Crime and Microenterprise Growth: Evidence from Mexico

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Abstract: Recent studies of microenterprises reveal that despite generating high returns to capital, many microenterprises do not grow. We investigate one potential explanation for this puzzle: robbery, as this constitutes weak protection of property and limits the incentives of entrepreneurs to invest in moveable assets. Robbery is one of the main shocks reported by urban microentrepreneurs in a recent survey in Mexico, and more entrepreneurs report suffering a robbery in the past year than having to pay bribes or fines to authorities. We explore the relationship between property crime and growth among microenterprises in Mexico using repeated cross-sectional data on these enterprises and the perception and incidence of crime. We find that higher rates of property crime are associated with a significantly lower probability that an enterprise will plan to expand in the next 12 months or experience income growth. These effects are unique to property crimes and are independent of other types of crime, including violent offenses. Moreover, we find that vehicle robberies differentially affect transport enterprises' expansion plans, indicating that these effects are due to risk of asset expropriation rather than demand factors. Finally, our results are not driven by border or drug crime states, and are robust to a number of controls for heterogeneity in the growth potential of firms, and for local institutional quality.

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Microenterprises—firms that operate with 10 employees or less—are recognized as large generators of income and employment in the developing world, and there is increased interest among policy-makers and researchers in improving their productivity. The expanding literature on the subject, however, has generated conflicting observations about the barriers to growth faced by the sector. On one hand, several papers that estimate returns to capital for microenterprises using field experiments find that some firms generate very high returns, often significantly above the cost of financed capital (McKenzie and Woodruff, 2006, 2008). For example, in Mexico, the country of focus of this paper, McKenzie and Woodruff (2008) using a field experiment find estimated monthly returns in the range of 20-33%. These are well above the rates charged by most formal lenders and suggest that some microentrepreneurs have the capacity to grow their way into higher levels of capital, employees, and income. These and other authors argue that what prevents these entrepreneurs from doing so are the high effective costs of expanding their capital (due to credit and savings constraints, e.g., McKenzie and Woodruff 2008) or labor inputs (due to fixed labor costs, e.g., Emran et. al. 2007).

Other work, however, suggests that even if credit and savings constraints were relaxed, the majority of microenterprises still would not grow. One cause could be low initial levels of productivity. For example, Mandelman and Montes-Rojas (2009) investigate the self-employed sector in Argentina and find that while there is a degree of voluntary entry by high-skill, salaried workers, the sector is primarily characterized by involuntary entry from less-skilled workers unable to find work elsewhere. Bruhn (2010) finds similar trends in her examination of a program in Mexico that lowered registration requirements for microenterprises. She finds that while the program did little to increase registration among existing firms, it did increase the number of new, registered firms started by high-skill, salaried workers moving into self-employment. These papers

suggest that other factors, such as skill constraints, may also be important barriers to higher microenterprise productivity.

Another potential cause for low rates of microenterprise growth, however, is weak institutions, specifically the potential for weak property rights to limit firm size (De Soto 1989). In the absence of formal and informal institutions which protect property, entrepreneurs have reduced incentives to invest in productive assets. An institutional story can better explain why some firms appear reluctant to increase in size even when given the opportunity. For example, De Mel, McKenzie and Woodruff (2008) find that many microenterprises do not invest in additional assets, even when provided with capital. The fact that some microentrepreneurs choose not to invest in equipment or machinery for their businesses, even when they have access to cheap (or free) capital, suggests that these investments may be riskier than one might believe based on mean returns alone.

In studying the institutional drivers of low microenterprise growth, the focus to date largely has been on the role of the state (De Soto 1989). Many studies have examined the role of a rapacious state, arguing that in the face of high taxes, fees or bribes, firms may find it optimal to stay small to reduce their exposure to rent extraction (DeSoto 1989). In this paper, however, we explore another channel through which weak property rights may limit microenterprise growth: the role of private individuals or groups who can seize others' assets with impunity- or robbery. Robbery can pose a severe threat to firm owners and might provide a strong incentive for enterprises to limit growth. For example, a 2008 survey of microenterprises in Mexico finds that the incidence of robbery is higher than that of fines and bribes and the average loss three times as high (Table 1). In the face of such risks, entrepreneurs may reasonably limit their plans for investment in new capital or expanded operations. Furthermore, they may face reduced credit access if microfinance institutions are reluctant to accept as collateral assets that have a high probability of being stolen.

