

Crime, Security and Firms in Latin America

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April, 2009

Existing studies on crime are exclusively focused on crime against individuals and households. These studies show that crime is more rampant in the larger cities and against the relatively well off agents. Using Enterprise Surveys data for 14 Latin American countries we find that one third of the firms suffer from one or more incident of crime annually which is roughly similar to the available estimate of 38.6% for households. Crime related losses average 2.7% of annual sales for all firms in the sample which is more than the reported amount of bribery, losses due to power outages and firms' expenditure on R&D. We also find that the relatively well off large firms are more likely to be victims of crime than the small firms but losses due to crime as a percentage of annual sales are bigger for small firms. In short, crime in the region is regressive. Last, larger cities are more prone to crime than the smaller cities. However, this holds only across cities within countries but not across countries. That is, what matters for crime is the relative size of a city within a country but its absolute size is irrelevant. We argue that this distinction is important for understanding the dynamics of crime and for the optimal design of crime prevention policies.

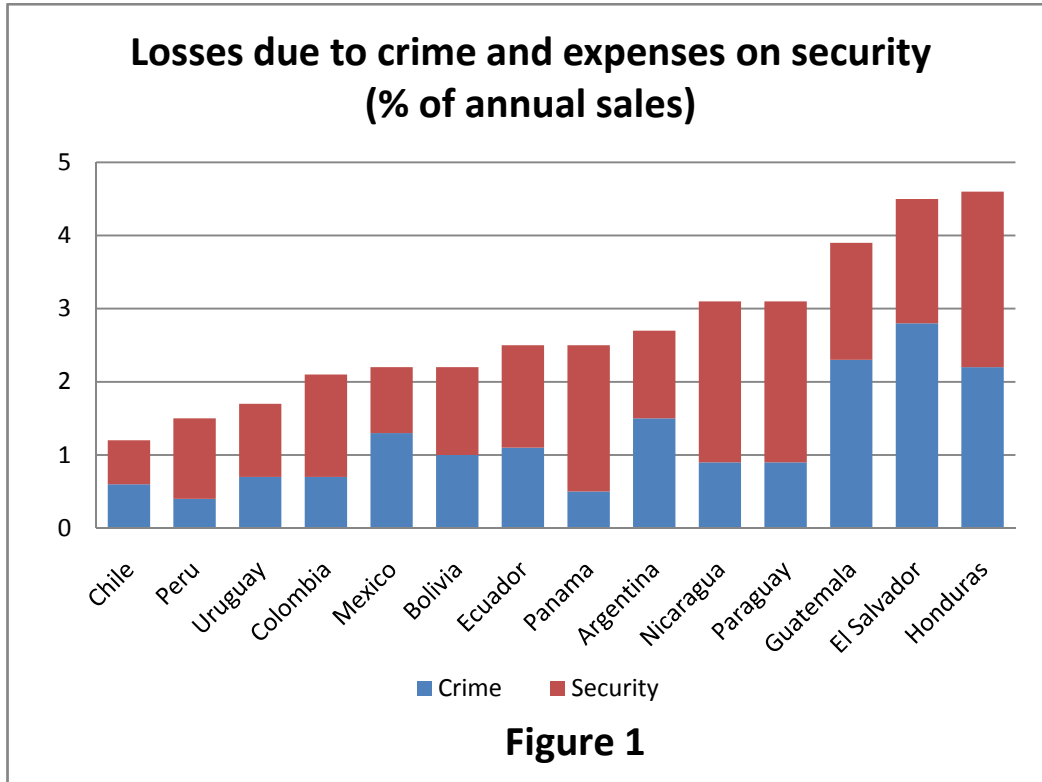
Anecdotal evidence suggests that crime is a common feature in many Latin American cities. Yet there is precious little formal work on precisely how big the problem is or its sources and effects. Lack of reliable data is often cited as the main hindrance to a rigorous analysis. This holds not just for Latin America but other regions as well. The studies that do exist are exclusively focused on crime against individuals and households as opposed to firms. The two most important themes that emerge from these studies are that the incidence of crime is higher in the relatively bigger cities (population wise), and that criminals tend to target the relatively well off (richer) individuals. Both these findings have important socio-economic and policy implications especially for crime prevention related policies.

