Understanding High Crime Rates in Latin America: The Role of Social and Policy Factors [*]

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Abstract

This paper discusses the pattern, causes and consequence of the high crime rates observed in Latin America. Crime represents a substantial welfare loss and a potentially serious hindrance to growth. We conduct an informal assessment of the relative strength of the alternative hypotheses raised in the literature to explain the phenomenon. We argue that, despite being extremely high, the incidence of crime in the region is not much different from what should be expected based on socioeconomic and public policy characteristics of its countries. Estimates from the empirical literature suggest that most of its seemingly excessively high violence can be explained by three factors: high inequality, low incarceration rates, and small police forces. Still, country specific experiences have been different in many respects. The evidence suggests that effective policies toward violence reduction do exist and have been shown to work within the context of Latin America itself.

Keywords: crime, homicide, welfare, development, Latin America

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1. Introduction

Latin America has been traditionally seen as a particularly violent region of the world. This perception is not new, even though it may have been enhanced over the last decades with the escalation of violence in countries such as Brazil, Colombia, and Venezuela (see Aguirre, 2000). Still, despite the fact that several candidate explanations have been put forth, there is no consensus regarding the reasons behind this phenomenon.

Tables 1 and 2 present mortality rates due to violence[1] and statistics related to various dimensions of development, for regions of the world and individual countries respectively (73 countries for which mortality by cause of death is available from the World Health Organization –WHO). The occurrence of deaths due to violence is much more common in Latin America than in any other region: it is roughly 200% higher than in North America and in the Western Pacific, 450% higher than in Western Europe, and 30% higher than in the Former Communist block. The region is also significantly poorer and less educated than the developed countries, but statistical analyses have failed to establish an unequivocal and quantitatively significant link between these variables and crime. In addition, Latin America enjoys higher levels of income and life expectancy than most of the Former Communist block, but still displays substantially higher violence levels.

Crime and violence have many potential welfare implications. As the tables show, the loss in life expectancy at birth due to violence in violent societies can be higher than 1 year and sometimes even above 2 years. Recent estimates have shown that increases in mortality represent a quantitatively significant welfare loss, be it directly from the reduced welfare due to a shorter life span, or from the indirect effects of a shorter planning horizon on investments in physical and human capital (see Murphy and Topel, 2004, and Lorentzen, McMillan , and Wacziarg, 2006, for example). In addition, material costs, including both direct costs and expenditures on criminal justice and crime prevention, add up to a significant fraction of overall production across different regions of the world (see Bourguignon, 1999). Finally, loss of human capital and productivity of

[1] Mortality due to violence is defined as the number of deaths caused by homicides and injuries purposely inflicted by other persons, plus other violent deaths, according to the International Classification of Diseases (ICD). Later on, we restrict our analysis to the category that is most closely related to common crimes, the homicide rate.

those deceased, incapacitated and incarcerated add yet another layer to the social inefficiencies generated by crime.

The economic relevance of this phenomenon has been widely recognized in recent years, both in the research community and in the public debate. Today, the causes and consequences of crime are common themes in economic research. They are also among the main topics in the popular media in Latin America, and often bring the region to the headlines in the major media outlets worldwide (see, for example, the Economist, 2006 and The Washignton Post, 2007). In reality, crime and violence have been identified as the second most important public policy issue in the region, ranking first for various specific countries such as Argentina, El Salvador, and Venezuela (Latinobarómetro 2006).

There are many possible explanations for the differences in violence observed across regions of the world and the particularly high levels observed in Latin America. These range from distinct definitions of crimes and different reporting rates (percentage of the total number of crimes actually reported to the police), to real differences in the incidence of crime due to inequality, degree of repression, effectiveness of the government, and age composition of the population. The goal of this paper is to discuss the pattern, causes and consequence of the high crime rates observed in Latin America. We argue that crime in the region represents a significant welfare loss and a potentially serious hindrance to growth. We then conduct a preliminary assessment of the relative strength of the alternative hypotheses raised in the literature to explain the high incidence of violence.

In pursuing this goal, we take the rational choice perspective typical from the economic theory of crime. In this setup, criminals respond to economic incentives in the same way that legal workers do (Becker, 1968 and Stigler, 1970). In Stigler's words, "[the criminal] seeks income, and for him the usual rules of occupational choice will hold" (Stigler, 1970, p.530). Particularly important from our point of view is the fact that the relative attractiveness of the criminal activity is intimately related to variables that undergo significant changes during the process of economic development, such as income distribution, institutional development, government effectiveness, and demographic composition of the population. We ask how the economic and social

landscape of a society affects the incentives of its citizens to engage in criminal behavior, and confront it with the actions that the government takes to reduce the incidence of crime and violence. From this interaction of forces – the supply of potential criminals faced with the repressive measures imposed by the State – an equilibrium level of crime and violence emerges. We therefore concentrate our discussion on the dimension of crime that is economically motivated and is subject to a cost benefit analysis on the part of the perpetrator.[2]

Our analysis shows that, despite being extremely high, the incidence of crime in Latin America is not much different from what should be expected based on socioeconomic and public policy characteristics of its countries.[3] Estimates from the empirical literature suggest that most of its seemingly excessively high violence can be explained by three factors: high inequality, low incarceration rates, and small police forces. In addition, country specific experiences in the recent past have been heterogeneous in many respects. There are examples of countries that maintained reasonably low violence levels throughout the last decades and also of countries that, starting with very high violence, were able to achieve levels comparable to that of some developed countries. Still, some other countries went through the last 30 years experiencing increasingly high and seemingly uncontrollable crime rates. As a whole, the evidence suggests that it is possible to have an effective policy towards violence reduction, and that this goal has indeed been attained by certain local governments from some countries within the region itself.

The remainder of the paper is structured as follows. Section 2 discusses the welfare implications of crime and violence. Section 3 summarizes the main issues in the measurement and comparison of crime rates across countries. Section 4 presents the pattern of crime in Latin America, both across countries and through time. Section 5

[2] Random acts of violence or violence among family members, which sometimes are regarded as the result of loss of control over one's self, are outside the scope of our analysis. Though these represent a significant fraction of the violent acts registered in different regions of the world, we do not believe that they are responsible for most of the differences observed across regions or countries.

[3] The position of Latin America as a major producer of drugs and route of the international drug traffic has important implications for organized crime and sometimes also for the institutional stability of its states. Here, we concentrate on common crimes and do not deal with this issue explicitly. Our analysis suggests that one can understand most of the incidence of common crimes in the region without resorting to the role of drugs.

analyzes some candidate explanations for the levels of violence observed in the region. Section 6 conducts a preliminary assessment of the relative importance of these candidate explanations based on estimates available from the empirical literature. Section 7 discusses the strategy and institutional context of a few successful experiences of violence reduction in Latin America. Finally, Section 8 concludes the paper.

2. Welfare Implications

Crime and violence are a burden to society in several dimensions. There are straightforward consequences to the quality of life, such as reduction in lifespan, widespread feeling of insecurity, and change in behavior through reduced time on the streets. There is also the social waste from the value of goods lost and destroyed, the public and private expenditures on prevention, and the costs related to criminal justice and prison systems. In addition, and far less straightforward, crime has important non-monetary welfare consequences, possibly reducing productivity and shortening planning horizons on investments in physical and human capital. It is therefore deleterious to welfare in different ways, and possibly an actual hindrance to development.

From this perspective, the Latin American situation is particularly worrisome. The region fell behind in terms of growth in the last 20 years and is remarkably violent by international standards. According to the International Crime Victimization Survey (ICVS), about 44 percent of Latin Americans are victims of some type of crime every year (average for the 1990s). During the last decade, the region had systematically the highest rate of deaths due to violence in the world: 21.8 per 100,000 inhabitants. This position has given Latin America headlines in major international media outlets and has made it infamous throughout the world. A recent example is a report stating that 729 Israeli and Palestinian minors were killed as a result of violence between 2002 and 2006, while 1,857 minors were reported murdered in Rio de Janeiro, Brazil, during the same period (The Washington Post, 2007).

Measuring the magnitude of the negative consequences of crime, however, is a difficult task. There are multiple dimensions that one should take into account, and there is no unified framework in the literature to tackle the problem. The material costs of crime and violence, including both direct costs and expenditures on criminal justice and

crime prevention, have been estimated to add up to a significant fraction of production across different regions of the world. This number is thought to be around 2.1% of the GDP per year for the United States, and 3.6% for Latin America (see, for example, Bourguignon, 1999 and Londono and Guerrero, 1999). Considering monetary costs related to property crime, the number rises to 2.6% for the US and 5.1% for Latin America (see Bourguignon, 1999). There is however debate in the literature on whether this is actually a social cost, rather than a transfer of resources between members of society. Glaeser (1999) argues that, since generally the goods are valued less by the criminals than by the people who lose them, it should indeed be considered a social loss. The value should equal, in equilibrium, the opportunity cost of criminal's time, i.e., the time spent on crime instead of legal activities, and this does correspond to a welfare loss.

On top of material costs, one of the most important direct consequences of crime is the increase in injury and mortality rates. Economists have recently developed tools that allow the estimation of the social cost from reductions in life expectancy and have shown that these can be quantitatively very important. In the case of violence, this has been shown to represent a substantial welfare loss, of the same order of magnitude of direct material costs of crime. Based on a willingness to pay approach, Soares (2006) estimates that 1 year of life expectancy lost to violence is associated on average with a yearly social cost of 3.8% of the GDP. This estimate still leaves out the costs due to injury and reduced health, for which there are no trustworthy economic based estimates available.

The non-monetary dimension reinforces the severity of the Latin American scenario. In the 1990s, individuals born in Latin America had life expectancies on average 0.6 year lower because of violence (see Table 1). This number was at least two times higher than the loss in life expectancy for any other region, but for the Former Communist countries. It reached its peak in Colombia, where 2.2 expected years of life were lost because of violence. To put these numbers in perspective, reductions in life expectancy due to violence represented social losses analogous to a permanent decline of 9.7% of yearly income for Colombia, as compared to only 0.9% for the United States (Soares, 2006).

Figure 1 shows the discounted present social value of violence reduction as a share of GDP for several countries, as estimated by Soares (2006), ordered from highest to lowest. From the nine frontrunners, eight are Latin American: Colombia, with an astounding 281%, followed by the Philippines (280%), Venezuela (95%), Chile (86%), El Salvador (73%), Belize (71%), Suriname (67%), Mexico (67%), and Brazil (65%). The 11 remaining countries that complete the top-twenty in Figure 1 are all Latin American and Caribbean or Former Communist. In the other extreme of the distribution, the 10 lowest values are all Western European countries, plus Japan.

Mortality due to violence in high-violence areas is a particularly perverse phenomenon due to its concentration at prime ages. Figures 2 (a) and (b) show the age profile of mortality by violence for selected countries. In addition to illustrating the extent of difference between the various countries, the figure also highlights that violent countries such has Brazil, Colombia and Russia have the vast majority of mortality due to violence concentrated between ages 15 and 40.

The non-monetary dimension of the costs of crime, together with its specific age profile, induces also indirect economic consequences. These are effects from changes in behavior induced by reductions in the length of productive life, such as decreased investments in human capital and health, reduced savings and investments in physical capital, and, therefore, reduced long-run growth.

Shorter life horizons reduce the incentives for individuals to take actions that generate long-term benefits and short term costs, such as investing in education and saving for the future.[4] One of the main channels linking mortality to growth is fertility (Lorentzen, McMillan, and Wacziarg, 2006). There is a positive relationship between mortality and fertility, and a negative relationship between these two variables and investments in human capital. In countries with a high HIV prevalence, for example, parents have on average two more children when compared with countries with low HIV prevalence (Kalemli-Ozcan, 2006). This connection leads to a negative correlation between adult mortality and investment in human and physical capital, and it can be a source of poverty traps.

[4] Even for those who do go to school, a violent environment can be harmful to human capital accumulation. According to Severnini (2007), conditioning on individual characteristics, students attending more violent schools perform significantly worse in a Brazilian national exam.

