

4. SOCIOECONOMIC COSTS OF CRIME

There are a wide variety of approaches that have been used to catalog and measure the costs of crime and violence. Analyses for the Caribbean have found that fear of crime causes individuals in Jamaica, the Dominican Republic, and Haiti to avoid activities and locations that are perceived as exposing them to risk of being victimized by crime. People whose families have suffered from crime report substantially lower levels of life satisfaction, and this effect is much greater in the Dominican Republic than in non-Caribbean countries. Crime also reduces tourist arrivals in the region, discourages business investment, and stifles economic growth. Cross-country panel data suggests that Haiti and Jamaica could boost economic growth per capita by 5.4 percent per year if they were to bring their homicide rates down to the levels of Costa Rica. Guyana and the Dominican Republic would also benefit substantially, with potential growth rate increases of 1.7 percent and 1.8 percent respectively.

4.1 The literature on crime and violence covers a wide ground, and there are multiple typologies for the possible sorts of costs that could be contemplated. The World Health Organization (2004) draws a distinction between direct costs (medical, legal, policing, prisons, foster care and private security) and indirect costs (lost earnings and time, lower human capital, lower productivity, lower investment, psychological costs and other non-monetary costs). Buvinic and Morrison (1999) use a more complex typology and distinguish between the following:

- Direct costs: the value of all goods and services used to prevent violence or offer treatment to its victims or perpetrators. This has been the most commonly estimated category of costs and includes health costs, police, justice and prison costs, as well as resources spent on private security measures. While the most frequently measured, this category may not be the most important.
- Non-monetary costs: higher mortality and morbidity rates that result in pain, suffering and death, but not necessarily result in either expenditures on health care or in easily quantifiable economic losses.
- Economic multiplier effects: impacts on human capital, labor force participation, lower wages and incomes, savings and macroeconomic growth.
- Social multiplier effects: erosion of social capital, inter-generational transmission of violence and lower quality of life.

4.2 One also might distinguish between short-run costs of all sorts and the long-run effects on growth. An earlier report on youth in the Caribbean by the World Bank (2003a) lists the following costs: 1) arrest, prosecution, and detention of criminals; 2) property loss and damage; 3) medical costs, public programs for victims, and lost income of the victim; 4) intangible costs (pain, suffering, and quality of life); 5) security costs; 6) lower tourist receipts; 7) lost income due to incarceration; and 8) lost social capital.

APPROACHES TO MEASURING THE COSTS OF CRIME AND VIOLENCE

4.3 There are a number of different methodologies that have been employed to assess the costs of crime and violence. These include: 1) assessing specific costs; 2) adding up total costs using an “accounting approach”; 3) estimating total cost (more accurately, willingness to pay) using econometric methodologies; 4) calculating the Disability-Adjusted Life Years (DALYs) lost due to violence; and 5) estimating effects on economic growth through cross-country regressions.¹

4.4 Each of the methodologies has its relative strengths and weaknesses. Studies which look at specific costs analyze the effects of crime on particular sectors or population groups without attempting to be comprehensive—i.e., without attempting to calculate the total cost of crime to society.

4.5 Among economists, the more popular approach has been to summarize the various costs of crime and violence in a single monetary figure that purports to represent the total cost associated with crime for a particular country. This is frequently done using an accounting approach, which collects data on the costs of crime in disaggregated categories and then sums up over categories (Buvinic and Morrison, 1999). This generally involves adding up all the assorted public and private expenditures associated with crime.

4.6 The accounting approach has both advantages and disadvantages. On the one hand, a single number may be useful for summarizing the myriad costs, for providing a comparison point to assess the cost-effectiveness of interventions, and for communicating to economists and business interests used to thinking in monetary terms. It is also attractive in data-poor environments; if information is missing for some categories of costs, estimates can be generated using categories for which data are available (Buvinic and Morrison, 1999b; World Bank, 2006b). On the other hand, no single measure can capture all imaginable costs and any specification of categories is necessarily arbitrary.

4.7 Another approach—which does attempt to measure the marginal benefit of crime reduction—is to estimate individual willingness-to-pay for marginal reductions in crime rates. This has been done in the case of Brazil, for example, by using hedonic housing models to estimate a relationship between housing prices and crime rates (Hermann and Haddad, 2003). It also could be done using contingent valuation methodology, which uses surveys to measure individuals’ willingness to pay for reductions in crime.

4.8 A fourth approach is to estimate disability-adjusted life years (DALYs) lost to violence. The World Health Organization (2002) has estimates of violence-related DALYs lost for a large number of countries; DALYs are a widely-accepted measure of the health costs of violence.

¹ There are also studies which attempt to measure the marginal willingness-to-pay for reductions in crime. No such study has been conducted in the Caribbean.

4.9 A fifth method is to estimate the effect of crime on growth using dynamic panel regressions. The growth effects approach has the advantage that is a summary measure which in principle captures the ultimate long-run effects of crime through many channels.

4.10 Rather than choose a single methodology to measure the costs of crime and violence, this chapter reviews a variety of work on its costs in the Caribbean, including several studies that estimate specific costs of crime, an accounting approach to measuring total costs, and estimates of DALYs lost due to violence. Also presented are new estimates of the effects of crime victimization on a self-reported measure of life satisfaction. Finally, the chapter builds on recent (2006) World Bank estimates of the impact of violent crime on growth to calculate the “growth dividend” that could be produced by reducing the homicide rate in several Caribbean countries.

SPECIFIC COSTS OF CRIME

4.11 Several studies in the Caribbean examine specific costs of crime. These necessarily cover a wide variety of types of costs. Considered here are those that address the effects of crime on tourism, the non-monetary effects of violence in poor urban neighborhoods in Jamaica, gender-based violence in Haiti, and private sector responses to crime.

Tourism

4.12 Because of the key role that tourism plays in many Caribbean countries, the effects of crime on tourism are of particular concern. In 2004, the Jamaican tourism minister said that Jamaica's unprecedented crime level was threatening to derail the tourism industry by scaring away visitors and hurting investment (Associated Press, 2004). A study of popular perceptions of those working in the tourism industry found that crime and violence were perceived as the main problem afflicting the tourism industry (Dunn and Dunn, 2002).

4.13 A few studies consider the relationship between crime and tourism for the Caribbean. Albuquerque and Elroy (1999) showed that property crime tends to be disproportionately directed at tourists. Nonetheless, King (2003) showed that the odds of being victimized as a tourist in the Caribbean are low. He suggested that perceptions of the danger of crime do affect tourism but that such perceptions are driven much more by mass media coverage in the sending country than by actual dangers.