This note focuses on crime against enterprises – the magnitude of the problem and the pattern across cities and firm-size. The data used is a survey of 10,439 firms in 14 Latin American countries conducted by World Bank's [Enterprise surveys](#) in 2005.¹ The survey asked firms if they experienced an incident of crime during the previous year, losses incurred due to crime (as % of annual sales), and the amount they spent (if any) on security (personnel and equipment). Note that these reported losses due to crime and security expenses capture only the direct cost of crime related problems. Additional indirect costs may be incurred, for example, when firms are unable to operate night shifts or avoid crime-prone locations that are otherwise optimal for its business.

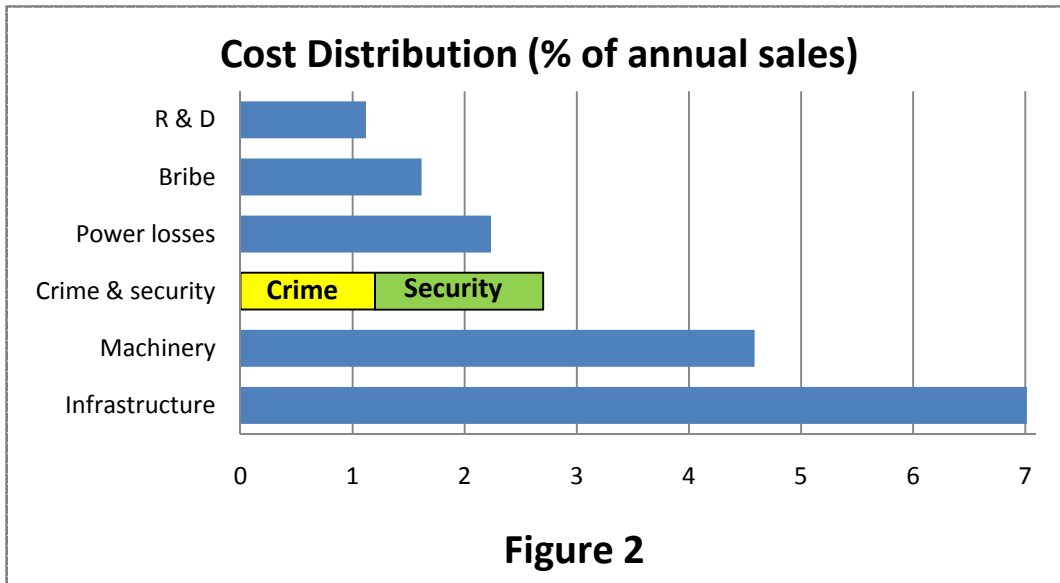
The main findings of the note can be summarized as follows. First, firms in Latin America are as likely to be victims of crime as individuals and households. Second, what seems to matter for crime is the size of a city relative to other cities in the country. The absolute size of a city or the average size of cities across countries seems irrelevant for the level of crime. Third, much like the richer households, larger firms are more likely to be crime-victims. However, losses due to crime as a proportion of annual sales (averaged over victims and non-victims of crime) are much higher for small than for large firms. Compared with larger firms, if smaller firms represent the relatively weaker sections of society (less wealthy owners, less skilled workers and lower paying jobs) then crime against enterprises in Latin America appears to be regressive.²

Crime against firms in Latin America: How big is the problem?

The survey reveals that about one third of the firms experienced at least one incident of crime during the survey year and close to two thirds incurred security related expenses. 72.8% of all firms in the region lost money either due to crime or incurred expenses on security with a high of 82.8% (Argentina) and a low of 45.3% (Mexico). As a percentage of annual sales of firms, losses due to crime average 1.2% in the region and expenses on security, 1.5%. The former varies between 2.8% (El Salvador) and 0.4% (Peru) and latter between 2.4% (Honduras) and 0.6% (Chile). Figure 1 shows the full distribution across countries.



