework[17]. However, in most countries, and particularly in developing countries, the data base necessary to make the corresponding calculation is hardly available.

From a positive point of view, the endogeneity of expenditures on criminal justice and police leads to an analysis of crime and its evolution partly based on the public-decision process behind these expenditures. In times of rapid urban expansion, all public infrastructures, including those linked to crime prevention and sanction, tend to lag behind the needs of the population, which should imply some increase in criminality, other things being the same. An increased demand for crime deterrence is then expressed by the civil society, part of which will be effectively met. How much essentially depends on public-spending decision mechanisms and possibly on the social structure of urban society. It is interesting to note that through this political economy of spending on crime deterrence, economic and social inequality may in effect play an indirect role on crime, on top of the direct incentives they represent for criminals. It is not clear, however, whether more inequality should lead to a larger anti-crime budget or the opposite. 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 of crime prevention. One may well imagine instances where the public-decision mechanism about spending on crime deterrence lead to rich neighborhoods and business districts being heavily protected and relatively little being spent in poor neighborhoods and on more general crime disincentives. That in many societies not only criminals but also victims are found predominantly among disadvantaged social groups may be explained by such a mechanism. Of course, a less inequitable outcome may also be possible depending on the social characteristics of the city[18].

[17] *See* Kelling and Coles (1996). *See* also the recent book review by Massing (1998).
[18] This is partly studied in Bourguignon (1998).

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

An important implication of private protection against crime is that it may drastically modify the relationship between poverty, inequality and crime. In effect, the possibility of self-insurance against crime logically lessens the relationship between the rate of crime and poverty. This works as follows. Potential victims anticipate that more poverty and inequality associated with an unbalanced process of urbanization increase crime risks. They buy additional protection and this reduces the actual change in criminality. The marginal social cost of poverty and inequality going directly or indirectly through crime remain the same, however. In the expression (5) of this loss, the effect of a marginal increase in the rate of crime c at constant 'police' expenditures, P, is simply replaced by 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 simply as an 'honesty' parameter. But, actually, one should include in it all the variables which may explain that given some cost-benefit ratio of crime and some characteristics of the justice and police systems, the degree of crime may vary drastically from a city or a country to another. These include ethnicity, religion, family structures, residential segregation, etc. Some of these factors may clearly be related to economic phenomena. The increase in the proportion of single mothers in urban areas is probably not foreign to conditions on the labor market –see, for instance, Burtless and Karoly (1995) for the case of the US It is also often singled out as a powerful sociological factor of violence[19]. Likewise, residential segregation has been analyzed as a mechanism to reproduce

[19] See diIulio (1996). More generally see the implications of out-of-wedlock childbearing and 'men without children' in Akerlof (1998).

existing economic inequalities –see, for instance, Benabou (1996). The variable 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 one is through the direct benefit and cost of crime. The second one goes through public decision making in matters of crime deterrence. This third one goes through the influence of economic conditions on some sociological factors behind the propensity of individuals to commit crime[20].

In any case, the main economic mechanism directly linked to the honesty variable is probably the one alluded to above, that is the way this part of the social capital may be eroded durably by an increase in a crime rate whose causes lie in the economic sphere. In the presence of more crime resulting 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[21].

There may be an objection to this and most of the preceding arguments that they are taking too much an economist' view of criminal behavior and therefore that they may be misleading for policy. For instance, many observers insist that violence in big metropolitan areas of developed and developing countries is often not directed towards the property of others but takes place internally within specific segments of society located in the poorest districts[22]. Obvious examples of this is all the violence related to conflicts related to the control of illicit activities like drug dealing, drug trafficking, and different types of gambling or prostitution. In many violent parts of today's metropolises this, rather than more conventional property crime 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 very low probability of crime detection and sanction noted in many studies of crime and violence

[20] For a general analysis of these factors with a framework similar to the present one, *see* Hagan (1994).

[21] On this relationship between societal values and crime, see Akerlof and Yellen (1994). *See* also Verdier and Bisin (1997).

[22] *See*, for instance, the taxonomy of violence proposed by Moser (1997).

in marginalized urban areas of developing countries. Typically, the probability of being arrested and incarcerated for a murder is estimated to be below 10 per cent in many Latin American cities[23]. Are these stylized facts consistent with the previous general model? If this is not the case, how do they modify its predictions, in particular with respect to the economic determinants of crime and violence?