Finally, there are intangible costs in the labor market and negative effects to business climate. According to Londono and Guerrero (1999), intangible costs of crime – deterioration of productivity, consumption, and labor force – constitute the major part of Latin American's estimated cost of violence, corresponding to 7.1% of the region's GDP. Nevertheless, these dimensions are conceptually less clear and difficult to estimate in a convincing way. Still, it is important to highlight the impact of crime on institutional stability and business environment, particularly where there is a significant presence of organized crime. Gaviria and Velez (2002) argue that crime has a perverse effect on economic efficiency, reducing investment and employment in poor urban Colombian communities. In Brazil, 52% of managers rank crime as a major business constraint according to the World Bank's Investment Climate Survey (2003).

The perverse effects of crime are therefore multi-dimensional and the magnitude of its costs depends on what is taken into account. In any case, costs of crime and violence represent a significant share of aggregate production, and particularly so in Latin America, where crime rates have been high for most of the last decades. In order to illustrate this point, we draw on the literature discussed before and gather in Table 3 a set of estimates related to various dimensions of the costs of crime and violence. These are the dimensions over which there is not much theoretical controversy and for which comparable estimates exist for the US and Latin America.

As can be seen, costs of violence as a proportion of GDP are substantially higher in Latin America when compared to the US. Most of the difference comes from costs related to increased mortality and public and private security expenditures. Overall, costs of violence in the region would be even higher, around 13% of GDP, if the intangible dimensions suggested by Londono and Guerrero (1999) were included in the calculations.

Regardless, it seems indisputable that violence and crime represent a very serious public policy issue in the region. The remainder of this paper tries to understand the reasons behind this state of affairs. We start by addressing the issue of comparison of crime rates across countries, and then describe the pattern and evolution of violence in the recent past. Following, we ask what factors could lie behind the observed pattern and investigate whether there seems to be effective policies to fight crime available for the governments in the region.

3. The Measurement of Crime

Any international comparison of crime has to deal inevitably with the issue of measurement error in crime rates. This problem can be illustrated by the pattern of results usual in the first generations of papers on the topic. Early empirical studies on the determinants of cross-regional differences in crime rates were mainly concentrated on the analysis of the effects of inequality and development on crime. Detailed reviews of the criminology literature are presented in Patterson (1991) and Fowles and Merva (1996). The statistical approaches used in the different studies and their respective conclusions were as diverse as they could possibly be. The major part of the evidence regarded within US studies, with the units changing from neighborhoods and cities to counties and metropolitan areas. Results on inequality in this case varied between positive and non-significant from crime to crime and from study to study, leaving no clearly identifiable pattern. In relation to development, US studies most often indicated a negative effect of income level (or positive effect of poverty level) on crime rates, although non-significant and even positive results were sometimes present. The international evidence, surprisingly, suggested a conclusion strikingly different from this one. While the few inequality studies left no clear answer, the evidence on development seemed to be overwhelming: virtually all the international evidence from the criminology literature suggested that development and crime rates were positively and significantly correlated.

The empirical literature from economics has challenged this consensus and raised concerns regarding the problem of underreporting in official crime statistics (see Fajnzylber, Lederman, and Loayza, 2002a and 2002b and Soares, 2004a and 2004b). Previously, this result was regarded almost as a stylized fact by criminologists and sociologists used to the international comparisons of crime rates. Burnham (1990, p.44), for example, claims that “evidence as exists seems to suggest that development is indeed probably criminogenic.” Along the same lines, Stack’s (1984, p.236) empirical specification includes “level of economic development, a factor found to be related positively to property crime rates in the previous cross-national research.”

But recent evidence has shown that these results have an explanation far more simple than the industrialization induced social disintegration usually suggested in the

sociological literature. One major statistical problem is systematically overlooked in most cross-national studies: the non-randomness of the reporting error (see, for example, Krohn and Wellford, 1977, Krohn, 1978, and Stack, 1984). Official data is known to greatly underestimate actual crime rates, and this can constitute a serious problem if the degree of underestimation is correlated with the characteristics of the country.

The rate of crime reporting is the fraction of the total number of crimes that is actually reported to the police. We draw on Soares (2004a) and construct this variable by crossing data from official crime records (United Nations Survey of Crime Trends and Operations of Criminal Justice Systems, UNCS) with data from victimization surveys (International Crime Victim Survey, ICVS).

The International Crime Victim Survey (ICVS) is a survey conducted by a group of international research institutes under the coordination of the United Nations Interregional Crime and Justice Research Institute (UNICRI). It contains data for selected countries, irregularly distributed over the years 1989, 1992 and/or 1996/7. Since it is an independent standardized victimization survey, the ICVS should be free from the systematic bias introduced by the problem of underreporting and, therefore, should give an unbiased estimate of the "true" crime rate and of its variation across countries. The other dataset used is the United Nations Survey of Crime Trends and Operations of Criminal Justice Systems (UNCS), which is a dataset created by the United Nations with information related to several crime and justice related variables, based on official records. Several countries and years are irregularly covered in the period between 1971 and 1994.

We concentrate on the three types of crimes that can be compared across the victimization survey (ICVS) and the official records survey (UNCS): thefts, burglaries, and contact crimes (robberies, sexual incidents and threats/assaults). See the discussion in Soares (2004b) for a detailed account of the comparability of the two datasets.

Table 4 presents descriptive statistics for crime rates obtained from victimization surveys and from official records (sample composed by 45 countries). The numbers are extremely different. Comparing the cross-country averages from the ICVS with the ones from the UNCS, we have the following numbers: according to the official records, 2.1% for thefts, 0.7% for burglaries and 0.3% for contact crimes; according to the victim

survey, 25.1% for thefts, 6.7% for burglaries and 7.7% for contact crimes. Implicitly, this means that the fraction of the total number of crimes reported to the police varies widely across countries and across different types of crime. In reality, this statistic ranges from virtually zero (as for thefts in Egypt or India) to virtually one (as for burglaries in Austria and Finland). Soares (2004a) shows that this variation is strongly related to income per capita. Figure 3 reproduces this result and illustrates the strong positive correlation between reporting rates of, respectively, thefts, burglaries, and contact crimes and income. Income per capita alone explains 65% of the cross-country variation in reporting rates for thefts, 54% for burglaries, and 45% for contact crimes. Soares (2004a) also shows that this correlation is responsible for the criminologists' erroneous conclusion that development and crime rates are positively related.

This result suggests that the positive link between crime and development, usually cited in the criminology literature but regarded with suspicion by economists, does not exist. More generally, it suggests that care must be exercised when comparing official crime rates across countries, since reporting depends on various characteristics that may also be related to the incidence of crime itself. In particular, Soares (2004b) shows that crime reporting is strongly related to institutional stability, police presence, and perceived corruption.

Table 5 presents pair-wise correlations between various variables[5] measured as averages for the 1990s and the three reporting rates discussed before. Reporting rates for different crimes are strongly correlated with each other (correlation coefficient significant and above 0.6 in all cases). Time of democratic stability, degree of urbanization, and average schooling are also positively and significantly related to the rate of crime reporting for the three types of crimes. Number of policemen per capita is positively correlated with reporting rates, but coefficients are not significant. Finally, corruption has an extremely high negative and significant correlation with the reporting rates of all types of crime.

[5] Number of policemen per 100,000 inhabitants from the UNCS; time of democratic stability from Beck et al. (2001); percentage of the population living in urban areas from the World Development Indicators; average years of schooling in population aged 15 and above from the Barro and Lee dataset; and indicator constructed from the financial risk associated with corruption, as estimated by the International Country Risk Guide.

Since most of these variables are correlated with overall development, it is difficult to tell precisely what this pattern of correlations reveals. In a multivariate setting, Soares (2004b) shows that the most robust correlation is that between reporting rates and measures of institutional development. We reproduce his basic result in Table 6. The table shows that, in a multivariate setting, the reporting rates of crime tend to be strongly related to institutional development – be it measured as time of democratic stability or as incidence of corruption – and also to police presence. Therefore, comparisons of crime rates across regions, or within a region through time, should bear in mind that differences or changes in the level of institutional development may compromise the meaningful use of official crime statistics.

Still, as of today, victimization data are very irregularly distributed over countries and years, and have limited coverage in terms of the developing world. So, for practical purposes, they cannot be used to give an encompassing picture of the state and evolution of crime rates across different areas of the globe. The alternative is to use the crime data less likely to be contaminated by the reporting bias, namely, homicide rates obtained from sources based on death certificates. It is likely that the elasticity of the reporting rate in relation to development is much smaller for homicides than for other types of crime. In addition, death certificates have always to be filed. Therefore, in this case, reporting does not depend directly on the willingness of citizens, and the record keeping has automatic mechanisms that work outside of the police and judicial structures.

For the reasons outlined above, we concentrate most of our analysis of the causes and consequences of crime in Latin America on the number of homicides per 100,000 inhabitants. In the next section, we lay out a broad picture of the pattern and recent evolution of crime in Latin America, using both the scant data available from victimization surveys and time series of homicide rates.

4. Crime Patterns in Latin America

Tables 1 and 2 showed that, by international standards, Latin America has an exceptionally high number of deaths due to violence. Tables 6 and 7 show that high crime in the region is not restricted to homicides and other types of violence that culminate in death. The tables present numbers from victimization surveys (ICVS) for world regions

and individual countries, respectively. Excluding Africa, burglary rates are at least 40% higher in Latin America than in any other region of the world, while theft rates are at least 30% higher and contact crimes rates are at least 70% higher. When compared to Africa, Latin America has lower burglary rates by 1 percentage point, virtually identical theft rates, and contact crimes rates 3.6 percentage points higher, while overall crime rates are 4 percentage points higher. High crime rates in Latin America span different types of crime and clearly dominate the levels observed in any other region.

Still, there are marked differences in country specific experiences within Latin America itself. In the victimization dataset, a very narrow set of countries is available (Argentina, Bolivia, Brazil, Colombia, Costa Rica, and Paraguay), but still victimization rates ranges from 4.6% to 14.4% for burglary, 11.8% to 20.2% for thefts, and 11% to 21% for contact crimes. Costa Rica, for example, has both relatively low crime and low mortality due to violence, while Colombia has high marks in both statistics.

Heterogeneity across countries also manifests itself in the dynamics of crime rates through time. In order to take a closer look at the evolution of crime rates over the last few decades, we concentrate on homicide rates, the only trustworthy statistic available for a longer time span. We choose a restricted group composed by some of the main countries in the region. This group will also guide our analysis in the later discussion about the candidate explanations for the high crime rates observed in Latin America. It is composed by: Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, and Venezuela. The choice of these specific countries makes our discussion a little more focused and concrete, and allows the investigation of certain types of phenomenon for which data is not immediately and widely available.

Figures 4 (a) and (b) plot the homicide rates for Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico and Venezuela for the period between 1979 and 2004. Figure 4 (a) presents the data for countries within this group with increasing crime rates during the period, while Figure 4 (b) presents the data for those with declining or stable trends.

The first group includes Argentina, Brazil, Colombia, and Venezuela, with homicide rates ranging from 7 to 50 per 100,000 by the beginning of the 2000s. Among these, the Colombian case is the most striking, with an already high rate rising from 30 in

the early 1980s to 82 in the early 1990s, and then falling to reach a still very high level by the end of the 1990s. Starting in 2002, Colombia then experiences successive declines in homicide rates, which persist until today.

The scale of the magnitude and of the changes observed in the Colombian case dwarves the trends registered in the other countries, but changes in these cases have also been substantial. In the case of Brazil, the homicide rate rise monotonically in the period, increasing by more than 200% of its initial value by 2002, when it reaches 28. Argentina, though registering much lower levels than those of the other countries in the figure, also experiences a monotonic increase, with the homicide rate roughly doubling between 1979 and 2003, when it reaches 7.3. Finally, Venezuela starts at levels similar to those of Brazil, and experiences stable homicide rates until the mid 1990s, when it also starts registering major increases, surpassing Brazil by the early 2000s. Venezuela more than doubles its homicide rate in the short period of time between 1997 and 2001.