These numbers make two important points. First, incidence of crime against firms is roughly comparable to that against individuals and households. For example, [Gaviara and Pages](#) (2002) use data from Latinobarometer for major cities in 17 Latin American countries. They find that about 38.6% of the households (versus 33% of firms in our sample) suffer from at least one incident of crime during a given year. The figure varies between 55% in Guatemala and 25% in Uruguay. Second, losses due to crime and expenses on security are quite significant. Figure 2 shows that these combined losses are more than twice what firms spend on R&D, 1.7 times the reported amounts paid in bribery, 1.2 times the losses due to power outages and 39% of firms' total expenditure on infrastructure (electricity, water, transport and telecom). Alternatively, investment in machinery and equipment by firms per annum could increase by over 50% of the current level if a crime-free world were to be achieved. Provided that the cost of crime prevention is not too high, these numbers suggest substantial gains from greater allocation of resources towards crime prevention.



Are larger cities more prone to crime?

An important finding in the literature is that crime rates are typically higher in cities that are larger in terms of total population. Broadly, there are two main reasons for this. First, the level of anonymity is higher in larger cities making it easier for criminals to hide. Second, larger cities have more wealthy individuals making them greener pastures for criminals. These are plausible explanations but they are consistent with contrasting dynamics of crime and the optimal policy response. For example, consider first the self-selection case where crime is higher in the larger cities simply because criminals choose to locate in such cities (greater anonymity and more wealth in large relative to small cities). In this case there is no reason to believe that a doubling of all city populations would increase the level of crime in the country (optimal location of criminals is unaffected by the change) and crime need not be higher in countries that on an average have bigger cities. In short, city-size and crime nexus is essentially about the distribution of criminal activity within a country with no obvious implication for the overall level of crime in the country. Hence, what matters is the relative size of a city in a country and not the absolute size. In terms of policy implications, the natural growth of city populations does not call for increasing resources towards crime prevention – simply redistribute existing resources devoted to crime prevention away from slow growing and towards faster growing cities. In the alternative scenario, where an increase in city population encourages more people to become criminals (due to the associated increase in city-wealth and/or anonymity), the prediction is quite different: doubling of all city populations would lead to an across the board increase in crime, countries that on an average have larger cities would experience more criminal activity and the natural growth of populations in cities would require increasing amounts of resources devoted to crime prevention to keep the level of crime at a specified level. In short, in this scenario the

absolute size of a city does matter for the level of crime. Of course, these two extreme scenarios are not inconsistent with one another so that the reality may lie somewhere in between the two. This is largely an empirical issue.

One way to check for these scenarios is by comparing the city-size and crime relationship within and across countries. The first case suggests that city-size and the incidence of crime should be positively correlated within a country but not across countries (cross-border movement of criminals and also the wealthy is still very limited). In contrast, the second case predicts a similar positive relationship between city-size and crime within and across countries. We check for these cases using variation at the region-sector level. We filter out sector specific effects on the incidence of crime although doing so makes virtually no difference to the results. For within country crime and city-size relationship we use deviation of city populations from the average population of the sampled cities in each country. Figure 3 shows that this relationship is positive and strong.³