4.14 Alleyne and Boxil (2003) examined the relationship over time between tourist arrivals and crime in Jamaica and concluded that crime has discouraged tourists, particularly from European countries, but that the negative effect of crime has been mitigated by increased advertising and promotion and the growth of all-inclusive hotels. All-inclusive hotels, however, are incapable of fostering significant backward linkages to the rest of the local economy. A new business model for tourism that goes beyond airlines, cruise lines and hotels to span the entire “destination experience”—restaurants, taxis, tour operators, cultural and heritage sites and scenic locations—is necessary to

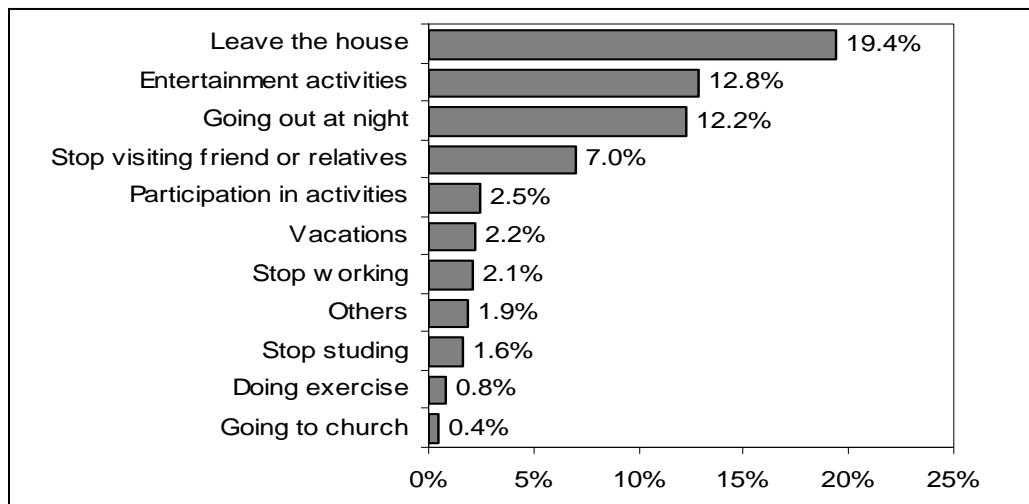
generate backward linkages (World Bank, 2006a). This new model, however, cannot succeed if tourists are unwilling to leave all-inclusive resorts because of fear of crime.

Non-Monetary Effects in Jamaica and the Dominican Republic

4.15 Other qualitative work has examined the non-monetary effects of violence. A participatory study in poor urban Jamaican neighborhoods (Moser and Holland 1997) considers the effects of violence. The study notes that residents of inner-city neighborhoods in Jamaica suffer from “area stigma.” They are judged to be associated with criminals based on where they live, which makes it difficult for them to find employment. The study also considers the intangible effects of violence on social capital, noting that “violence erodes social relationships, not only through death, but by restricting physical mobility and increasing levels of tension.” Due to the high levels of violence in parts of urban Jamaica, residents are afraid to leave their homes and interact less often with friends and family who live elsewhere.

4.16 A similar phenomenon is evident in responses to the Encuesta Nacional de Hogares de Propósitos Múltiples (ENHOGAR) survey conducted in the Dominican Republic in 2005. Surprisingly large numbers of respondents report that they have stopped doing many activities due to fear of crime. As can be seen in Figure 4.1, due to the high levels of delinquency, Dominicans have reduced their recreational activities outside the house.

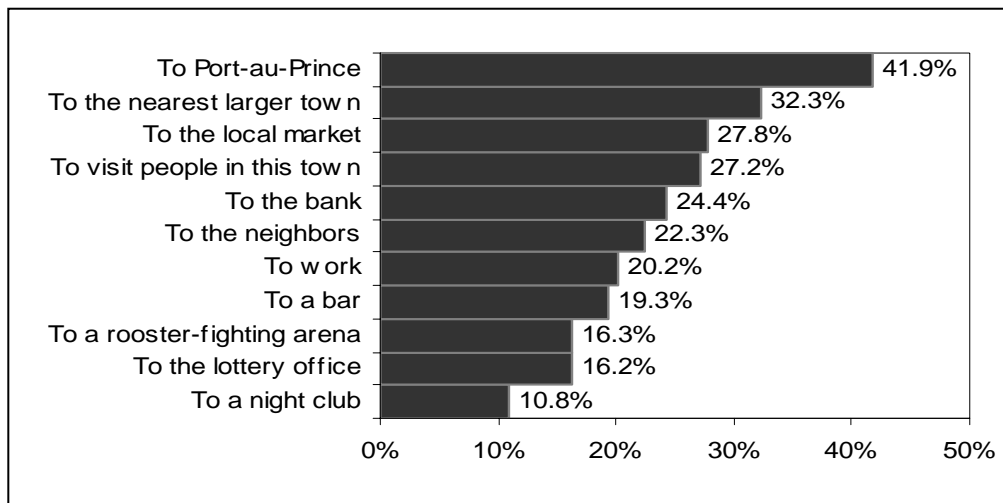
Figure 4.1: Responses to Fear of Crime in Dominican Republic -What Do People Stop Doing Due to Fear?



Source: Own analysis of ENHOGAR 2005. Note: Shown are the percentages responding in the affirmative to “Which of the following activities have you stopped due to fear to crime?”

4.17 Similarly, survey data from Haiti show that a high percentage of respondents are afraid of going to specific places due to fear of being mugged, attacked or having money or other belongings stolen. Figure 4.2 depicts that Haitians are more likely to avoid places like Port-au-Prince or the nearest larger town.

Figure 4.2: Responses to Fear of Crime in Haiti: Where Do People Stop Going Due to Fear?



Source: ECVH 2001.

Note: Shown is the percentage responding in the affirmative to “Are you ever afraid of going to any one of the following places out of fear of being mugged, attacked or having money or things stolen from you?”

Gender-Based Violence in Haiti

4.18 Morrison and Orlando (2005) examine the impact of gender-based violence in Haiti on women’s health and employment and children’s health, using propensity-score matching techniques. Results from this analysis for lifetime physical violence by an intimate partner are shown in Table 4.1.² Key results are that suffering from physical violence is strongly associated with an increased likelihood that: i) women do not receive antenatal care; ii) women suffer from genital sores and ulcers; and iii) both women and their children suffer from anemia.

² Lifetime physical violence is physical violence suffered at any point in an individual’s life.

Table 4.1: Effects of Lifetime Physical Violence by Intimate Partner in Haiti

OUTCOME VARIABLE	<i>Average net effect of lifetime physical violence by intimate partner (% increase or decrease compared to non-victims)</i>
WOMEN'S HEALTH	
Weight for Height (centimeters x kilograms)	-1,99%
Anemia (severity degree 0-3; 0=no anemia; 3=severe anemia)	27,63%*
Number of Children	-5,46%
% of Women who Ever had a Terminated Pregnancy	33,18%
Last Child Wanted (index 1 =wanted -3=did not want more children)	5,53%
Sexually Transmitted Disease (%)	55,12%
Genital Sore /Ulcers (%)	116,22%*
WOMEN'S USE OF HEALTH SERVICES	
Visited Health Facility (%)	19,68%
Antenatal Care (%)	-17,88%**
Births Assisted by Health Care Professional (%)	1,88%
Unmet Family Planning Needs (%)	8,57%
Contraceptive Use (%)	22,16%
WOMEN'S EMPLOYMENT	
Employed and Earning Cash (probability)	2,27%*
CHILDREN'S HEALTH (AGES 0-5)	
Diarrhea (%)	25,19%
Coughing (%)	13,83%
Anemia (%)	31,81%*
Height for Age (centimeters x age in months)	-5,79%
Weight for Height (centimeters x kilograms)	-3,41%
Immunization (%)	-13,73%
Under 5 mortality (per 1000 births) #	17,43%
CHILDREN'S EDUCATIONAL ACHIEVEMENT (AGES 7+)	
Education Years	-12,21%
Education Gap	7,95%
School Attendance (%)	-3,96%

Source: Propensity score matching estimates from Morrison and Orlando (2005), based on analysis of Haiti Demographic and Health Survey Data.