Figure 4 (b) presents the experiences of Chile, Costa Rica, and Mexico, all of which displayed decreasing or roughly stable trends in homicide rates. The Mexican experience is impressive. After almost 20 years of sustained reductions in homicides, by 2004 it reaches a rate corresponding to roughly 50% of that observed in beginning of the period. Chile experiences extremely low homicide rates for the entire period, despite a discrete but stable increase around year 2000. Similarly, Costa Rica maintains very low violence levels throughout the period, never reaching a homicide rate above 6, and never going below 3. The rates for Chile and Costa Rica are comparable to those observed in most of the developed world, and those for Mexico by the end of the period, though relatively high for international standards, are still well below the average levels observed in the region.[6]

An important point raised before can be illustrated by the experiences of these countries. Everywhere, but particularly in violent places, homicides are disproportionately concentrated on the young population. Figures 5 (a) and (b) present the same statistic presented in Figures 4 (a) and (b), but restricted to the age group between

[6] For the total number of deaths due to violence, results are much more extreme and positive for Chile and Mexico, with the total mortality rate due to violence falling from 40 to 7 in Chile, and from 28 to 13 in Mexico. For the other countries, patterns are very similar to those observed for the homicide rates, just with higher levels.

15 and 24. The figures display similar patterns to the ones discussed previously, but for two distinguishing features. First, in the case of Figure 5 (a), the scale is almost twice that observed in Figure 4 (a). Second, in Figure 5 (b), the incidence of mortality by violence is generally higher than that observed in Figure 4 (b), but the difference is not so stark. So, for example, by the end of the 1990s the homicide rate in the age group between 15 and 24 was more than 74% higher than that of the general population for Brazil, Colombia, and Venezuela. The same number for Costa Rica was 25%. The general point about these figures is that violence falls disproportionately on the young, and particularly so in high violence societies. Figure 5 (a) also highlight that changes in violence tend to be more extreme when one looks at younger fractions of the population, as compared to the entire population distribution. The same thing is true about the male population. If we restricted the homicide rate to the male population between 15 and 24 years of age, we would end up with numbers almost two times higher than those observed in Figure 5(a).

This section highlighted that the high crime rates observed in Latin America span various different types of crime and do not seem to be an artifact of the particular statistics used. Nevertheless, it also showed that country specific experiences in the region have been different in many respects. The question remains therefore why some countries have been successful in maintaining low levels of violence or reducing violence to levels observed in the developed world, while others have seen increasing crime rates and seemingly uncontrollable trends. In the next sections, we explore some possible explanations.

5. Candidate Explanations

In this section, we concentrate on the group of seven countries enumerated before and conduct an informal assessment of the merit of some hypotheses raised in the literature as potential explanations for the crime rates observed in Latin America. These hypotheses can be broadly classified into two categories: (i) those related to social and economic conditions conducive to an environment where criminal activities are more attractive to a larger fraction of the population; and (ii) those related to government actions targeted at repression of criminal activities.

The first group includes economic and demographic conditions that put a large fraction of the population at the margin of choosing whether or not to engage in criminal and violent activities. Economic conditions typically identified are related to growth and inequality. According to the economic theory of crime, the likelihood that individuals will engage in criminal activities increases with the potential gains of crime and falls with its opportunity cost (see, for example, the early treatment of the topic in Ehrlich, 1973). The potential gains from criminal activities are related to the wealth of potential targets, while its opportunity costs are given by the gains from legal activities (low-skill wages in the labor market or returns to micro-entrepreneurship). A poor economic performance in the short-run reduces legal opportunities in the economy, without necessarily affecting significantly its stock of wealth, therefore increasing the attractiveness of criminal behavior. Inequality, on its turn, leads to a situation where a significant fraction of the population is endowed with wealth and high income, constituting therefore potential criminal targets, while another fraction has very low income, and therefore low opportunity cost of engaging in criminal activities. Sociological theories of relative deprivation also link economic inequality to higher crime.

For these reasons, economic growth and income inequality are variables thought to be important determinants of the incidence of crime. In general, the statistical evidence does support this relationship and recent studies have been able to find systematic correlations between these two variables and various measures of crime rates (see, for example, Bourguignon, Nuñez, and, Sanchez, 2003, Fajnzylber, Lederman, and Loayza, 2002a and 2002b, and Soares, 2004a). In particular, inequality seems to be a variable closely related to the incidence of crime and violence, both in theory and in the data, and it has been one of the main focuses of both theoretical and empirical work (see papers cited above and Ehrlich, 1973, for example).

Demographic factors are associated with the age structure of the population and socioeconomic conditions. A traditional literature from criminology argues that both perpetrators and victims of criminal and violent activities are, in the majority of cases, young. For example, according to the Brazilian 2007 “Map of Violence”, the increase in homicide rates in Brazil over the last decades is due exclusively to the increase in the homicide rate among young people: it soared from 30 in the 1980s to 51.7 in 2004, while

the rate in other age groups fell slightly, from 21.3 to 20.8 (Waiselfisz, 2007). The relationship between age distribution and crime is well established at the individual level in the empirical literature, despite the evidence that its role in explaining aggregate variations in US crime rates in the recent past is rather limited (Levitt, 1999). The particularly intense susceptibility of the young to fall into a trajectory of crime and illegality is most likely related to its weak attachment to the labor market and lower risk aversion, and maybe also to stronger peer effects (see Grogger, 1998). In any case, evidence seems to suggest that this may have been an important factor in the recent experience of some Latin American countries (Mello and Schneider, 2007).

Recently, a more sophisticated version of this argument was developed, claiming that not only the size of a cohort is important, but specifically the number of births of lower quality within a given cohort (unwanted births, births to broken homes under disadvantaged socioeconomic conditions, etc). This is the logic underlying the idea that the legalization of abortion in the US was one of the main reasons behind the reduction in crime rates observed in the 1990s (Donohue and Levitt, 2001). A similar argument has been applied to the context of developing countries, specifically to the case of Brazil, to suggest that the increase in crime rates starting in the end of the 20^{th} century was the result of reductions in child mortality rates in the low socioeconomic strata 20 years beforehand (Hartung, 2006).

The other relevant dimension in the determination of crime rates is related to the strength and effectiveness of the repressive policies adopted by the government. Policies to curb the incidence of crime include incarceration of offenders and harsher penalties for criminals, large police forces, effective judicial systems, and, overall, respect to the law and a clean and efficient government apparatus. Careful statistical analyses have confirmed beyond doubt the crime reducing role of police presence and incarceration of criminals (for example, Levitt, 1996, 1997, and 2002, and Di Tella and Schargrodsky, 2004). Data availability and the nature of the statistical problem have precluded more detailed evaluation of some of the other dimensions.

In order to evaluate whether these factors seem to have some merit in explaining the incidence of crime in Latin America, we take a closer look at some variables that try to capture the various dimensions discussed above. Data on some of these issues are very

scarce in the cross-country context, so we restrict the analysis to the seven Latin American countries enumerated before (Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, and Venezuela) and to a set of six reference countries. These reference countries are chosen so as to include: two of the most developed countries in the world, the first with low and the second with reasonably high crime rates (Japan and US, respectively); an Eastern country that had a similar level of development to that of Latin America until the recent past (South Korea); an European country of similar cultural background (Spain); and a low and a high crime countries from other cultural traditions (Sweden and Russia, respectively).

For this set of thirteen countries, we look for variables representing the different economic, demographic, and policy factors discussed previously. For the economic and demographic factors, we choose the following variables: growth rate of income per capita between 1980 and 2000 to represent recent economic performance; Gini index to measure income inequality; birth rate in 1980 to represent the size of the entering cohort 20 years prior to 2000; and share of the population between 15 and 29 years to capture the relative size of the group most likely to engage in criminal activities. In relation to the policy dimensions, we choose the following variables: number of policemen per capita, number of judges per capita, incarceration rate, and a variable indicating the level of institutional development and rule of law in the country (rule of law).[7] The definitions and sources of all the variables are presented in the notes to the table below.

Table 9 presents the homicide rate and the eight variables described in the last paragraph for the set of thirteen countries chosen for this closer inspection. The average homicide rate for the selected Latin American countries, which equals 21.5, is much higher than that observed in any country in the comparison group but Russia. Japan, Korea, Spain, and Sweden have all extremely low homicide rates (all below 2), while the US has a rate (5.9) comparable to the lowest Latin American numbers.

A clear pattern immediately emerges from this table. First, in relation to the economic variables, the selected Latin American countries display particularly poor

[7] The rule of law index is defined as the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence. The index is a standardized measure with range between -2.5 (weakest institutions) and 2.5 (strongest institutions). For more detailed description, see Kaufmann, Kraay, and Mastruzzi (2006).

economic performances and exceptionally high inequality levels. The average growth rate of income per capita between 1980 and 2000 for the countries in the region is only 0.7%, less than half that of the lowest growth rate observed in the comparison group, apart from that of Russia. Russia faced the collapse of communism during this time interval, so its performance does not seem to constitute a particularly appealing comparison in what refers to economic growth. In relation to inequality, the lowest level observed among the selected Latin American countries (45.8 for Venezuela) is higher than the highest level observed in the comparison group (42.5 for Russia). On average, the Gini index is almost 20 points (54%) higher in the region than in the comparison group.

The demographic variables also work in the same direction, though maybe not with such extreme differences. Birth rates in the region in 1980, as well as the share of the population between ages 15 and 29 in 2000, indicate the presence of a large fraction of the population in age groups particularly prone to criminal involvement and victimization. The birth rate in 1980 for the Latin American countries included in the table was 24.9, in contrast to 20.9 in the comparison group, while the shares of the young population in 2000 were, respectively, 27% and 22%. At the same time, Latin America experienced very fast and intense declines in child mortality rates between 1960 and 1990, opening space for an argument in the reverse direction of that developed by Donohue and Levitt (2001), as suggested by Hartung (2006). In this sense, the frequency of individuals from extreme socioeconomic conditions and fragile household environments is likely to have increased in the distribution of adolescents and young adults.

The previous paragraphs paint a picture of a large fraction of the population in Latin America in age groups prone to involvement in criminal activities, at the same time when economic conditions – low growth and high inequality – make criminal activities particularly attractive. The other side of this equation is the set of repressive policies put in place by the government, and the effectiveness of these policies. The balance between these two forces determines the final incidence of crime and violence in a given society.

Overall, the group of Latin American countries under analysis has very timid repressive policies when compared to the reference group. The average number of policemen per 100,000 inhabitants is 252, as opposed to 398 in the comparison group,

while the number of judges is 7.5 in comparison to 15.2, and the incarceration rate is 139 in comparison to 282. In addition, if the index of rule of law captures the efficiency of government policies, it is likely that these instruments are less effective in Latin America than in countries in the comparison group: the average of the index, which varies between -2.5 and +2.5, is -0.4 for the selected Latin American countries and +1.0 for the comparison group.

The differences are even more striking when we contrast the Latin American average to the most violent countries in the comparison group. These are Russia and the US, which react to the high violence levels by enforcing a very strict set of repressive policies: the number of policemen per 100,000 inhabitants is 1,222 in Russia and 325 in the US, while the number of judges is 47 and 11, and the incarceration rate is 638 and 685, respectively. In comparison, Brazil Colombia, and Venezuela, the most violent among the selected Latin American countries, have modest levels for these three variables, roughly comparable to or below that of Spain, a country with extremely low incidence of crime. In reality, the most intense use of repressive policies in Latin America is observed precisely among those countries that have enjoyed reasonably controlled levels of violence: the highest numbers of policemen per 100,000 inhabitants are observed in Argentina and Mexico, while the highest number of judges is in Costa Rica, and the highest incarceration rate is in Chile.