To our knowledge, only one other paper has examined the impact of crime on microenterprise behavior. Krkoska and Robeck (2009) find cross-sectional evidence that enterprises in Eastern Europe and Central Asia suffer substantial losses from street crime, and that those enterprises that suffer the largest losses are the least likely to make new investments. We argue that crime is an important new dimension of the costs of weak property rights, particularly in developing countries facing high degrees of property and personal violence.

We investigate the link between crime and microenterprise growth using data from Mexico, a country with a large microenterprise sector and high rates of property-related crimes. We combine repeated cross-sectional surveys of microenterprises with repeated surveys of the general population on crime. By using repeated surveys we can control for time-invariant, state-level unobserved characteristics as well as control for a host of state-time varying effects that may jointly determine robbery and microenterprise decisions, such as local economic conditions, local institutional quality and demographic changes. Overall we find strong suggestive evidence that higher robbery rates significantly reduce the probability that microenterprises will expand their operations. Higher home robbery rates are associated with significantly lower probabilities that a microenterprise plans to expand its business in the next 12 months. We also find that these microenterprises are much less likely to experience income growth in the ensuing 12 months. This relationship holds after controlling for other types of crime, including homicides and assaults, which may be related to underlying factors that determine both crime and microenterprise behavior but have little direct impact on microenterprises. The relationship also holds after we control for other types of property crime, such as mugging, that may indirectly impact microenterprises through the effect on their customers. Finally, we find differential effects of property crimes by industry, with vehicle robbery rates only affecting expansion among enterprises in the transport sector. These results suggest that

although Mexican microenterprises operate in an environment with widespread violent crimes, their growth is primarily limited by the threat of asset loss due to robbery.

We also perform a large number of robustness checks to address concerns that factors other than expropriation risk drive the link between microenterprise expansion and robbery rates. These factors include; heterogeneity among microenterprises and the potential for low productivity firms to be differentially located in states with high robbery rates; the potential for groups of states that have been more affected by violence to drive the results; and the potential for unobserved institutional changes to simultaneously determine robbery rates and microenterprise behavior. We include numerous controls and find that our results are robust to their inclusion. Overall we view our results as a strong indication of a causal relationship between property crimes and microenterprise expansion.

The paper proceeds as follows. In Section 2, we describe the datasets that we use to conduct the analysis. Section 3 outlines our empirical strategy. Section 4 presents baseline results. Section 5 provides robustness checks. In Section 6, we offer conclusions.

Section 2: The Data

2A. Microenterprise Data

The data on microenterprises come from the ENAMIN, or National Survey of Microentrepreneurs, a cross-sectional, nationally representative survey conducted on a regular basis by INEGI, the National Statistical Institute. We restrict attention to the two most recent ENAMIN surveys, conducted in 2002 and 2008, as they match most closely to available crime data[1]. For comparability

[1] The 2002 ENAMIN survey was conducted from October 2001 to January 2002. The 2008 ENAMIN survey was conducted between October 2008 and February 2009. We take the 4th quarter of 2001 and 2008 as the relevant period. The sample framework for the ENAMIN changed between 2001 and 2008. The earlier sample was drawn from the

we limit the 2008 sample to urban microenterprises, defined as those operating in areas with a population of 100,000 or more. We also limit the sample to municipalities that appear in both survey years. Our geographic area of focus therefore is urban areas of states. This is the finest level of geographic detail we can achieve, as none of the data are representative at the municipal level[2].

Summary statistics on the sample are provided in Table 2. The sample is largely male (64%), married (73%), and with a high level of education (25% have some tertiary education). Overall 36% of the sample is in commerce, 40% in services, 11% in manufacturing, 7% in construction, and 5% in transportation and communications, with the composition changing very little across the two periods. In terms of size, as measured by employees, only 21.8% of enterprises in 2001 and 22.8% in 2008 had any employees other than the owner, with the average number falling from 1.9 in 2001 to 1.7 in 2008. Approximately 40% of these employees are unpaid. Average monthly profits were $415 in 2001 and $425 in 2008. These statistics confirm the "micro" size of many microenterprises.