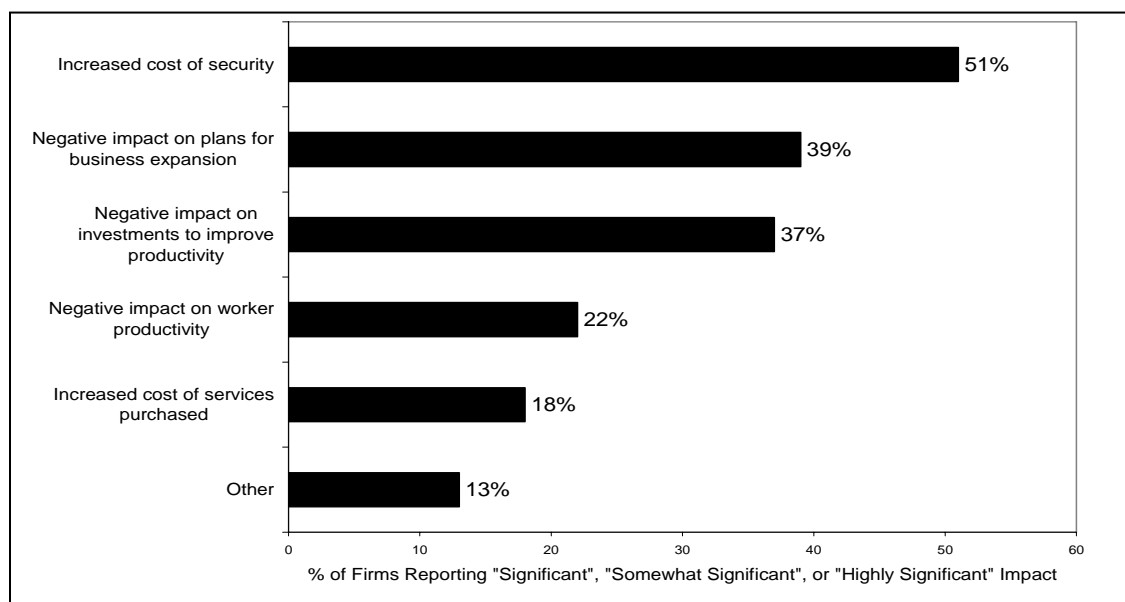
* significant at 10% ** significant at 5% *** significant at 1%

This is not a population child mortality rate. This variable is the sample *average* of the number of children under 5 who died divided by each woman's total number of births per 1000. In this case both rates are similar since there is no significant difference in the total number of children between the victims group and the control group.

Costs of Crime to Business

4.19 The effects of crime on businesses can be particularly damaging because they can involve both short-run costs and long-run consequences for development by diverting resources to crime prevention measures and otherwise discouraging investment. This section reviews key findings from surveys of businesses on the costs of crime in Jamaica and the Dominican Republic. The survey in Jamaica was carried out by Francis et al. (2003) as part of the background work for the 2003 World Bank Country Economic Memorandum (CEM). The results from the crime module of the 2005 Investment Climate Survey (ICS) in the Dominican Republic are presented in the country's most recent CEM, World Bank (2006a).

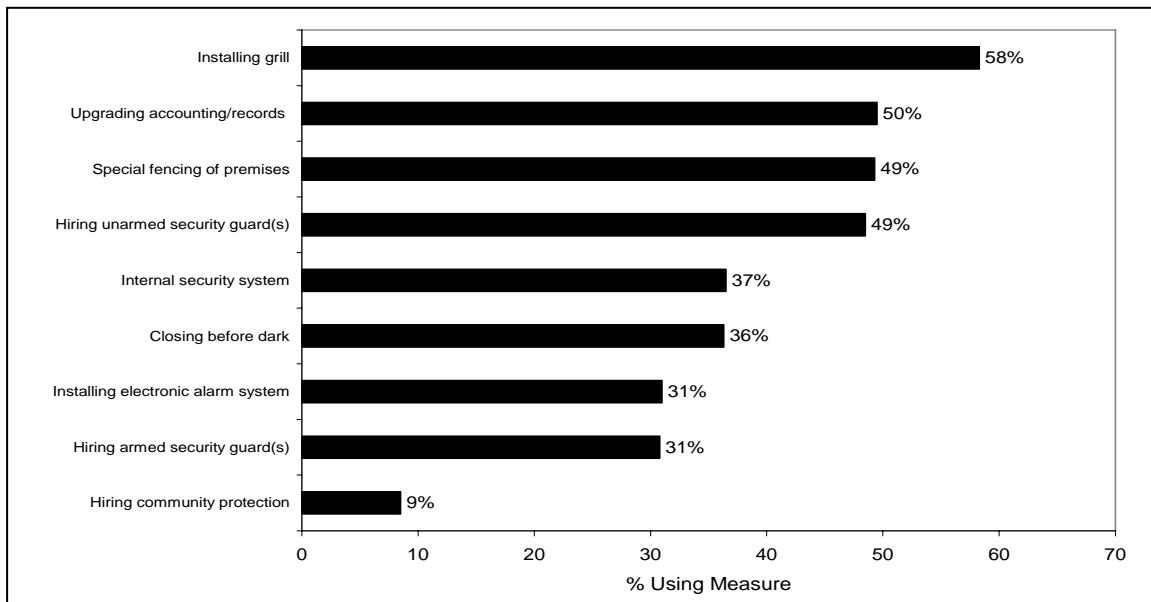
Figure 4.3: Impact of Crime on Various Business Practices in Jamaica



Source: 2001 Firm Victimization Survey, described in Francis et al. (2003).

4.20 Managers interviewed for the Jamaica study described how crime affected their business practices. Figure 4.3 shows the percentages of managers indicating that crime had either a significant, somewhat significant, or highly significant impact on particular business practices. Unsurprisingly, security clearly dominates the impact of crime, with more than half of firms reporting that crime increased security costs. Managers also indicated, however, that crime affects business decisions in ways that are likely to affect output in the long run. Thirty-nine percent responded that they were less likely to expand their business because of crime, and 37 percent reported that crime discourages investments that would improve productivity.

Figure 4.4: Crime Protection Measures Taken by Firms in Jamaica



Source: 2001 Firm Victimization Survey, described in Francis et al. (2003).

4.21 The steps taken by businesses to protect themselves from crime are varied and not limited to security measures narrowly defined. A summary of these responses is shown in Figure 4.4. Physical security measures are the most common: 58.3 percent have installed protective grills on buildings, 49.3 percent have special fencing, and 31 percent have installed alarm systems. Nearly half have unarmed guards, and a remarkable 30.8 percent of firms have armed guards. Many firms (36 percent) have opted to close before dark; this practice has especially high costs in the manufacturing sector, where second shifts are not used and productive capacity consequently sits idle.