If we consider the extreme case where there exists a market of a given size for illicit activities and where those engaged in them have no big 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 so that individuals operating in them rely on their pure capacity to physically neutralize or eliminate potential competitors. At some stages of the organizational development of this sector in a given local environment, 'non-market' 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 with, paradoxically, some drop in the level of violence. The analysis of crime and violence linked to illegal activities thus becomes that of the conditions under which some type of organization of this particular sector of activity will predominate over others[24].

If a high degree of non-market competition in the sector of illegal activities is responsible for the violence and criminality observed in some parts of metropolitan areas in developing countries, are the causes and possible remedies identified above still valid? As a matter of fact, this analysis of the causes of violence does not deeply modify the nature of the initial model of crime. As already noted above, it simply makes the premium, x, of getting into illegal activity exogenous, rather than more or less loosely related to the mean income in the whole urban population, and modifies the nature of the risk, q, involved and penalty, F, incurred. Risk is not any

[23] A rate of 8 per cent is reported for El Salvador in Londoño and Guerrero (1998, p. 37). This figure was lower than 6 per cent in 1983 in Cali, and probably of the same order of magnitude in other metropolitan areas in Colombia. Moreover, it most certainly has worsened since then. See Guerrero (1997, p. 98).

[24] On organized crime see Fiorentini and Peltzman (1995).

more given exogenously by public expenditures on crime deterrence. They are supposed to be too small for deterrence to be effective. Risk now depends on the organization of the illegal sector itself. For instance it may be the probability of being killed by a competitor willing to control a given territory for drug dealing. But the main economic factor pushing toward crime remains the income people may get if they stay in legal activities in comparison with the expected utility of illegal activity. In the present framework as in the original model any fall in this level of income, that is, any increase in urban poverty, increases the incentives to switch to illegal activities. Unlike in the canonical model, however, it is not clear that more or less inequality in society leads to more crime and violence. This essentially depends on the way the illegal sector is organized and of course on the size of that sector[25].

Transforming the original model so as 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, strictly speaking, and with extremely low probability of being apprehended, does not radically modify the initial analysis. It remains true that any increase in urban poverty should, other things being equal, result in an increase in violence. It is also still the case - in fact a fortiori so –that increasing effective crime deterrence should reduce the extent of violence–. A new determinant of the general level of crime and violence appears, however. It is the importance of the market for illegal activity and the way the demand for the services supplied by that sector –drug consumption in the first place– depends on the characteristics of the city or of the urbanization process.

3. The Limited Available Evidence on the Relationship between 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

[25] A model of this type is explored in Bourguignon (1998).

violence. Through this channel, they may inflict serious losses to society. This relationship may be direct, as more inequality and poverty make crime more profitable at a given level of crime deterrence. It may also be indirect, going through the amount that a society is willing to spend in crime deterrence. The questions we ask in this section are: (i) whether there is evidence of such a relationship between crime and inequality or poverty and (ii) what may be the importance of the negative effect of inequality on total (urban) income which goes through crime. We also address briefly the issue of the possible influence on inequality on crime deterrence.

It must be stressed at the outset that it is extremely difficult to answer the preceding questions. There essentially are two main sets of reasons for this. First, we have seen that 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 cause of criminality, they are a necessary, but certainly not 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 developed countries where crime rates are high are characterized by high indicators of social and economic disadvantage, the converse is not necessarily true. In England, Indian migrants are as discriminated against as much as Caribbeans and Africans. Yet crime and imprisonment rates are much higher in the second group. The same is true of Moroccans *versus* Turks in the Netherlands, or Southeast Asian *versus* Latin American immigrants in the US[26].

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 put into evidence a relationship between these series and data on international or inter-temporal differences in poverty and inequality. Even though we are more interested in developing countries, this is the reason why we shall begin by reviewing briefly the case of the US, undoubtedly the country where crime data are the least scarce. We

[26] These various examples are taken from Tonry (1997).

shall then move to cross-country comparisons involving both developed and developing countries.