The superficial inspection of the numbers from Table 9 seems to suggest that the high crime rates observed in Latin America are not that surprising after all. Economic and demographic factors are conducive to an environment where a large fraction of the population is at the margin of choosing whether or not to engage in criminal activities. Differences in inequality are particularly striking in this respect. The average Gini index among our 7 Latin American countries is almost 20 points higher than that in the comparison group. At the same time, policies toward the repression of crime are weak and likely ineffective. Most noticeable in this case is the very low number of policemen per 100,000 inhabitants and the incarceration rate, the latter being less than half of that observed in the comparison group.

In the remaining sections, we discuss the scope for successful policy interventions targeted at reducing crime in the region. First, based on the statistical estimates available

from the literature, we ask how much one can hope to achieve with the use of the policy instruments available and, over the long-run, with changes in socioeconomic conditions. Following, we briefly analyze some specific experiences of localized interventions that have been successful at reducing crime and violence.

6. The Scope for Action

The previous section argued that several factors identified as potentially important seem to contribute to the high crime rates observed in Latin America. In this section, we draw on estimates from the empirical literature and ask how much the dimensions discussed before can explain, given what is known quantitatively from the evidence available. In doing so, we are constrained to work only with those variables that map well established estimates from the empirical literature. For natural reasons, these are also the variables that typically attract most attention.

In what follows, we concentrate on the effects of incarceration rates, number of policemen per 100,000 inhabitants, fraction of the population between 15 and 29, inequality, and economic growth. Regarding the other variables appearing in Table 9, there are no widely accepted estimates available in the literature.

In relation to public safety policies, theory argues that increases in prison population can reduce crime through either deterrence or incapacitation effects. Levitt (1996) estimates that violent crime in the US would be 70% higher if the number of prisoners had remained constant over the last decades. He argues that incarcerating one additional prisoner reduces the number of crimes by approximately fifteen per year, a number in close accordance with the level of criminal activity reported by the median prisoner in surveys. His estimates suggest that a 1% increase in the incarceration rate reduces the number of violent crimes by -0.379%. Levitt (1997 and 2002) also argues that increases in police are very effective in reducing violent crime, even though the effect on property crime may be substantially smaller. In this case, the average estimate suggests that a 1% increase in the number of policemen per capita is associated with a reduction of -0.435% in the incidence of violent crimes.

Estimates for the effect of demographic composition are available from Levitt (1999). He shows that, in the case of the US, changes in age structure explain 20% of the

increase in murder rates observed between 1960 and 1980, and 40% of the reduction observed between 1980 and 1995. His counterfactual exercise implies an average response of homicides of 0.41% per each 1% increase in the fraction of young people in the population.

Inequality is probably the single factor most widely studied in the cross-country literature on crime rates. It has been consistently identified as one of the main economic determinant of crime and violence, through its effects on the costs and benefits of criminal activities and on social cohesion (see, among others, Bourguignon, 1999, Fajnzylber, Lederman, and Loayza, 2002a and 2002b, Bourguignon, Nuñez, and Sanchez, 2003, and Soares, 2004a). A widely cited study by Fajnzylber, Lederman, and Loayza (2002b) shows that increases in income inequality and reductions in the level of economic activity are significantly related to increases in crime rates. Their statistical model implies that a 1 percentage point increase in the Gini index is associated with a 1.5% increase in homicide rates, and that a 1 percentage point increase in the growth rate of income per capita is associated with a decline of 2.4%.

Though these various estimates are from different types of data and different sources, not necessarily applicable to the Latin American reality, we use them as benchmarks to guide the discussion on the potential for crime reduction in the region, along the dimensions discussed in the previous section. The question being addressed is whether, given the numbers most commonly cited in the literature, changes in factors typically identified as associated with crime would lead to substantial reductions in crime rates in Latin America. If the answer is yes it means that, at first sight, the Latin American case would not be exceptional and standard policies would be the obvious first choice to tackle the problem. On the other hand, if the answer is no, it would seem that still unidentified characteristics of the region would be responsible for the high crime rates observed, and non-orthodox policies might be called for.

Table 10 presents the estimates of the effects on crime of the explanatory variables discussed in the last paragraphs. It also presents counterfactual calculations of the average homicide rate that would be observed in the selected Latin American countries if the different explanatory variables were set to the levels observed in the comparison group. We present the partial impact of each explanatory variable (each one

being changed separately), as well as the cumulative impact (various variables being change simultaneously, cumulative from top to bottom).

Maybe the most striking result from this table is the fact that, given the numbers observed and the estimates available from the literature, the high violence levels observed in Latin America are not surprising at all. This fact was already alluded to in the previous section, but it becomes clearer in the simple quantitative exercise from Table 10. If the average incarceration rates, number of policemen per capita, fraction of young population, inequality, and growth in the selected Latin American countries were set to the averages observed in the comparison group, mortality by violence in Latin America would drop from 21.5 to 6.3. Since Russia is somewhat of an outlier within the comparison group in terms of the harshness of its repressive policies and its crime rates, we also present an alternative scenario where the variables in Latin America are set to the average of the comparison group excluding Russia. In this scenario, the homicide rate in Latin America would fall to 10.7. In any case, the homicide rate falls between 50% and 66% in the counterfactual exercises, when the explanatory variables are set to the levels observed in the comparison group (including and excluding Russia, respectively).

In the first scenario, homicide rates are actually reduced to a level almost identical to that observed in the comparison group, while in the second scenario it still remains substantially above it, despite attaining quite reasonable levels (equivalent to those observed in the US during the 1990s, for example). In words, the violence levels observed in Latin America do not seem to be unusually high, given the socioeconomic conditions observed in the region, the repressive policies adopted by its governments, and what is known from the empirical literature about the relationship between these variables and crime.

Separately, the quantitative roles of inequality, incarceration rates, and police seem to be the most important ones, while age composition and economic growth seem to have only modest effects. According to the counterfactual scenarios, changing the level of inequality to that observed in the comparison group would lead to a reduction of 28% in homicide rates, while the similar number for incarceration rates and police presence would be, respectively, 39% and 25%.

While incarceration rates and number of policemen are policy variables directly under the control of the government, inequality is an outcome variable that changes typically slowly through time (see Deininger and Squire, 1996). There are various reasons why reduction in inequality is desirable for its own sake, and it should indeed be seen as a valid policy goal. But it is generally not an instrument subject to immediate control of the government, so it should not be seen as a tool within a short or medium-term strategy for reducing crime.

Given this evidence, a stronger set of measures in relation to incarceration and policing seems to be the most obvious immediate policy choice available. Still, to the extent that income inequality is related to inequality in the provision of public goods and to lack of access to a wide range of basic services by a large fraction of the population, preventive social policies may also be effective. It is difficult to map this idea quantitatively on the empirical estimates of the effect of inequality on crime, but it seems reasonable to assume that, for example, better provision of basic health and education, leading in the medium-run to individuals with better opportunities in the legal market, could also lead to reductions in the incidence of crime. The combination of these two perspectives would suggest crime fighting strategies based on the two dimensions identified before: increased intensity and effectiveness of repressive policies, coupled with improvements in the socioeconomic environment and better access to public goods. As the next section illustrates, successful experiences of crime reduction in the region have adopted strategies along these lines.

The discussion in this section brings implicit the idea that the effectiveness of the penal system and of the police force in Latin America, when expanded, would be similar to that of the countries from which the estimates in Table 10 were generated. This is obviously not necessarily, and not likely, the case. In reality, the effectiveness of any given intervention will depend on the way it is conducted from an operational perspective, and on the institutional context in which it is implemented. In the next section, we discuss the strategy and institutional context of some successful experiences of crime reduction within Latin America.

7. Success Experiences

In this section, we take a closer look at two specific experiences of successful crime reduction in Latin America. Local governments have played a key role in the recent past as agents of effective policy changes. In particular, the impressive achievements of Bogotá, Colombia, became an example to many other cities in the region. São Paulo, the largest city in Brazil, followed some of Colombia's capital footsteps, and results are also promising.

Bogotá

Bogotá became a landmark for crime prevention in Latin America. Its policy strategy was inspired by the Development Security and Peace Program (DESPAZ), initially designed for the equally violent city of Cali. This program was launched in mid 1994, when Rodrigo Guerrero was the mayor of Cali, aiming at both fighting and preventing violence through a public health approach. The program was abandoned after Guerrero left office in 1994, but by then it had already been incorporated into a broader public security plan for Bogotá, under the mayoral administration of Antanas Mockus.

In 1994, Bogotá had the highest homicide rate among capital cities in Latin America. Today, it has a homicide rate substantially lower than that of Caracas, Rio de Janeiro, and Washington DC, similar to that of Lima and Mexico City, and still above that of Buenos Aires, Miami, Panama City, and Santiago (Stanford Project on Urban Ecology and Violence, 2007).

The public health approach started with the development of a reliable information system aiming at monitoring the characteristics and demographics of cases of intentional and unintentional deaths or injuries, as well as of certain types of other crimes. This was achieved through the creation of an observatory of violence and crime. A package incorporating several different measures along various dimensions was then implemented (Concha-Eastman, 2005). This package included the following measures: limited hours for alcohol sales in bars, voluntary disarmament, improved police equipment targeted at faster response, and local projects to improve police performance and manage small conflicts. Local projects comprised conflict resolution initiatives, family police stations, and the Houses of Justice (Casas de Justicia), centers in popular neighborhoods where

individuals could access the services of lawyers, social workers, psychologists, and in some cases judges.

The Colombian interventions were based on the idea of integrated municipal programs, combining public health, reclaiming of public space, and criminal justice improvements. These were materialized on crime and violence information systems, improving access to justice, control of alcohol consumption and traffic accidents, assistance to vulnerable groups such as youth-at-risk, the 'citizen culture' program, and the recovery of public spaces such as parks and bicycle paths. In addition, there were efforts to strengthen the police force, as well as judicial reform. Much media attention was given to the "Ley Zanahoria," imposing a 01:00 a.m. curfew on alcohol sales, and on the rush hour restrictions on private cars.

As a result, there was a significant reduction in crime rates in Bogotá, in reality much more extreme than initially anticipated. The homicide rate, which was around 80 per 100,000 in 1993, declined to 21 in 2004. In Cali, significant reductions in crime were also observed when DESPAZ was implemented, but as the program was abandoned the change was reversed. In the case of Bogotá, on the other hand, the Peñalosa administration (starting in 1998) persisted pursuing the Mockus's policies, incorporating also an impressive public space recovery program (Concha-Eastman, 2005 and World Bank, 2006).

São Paulo

On December 7th 2007, the city of São Paulo experienced 24 hours without a homicide. This was the first time the city went through an entire day without a single murder since the 1950s (Veja, 2007). This remarkable event was the culmination of years of consistent and successful policies in the fight against violent crime.

Following the experience of Bogotá, several cities in the metropolitan area of São Paulo implemented different combinations of the measures included in the Colombian package. Policies included dry-laws, programs of voluntary disarmament, social programs, increases in incarceration rates, and changes in police organization and operation. The result was a continuous decline in homicide rates since 1999, against the Brazilian national trend of increasing homicide rates.

The reorganization of the police force and an emphasis on incarceration appear as particularly important factors in the case of São Paulo. This included a change in attitude towards a more quantitative approach to crime fighting and prevention, emphasizing empirical diagnosis of the pattern and distribution of crime, adoption of standardized procedures for police actions, and constant monitoring and evaluation of actions and use of resources. One of the first steps was the creation of Infocrim, a system of criminal information to map criminal data in different police districts to enable a more organized and efficient use of resources. The change in policies also marked a shift to a more systematic involvement of the municipal and federal administrations on the fight against crime, as opposed to the more traditional model which relied mostly on the state government (Kahn, 2007). Some credit is also given to dry laws, which are estimated to have been responsible for a reduction in homicides between 10% and 29% (Biderman et al, 2006).