We use several variables to measure enterprise growth. Our primary one is entrepreneurs' responses to the question of how they plan to continue the enterprise in the future. Responses include: increase the number of products, increase the number of workers, reduce the number of products, reduce the number of workers, improve the quality of services or products, change location, seek a loan, or not enact important changes. We count entrepreneurs who plan to increase the number of products as having expansion plans, as this will necessitate an increase in capital, either fixed or working. Thus we view this response as one that is highly correlated with enterprise growth. Meanwhile most of the other responses are most likely correlated with stagnation or

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National Survey of Urban Employment (ENEU), creating an entirely urban sample, while the later sample was drawn from the National Survey of Occupation and Employment (ENOE), creating a combined urban-rural sample.

[2] By focusing on urban areas, however, we achieve a relatively narrow geographic focus, as our sample includes only 120 municipalities out of almost 2500 in total.

shrinkage of the business. It is important to note that we cannot use enterprise assets to measure enterprise growth, because the survey module changed dramatically in 2008, generating a very high non-response rate (over 20%) and values with a likely high degree of measurement error.

The overall percentage of enterprises with expansion plans falls across the two periods. In 2001, 14.3% of enterprises had plans to expand products/services or employees. This figure falls to 9.1% in 2008. There also is significant variation in the averages at the state level. In 27 out of 32 states, the average percentage of enterprises with expansion plan falls, while in 5 states it rose. The size of the changes ranges from a 20.7 percentage point decline to a 9.9 percentage point increase. Thus, the trajectory has been far from uniform across states, a fact we exploit in our estimations.

We perform several checks to ensure that the expansion measure captures enterprise growth. First we compare estimated working capital investment, measured as purchases of primary materials, packaging, products and merchandise for sale[3]. Second, we consider measures of enterprise growth from the labor force surveys from which the ENAMIN are drawn. These surveys (ENEU/ENOE) are rotating panels that follow households for five quarters. Approximately twenty percent of the sample rotates out every period, such that we can follow eighty percent of the ENAMIN sample for one quarter, 60% for two quarters, etc. We consider three variables in the labor force surveys that likely are closely related to enterprise growth. These include moving from a non-fixed to a fixed location (Fayzlnber et. al. 2010), changing from an enterprise with zero employees to an enterprise

[3] These values come from the ENAMIN and are converted to December 2001 pesos and then to US dollars at the 2001 year-end exchange rate.

with any employees[4], whether or not the individual reports exiting self-employment, and percent changes in income. In all cases the differences are from the original quarter of the ENAMIN.

In Table 3, we compare the changes in the aforementioned variables one, two and three quarters following the ENAMIN survey, as well as the information on working capital. We find that average and median working capital investments are significantly larger for firms that have expansion plans than for those that do not. We also find that entrepreneurs who say they plan to expand have significantly higher income growth two and three quarters after the ENAMIN survey, are significantly more likely to have moved their enterprise to a fixed location one quarter after, significantly more likely to have added at least one employee one or three quarters after, and significantly less likely to exit self-employment two or three quarters after. To the extent that these variables are linked with expansion, these comparisons provide evidence that responses on expansion plans are indeed linked with enterprise growth.

2.B. Crime Data

The data on crime come from the National Survey of Insecurity, or the ENSI. This nationally representative household survey generates dependable estimates of the incidence of common offenses, including vehicle robbery, home robbery, physical assault and sexual assault, as well as reporting rates, economic losses, and perceptions of insecurity. As a household level survey the ENSI produces more reliable estimates of victimization rates than official crime statistics due to the low reporting rates for many of these crimes. For example, according to the ENSI, on average 32% of home robberies, 17% of partial vehicle robberies, 87% of full vehicle robbery and 47% of physical assaults are reported to the authorities. Furthermore, the ENSI provides details on robbery

[4] We cannot use total changes in employees as the ENEU includes bins for different ranges of employees rather than totals.

which are absent in official statistics. This allows us to separate crimes that more likely affect microenterprise customers than microenterprises themselves and to consider the implications of robbery of certain assets for firms that are more likely to use them.

There are two drawbacks to the ENSI for the purposes of our study. The first is that the finest geographic level at which it is representative is state-urban[5]. While we can achieve more geographic disaggregation by using reported crimes, we lose a vast amount of detail as there is only one "robbery" category. In addition, as a proxy for true crime incidence, reported crimes likely suffer from high rates of measurement error. This is problematic as reporting rates and the degree of measurement error likely are linked with factors- such as institutional quality- that jointly determine crime rates and microenterprise outcomes, introducing a source of bias (Soares 2004).