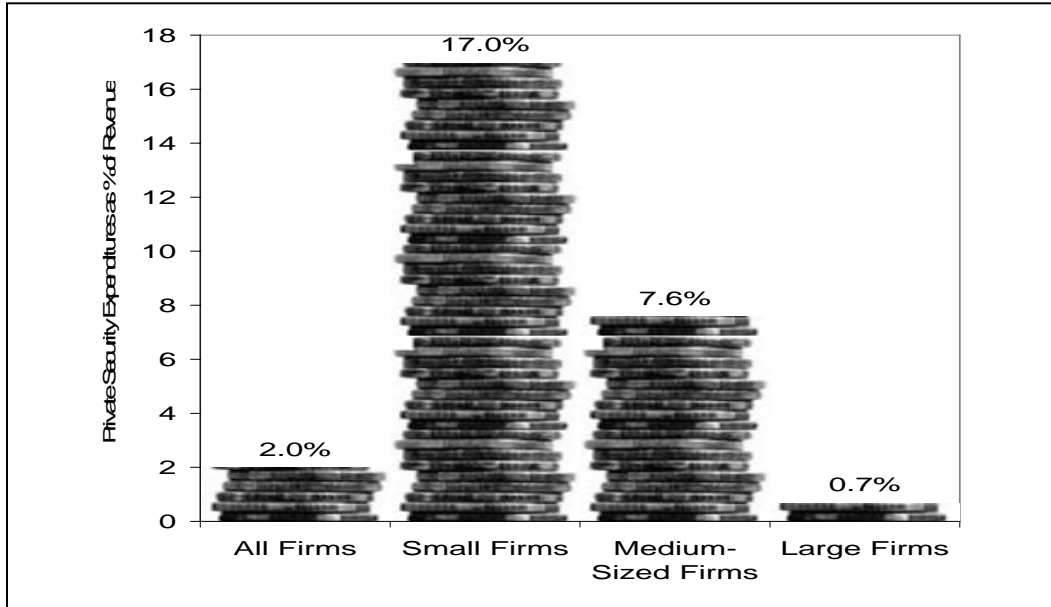
4.22 Among the more troubling costs to business are extortion and protection costs. Extortion occurs when a firm pays an extortionist in order to avoid victimization threatened by the extortionist. A protection racket, though similar, is distinguished in that the payment is in exchange for protection from criminal behavior from all other sources. To capture both types of coerced payments, the survey inquires about both. Notably, 8.5 percent of managers in Jamaica list paying for protection as being among their crime prevention measures, and 5 percent reported that they were force to pay extortionists.

4.23 Data from the firm victimization survey shows that security costs pose the largest burden for small firms. As shown in Figure 4.5, small firms pay security costs equal to 17 percent of their revenue on average, as compared to just 2 percent of revenue for firms overall.

4.24 Findings regarding crime from the ICS in the Dominican Republic were broadly similar to those from the Jamaica study. Seventy-two percent of firms surveyed took at least one action to prevent crime. As in Jamaica, substantial numbers of firms reported

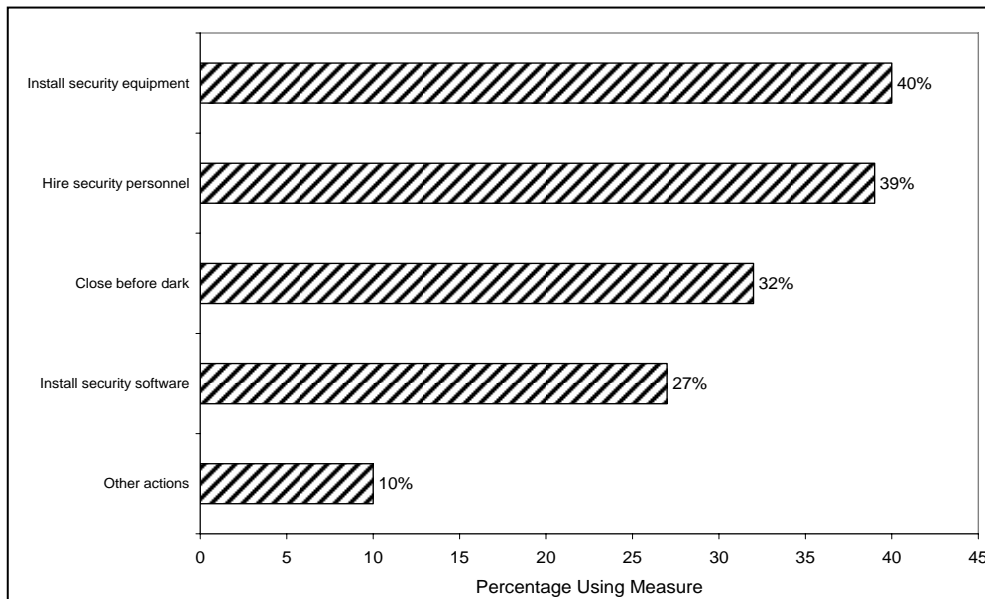
that they installed security equipment or software, hired security personnel, and closed before dark in response to the threat of crime (see Figure 4.6).

Figure 4.5: Private Security Costs for Firms by Size of Enterprise as Percentage of Firm Revenue in Jamaica



Source: 2001 Firm Victimization Survey, described in Francis et al. (2003).

Figure 4.6: Crime Protection Measures Taken by Firms in the Dominican Republic

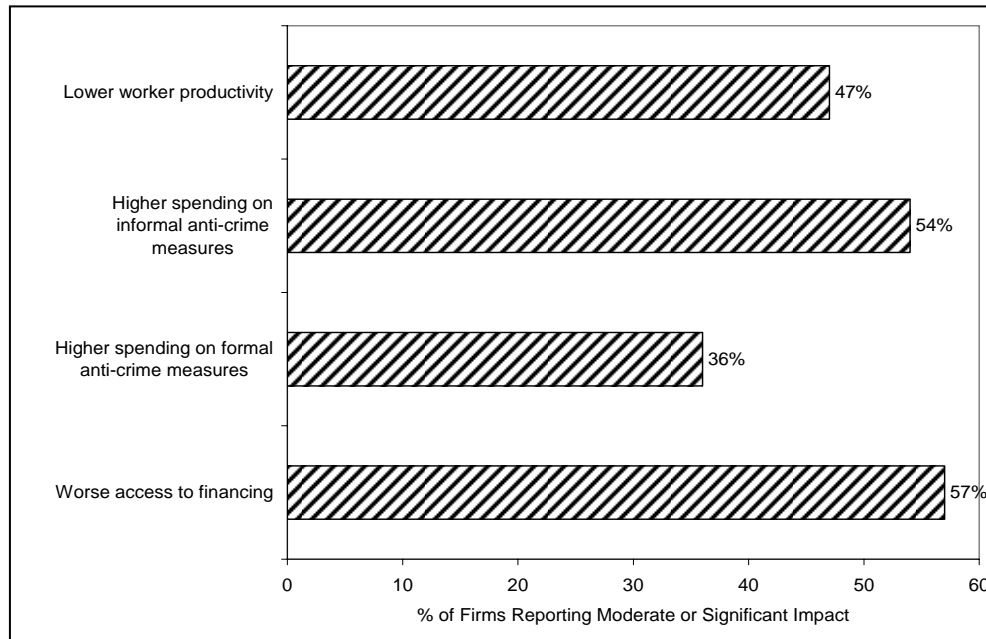


Source: World Bank (2006a), based on 2005 Investment Climate Survey.