Before doing so one may wonder whether historical trends are in agreement with the hypothesis that, ceteris paribus, more inequality of relative poverty should bring about more crime. However, the ceteris paribus condition is extremely demanding here. For instance, it is well known that inequality in the UK has been going up 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 US is thought to have peaked around 1930 and then fallen sharply until the 1950s. Afterwards, it remained stable before starting to increase again at the end of the 1970s. According to the simple hypothesis above, we thus should have seen criminality increasing in the 19th century and decreasing during most of the 20th in the UK. The same evolution should have been observed in the US with a peak around 1930, or possibly later, allowing for some delay in the sequence of effects[27]. Too many deep sociological changes happened at the same time to really hope that such a relationship could be observed. As mentioned above, the general evolution since the beginning of the 19th century is one of declining violence, which does not fit well the evolution of inequality in the UK. The upturn of violence observed in the 1930s in the US –i.e., the J– curve hypothesis –may not be inconsistent with a peak of inequality around 1930, but this is indeed very weak evidence–. The same inconclusive evidence may be gathered for continental Europe. Clearly, a much more rigorous analysis controlling for other factors which may influence the evolution of violence and crime would be necessary, but all the data necessary for such a long time series analysis are not available. As a matter of fact, we shall see that this is already the case for more recent periods.

Crime and Inequality in the US 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 a given point in time suggest that indeed income inequality is positively and significantly associated with crime rates. This is true of

[27] See Lindert (1998).

both property crime –robbery, burglaries and the like– and homicides[28]. What is more, the elasticity of the crime rate with respect to inequality appears to be substantial. The original estimates by Ehrlich suggested that, in 1960, a 1 per cent increase in relative poverty, measured by the number of persons below half the median income, in one state increased the crime rate by approximately 2 per cent for most property crimes. Using more recent data, Lee (1993, cited by Freeman, 1996, p. 33) found that when observations for the various states at different times were pooled together the increase in inequality that took place during the 1980s might have caused an estimated 10 per cent increase in crime rates. Interestingly enough, this order of magnitude turns out to be not very different from Ehrlich's estimates.

Time series analyses do not seem to lead to such clear conclusions. Freeman (1996), still reporting Lee's results, mentions that changes in crime rates in US metropolitan areas during the 1980s were not significantly correlated with changes in inequality, whereas Allen (1996) finds no significant effect of inequality –and a negative effect of absolute poverty– on the aggregate crime rate during the last 30 years. The latter also reports insignificant effects of poverty and inequality in other time-series analyses. A possible explanation of positive results obtained with cross-section data would thus simply be that there are some States where crime and inequality are both higher or lower than average because of a third unobserved factor more or less constant over time. Cross-sectional analysis would thus simply pick up the effect of these factors and conclude to a positive relationship between crime and inequality, even though there might not be any causal relationship between both variables.

An important correction to time series analysis of crime is proposed by Freeman (1996) in view of the substantial increase in the number of incarcerated people observed during the period where most of the increase in inequality took place. This number doubled between 1980 and 1990 from 0.5 to 1.1 million[29]. His point is that if the frequency of crimes had remained the same among all criminals, this increase in the incarceration rate should logically have produced a drop in the aggregate crime rate. But no such drop occurred, so that one must conclude either that the frequency

[28] See the discussion of this evidence in Freeman (1996, p. 33).
[29] See dilulio (1996, p. 13).

of crimes increased among non-incarcerated 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 indeed leads to a series which increases quite substantially in the 1980s, a few years after relative poverty and inequality of both individual earnings and household income started to rise[30]. 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 there practically was a single big change in the distribution of earnings over the last 30 years would probably make these results statistically inconclusive even though it clearly preceded an increase in the propensity to commit crime. Combined with cross-sectional evidence it nevertheless gives support to the hypothesis that criminality is positively and significantly associated with the degree of inequality and relative poverty in the US.

The recent evolution of criminality in the US does not invalidate the preceding argument. The crime rate has declined there every year since 1992. This evolution was so dramatic that public attention has been drawn to a few police chiefs and criminologists who were thought to be responsible for it. Instead of explaining it by new crime prevention and law enforcement policy some observers link that evolution to the end of the war for the control of *crack* distribution. Others note that as in the 1980s, incarceration rates have increased quite substantially during the recent years. Indeed, the total number of persons 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[31]. Also, expenditures in crime prevention and law enforcement increased substantially. That the 'propensity to commit crime' may have not changed radically despite all this is a hypothesis that cannot be discarded.

It would be interesting to investigate systematically the evolution of crime in all countries where important changes took place in the distribution of income during the last ten or 20 years and to see whether a simultaneous increase occurred in crime rates. According to the UN statistics, there was an increase in the robbery rate in the UK in the first half of the 1980s at a time when inequality was increasing quite substantially. Unfortunately, there is a break in the series between 1985 and 1989. When it resumes, it is

[30] *See* Juhn, Murphy and Pierce (1993) for the evolution of earning inequality in the US during the 1980s.