The second drawback is that the earliest nationally representative ENSI survey starts in year 2004. As such we use two rounds of the ENSI: the ENSI-3, which corresponds to the year 2004 and the ENSI-6, which corresponds to year 2008[6]. We address the time gap by projecting 2001 crime rates using a linear time trend. For robustness, we consider two alternatives. The first is using 2004 crime rates as a proxy for 2001 crime rates- a strategy that assumes no change in crime incidence across the three year period. The second is projecting 2001 crime rates using an exponential time trend- a strategy that assumes a constant percentage change in crime rates. In the projections a lower bound is set at zero. We do not show the results from the two alternative specifications, but they are similar to those produced by the linear time trend and are available upon request. In the remainder of this section we discuss the 2004 and 2008 crime data.

[5] It is also representative for a small group of cities, chosen by ICESI in each survey round. This group of cities is small (12 can be matched across both waves) and non-representative (some resort cities are included while many of the largest cities are not). Nevertheless, the microenterprise data are not representative at the city level.

[6] There are other ENSI surveys, but only these three are representative at the national and state level.

To measure crime incidence we take the percentage of individuals age 18 or older in urban areas of the state who report being victims of a particular crime in the past year[7].Our interest is in property crime, and thus we focus on home robbery, which is the closest measure of robbery of an establishment. We also consider vehicle robbery, as this may impact firms in the transportation industry. There are two types of vehicle robbery; "full" robberies in which the entire vehicle is stolen and "partial" robberies in which parts and accessories are stolen. We are also concerned about controlling for other types of crime that would not be expected to directly influence the investment and formality decisions of microentrepreneurs but may capture underlying local factors that affect them. We thus also consider physical assault, sexual assault and mugging from the ENSI as well as official statistics on homicide rates per 100,000 inhabitants, compiled by the Citizens' Institute for the Study of Insecurity (ICESI), which also coordinates the ENSI surveys. It is important to note that two states are not included in the 2008 ENSI - Tamaulipas in the North and Tabasco in the South, Gulf region - restricting the overall sample to 30 out of 32 states.

Summary statistics on the incidence of different crimes and reporting rates are provided in Table 4. In 2004 the average home robbery rate of incidence was 2.8%, higher than vehicle robbery, assault, and sexual assault. For interpretation, a value of 2.8% means that, on average 2.8% of adults age 18 or older in urban areas report being a victim of home robbery at least once in year 2004. This compares to 0.6% for full vehicle robbery, 1.9% for partial vehicle robbery, 0.2% for sexual assault and 1% for assault. The crime rankings change in 2008 due to a large increase in the incidence of partial vehicle robbery. While home robbery falls slightly to 2.3%, partial vehicle robbery shoots up to 5.2%, more than double the incidence of home robbery and close to five times the incidence of

[7] Averages are weighted to be representative at the state level

assault. While recent attention on crime in Mexico has focused on drug related violence, these statistics establish that non-drug crimes are also a serious concern for many residents.

To show the distribution of crimes across states, Figures 1A and 1B map average incidence across states for home robbery, partial vehicle robbery, full vehicle robbery and mugging for the years 2004 and 2008. Figure 1C maps changes in the averages over the four year period. The maps show a high degree of dispersion across states in crime incidence across states, and also show an absence of geographic concentration of property crime and physical assault. This means we are not simply capturing regional phenomena with state level averages. The maps also show that changes in crime rates have been far from uniform across states, with some states registering an improvement in crime rates while other register deteriorations. Again, there do not appear to be strong regional trends in the changes, which aids our empirical estimation.

3. Empirical Strategy

Our starting point is a model in which robbery rates affect expansion:

$$y_{ijst} = \alpha + \beta_1 X_{ist} + \beta_2 Z_{st} + \beta_3 robbery_{st} + \beta_4 othercrime_{st} + \delta_t + \gamma_s + \eta_j + \varepsilon_{ijst} \quad (1)$$

where y_{ijst} is the outcome variable of individual i living in state s working in industry j interviewed at time t, X_{ist} is a vector of individual-level controls, Z_{st} is a vector of state time-varying controls, $robbery_{st}$ is the state and time-specific robbery rate, $othercrime_{st}$ is a vector of non-robbery crimes that vary by state and time, δ_t is a year fixed effect, γ_s is a state-level fixed effect, and η_j is an industry fixed effect. Our main outcome variable is a dummy variable that equals one if the firm plans to expand and zero otherwise. Our theory suggests that higher robbery rates are associated with reduced microenterprise expansion ($\beta_3 < 0$).