4.25 Firms in the Dominican Republic also report other impacts of crime. Sixty-three percent cite crime as a major obstacle to investment. Similarly, 57 percent indicated that their access to financing had declined as result of crime, although only 10 percent of the

firms were actually victims of crime, illustrating the fact that the effects extend far beyond the direct effects on victims. Other impacts of increased crime mentioned by respondents to the ICS include increases in spending on formal and informal security measures and declines in worker productivity (see Figure 4.7).

Figure 4.7: Impact of Higher Crime on Businesses in the Dominican Republic



Source: World Bank (2006a), based on 2005 Investment Climate Survey.

TOTAL COSTS: ESTIMATES USING AN ACCOUNTING APPROACH

4.26 Estimates using the accounting approach for measuring costs vary in terms of the extent of costs they measure. As part as the background work for this report, Holder and Mutota (2006) estimated that the costs of crime in Trinidad and Tobago in 2003 amounted to TT\$1.098 billion (US\$160 million), 1.6 percent of 2003 GDP. This estimate includes the value of lost productive years due to both fatal and non-fatal injuries, the value of the lost productivity of ex-criminals who have reduced earnings capability after serving jail time, funeral costs, and business security costs. It does not include the costs of public security and other elements of the criminal justice system.

4.27 An attempt at a comprehensive study of the costs of crime in Jamaica was conducted by Francis et al. (2003). They included both private and public costs in their summary measure. The study considered health costs—both those borne by the public health system and those paid by private citizens—along with the value of lost production due to mortality and injury related to crime, public expenditures on security, and private expenditures on security.

4.28 Health costs are among the most important costs of crime and violence in Jamaica. Violence has reached such high levels that it puts a substantial strain on medical

services. A study of hospital-based data suggested that violence is the chief source of injuries in Jamaica. Data collected at three hospitals in 1999 and 2000 showed that 51 percent of injuries were violence-related, with the remainder classified as unintentional (33 percent) and motor vehicle-related (15 percent) (Sharon Arscott Mills, 2002). Other studies in Jamaica show similar figures.³

4.29 The Francis et al. study estimated the public health costs of violence by calculating the share of emergency room admissions that are due to violence-related injuries and then multiplying that share by the total cost of the public health system. Using this method, they find that the total annual cost to the public health system is J\$996 million or about 0.3 percent of GDP in 2001.

4.30 Private health costs for those hospitalized due to injury are estimated based on data from the 1998 Jamaica Survey of Living Conditions. Using data on the average cost of hospital stays, treatment, and medication for those hospitalized for violence-related injuries, along with the number hospitalized for such injuries, the total private costs from violence-related hospitalization are found to be J\$254 million, just under 0.1 percent of GDP in 2001.⁴ This estimate does not include the private costs of treatment to those not hospitalized.

4.31 Apart from direct private health costs, some victims of violence are incapacitated and unable to carry out normal activities during periods of convalescence. Survey data suggest that the average length of hospital stay for violence victims was nine days. Using information on the average wage and number of people hospitalized for violence, and assuming that a hospitalized victim is out of the workforce for two weeks, the value of time lost due to violence-related morbidity is estimated to be J\$337 million, about 0.1 percent of GDP.⁵

4.32 Another part of the cost of violence is the funeral costs for murder victims. Based on a poll of funeral service providers, the study estimates funeral costs to be J\$66,000 per person average, for a total cost of J\$64 million. The study also counts the time required for funeral preparations, which are found to have a value of approximately J\$41 million.

4.33 Additionally, the study considers the output lost due to the loss of what the individual would have produced during the year of his or her death.⁶ They calculate this

³ Intentional violence cases accounted for 39.4 percent of cases at emergency rooms at the University Hospital of the West Indies in 1996 and 43 percent of emergency room visits at public hospitals in 2001. (McDonald et al., 1999) and Francis et al. (2003).

⁴ An earlier study, Mansigh and Ramphal (1993) examined the costs of treating interpersonal violence in Kingston Public Hospital and estimated them at a value equivalent to \$709 in 2001 U.S. dollars.

⁵ The study values the time of injury victims using the average weekly wage estimated in the study for murder victims of J\$8423. While it is not clear in the study, presumably this average is among those who are employed. Because unemployment is high in Jamaica, this is likely to be an over-estimate of the value of victims' time in terms of wages. If not incapacitated by injury, some victims would be unemployed or out of the labor force rather than working.

⁶ Note that it would be preferable to calculate the net present value of a discounted lifetime stream of wages, rather than take the wages in one year. The use of just one year's wages gives an underestimate of

by examining the occupational distribution of a random sample of murder cases in the previous three years and constructing a corresponding average wage. Multiplying this wage (on an annual basis) by the number of murder victims, they find a total lost output of J\$194 million.

4.34 Security costs dominate the total costs of crime as calculated by the accounting method. In the year examined in the study, the Government's budget for security services, including defense, justice, correctional services, and the police, totaled J\$10.5 billion or about 3.1 percent of GDP. Government expenditures on the justice system and the police are oriented chiefly towards criminal cases; of all cases filed with the Resident Magistrate courts in 2001, just 10 percent were civil cases. For the purposes of the costs exercise the full value of public security forces is counted as a cost of crime.

Table 4.2: The Costs of Crime in Jamaica: an Accounting Exercise

1) Health Costs	1.3 bn (0.4% of GDP)
Public Health System	995.7
Private Citizens	254.5
2) Lost Production	0.5 bn (0.2% of GDP)
Mortality	194.1
Injury Due to Crime	337.2
3) Public Expenditure on Security	10.5 bn (3.1% of GDP)
Total (1) + (2) + (3)	12.4 bn (3.7% of GDP)

Source: Francis et al. (2003).

4.35 Table 4.2 above summarizes the costs of crime as calculated by Francis et al. (2003). They find that the total costs of crime in 2001 came to J\$12.4 billion, which was 3.7 percent of GDP.

4.36 It is important to note what costs are not included in the 3.7 percent of GDP figure. First, this does not include the private security costs to firms shown in Figure 4.7, which average 2.0 percent of firm revenue across all firms.⁷ The Francis et al. study makes no attempt to quantify non-monetary costs like the pain and suffering of victims and their families and the psychological effects of living in fear of being victimized. The estimate of crime's effect on GDP also does not take into account the long-run economic or social effects of violence, such as the impact of violence on capital accumulation and future growth rates. In particular, there is a risk of a vicious circle, where violence-plagued neighborhoods receive little productive investment and hence offer few productive employment opportunities. The lack of opportunities, in turn, could lead youth to engage in violent and criminal activities. Nor does the cost estimate capture the fact

the future value of the individual's production. Calculations like this of the value of a person's life are controversial because they essentially assume that the life of a person with low-earning power is worth less than that of someone who earns more.

⁷ Because the firm survey is not representative of the population of Jamaican firms and because security costs as a percentage of revenue vary greatly with firm size, it is not possible to reliably convert the 2.0 percent of revenue figure into a percentage of GDP.

that children who grow up in violent environments are themselves more likely to be violent as adults. This last effect—sometimes called “the inter-generational transmission of violence”—means that violence has significant inertia.