[31] *See* Massing (1998).

at a much higher level, which favors the hypothesis that more inequality leads to more crime. But this may also be due to a change in definitions. The UK and the US are practically the only developed countries where what may be called a drastic change in inequality took place over the last 20 years or so[32]. It is interesting that in both countries there is evidence of a concomitant increase in criminality. Inequality also increased significantly in Sweden and in the Netherlands since the mid 1980s[33]. Crime rates apparently did not change much. However, it is interesting that 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 above, it is the latter which 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 both on crime and on inequality and having experienced substantial changes in inequality further 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 (FLL) (already referenced). It is based on the UN data complemented for a few countries by homicide rate series obtained from cause of death statistics compiled by the World Health Organization (WHO). As discussed above, this data base is very 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 which are likely to be the most serious source of bias. Inequality data are taken from Deininger and Squire (1996). They are not themselves without problem. In particular, they are not available for all countries and all points of time, which still reduces the data sample used by FLL.

Standard cross-sectional analysis on mean robbery and homicide rates for the period 1970-1994 are based on samples of 50 to 60 countries depending

32 Inequality has also increased significantly in Sweden and in the Netherlands since the mid-1980s. Crime rates apparently did not change much. However, it is interesting that in both countries inequality increased more because of distributional changes at the top rather than at the bottom of the distribution.

33 *See* Gottschalk and Smeeding (1998).

on the explanatory variables that are introduced. The core independent variables are GNP *per cápita*, the Gini index for the distribution of income, average education, urbanization rate, and variables controlling for the importance of drug consumption. Among them, it is noteworthy that the only variable more or less systematically significant turns out to be the Gini index with, as expected, a positive influence on crime. Moreover, this effect is sizable. All other things being equal, a 5 percentage point change in the *Gini index*, which corresponds very roughly to the increase in household income inequality observed during the 1980s in the US and in the UK, would produce on average an increase of approximately 15 per cent in the homicide rate, and two or three times this figure for robberies. However, it is worrisome that, in the case of homicides, the corresponding coefficient becomes insignificant when one controls for regions, and, in particular, when a *dummy* variable for Latin America is used as an explanatory variable. In view of the regional orders of magnitude of crime rates reviewed above, this is not really surprising. This result suggests that the significance of inequality 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. There, 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 be significantly associated with the crime rate within these various groups of countries rather than mostly across them. Somehow, this is reassuring since it fits the intuition that the economic determinants of crime are likely to be stronger for property than other crimes.

Other variables do not come out significantly. This is not too surprising for GNP *per cápita* since most of the economic explanation of crime somehow refers to relative rather than absolute income factors. It is less expected that the average educational level of the population at working age, drug consumption and the urbanization rate all 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 a bad approximation in some countries. The urbanization rate does not have these problems. Interestingly enough, it is positive and not far from statistical significance

for robberies, whereas it is close to zero and very far from significance for homicides. This goes in the direction suggested by simple theory.

As recalled above, the ambiguity of pure cross-sectional estimates is well-known. One way of eliminating it is to use panel data and to control for country fixed-effects. This is what the study of FLL does. However, it also explicitly takes into account the hysteresis effect of criminality we referred to in the previous section 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 auto-regressive model in first differences. They do so on reduced samples of countries defined by the availability of all variables of interest after taking first differences and lags. They also instrument some of the explanatory variables by lagged values of the variables of the model so as to avoid endogeneity problems. The resulting estimates are reproduced in Table 1.

Table 1 **Panel Regressions of Crime Rates: First Difference Auto-regessive Models[a]**

(p-values in italics)

Explanatory variables	Homicide rate (growth rate)	Robbery rate (growth rate)
Difference in:		
Gini coefficient[b]	0.036	0.011
	0.000	*0.009*
Urbanization rate	0.004	0.011
	0.063	*0.000*
GDP per capita (log)	-0.207	-0.045
	0.000	*0.035*
GDP growth rate[b]	-0.036	-0.072
	0.001	*0.000*
Drug possession crime rate	0.001	0.001
	0.047	*0.019*
Secondary enrollment rate	0.009	0.002
	0.000	*0.191*
Lagged homicide rate	0.640	0.839
	0.000	*0.000*
Number of observations (countries)	58(20)	50 (17)

a) GMM estimates. Second lags and third lags of dependent and independent variables used as instruments with the exception of the lagged crime rate for which third lag is used as an instrument.
b) Strictly exogeneous.