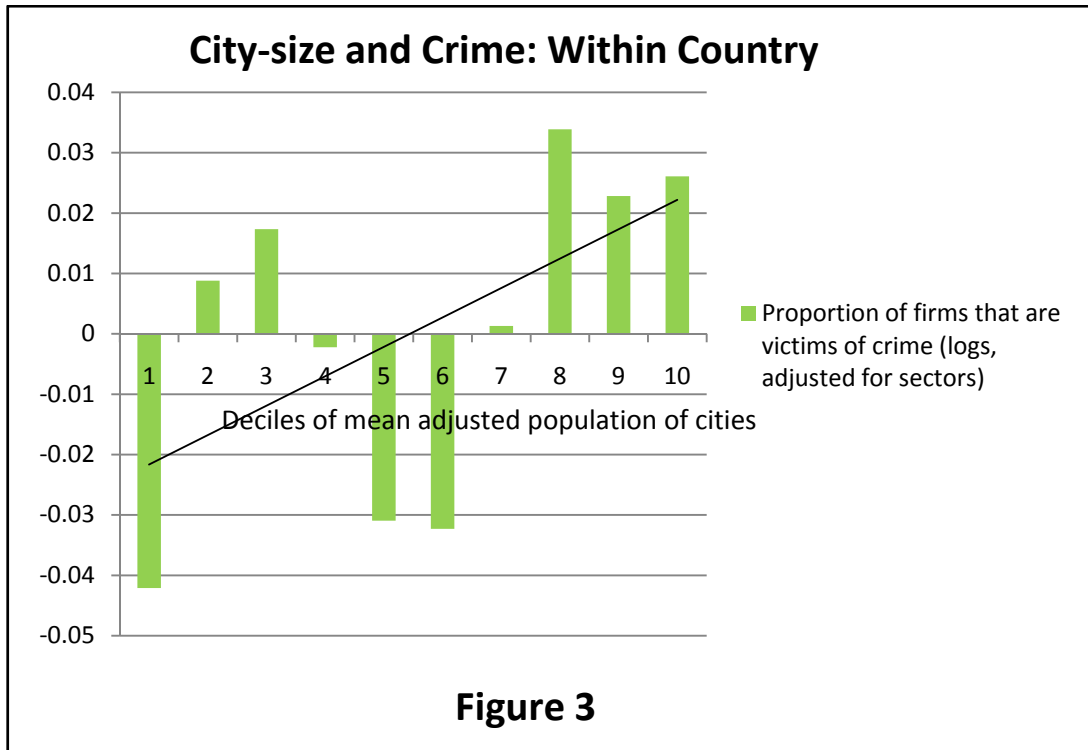
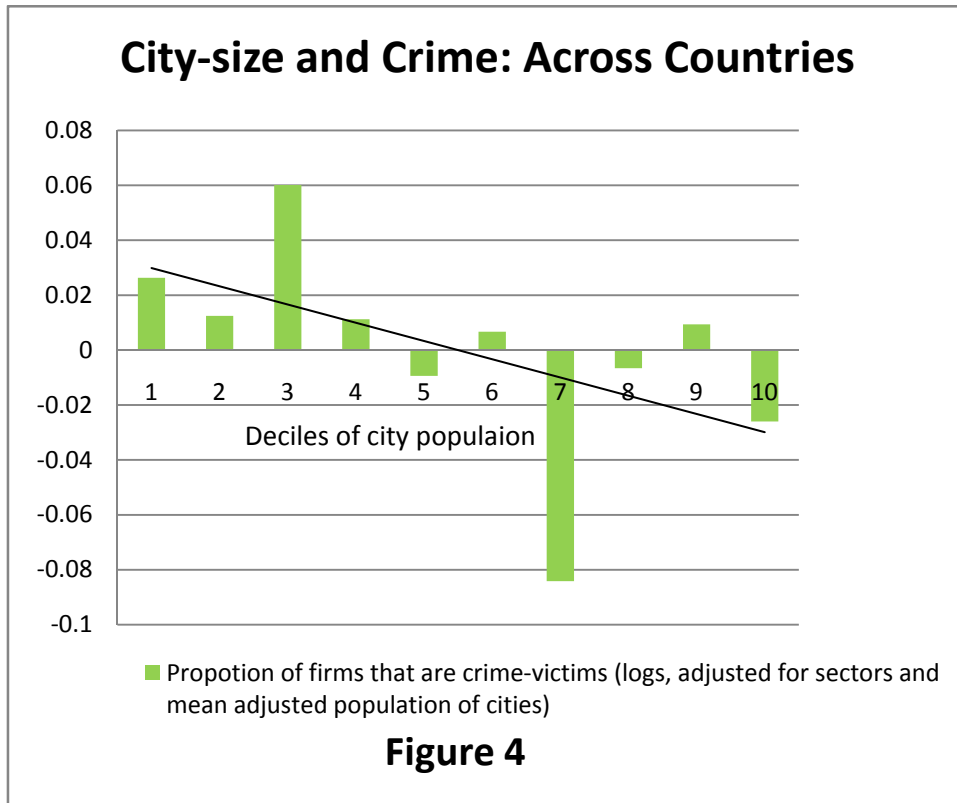


Figure 4 shows the partial scatter plot of crime and city-size after controlling for the mean adjusted populations. This is the pure case of city-size and crime relationship across countries. Note that this relationship is negative although weak.⁴ Combining within and across country figures we get virtually no association between city-size and crime incidence. These results suggest that the positive crime and city-size relationship is most likely driven by relocation of criminal activity from the smaller to the larger cities. There is little evidence of higher crime in countries that on an average have larger cities or for crime increasing with the natural growth of city populations.