DISABILITY-ADJUSTED LIFE YEARS LOST TO VIOLENCE

4.37 Another way to summarize the costs of violence is by examining the Disability-Adjusted Life Years (DALYs) lost to violence. DALYs are the standard international health measure of the burden of disease. DALYs express years of healthy life lost, summarizing both the years of life lost to mortality and the suffering or incapacity associated with morbidity (Mathers et al., 2003). An important strength of analysis based on DALYs is that it provides a clear basis to compare the impact of violence on health with impacts from other threats to health.

4.38 The World Health Organization (2002) publishes estimates of cause-specific deaths and Disability-Adjusted Life Years (DALYs) lost, and violence is among the listed causes.⁸ One weakness of the WHO figures is that they measure only the direct effects of violence on those who are killed or injured and do not capture indirect effects on other individuals (such as increased stress levels or other reductions in the quality of life due to the fear of violence) or on society more broadly (such as lowered saving, investment and growth).

4.39 The DALYs lost to violence are calculated based on two estimated components: age-specific rates of death (mortality) due to violence, and age-specific rates of suffering and incapacity (morbidity) due to violence. The WHO publishes the overall deaths due to each cause, including violence.

4.40 The quality of the WHO data varies enormously by country. The reliability of the WHO data can be considered by examining the WHO figures on deaths due to violence with official homicide rates for each country. Figure 4.8 shows a scatter plot of the WHO data for 2002 vs. data from official sources for the closest available comparison period. The official source figures for Jamaica, the Dominican Republic, and Guyana are the respective governments’ published figures for 2002. The Haiti figure is calculated from responses to a 2001 household survey. Figures for other countries are from government reports for various periods during the 1990s.

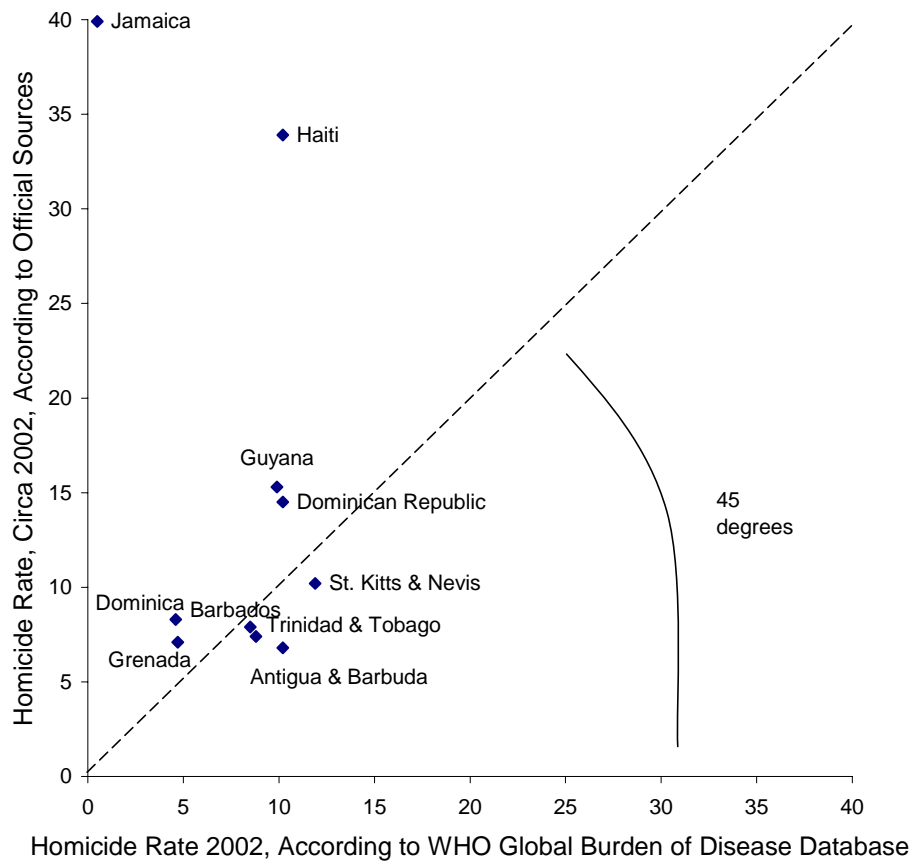
4.41 The figure shows that for particular countries the WHO data are substantially in error. In the case of Jamaica, in particular, the WHO data appear to be significantly flawed: the WHO data for 2002 show a murder rate of 0.5 murders per 100,000 Jamaicans, compared to the rate of 40 per 100,000 reported by the police for that year. Likewise, the WHO’s figure (10.2) for Haiti is less than a third of the estimate based on 2001 household survey data (33.9).⁹ For Guyana and the Dominican Republic—the two

⁸ Jamaica homicide figures from multiple sources are examined in detail in the World Bank’s forthcoming Jamaica Poverty Assessment (2006).

⁹ Note that the household survey-based estimate for Haiti has a wide confidence interval and is not as reliable as the estimates from official reports.

other large countries in the region for which both official and WHO data are available—the WHO figures are also substantially below official homicide rates. Nonetheless, excluding the two cases where the data are clearly deeply flawed—Jamaica and Haiti—the WHO figures do not appear to show any systematic bias with respect to the official figures. For the remaining eight countries, the WHO estimate is above the official figure in half the cases and below it the other half. This suggests that although there are problems with the data, for countries other than Jamaica and Haiti, the DALY figures are not necessarily over- or under-stated and may be cautiously interpreted as a measure of violence’s cost in terms of health.

Figure 4.8: How Reliable is WHO Homicide Information for the Caribbean? Homicide Rates According to WHO vs. Official Sources Homicide Deaths per 100,000 Population



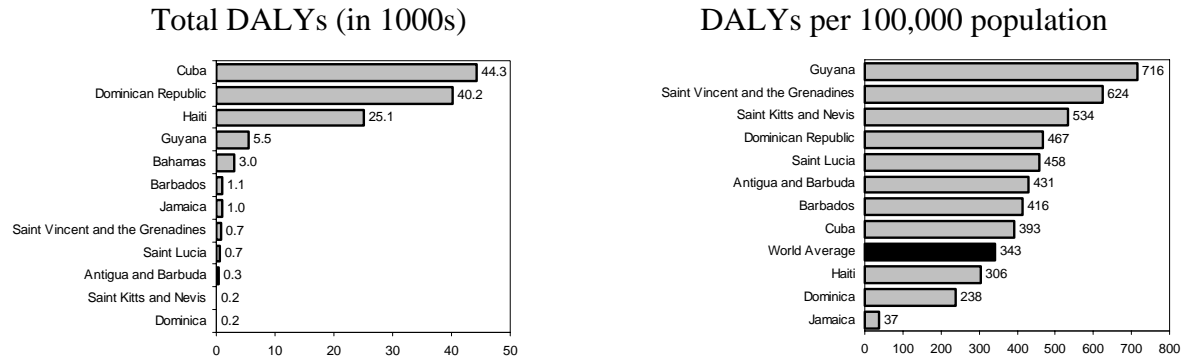
Source: WHO and various national sources.