Source: Fakjnzylber, Lederman and Loayza (1998).

These estimates, which are essentially based on the longitudinal dimension of the data, confirm the results of the cross-sectional analysis and put into evidence additional effects. The comparison is not totally valid since 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 somewhat remarkable and would suggest that the phenomena put into evidence by all these regressions are rather robust.

This seems to be true, first of all, for the effect of income inequality upon criminality. This effect is significant and substantial both for homicides and robberies. In the short-run a 1 percentage point increase in the *Gini coefficient* would produce on average in the countries included in the sample a 3.6 per cent increase in the homicide rate and a 1.1 per cent increase in the robbery rate. However, this effect is much stronger in the long run because of the compounding effect of hysteresis in crime rates. The coefficients of the lagged crime rate are such that the effect of inequality would be multiplied by 3 for homicides and by 7 for robberies[34]. If one has in mind major changes in inequality like those observed recently in the 1980s in the US and in the UK, but also in several Latin American countries, increases of the *Gini coefficients* of 3 or 5 percentage points are not unreasonable orders of magnitude for periods extending over 5 years or a little more[35]. Other things being equal, this would correspond to increase in crime rates from 40 to 60 per cent at a horizon of 10 to 15 years, a rather frightening order of magnitude. This long-run effect may be somewhat biased since the data sample does not include national time series long enough for a satisfactory representation of the complete dynamic processes governing crime rates.

A second effect discussed above in connection with the cross-sectional model is that of the urbanization rate. It still fails to be sizable and significant for homicides, but it is very much so for robberies. For the latter, a once and for all 1 percentage point increase in the urbanization rate by 1 per cent produces in the long run an increase in the nationwide crime rate equal to 8 per cent. Although the full dynamics of this process

[34] These multiplicative factors are simply the inverse of $1 - l$, where l is the coefficient of the lagged crime rate in Table 1.

[35] See Atkinson, Gottschalk and Smeeding (1995), and Gottschalk and Smeeding (1998), for series of *Gini indices* in OECD countries and Morley (1995) for Latin American countries.

is imperfectly represented by the estimated model, the preceding figure becomes still larger when the continuity of the urbanization process is taken into account. For instance, in a country where the urbanization rate would be increasing by 0.5 percentage point per year, a reasonable order of magnitude in view of the experience of many developing countries over the last two or three decades, then, other things being equal, the nationwide robbery rate would increase by approximately 60 per cent in 20 years. If nothing else were changing, 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 1 suggest that economic growth tends to offset the adverse effects of urbanization. In other words, it is only if urbanization proceeded without sufficiently rapid economic growth that crime would develop as suggested by the preceding figure. This is in agreement with the theoretical argument recalled above of the push and pull factors of urbanization. Overall, FLL results thus describe a rather complex combination of forces which together contribute to possible changes in crime rates or, alternatively, permit maintaining it steady in the course of development.

Another interesting feature of the preceding equations is the substantial histeresis they suggest in the evolution of criminality. Here again, and as could be expected, it is more pronounced for robberies than for homicides. In the former case, a simple calculation made on the basis of the coefficients shown in Table 1 suggests that a major recessions leading to a sudden and once for all 5 per cent drop in GDP would produce an instantaneous 50 per cent increase in the robbery rate. However, the hysteresis effect is such that the crime rate would still be 10 per cent above its pre-recession level 7 years after the economy resumed normal growth[36]. Again, these orders of magnitude are only indicative. But such recessions are not uncommon in developing countries and the preceding figures show that the lasting increase in crime caused by a temporary surge in poverty may add very much to their social cost.

It might be thought that because they are based on a restricted number of observations and countries, the preceding results are not truly representative. It turns out that fixed effects are less of a problem in the

[36] Because of the symmetry built in the model this effect would disappear in case the initial loss were fully compensated by faster growth in the following years.

case of homicide than in the case of robberies, so that alternative specifications may be estimated in that case on larger samples. The results reported by FLL lead to the same general conclusions as above. In addition, they confirm that crime deterrence variables, essentially police and conviction rates, have a significant negative influence on homicides.

Convergent findings are reported by Londoño and Guerreo (1998) who 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 FLL, so a detailed comparison is not possible. But they find sizable effects of poverty and inequality on homicide also. According to the figures they indicate, a 1 percentage point increase in the poor population would produce on average an instantaneous 2.5 per cent increase in the number of homicides[37]. This does not seem very different from the orders of magnitude seen above.