Is crime regressive?

Another important finding in the literature is that crime is not regressive. That is, the relatively poorer agents suffer less from crime than the richer ones. Precisely how do we define the level of “suffering”? Existing studies use the probability of being a crime victim but this is at best a partial measure. Loss from crime as a proportion of household income or wealth (burden of crime) is perhaps a better measure but largely neglected due to data limitations. It is entirely possible that the burden of crime may be regressive even when the incidence of crime may suggest otherwise.

A natural extension of these ideas to our data is how crime affects small vs. large firms. Compared with the latter, the former typically have owners that are less wealthy, workforce that is less skilled and lower paid jobs. Consistent with existing studies, incidence of crime is least among small firms (31.4%) and highest among the large firms (42.4%). However, Figure 5 reveals the dangers of jumping to a conclusion based on the incidence of crime alone. Measured as a percentage of annual sales, small firms suffer significantly higher losses due to crime than the large firms (1.4% vs. 0.65%). Expenses on security are slightly higher for larger firms (1.55% vs. 1.5%) but the combined burden of crime and security is still regressive.⁵ We note that these differences are robust to controls for country and sector fixed effects and various firm characteristics. Following suggestions in the literature ([Glaeser and Sacerdote 1999](#)), we also checked if crime is higher against firms that have women owners and greater proportion of women in the workforce. We did not find any significant differences along these dimensions. The same

holds for young vs. old firms and registered vs. unregistered firms.⁶ What is so important about firm-size as far as crime is concerned requires a detailed analysis.



The discussion above shows that crime in Latin America is widespread and that it imposes substantial costs on firms. Further, the regressive nature of crime makes policy initiatives aimed at crime prevention even more important. Yet, the current state of the literature offers little help in guiding policy. To guide policy measures, more work is needed to understand the effect of crime on firm performance, how crime prevention measures impact on the burden of crime, and as discussed above, the distinction between absolute and relative size of cities in affecting the level of crime. Last, the regressive nature of crime (or the lack of it) has important distributional implications that may alter the priority we accord to crime prevention.

References

- Gaviria, A. and C. Pages (2002), “Pattern of Crime Victimization in Latin American Cities,” *Journal of Development Economics*, 67: 181-203.
- Glaeser, E. and B. Sacerdote (1999), “Why Is There More Crime in Cities?” *Journal of Political Economy*, 107: S225–S259.

¹The sample for the survey was stratified at the region-sector-size level. Using sampling weights provided in the data we are able to compare across data points that are representative at the level of country, region, region-sector, size, etc. For more information on the Enterprise Survey data please consult www.enterprisesurveys.org. The remaining data includes population of the sampled cities that are taken from the most recent Census available.

² These results were confirmed for various robustness checks using simple regression analysis at the firm level and also at various levels of aggregation. However, they should be treated with due caution. A more rigorous analysis is required to validate or reject them.

³ The relationship in Figure 3 is significant at less than 1% level with all standard clustered on the country. Mean adjusted population of cities are grouped into deciles for expositional convenience.

⁴ The relationship in the figure is statistically insignificant at the 10% level. City populations (logs) have been grouped into deciles for expositional convenience.

⁵ Regression results show that the difference between small and large firms in losses due to crime as percentage of annual sales is significant at less than 5% level. The result holds even if we add security expenses with losses due to crime and/or control for various firm and country characteristics.

⁶ For age we used 2006 minus the year firm was established. For crime against women vs. men we used a dummy variable indicating if a firm has a female owner or not and the proportion of women employees in the firm's workforce. In the regressions, these variables were defined at the firm level and also aggregated at the region-sector level.