Diadema, a city in the metropolitan area of São Paulo, also achieved considerable success by coordinating the initiatives from various political and social actors and focusing on community cooperation within high-risk areas (World Bank, 2006). The municipality implemented monthly town meetings between the mayor, the city council, military and civil police chiefs, business, and religious and community leaders. At the same time, knowledge on violence reduction approaches and contacts with experts were established. As in the city of São Paulo itself, policies also included dry-laws, modern information systems to monitor the evolution of crime through time and space, and, in addition, creation of a task force to work with parents, students and teachers on violence prevention, particularly targeting school violence. The number of homicides in the case of Diadema was reduced by roughly 70% between 1999 and 2005 (data from the Secretary of Public Safety of the state of São Paulo).

In the city of São Paulo itself, the number of intentional homicides was reduced by 79%. In the entire state, intentional homicide rates fell from 36 to 11, or by 69%. In contrast, the most recent numbers for Rio de Janeiro and Brazil as a whole indicate homicide rates of, respectively, 39 and 22 per 100,000. If São Paulo's government reaches its goal of 10 homicides (both intentional and non-intentional) per 100,000

inhabitants, the state will reach what the World Health Organization recognizes as an acceptable level of mortality due to homicides.

8. Concluding Remarks

This paper argues that the high crime rates observed in Latin America seem to be consistent with the socioeconomic characteristics of its countries and with the policies implemented by governments in the region. There seems to be no basis for the claim that the patterns observed are due to unusual and exceptional characteristics faced by its countries. On the contrary, three factors widely recognized as being major determinants of the incidence of crime – inequality, police presence, and incarceration rates – account for most of the seemingly exceptionally high crime rates. This interpretation is further supported by successful experiences of crime reduction in some areas that would rank among the most violent in the region just a few decades ago. Among others, Bogotá and São Paulo have sustained steady declines in crime rates, particularly homicide, following the consistent and continued implementation of policies combining the use of more intense and effective repressive measures with social support programs.

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Table 1: Homicide Rates and Development Variables, World Regions, Average for the 1990s

Region	Mortality due to Violence (per 100,000)	Exp. Years of Life Lost	Life Exp.	GDP per capita	Avg Schooling (pop above 15)
Latin Am. & Carib.	21.8	0.6	71.4	7,708	6.6
North America	6.5	0.2	76.1	25,672	11.6
Western Europe	4.0	0.1	76.2	19,532	8.7
Form. Communist	17.2	0.4	68.9	6,009	8.9
Western Pacific	7.8	0.2	76.0	17,839	9.4

Notes: Regional numbers are unweighted country averages. The only African country included in the WHO cause specific mortality data is Mauritius, and the only Eastern Mediterranean country is Kuwait. Therefore, these regions are not included in this table. Mortality due to violence and life expectancy calculated based on data from the WHO, income per capita from the PWT 6.1, and average schooling from the Barro and Lee dataset. Mortality due to violence is homicide and injury purposely inflicted by other persons plus other violent deaths, from the International Classification of Diseases (ICD).

Table 2: Homicide Rates and Development Variables, Latin American Coutnries, Average for the 1990s

Country	Mortality due to Violence (per 100,000)	Exp. Years of Life Lost	Life Exp.	GDP per capita	Avg Schooling (pop above 15)
ALBANIA	14.2	0.40	73.6	2,573	.
ARGENTINA	15.8	0.41	71.9	9,938	8.47
ARMENIA	13.8	0.34	72.0	2,486	.
AUSTRALIA	2.6	0.08	77.4	22,047	10.66
AUSTRIA	1.9	0.05	76.0	21,099	8.06
AZERBAIJAN	22.2	0.59	69.2	2,288	.
BAHAMAS	24.7	0.63	70.4	16,527	.
BARBADOS	9.9	0.26	73.2	14,339	8.33
BELARUS	22.5	0.45	68.4	6,870	.
BELGIUM	4.5	0.11	75.6	21,025	9.10
BELIZE	8.6	0.29	73.8	6,131	.
BRAZIL*	34.4	0.83	69.0	6,591	4.45
BULGARIA	6.2	0.13	70.2	6,263	9.30
CANADA	2.8	0.08	77.1	22,827	11.33
CHILE	33.5	0.91	73.2	8,116	7.25
COLOMBIA	83.2	2.23	71.2	5,249	4.98
COSTA RICA	7.8	0.23	74.7	5,247	5.79
CROATIA	31.4	0.80	71.2	7,838	6.06
CUBA	10.6	0.26	74.0	5,498	7.54
CZECH REPUBLIC	6.5	0.14	71.5	12,876	9.32
ECUADOR	15.5	0.46	71.2	3,691	6.15
EL SALVADOR	42.3	1.22	70.1	3,959	4.70
ESTONIA	26.4	0.56	68.0	7,771	8.97
FINLAND	7.2	0.18	75.3	19,423	9.67
FRANCE	5.2	0.13	77.3	20,299	7.41
GEORGIA	12.8	0.28	69.0	4,776	.
GERMANY	3.6	0.08	75.6	20,848	10.03
GREECE	1.4	0.04	76.7	12,583	8.33
GRENADA	10.3	0.26	67.8	4,984	.
HONG KONG	3.3	0.09	77.8	24,556	9.28
HUNGARY	4.5	0.09	68.5	8,941	8.96
ICELAND	2.0	0.06	77.6	21,728	8.48
IRELAND	1.5	0.04	74.6	17,692	9.07
ISRAEL	6.5	0.17	76.4	15,534	9.48
ITALY	2.8	0.07	77.1	20,216	6.84
JAPAN	2.9	0.07	79.6	23,406	9.22
KAZAKSTAN	38.6	0.83	65.4	6,052	8.87
KUWAIT	3.3	0.10	74.9	23,386	6.53

Country	Mortality due to Violence (per 100,000)	Exp. Years of Life Lost	Life Exp.	GDP per capita	Avg Schooling (pop above 15)
KYRGYZSTAN	17.6	0.44	66.3	2,836	9.45
LATVIA	34.6	0.63	66.5	7,323	9.42
LITHUANIA	16.0	0.35	69.4	6,920	.
LUXEMBOURG	3.2	0.08	75.8	33,969	.
MACEDONIA	3.4	0.08	71.2	4,559	.
MALTA	2.7	0.07	76.0	13,101	.
MAURITIUS	2.5	0.06	69.2	11,145	5.79
MEXICO	20.8	0.59	71.2	7,630	6.97
NETHERLANDS	1.6	0.05	76.7	21,122	9.07
NEW ZEALAND	2.5	0.07	75.8	16,807	11.49
NORWAY	1.6	0.04	76.5	23,515	11.71
PHILIPPINES	33.2	0.95	70.6	3,086	7.79
POLAND	8.3	0.17	70.8	7,277	9.65
PORTUGAL	13.3	0.29	73.8	13,434	5.42
PUERTO RICO	28.5	0.76	71.9	9,974	.
REP. OF KOREA	3.7	0.10	74.9	12,706	10.45
REP. OF MOLD.	25.1	0.52	65.7	2,251	.
ROMANIA	4.6	0.10	68.6	4,629	9.46
RUSSIAN FED.	49.9	0.94	65.8	7,918	10.10
ST KITTS & NEVIS	11.6	0.41	68.7	10,567	.
SINGAPORE	6.6	0.17	76.2	22,265	6.57
SLOVAK REP.	5.4	0.12	71.2	10,443	9.09
SLOVENIA	3.2	0.08	73.5	12,823	6.86
SPAIN	1.3	0.03	76.9	15,541	6.85
SURINAME	15.9	0.44	71.2	2,948	.
SWEDEN	6.6	0.16	77.5	20,788	10.72
TAJIKISTAN	15.9	0.48	66.3	1,153	9.79
TRIN. & TOBAGO	12.3	0.31	69.6	9,514	7.46
TURKMENISTAN	8.8	0.22	64.5	4,533	.
UKRAINE	29.9	0.57	67.5	6,223	.
UNITED KINGDOM	4.6	0.12	75.8	19,650	9.09
UNITED STATES	10.2	0.31	75.0	28,517	11.89
URUGUAY	4.4	0.11	71.8	8,810	7.32
UZBEKISTAN	7.8	0.22	67.5	2,595	.
VENEZUELA	23.6	0.66	71.3	6,746	6.10

Notes: * The mortality data for Brazil refers only to the South, Southeast, and Central-West regions. GDP per capita figures used are for the whole country. Mortality due to violence and life expectancy calculated based on data from the WHO, income per capita from the PWT 6.1, and average schooling from the Barro and Lee dataset. Mortality due to violence is homicide and injury purposely inflicted by other persons plus other violent deaths, from the International Classification of Diseases (ICD).

Table 3: Social Cost of Violence, Latin America and US, 1990s

		Latin America	US
Mortality due to Violence (per 100,000)		21.8	10.2
GDP per capita		7,708	28,517
Social Cost of Crime and Violence (yearly cost as % GDP)	welfare loss from mortality increase	1.98	0.85
	public security expenditures	1.10	0.50
	justice system expenditures	0.50	1.30
	private expenditures on prevention	1.40	0.60
	opportunity cost of incarceration	0.10	0.60
	monetary costs (medical, etc.)	0.60	0.20
	reduced growth	0.11	0.04
	Total	5.79	4.09

Notes: Homicide and life expectancy data from the WHO, income per capita from the PWT 6.1. Social cost from mortality due to violence calculated in Soares (2006). Costs from expenditures on public security, justice system, and private prevention for Latin America from Lodono and Guerrero (1999). For the US, numbers on public security and justice sytem from Levitt (1997). Remaining numbers on private expenditures, opportunity and monetary costs from Bourguignon (1999). Impact on growth based on IV estimates of the effect of adult mortality on growth presented in Lorentzen, McMillan, and Wacziarg (2006, Table 10, column 1), using mortality due to violence from the WHO and population fractions from the WDI (estimate presented as the yearly cost in terms of current GDP corresponding to the loss in growth induced by the higher mortality due to violence).

Table 4: Official and Victimization Crime Statistics, Cross-section of Countries, 1990s

	Official Data			Victim Survey Data		
	Theft	Burglary	Contact	Theft	Burglary	Contact
Mean	2.07	0.67	0.25	25.08	6.68	7.65
Std Dev	2.23	0.72	0.31	6.84	3.74	3.68
Max	7.73	2.74	1.64	41.80	17.40	21.00
Min	0.01	0.01	0.00	11.60	0.80	2.00

Notes: Data is number of crimes as a percentage of population. Official data is taken from the UNCS data set and victim survey data from the ICVS. For comparability between the two data sets, statistics for the official data are calculated from country averages, from 1989 to the last year available. ICVS data are averages for all the surveys in which the country was included (1989, 1992, and/or 1996/7). Source: Table 3 from Soares (2004a).

Table 5: Correlation between Reporting Rate and Development, Cross-section of Countries, 1990s

	ln(report theft)	ln(report burgl)	ln(report cont)	ln(police)	time democ stability	urban	education
ln(report theft)	1						
ln(report burgl)	0.72 (0.00)	1					
ln(report cont)	0.72 (0.00)	0.62 (0.00)	1				
ln(police)	0.30 (0.08)	0.18 (0.34)	0.25 (0.13)	1			
time democ stability	0.64 (0.00)	0.58 (0.00)	0.61 (0.00)	0.12 (0.50)	1		
urban	0.67 (0.00)	0.52 (0.00)	0.53 (0.00)	0.24 (0.16)	0.49 (0.00)	1	
education	0.61 (0.00)	0.49 (0.00)	0.39 (0.02)	0.18 (0.29)	0.37 (0.02)	0.67 (0.00)	1
corruption	-0.61 (0.00)	-0.68 (0.00)	-0.63 (0.00)	-0.11 (0.52)	-0.70 (0.00)	-0.52 (0.00)	-0.65 (0.00)

Notes: Numbers in parenthesis are p-values. Variables are natural logs of reporting rates for, respectively, thefts, burglaries, and contact crimes, natural log of number of policemen as % of population, time of democratic stability, % of population living in urban areas, average schooling in the population aged 15 and above, and ICRG corruption index. Source: Table 3 from Soares (2004b).