Having said this, the preceding estimates must be viewed with very much care. We already have 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 certainly should lead to more satisfactory conclusions. In the present case, however, it must be kept in mind that both in the FLL study and in that of Londoño and Guerrero the corresponding samples of observations are very limited so that the relevant effects may be estimated on the basis of a few observations. All this definitely points to the need for better and more consistent data being regularly collected 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 a likely positive association 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 which goes through

[37] It would certainly be worthwhile to obtain estimates based on this sample comparable to those given by FLL.

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 very rough estimates, we shall see that it is surprisingly important.

Table 2 puts together some crude estimates of the various components of the cost of crime in the US and in Latin America as a proportion of GDP. They draw respectively on Freeman (1996) and Londoño and Guerrero (1998) –hereafter LG–. As a first approximation, one may consider that estimates for other countries or regions may be obtained by scaling these estimates up or down depending on observed crime rates.

The first line of the table corresponds to the straight estimate of property crime, that is, the total amount of robberies, thefts, burglaries, frauds, embezzlements, etc. For the US, the figure is obtained from the National Crime Victimization Surveys. For Latin America it is based on special surveys taken in six countries[38] as part of a research project organized by IDB. Assuming that the average amount involved in property crimes is proportional to income per capita, the figures appearing in this row of Table 2 suggest that the rate of property crime in Latin America is three times that in the US, which seems a reasonable order of magnitude –as a matter of fact the same as that observed for homicides. Notice that this row is entitled 'transfers' and is not included in the social cost of crime. Such a view corresponds to the theoretical model seen above –*see* equation (5)– where property crime indeed appears as a simple exchange of property *status*, and therefore as a 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 2 as a 'monetary' cost of crime. But this item also includes the actual costs incurred by victims in addition to what they lost, that is, medical expenses in case of violent robbery, repair of property in case of a burglary, time spent dealing with the police or justice personnel, etc. There is no direct estimation of that cost in the Latin American case[39]. The figure appearing in Table 2 is obtained by assuming the same proportionality factor as in the US. The

[38] Brazil, Colombia, El Salvador, Mexico, Peru, Venezuela.

[39] LG only report 0.2 per cent for medical expenses and a much higher amount for 'productivity losses' which we do not take into account in Table 2.

resulting monetary costs of property crime are rather moderate. They amount to only 0.2 per cent of GDP in the US and 0.6 in Latin America.

To these monetary costs, we now add non-monetary 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 the case of property crime in the US It is approximately equal to the material cost of crime appearing in the first two rows of Table 2, that is 0.7 per cent of GDP. The same proportionality factor with respect to the total amount of property crime is applied for Latin America leading to a cost of 2.1 per cent of GDP[40]. The human capital loss is computed by LG in the case of Latin America on the basis of the average life expectancy of homicide victims and unskilled wage rates. The resulting cost is substantial since it amounts to 1.7 per cent of GDP. The figure for the US is obtained by proportionality with the homicide rate, that is approximately a ratio 1:4 with respect to Latin America.

Table 2 Estimates of the Cost of Crime in the US and in Latin America around 1995

(Per cent of GDP)

	US	Latin America
"Transfers" = monetary amount of property crime	(0.5)	(1.5)
Monetary cost (medical expenses, opportunity cost of time...)	0.2	0.6
Non-monetary 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: Based on estimates by Freeman (1996), Londoño and Guerrero (1998) and own calculations.

[40] Actually LG give a much larger estimate for that component –5.3 per cent of GDP– based on reported willingness to pay for safety. However, the figure they derived from the surveys at their disposal seems artificially high in comparison to the US figure.

Other costs arise through crime prevention and punishment. The opportunity cost of the time of the incarcerated population in the US is estimated by Freeman (1996) to be 0.6 per cent of GDP. Assuming this cost is proportional to the number of incarcerated people per inhabitant leads to a figure of only 0.1 per cent of GDP in Latin America. Indeed, the incarceration rate, i.e., number of incarcerated persons per inhabitant, is a little more than five times higher in the US 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[41]. Expenditures on criminal justice and police may be compensating somewhat for this difference since they amount to 1.6 per cent of GDP in Latin America and only 1.3 per cent in the US 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 there than in the US, although the ratio between these two figures is far from the ratio of crime rates.

Summing all these components leads to a sizable total cost of crime equal to 3.7 per cent of GDP in the US and an impressively high 7.5 per cent in Latin America. Of course, both figures are very rough. But it is difficult not to believe their orders of magnitude is about right. It must also be reminded that, by world standards, the countries covered by the preceding analysis have levels of criminality way above average. It is likely that the same calculation would lead in most European and Asian countries to figures below 2 per cent of GDP.