The difficulty in identifying the relationship between robbery and microenterprise outcomes arises from the fact that robbery rates and their changes over time are neither random across states nor orthogonal to other factors that impact the investment decisions of firms. This could lead to reverse causality, wherein microenterprise expansion attracts higher crime rates, or to omitted variable bias in our estimates of this relationship. Random assignment of a program that reduces crime rates could, in theory, eliminate these biases, though implementation of such a program on a sufficiently broad scale is challenging and costly. Instrumental variables could also provide unbiased estimates of the relationship between property crime and expansion decisions. Most of the instruments for crime rates used in the literature, such as weather, are likely to affect demand for microenterprise goods and services and thus would be directly correlated with microenterprise formality and expansion decisions, making them invalid for our estimation.

Instead, we rely on differences in crime rates over time and across urban areas of states using repeated cross-section data. This allows us to control for state fixed effects as well as observable state and time varying factors which may jointly determine robbery and microenterprise expansion. These controls include non-property related crimes, including homicide, physical assault and mugging. These controls serve multiple purposes. First, they allow us to isolate the impact of property crimes from those of other types of crime, such as mugging. This is important as robbery rates may be correlated with demand for goods and services offered by microenterprises. For example, higher home robbery rates could lead people to limit the time they spend away from home, thereby reducing their spending on goods and services supplied by microentrepreneurs. The inclusion of mugging, which is more likely to affect microenterprise clients than microenterprises themselves, allows us to test whether our estimates are driven by demand effects rather than microenterprise expropriation risk

Second, non-property related crimes help control for unobserved factors which vary across states and across time and may jointly determine crime rates and enterprises' investment decisions. For example, criminals may be drawn to areas where enterprises are more visible and growing more rapidly. If criminals do not differentially locate based on crime type, the inclusion of non-property related crimes such as homicides and assault can help account for this reverse causality.

Finally, the inclusion of different property related crimes, such as vehicle robbery, allows us to check if the effects of robbery stem from expropriation risk. If expropriation risk is the primary factor driving our estimates, for example, we should observe that transport enterprises respond differentially to vehicle robberies. Conversely, demand effects of asset-specific crimes would be reflected in broader conditions even for enterprises not actively using these assets or operating in these locations. If demand factors indeed are driving our estimates, transport enterprises should not differentially respond to vehicle robberies. In this case changes in vehicle robberies reflect broader conditions and should have a similar impact on transport and non-transport industries. Thus, comparing the differential effects of asset-specific robberies offers a useful test.

4. Results

We begin by estimating equation (1) using a probit model, using the ENAMIN survey sampling weights and clustering standard errors at the state level. Table 5 presents these results, with average marginal effects reported. We first estimate equation (1) without state-time varying controls (i.e., excluding Z_{st}) to see the correlation between home robbery and expansion plans. Covariates include the entrepreneur's gender, age, age squared, education, and experience, as measured by the number of years working in the enterprise or similar activity, as well as industry, state and year fixed effects. We begin by focusing on home robbery rates as our primary

explanatory variable. The results, presented in column (1), show a significant, negative correlation between home robbery and microenterprise expansion plans.

We next add homicides and assault rates as measures of non-property crimes, as well as state-level time-varying controls capturing economic conditions and employment opportunities that may jointly determine microenterprise and criminal activity. We include state-year measures of unemployment and real GDP per capita growth (from INEGI), as well as measures of average years of schooling for adults aged 15 or older and the percentage of the state population that is comprised of 16-19 year old males, obtained from the 2000 and 2005 Mexican censuses. These results are shown in column (2) of Table 5. We find that the average marginal effect of home robbery rates remains negative, significant and relatively unchanged in size, showing that the results are robust to the inclusion of other factor that change across states and over time. In column (3), we include sexual assaults, finding that the estimated effect of robberies remains little changed. Notably, we find that the marginal effects of physical and sexual assaults are negative but not significant (possibly because their relative infrequency limits the precision of these estimates). Homicides are not generally significant in these estimations.

We next consider the effect of adding, separately, mugging and vehicle robberies. Muggings – defined in the ENSI surveys as robbery of pedestrians – are likely to have a greater impact on microenterprise customers than microenterprises themselves (with the exception of street vendors). As a result, mugging rates offer a useful test of the degree to which the effects of robberies are primarily coming from reductions in demand rather than heightened expropriation risk. In fact, we find that the marginal effect of muggings is negative but not significant, while the effect of home robberies remains relatively unchanged (see Column (4)).