Table 6: Reporting Rate Regressions - Cross-section of Countries, 1990s

	ln(report theft)		ln(report burgl)		ln(report cont)	
	1	2	1	2	1	2
police	1.4439 *	1.4856 *	1.2543 *	1.5436 *	0.1431	0.1559
	(0.2612)	(0.3114)	(0.5999)	(0.5053)	(0.1772)	(0.1869)
time demo	0.0389 *	0.0196 *	0.0279 *	0.0045	0.0280 *	0.0066
	(0.0059)	(0.0076)	(0.0135)	(0.0129)	(0.0070)	(0.0094)
urban	-0.0083	0.0044	0.0048	-0.0085	0.0062	0.0222
	(0.0114)	(0.0124)	(0.0252)	(0.0194)	(0.0130)	(0.0137)
education	0.0204	-0.0535	0.0762	-0.2071	0.0109	-0.0796
	(0.0792)	(0.1067)	(0.1761)	(0.1716)	(0.0965)	(0.1181)
corruption		-0.5826 *		-1.2849 *		-0.5020 *
		(0.2150)		(0.3758)		(0.2367)
const	-1.7850 **	-0.5721	-2.6520	3.6299	-4.9126 *	-3.7837 *
	(0.9647)	(1.6521)	(2.0824)	(2.7438)	(0.7616)	(1.2783)
F	26.25	20.85	4.45	8.64	6.99	6.09
N Obs	33.00	33.00	30.00	30.00	35.00	35.00

Obs.: Standard errors in parenthesis. * indicates significance at 5%; ** indicates significance at 10%. Robust regression with iteratively reweighted least squares used to deal with outliers. Dependent variables are natural logarithms of reporting rates for, respectively, thefts, burglaries, and contact crimes. Independent variables are natural log of number of policemen as % of population, time of democratic stability, % of population living in urban areas, average schooling in the population aged 15 and above, and ICRG corruption index. Source: Table 4 from Soares (2004b).

Table 7: Crime Rates (%) from Victimization Surveys (ICVS), World Regions, Average for the 1990s

Region	Burglary	Thefts	Contact Crimes	Any Crime
Latin America	11.8	16.9	15.0	43.6
Africa	12.9	16.6	11.4	39.6
Asia	3.6	11.1	4.3	18.9
Former Communist	6.8	12.9	7.0	31.7
North America	8.0	10.1	8.7	34.0
Oceania	8.4	9.4	8.3	33.4
Western Europe	4.2	9.5	5.8	28.1

Notes: Regional numbers are unweighted country averages. Source is ICVS (1989, 1992 and 1996/7). Burglaries include attempted burglaries. Thefts are bicycle or motorcycle and other personal thefts, including pick pocketing. Contact crimes are robberies, sexual incidents and/or threats/assaults. Any crime includes all previous categories plus theft of car/joyriding, theft from car, and car vandalism. Numbers based on major cities from each respective country.

Table 8: Crime Rates (%) from Victimization Surveys (ICVS), Countries, Average for the 1990s

Country	Burglary	Thefts	Contact Crimes	Any Crime
ALBANIA	6.0	15.9	5.6	27.1
ARGENTINA	10.5	20.2	14.5	50.7
AUSTRALIA	7.8	8.1	8.0	30.7
AUSTRIA	1.1	12.3	5.8	27.0
BELARUS	2.9	8.8	6.2	21.1
BELGIUM	5.2	4.8	4.7	22.5
BOLIVIA	13.8	19.2	12.0	40.1
BRAZIL	4.6	11.8	20.5	41.0
BULGARIA	10.8	12.3	8.3	38.4
CANADA	7.5	10.6	7.7	33.0
CHINA	2.5	15.9	4.9	21.6
COLOMBIA	14.1	19.9	21.0	53.7
COSTA RICA	14.3	14.3	11.3	39.7
CROATIA	2.3	6.1	5.4	20.2
CZECH REP.	6.8	17.3	6.2	37.5
EGYPT	6.9	9.6	8.3	27.0
ENGL & WALES	6.8	7.8	6.4	31.1
ESTONIA	11.8	13.6	11.2	39.7
FINLAND	0.9	10.3	7.6	25.1
FRANCE	6.1	11.1	4.7	28.1
FYR MACEDONIA	3.5	8.1	3.6	21.6
GEORGIA	8.2	10.3	8.5	33.4
GERMANY (W)	3.3	9.4	6.7	29.3
HUNGARY	4.1	8.3	2.4	24.7
INDIA	3.2	11.1	4.5	19.7
INDONESIA	5.4	8.2	3.7	17.2
ITALY	5.5	10.4	4.6	31.4
KYRGYZSTAN	6.8	12.5	7.5	27.4
LATVIA	8.8	15.0	5.9	33.4
LITHUANIA	9.0	11.2	5.7	33.1
MALTA	0.8	4.0	3.4	23.3

Country	Burglary	Thefts	Contact Crimes	Any Crime
MONGOLIA	13.7	23.4	9.3	43.1
NETHERLANDS	7.8	18.6	8.6	38.4
NEW ZEALAND	9.0	10.7	8.5	36.0
NORTH IRELAND	4.1	5.7	6.3	24.4
NORWAY	4.9	6.6	6.8	26.1
PARAGUAY	13.4	16.0	10.9	36.3
PHILIPPINES	3.3	9.0	4.0	16.9
POLAND	5.3	13.4	7.6	33.1
RUMANIA	3.1	13.4	7.9	29.4
RUSSIA	6.1	14.1	9.6	35.0
SCOTLAND	5.0	6.1	5.4	28.3
SLOVAKIA	8.4	15.1	4.0	35.9
SLOVENIA	5.3	8.9	6.5	30.3
SOUTH AFRICA	9.5	10.0	13.8	35.7
SPAIN	5.3	7.1	7.2	31.9
SWEDEN	4.1	16.9	6.5	30.6
SWITZERLAND	2.7	11.2	2.0	23.6
TANZANIA	12.1	18.0	6.8	37.6
TUNISIA	10.1	16.5	9.4	35.9
UGANDA	21.5	21.7	13.2	53.9
UKRAINE	7.8	21.6	9.2	38.2
USA	8.4	9.5	9.6	35.0
YUGOSLAVIA (F.R.)	5.4	8.9	8.5	32.3
ZIMBABWE	17.4	23.8	16.9	47.5

Note: Source is ICVS (1989, 1992 and 1996/7). Burglaries include attempted burglaries. Thefts are bicycle or motorcycle and other personal thefts, including pickpocketing. Contact crimes are robberies, sexual incidents and/or threats/assaults. Any crime includes all previous categories plus theft of car/joyriding, theft from car, and car vandalism. Numbers based on major cities from each respective country.

Table 9: Mortality due to Violence and Candidate Determinants of Crime, Slected Latin American and Comparison Countries

Country	Homicides (per 100,000)	Avg Growth Income p.c.	Gini Index	Birth Rate (per 1,000)	% Population 15 29	Rule of Law	Police (per 100,000)	Judges (per 100,000)	Incarceration (per 100,000)
	2000	1980-2000	2000	1980	2000	2000	2000	2000	2001
Argentina	5.83	0.2%	52.3	24.1	26%	0.1	558	4.7	109
Brazil	26.08	0.6%	61.2	30.7	28%	-0.2	286	9.3	133
Chile	5.15	2.9%	56.9	22.8	24%	1.2	195	3.6	225
Colombia	70.21	1.1%	57.4	31.0	27%	-0.7	216	9.4	126
Costa Rica	6.13	0.1%	50.1	31.2	27%	0.7	39	15.3	157
Mexico	10.96	0.6%	55.6	13.5	30%	-0.5	451	.	164
Venezuela	26.20	-1.0%	45.8	20.7	27%	-0.9	15	2.6	59
Avg for Selected Latin American Countries	21.5	0.7%	54.2	24.9	27%	-0.04	252	7.5	139
Japan	0.6	2.4%	31.9	34.0	20%	1.7	182	2.4	51
Korea	1.7	5.8%	36.9	15.9	26%	0.5	192	3.4	133
Russia	28.1	-1.2%	42.5	15.2	23%	-1.0	1222	46.7	638
Spain	1.0	2.4%	31.5	11.6	23%	1.3	286	8.4	117
Sweden	1.0	1.5%	29.2	15.9	18%	1.9	181	19.2	68
United States	5.9	2.3%	39.4	32.9	20%	1.8	325	11.0	685
Avg for Comparison Group	6.4	2.2%	35.2	20.9	22%	1.0	398	15.2	282

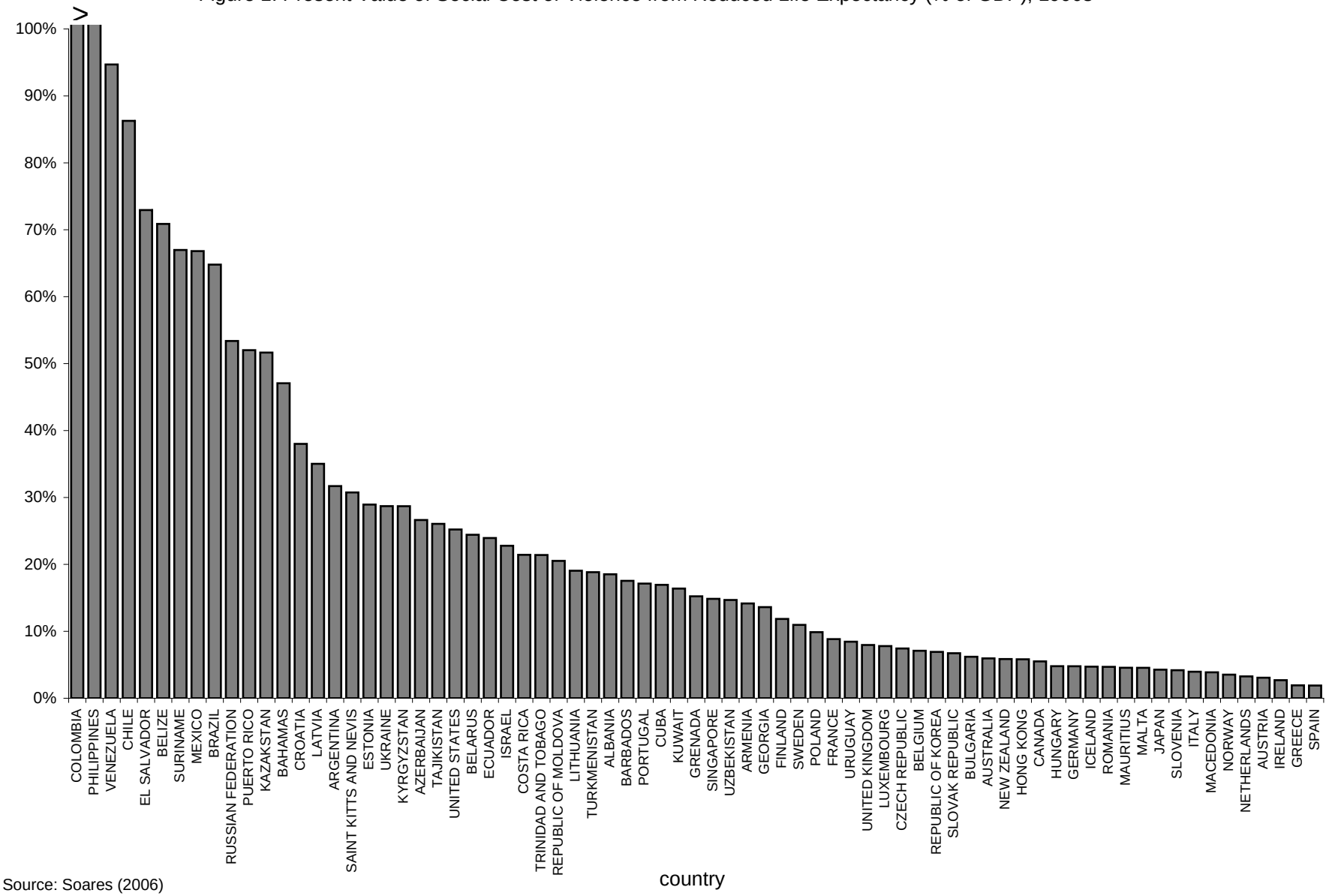
Notes: Growth rate from Penn World Tables 6.1 (real gross domestic income adjusted for terms of trade - rgdptt; the number for Russia is from the World Development Indicators gdp p.c. in 1995 US$). Gini index from WIDER-UN, birth rate from the World Development Indicators, population between 15-29 from the World Health Organization, rule of law index (range: -2.5; +2.5) from the Government Matters V dataset (World Bank). Police rate is total police personnel in 2000 from the United Nations Survey on Trends and the Operations of Criminal Justice (1998 for Argentina, 2001 for Mexico, Venezuela and US, 1994f or Russia; for Brazil, data from the Ministry of Justice for 2003). Judges refers to magistrates and judges (number of professional judges and magistrates in 2000 from the United Nations Survey on Trends and the Operations of Criminal Justice; 1997 for Argentina, 2001 for US; for Brazil, 2005 data from Ordem dos Advogados do Brasil - OAB). Incarceration rate is the official records of total prison population from the International Centre of Prison Studies (2002 for Costa Rica and 2000 for Venezuela).