Putting together the various estimates discussed in this section leads to a strikingly high order of magnitude for that part of the social cost of poverty and inequality which may go 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 coefficient reported in Table 1. According to these elasticities a 5 percentage point increase in the *Gini coefficient* in a given country might produce after some delay an increase in the crime rate of the order of magnitude of 50 per cent. The same kind of effect may be expected from a major recession leading to a 5 per cent

[41] Incarceration rates in European countries are comparable to those observed in Latin America. Yet crime rates are much lower there than both in Latin America and in the US.

fall in GDP or more. That part of the social cost of these events which goes through crime may be inferred from the figures appearing in Table 2. If nothing is done to increase crime deterrence, then the bottom half of the table has no reason to change. However, all of the top half is likely to increase proportionally to the crime rate. In a 'middle-crime' country like the US, this would entail a social cost approximately equal to 0.6 per cent of GDP. In 'high crime' countries like many Latin American countries, the cost would be above 2 per cent of GDP. Moreover, if one takes into account that the increase in criminality is likely to concentrate in large metropolitan areas, then the local social cost in these areas should be much larger. These are not small effects. Note also that they are likely to be magnified by hysteresis. Overall, these potentially are major effects.

One could think that an active crime deterrence policy could reduce the preceding cost of unequal development or recessions. In that case, it is the bottom of Table 2 that will be modified. The extent of modification depends on the efficiency of crime deterrence. However, there might not be very much to gain. The situation of the US in the 1980s is illustrative of this. As recalled above, it is likely that the potential increase in criminality which could be expected from the dramatic fall in the real income of low-skilled workers was offset by a drastic increase in the incarceration rate, which more than doubled since 1980. If this is the case, then, approximately half the opportunity cost of incarceration, and that part of the budget of criminal justice which covered the direct cost of that policy, e.g. the cost of prisons, must be considered as a price that society had to pay for increasing inequalities. It may be seen that the resulting figure is not far from the hypothetical 0.6 per cent that would have been observed if crime had been left increasing.

Inequality and the Demand for Safety

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

Interesting evidence is provided in a recent study by Pradhan and Ravallion (1998) in the case of Brazil. Drawing on subjective evaluations of the

importance of public safety collected in the 1966 Brazilian Living Standard Measurement Survey, these authors find that the current valuation of public safety and the desire for improving it are increasing functions of households' standard of living. The unequal valuation of public safety is an important result. It means that 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 result is not so much that the desire for public safety is increasing 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 subjective evidence and much more work is necessary to get a better idea of the relationship between inequality and the social demand for safety.

4. Conclusion

It was shown in this paper that crime and violence are likely to be a socially costly by-product of, among other factors, uneven or irregular economic development processes. Simple economic theory shows how property crime and, more generally, all the violence that may be associated with illegal activity may partly be the consequence of excessive inequality and poverty. Limited available evidence 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 the actual crime rate or the propensity to commit crime in that part of the population not confined to prison. By increasing the extent of poverty, major recessions may have an effect of comparable amplitude on crime. Moreover, hysteresis, in the way crime changes over time in a given society, of which there also is evidence, 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, it is not unreasonable to think that severe recessions of the type that was witnessed by several developing countries in the recent past or major increases in inequality measures comparable to what was observed in several countries during the 1980s could be responsible for social losses as high as 2 or 3 per cent of GDP. This order of magnitude would even be greater if only urban areas where most of that increase in criminality is likely to take place were considered.

It is interesting that 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 and also where economic growth has been extremely volatile. The recent surge of criminality in some countries of former socialist countries in central Europe and central Asia may probably be analyzed in the same way. However, that evolution also raises 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. But this raises two observations. First, in a political economy framework crime deterrence may itself be the consequence of existing or increasing inequality. A highly unequal society may in fact 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 an increase in inequality to yield higher levels of crime, these measures are costly, and it is not sure that they are socially less costly than crime itself.

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

References

Akerlof G. (1998), "Men without children", *in The Economic Journal*, 108(447): 287-309.

—— and J. Yellen (1994), "Gang behavior, law enforcement and community values", *in* H. Aaron and T. Mann (eds.), *Values and Public Policy*, Brookings Institution, Washington.