4.42 Figure 4.9 shows the DALYs lost to violence by country in the Caribbean, according to WHO figures, both in raw totals and per 100,000 residents. The largest numbers of DALYs lost to violence are in the region’s largest countries: Cuba, the Dominican Republic, Haiti, and Guyana. In terms of population-standardized rates of DALYs lost, Guyana ranks at the top in the WHO figures, followed by St. Vincent and

the Grenadines and Saint Kitts and Nevis. It should be noted, however, that because the populations of the OECS countries are small, the population-standardized rates are sensitive to small errors in the DALY figures.

4.43 The rate of DALYs lost to violence in almost all Caribbean countries is above the worldwide average. The exceptions are Dominica, and the two countries for which the data is evidently in error: Haiti and Jamaica.

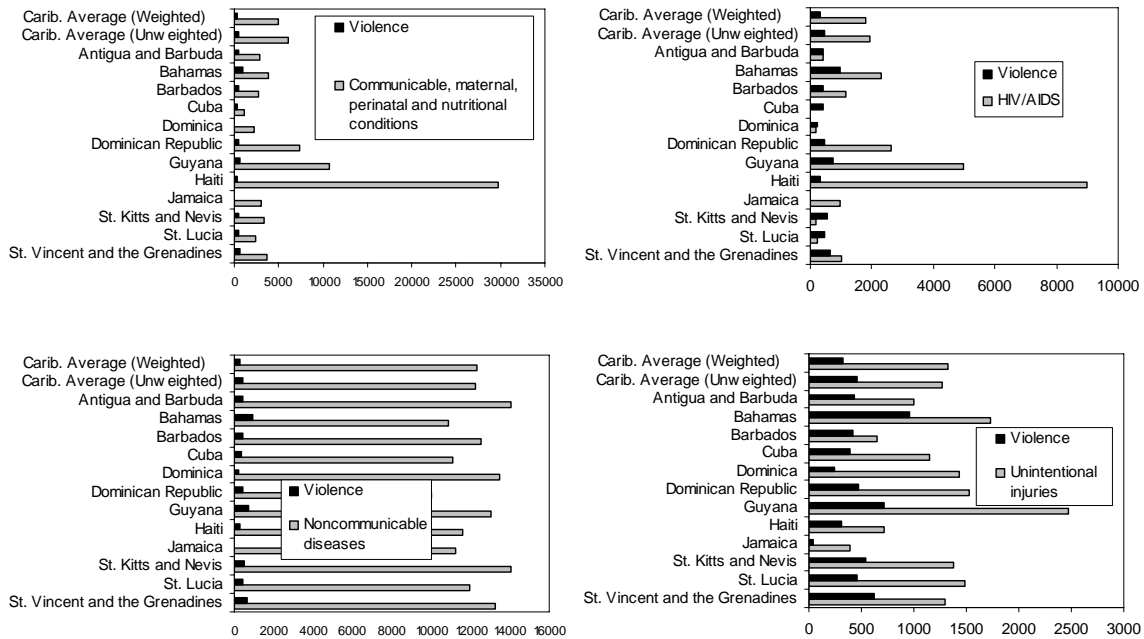
Figure 4.9: Disability-Adjusted Life Years Lost to Violence in the Caribbean, 2002



Source: WHO (2002).

Note: The world average DALYs per 100,000 population is calculated across all countries, weighted by population.

Figure 4.10: Disability-Adjusted Life Years Lost to Violence vs. Other Causes Caribbean, 2002



Source: WHO (2002).

4.44 How big is the direct impact of violence on DALYs relative to other causes? Overall, relative to all other causes, the impact seems to be relatively small, although this conclusion must be tentative because of the data problems affecting several countries in the region. In the WHO data, violence account for just 0.37 percent of all DALYs lost and 0.90 percent of all deaths in 2002 in the Caribbean. Figure 4.10 shows graphically DALYs lost to some of the other major categories. Other major health conditions, including HIV/AIDS, dwarf violence in terms of their impact on DALYs. For the Caribbean overall, DALYs lost to violence are equivalent to 24 percent of those lost to unintentional injury.¹⁰ As a whole, the DALY figures suggest that the direct health impact of violence—at least as measured in the WHO figures—may not be the most important part of the effect of crime and violence at a societal level.

THE IMPACT OF VICTIMIZATION ON SELF-REPORTED LIFE SATISFACTION

4.45 Another cost of crime and violence is the effect being a victim has on one's quality of life. It is well known that exposure to crime can have long-lasting psychological impacts on the victims and those close to them. However, very little empirical research has been conducted on the relationship between crime and well-being.¹¹ We analyzed the effect of being a victim or having a family member be a victim on subjective well-being, using Latinobarómetro surveys from 18 countries in Latin America.¹² The only Caribbean country included in the survey is the Dominican Republic.

4.46 In the Dominican Republic, controlling for a wide variety of personal and socioeconomic characteristics, those who have been victimized (or had family members victimized) in the previous 12 months are 8 percent less likely to say that they are “satisfied” or “rather satisfied” with life. The effect in the Dominican Republic is higher than the average estimated effect of 4.4 percent for the 14 countries surveyed. Full results from the analysis are shown in Annex 4.1.

4.47 It is possible that this reflects in part not a causal effect of victimization but rather the fact that victim and non-victim families differ along other lines relevant to self-satisfaction. For example, it may be that victimized families tend to live in particular neighborhoods with characteristics that make people both less likely to be satisfied with life and more likely to be victims of crime. The long list of covariates used in the analysis controls for such differences as best as possible using the available data. Overall, the analysis presented here provides reasonably strong evidence that crime has a substantial

¹⁰ The WHO divides injuries into two categories: intentional and unintentional. Subcategories for intentional injuries are self-inflicted injuries, those due to war, and those due to violence. The subcategories for unintentional injuries are as follows: road traffic accidents, poisonings, falls, fires, drownings, and other.

¹¹ One exception is Powdthavee (2005), which examines crime and subjective welfare data from a 1997 survey in South Africa.

¹² The relevant questions in the survey are “In general terms, how satisfied would you say you are with life? Very satisfied, rather satisfied, not very satisfied, or not satisfied at all?” and “Have you or someone in your family been assaulted, attacked, or the victim of a crime in the last 12 months?”

impact on the quality of life of victimized families and that this effect may be particularly high in the Dominican Republic.

THE IMPACT OF VIOLENT CRIME ON ECONOMIC GROWTH

4.48 Another way to assess the costs of crime is to estimate the impact of crime on overall economic growth using cross-country panel data.¹³ The advantage of this approach is that it summarizes the overall economic cost of crime. Because the estimates are based on data from across countries, they reflect an average relationship between crime and growth worldwide. This section reviews estimates produced using this method as part of a study of crime and violence in Brazil (World Bank, 2006b) and considers their implications for Jamaica.