Table 10: Estimates of the Effects of Explanatory Variables on Homicides and Differential in Crime Explained by Each Variable

Variable	Study	Data	Response of Crime to Explanatory Variable	Mortality to Violence in LA if avg were set to: avg of Comparison [viol.: 21.5 against 6.4]		Mortality to Violence in LA if avg were set to: avg of Comp. w.o. Russia [viol.: 21.5 against 2.1]	
				Partial	Cumulative	Partial	Cumulative
incarceration rate	Levitt (1996)	US	-0.379% per 1% change	13.1	13.1	17.3	17.3
police	Levitt (2002)	US	-0.435% per 1% change	16.1	9.8	22.2	17.8
fraction of young population	Levitt (1999)	US	0.41% per 1% change	19.8	9.0	19.7	16.3
inequality (gini)	Fajnzylber, Lederman, and Loayza (2002b)	Cross-country	1.5% per unit change	15.4	6.4	14.9	11.3
growth (income p.c.)	Fajnzylber, Lederman, and Loayza (2002b)	Cross-country	-2.4% per percentage point change	20.7	6.3	20.4	10.7

Notes: For Levitt (1996 and 2002), the estimates are elasticities for violent crime. For Levitt (1999), the crime variable is homicide rate and we calculate the average elasticity from the decomposition exercises performed. For Fajnzylber, Lederman, and Loayza (2002b), the estimates are semi-elasticities for homicide rates (ln of the homicide rate on the dependent variable).

Figure 1: Present Value of Social Cost of Violence from Reduced Life Expectancy (% of GDP), 1990s



Source: Soares (2006)

Figure 2 (a): Mortality due to Violence by Age Group, Selected Latin American Countries, 1990s

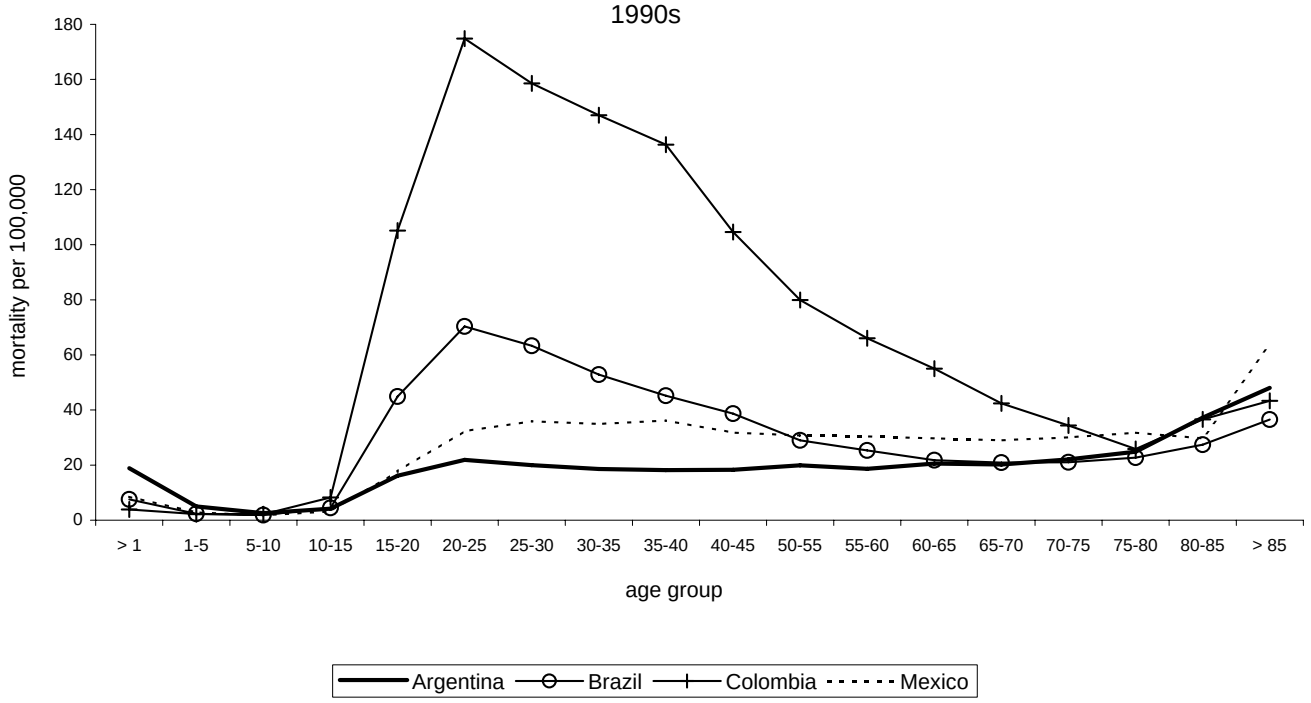
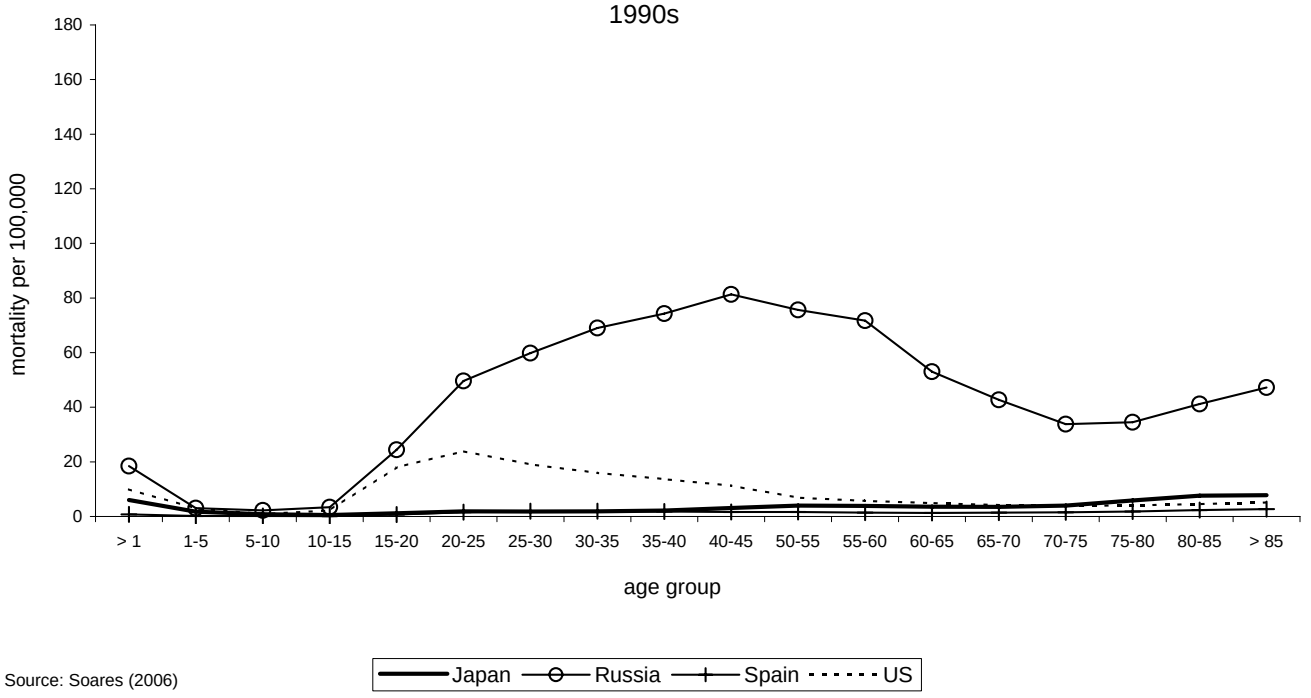


Figure 2 (b): Mortality due to Violence by Age Group, Selected Comparison Countries, 1990s



Source: Soares (2006)

Figure 3 (a): Income per Capita and Reporting Rate of Thefts, Cross-section of Coutnries, 1990s

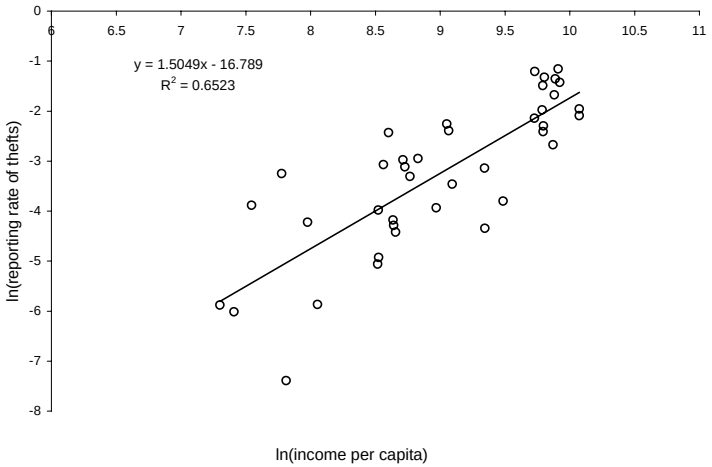


Figure 3 (b): Income per Capita and Reporting Rate of Burglaries, Cross-section of Coutnries, 1990s

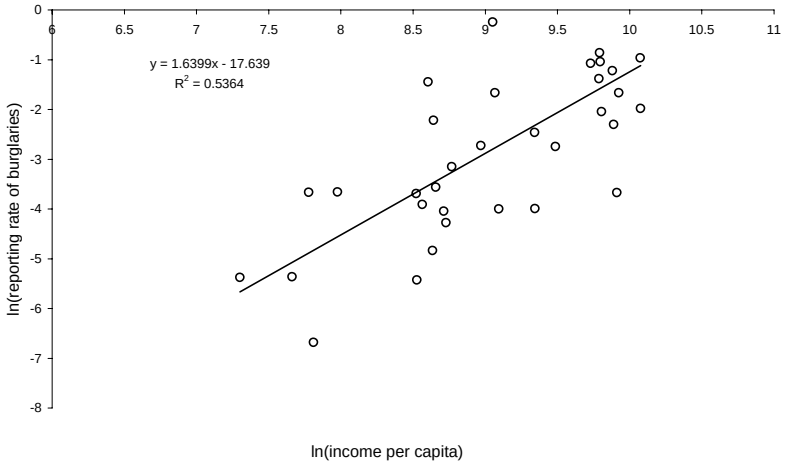
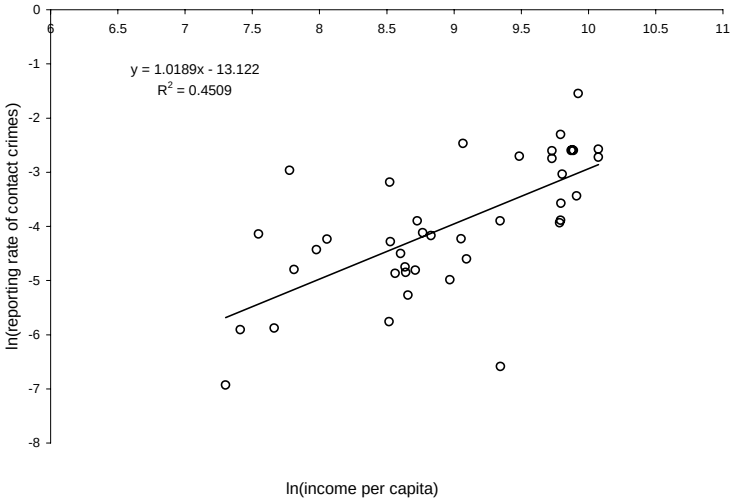