Allen, R. (1996), "Socioeconomic conditions and property crime: A comprehensive review and test of the professional literature", *in American Journal of Economics and Sociology*, 55: 293-308.

Atkinson, A., L. Rainwater and T. Smeeding (1999), "Income distribution in OECD countries: Evidence from Luxembourg income study", Paris: OECD.

Becker, G. (1968), "Crime and punishment: An economic approach", *in Journal of Political Economy*, 101: 385-409.

Benabou, R. (1994), "Education, income distribution, and growth: The local connection", Centre for Economic Policy Research, Discussion Paper: 995.

Bourguignon, F. (1998), "Inefficient inequalities: Notes on the crime connection", mimeo.

Burtless, G. and L. Karoly (1995), "Demographic change, rising earnings inequality, and the distribution of personal well-being, 1959-1989", *in Demography*, 32(3): 379-405.

Chesnais, J-C (1981), Histoire de la violence en Occident de 1800 à nos jours, Laffont, Paris.

Deininger and Squire (1996), "A new data set measuring income inequality", *in World Bank Economic Review*, 10(3): 565-91.

Deutsh, J., U. Spiegel and J. Templeman (1992), "Crime and income inequality: An economic approach", *in Atlantic Economic Journal*, 20: 46-54.

DiIulio, J. (1996), "Help wanted: Economists, crime and public policy", *in Journal of Economic Perspectives*, 10(1): 3-24.

Ehrlich, I. (1973), "Participation in illegitimate activities: A theoretical and empirical investigation", *in Journal of Political Economy, 81:* 521-565.

—— (1996), "Crime punishment and the market for offenses", *in Journal of Economic Perspectives*, 10(1): 43-67.

Eiden, G. (1997), "The economics of crime: Survey and bibliography", Working paper in Law and Economics, University of Oslo.

Fajnzylber, P., D. Lederman and N. Loayza (1998), "Determinants of crime rates in Latin America and the world", World Bank Latin American and Caribbean Studies, Washington.

Fiorentini, G. and S. Peltzman (eds.) (1995), *The Economics of Organised Crime*, 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", *in Journal of Economic Surveys*, 11: 267-295.

Gottschalk, P. and T. Smeeding (1998), "Empirical evidence on income inequality in industrialized countries", mimeo.

Guerrero, R. (1998), "Epidemiology of violence in the Americas: The case of Colombia, in World Bank", *in Poverty and Inequality*, Proceedings of the Annual World Bank Conference on development in Latin America and the Caribbean, Washington, pp. 71-82.

Hagan J. (1994), "Crime inequality and efficiency", *in* A. Glyn and D. Miliband (eds.), Paying for inequality, London, IPPR/Rivers Oran Press, pp. 80-99.

Juhn, C., K. Murphy and B. Pierce (1993), "Wage inequality and the rise in returns to skill", *in Journal of Political Economy*, 101(3): 410-42, June 1993.

Keeling G. and C. Coles (1996), Fixing broken windows, Touchstone, New York.

Lindert, P. (1998), "Three centuries of inequality in Britain and America", mimeo, University of California, Davis

Londoño, J-L (1998), "Violence, psyche and social capital, in World Bank", *in Poverty and Inequality*, Proceedings of the Annual World Bank Conference on development in Latin America and the Caribbean, Washington, pp. 71-82.

—— and R. Guerrero (1998), "Epidemología y costos de la violencia en América Latina", IDB, Washington, forthcoming.

Massing, M. (1998), "The blue revolution", *in The New York Review of Books*, (19 November).

Morley, S. (1995), *Poverty and Inequality in Latin America: The Impact of Adjustment and Recovery in the 1980s*, Baltimore: Johns Hopkins University Press.

Moser, C. (1998), "Urban poverty and violence: Consolidation or erosion of social capital, in World Bank", *in Poverty and Inequality*, Proceedings of the Annual World Bank Conference on development in Latin America and the Caribbean, Washington, pp. 83-89.

Piehl, A. and J. dilulio (1995), "Does prison pay? Revisited", *in Brookings Review*, 13: 21-25.

Pradhan, M. and M. Ravallion (1998), Household demand for public safety, mimeo. References.

Sah, R. (1991), "Social osmosis and patterns of crime", *in Journal of Political Economy*, 99: 1272-1295.

Sala-I-Martin, X. (1996), "Transfers, social safety nets and economic growth", *in International Monetary Fund Staff Papers*.

Tonry, M. (1997), Ethnicity, Crime and Immigration, University of Chicago Press.