4.49 In this analysis, violent crime rates are measured using national homicide rates. Homicide rates are typically used for cross-country crime studies because they are thought to be least subject to variation in definition and reporting to authorities. The analysis follows the literature on the determinants of growth: GDP per capita is regressed on homicide rates, controlling for a country's level of income inequality, the cost of investment, and average male and female education.¹⁴

4.50 The measure used for this analysis is “completed homicides”, referring to actual homicides.¹⁵ The analysis employs the Arellano and Bond (1991) GMM estimator, which provides consistent estimates of the effect of the explanatory variables on the outcome under the identifying assumption that the explanatory variables are not correlated to the time-variant components of the error terms. In all cases, the crime data is averages over five-year periods between 1975 and 2000.¹⁶

4.51 Estimates are presented in Table 4.3. The dependent variable is the log of future GDP per capita, while “Income” as shown in the table is the log of current GDP per capita. The coefficient estimate on the homicide rate is significant and negative. This

¹³ Obviously, causality runs in both directions: violence affects growth, but growth—by influencing opportunities for gainful employment—also affects violence. Here, we focus on the causal arrow running from violence to growth. See Chapter 3 for a more complete discussion of these causality issues.

¹⁴ Data on homicides for 1975-2000 is drawn from the United Nations Survey of Crime Trends and Operations of Criminal Justice Systems. Data on schooling comes from Barro and Lee (2000). Income inequality data comes from Deininger and Squire (1996).

¹⁵ This definition may seem tautological, but international data distinguish between completed and total homicides. Completed homicides are actually consummated homicides, while total homicides include both consummated and attempted homicides.

¹⁶ Dependent variable is average annual per capita growth. Robust standard errors are in parentheses. A constant was included in the model, as were dummies for time period. Observations are for five-year time periods between 1975 and 2000. Note that in this analysis violent crime rates are measured using national homicide rates. Homicide rates are typically used for cross-country crime studies because they are thought to be least subject to variation in definition and reporting to authorities. The analysis follows the literature on the determinants of growth: GDP per capita is regressed on homicide rates, controlling for a country's level of income inequality, the cost of investment, and average male and female education.

indicates that a country's homicide rate has a negative impact on subsequent economic growth¹⁷.

Table 4.3: Cross-Country Regression Estimate of the Effect of Violent Crime on Economic Growth

Variable	Estimates
Income	-0.1362 (.017)
Inequality	0.0013 (.0005)
Male education	0.0120 (.0168)
Female education	-0.0084 (.0179)
Price level of investment	0.0000 (.0001)
Homicide rate	-0.0021 (.0006)
Period Dummies	Yes
Countries	28
Observations	32

Source: World Bank (2006b).

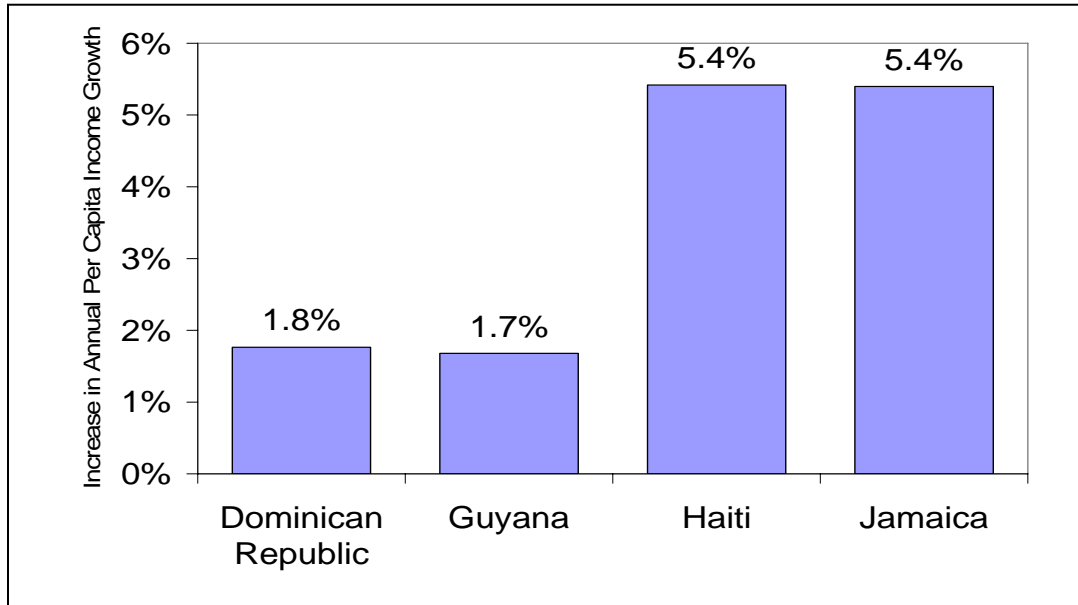
Note: Standard errors are shown in parentheses.

4.52 We can consider what these estimates imply for potential gains to economic growth from crime reduction in the Caribbean. For 1996-2000, Costa Rica—one of the least violent countries near the Caribbean—had a homicide rate of 8.1 per 100,000 population according to data collected by the UN Office of Drugs and Crime. In contrast, the homicide rates in Jamaica, Haiti, Guyana and the Dominican Republic for the nearest available comparable period were 33.8, 33.9, 16.1, and 16.5, respectively.¹⁸ What would be the gain in economic growth for these Caribbean countries if they were to bring down their homicide rates to that of Costa Rica? Estimates from this “simulation” are shown in Figure 4.11.

¹⁷ The regression estimates imply that violent crime substantially reduces economic growth. A decline of 10 in a country's completed-homicide rate per 100,000 persons is associated with a 2.1 percent increase in average annual growth over the next five years.

¹⁸ The Jamaica homicide rate figure is the average over 1998-2000 from the UN database. Because recent UN data is not available from the other three countries, homicide rates for those countries are drawn from alternative sources and for varying dates: 2001 household survey (Haiti), and the averages of 1999-2004 police reports (both Guyana and the Dominican Republic).

Figure 4.11 Potential Boost to Annual Economic Growth Rate from Reducing Homicide Rate to Costa Rica Level



Source: Own calculations.

4.53 The regression results suggest very large potential gains from reduction in violence for Haiti and Jamaica, the two countries in the region with the highest murder rates. The coefficient estimate implies that both countries could boost economic growth per capita by 5.4 percent per year if they were to bring their homicide rates down to the levels of Costa Rica. Guyana and the Dominican Republic would also benefit substantially, with potential growth rate increases of 1.7 percent and 1.8 percent, respectively.

4.54 Because the estimated effects are on annual growth, they are cumulative over time, suggesting that over the long term the impact of crime reduction on welfare would be very high. For example, an increase of per capita growth of 1.8 percent—the figure implied by the simulation for the Dominican Republic—would result over 20 years in a cumulative increase of income per person of 43 percent.

POLICY IMPLICATIONS

4.55 There are a number of ways to consider the costs of crime. Each approach illuminates a different aspect of the impact of crime, and no single approach is comprehensive. Even the accounting approach, which attempts to pull together a large variety of costs in a single measure, is limited to the extent that some costs of crime cannot be quantified; it is also generally limited to the current costs which can be more easily identified, rather than longer-term impacts.

4.56 The work reviewed and presented in this chapter shows that some of the most important costs such as impact on the investment climate and economic growth are those that are usually neglected in many analyses and in public discussions. Most importantly,

the economic growth effects implied by the dynamic panel estimates are very large. They suggest that the countries of the Caribbean, which suffer from the most severe crime and violence problems, could realize a very large dividend in increased growth from reducing them.