Figure 3 (c): Income per Capita and Reporting Rate of Contact Crimes, Cross-section of Coutnries, 1990s



Source: Soares (2004b)

Figure 4 (a): Homicide Rate, Selected Latin American Countries, Rising Trends

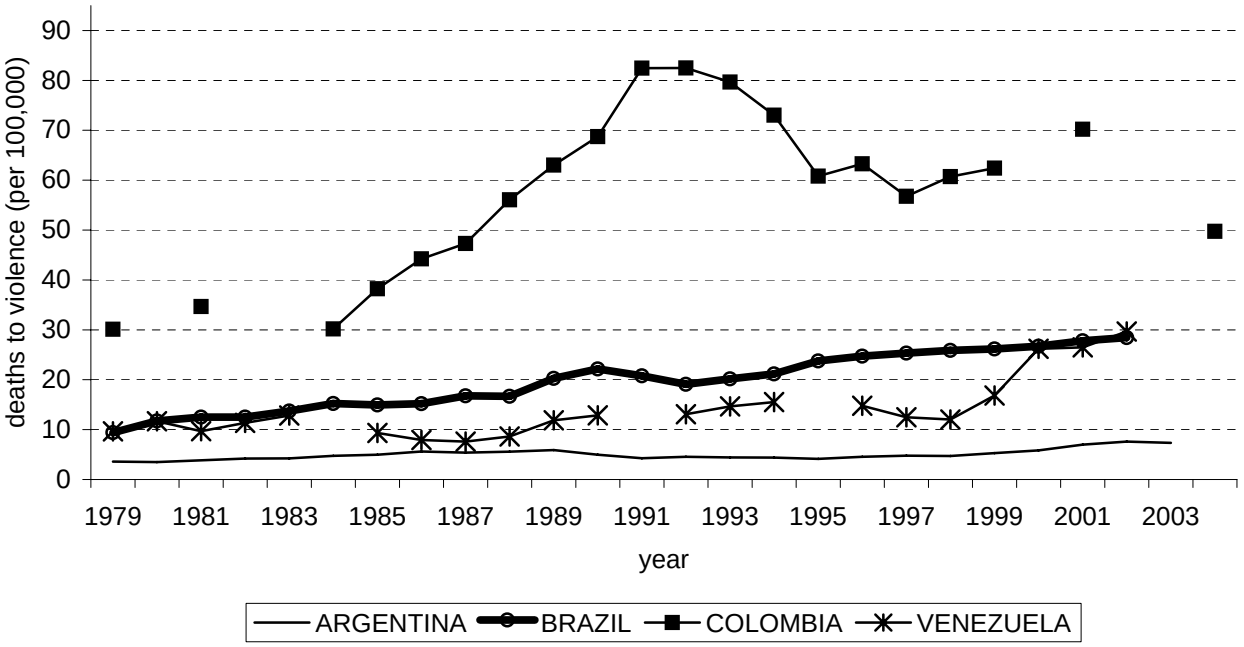
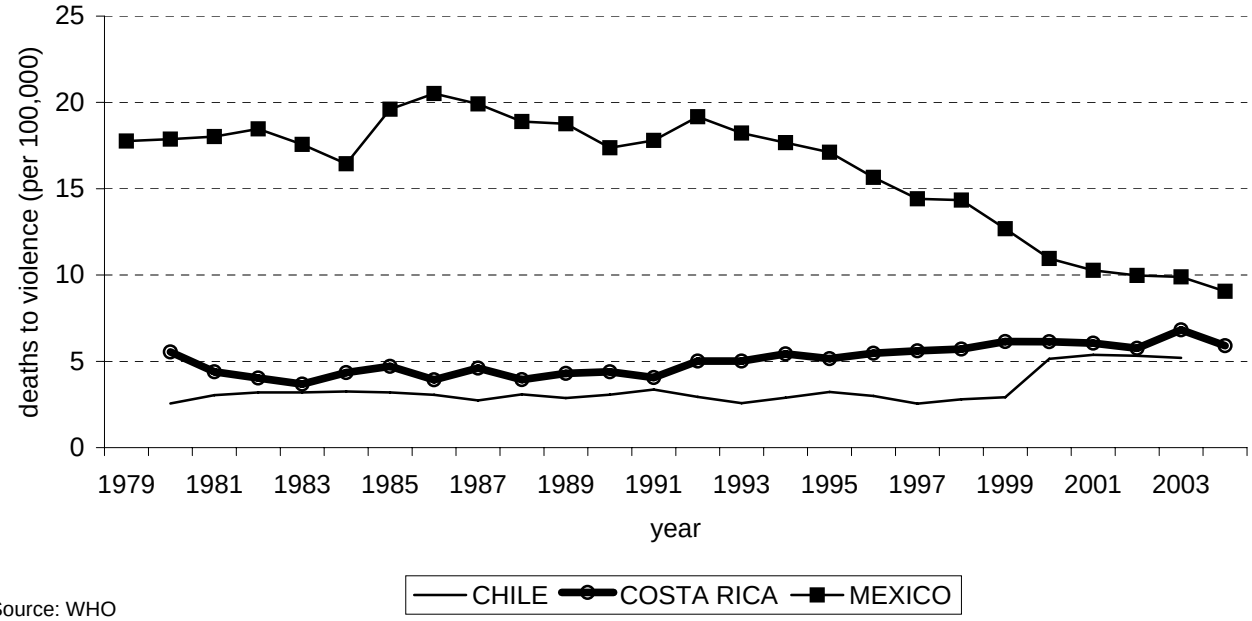


Figure 4 (b): Homicide Rate, Selected Latin American Countries, Declining and Stable Trends



Source: WHO

Figure 5 (a): Homicide Rate btwn 15 and 24, Selected Latin American Countries, Rising Trends

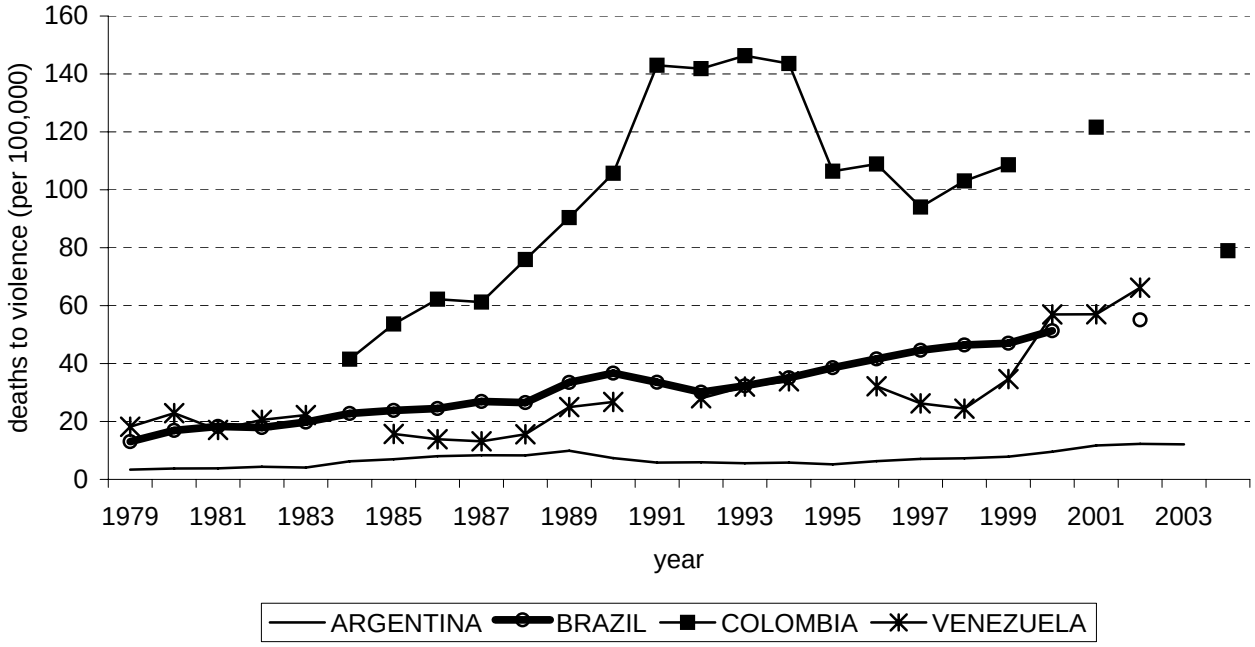
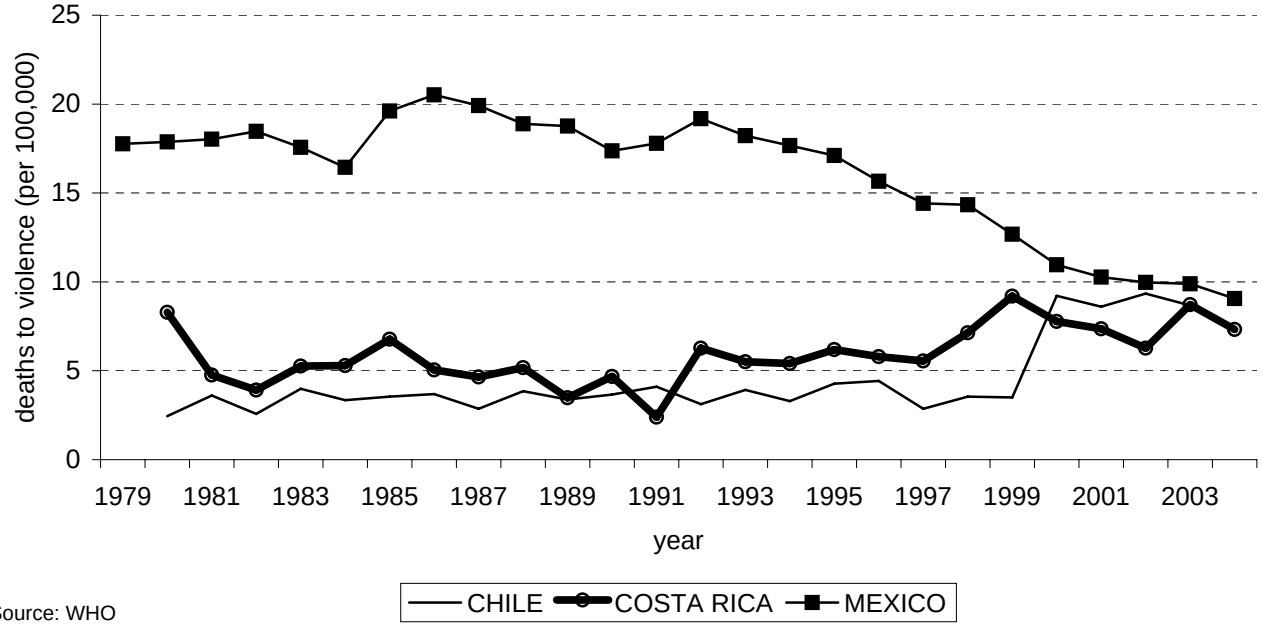


Figure 5 (b): Homicide Rate btwn 15 and 24, Selected Latin American Countries, Declining and Stable Trends



Source: WHO