We next consider vehicle robbery, both partial and full. In Column (5), we include home robberies, vehicle robberies and homicides as our crime variables, finding that home robberies continue to dominate our results. The effects of vehicle robberies are negative but not significant. This is not entirely surprising, as we expect that if expropriation risk is the primary channel through which robberies affect microenterprise growth, the effect of vehicle robberies should be concentrated in a small number of enterprises in the transport industry. We thus compare the effects of vehicle robberies among the entire sample to the effects among enterprises in the transport industry in Column (6). In this sub-sample we find that full vehicle robbery rates dramatically reduce the likelihood that a microenterprise will plan to expand. Considering that a vehicle represents a large share of the assets of a transport microenterprise these results on full vehicle robberies provide strong evidence that robberies heighten the asset expropriation risk faced by such entrepreneurs.

Overall, the estimated effects of robbery are non-trivial. The coefficient on home robbery in column (2) of Table 5 suggests that a 1 percentage point increase in home robbery incidence (half of the standard deviation) is associated with a 1 percentage point decline in the probability the average microentrepreneur plans to expand his/her business (20% of the standard deviation). With respect to home robbery, this is approximately equivalent to moving from an urban region in the 25th percentile to an urban region in the 50th percentile. The average marginal effect of full vehicle robberies among transport enterprises (see column (6)) is dramatically larger, indicating that a one standard deviation decline in vehicle robberies (0.82 percentage points) would increase expansion plans by 3.5 percentage points. Given that the average percentage of entrepreneurs who plan to expand their operations in the next 12 months is only 11.7%, the associated decline in average expansion plans is large and potentially can help explain why many microenterprises do not grow.

Did the higher rates of expansion in states with lower crime rates lead to faster income growth for these enterprises? We test whether robberies had similar effects on income growth using the subsequent labor force surveys (ENEU/ENOE). In order to capture the effects on these enterprises' trajectories we limit our sample to those microenterprises in the 2002 and 2008 ENAMIN samples who we observe in the labor force surveys at least 3 quarters after their ENAMIN interview.[8] In Table 6, we focus on the changes in income among these enterprises over these 3 quarters. In columns (1) and (2), we estimate an OLS model of income changes on home robberies, other crimes, and our full vector of controls and fixed effects. We find that home robberies negatively affect income growth, although this effect is only significant at the 10% confidence level and not significant when vehicle robberies are included.

Because the measure of income growth is likely to be quite noisy for a variety of reasons, we transform it into a dummy variable equaling 1 when this income growth is in the top 50% of enterprises in a given year and 0 when not. Columns (3) and (4) present the results of a probit model estimated using this measure as our dependent variable. We find that the effects of home robbery on the probability of being above the median level are now negative and significant. A one percentage point increase in home robbery rates is associated with between a 1.2−1.6 percentage point reduction in the probability that a enterprise will rank above the median in its subsequent income growth (depending on whether vehicle robberies are included as a covariate).

We also test whether home robberies affect fast growing enterprises in the same way as they do slower growing ones. In columns (5)-(7), we estimate these specifications using as our dependent variables a dummy indicating that an enterprise's income growth was in the top 5% for that year.

[8] Due to the rotating nature of the ENEU and ENOE this sample is approximately 40% of the full ENAMIN sample.

We find that home robberies significantly reduce an enterprise's probability of being in this top 5%, with a marginal effect of 0.49-0.74 (again, depending on whether vehicle robberies are included as covariates). This effect is large, given that a one standard deviation rise in home robbery rates (2%) would lead to a 20-30% drop in the probability of being in the top 5%. Notably, the marginal effect of full vehicle robberies is also negative and significant at the 10% level.

In column (7) of Table 6, we estimate the effects of robberies and homicides on this measure of income growth when these crimes are interacted with dummies for the enterprise being in the transport sector and non-transport sectors. We find that the effect of home robberies is negative and significant among non-transport enterprises but not among transport ones. Conversely, the effect of full vehicle robberies is negative and significant among transport enterprises but not significant among non-transport ones. Homicides and partial vehicle robberies are not significant among either type of enterprise. These results indicate that the effects of these crimes are specific to the types of enterprises whose assets are more likely to be at risk. Entrepreneurs who run their own taxi service are much more likely to be concerned about rising vehicle robbery risks than would entrepreneurs who work in construction or sewing. The latter may also be more likely to store their tools and equipment at home and thus may be more concerned about home robbery rates than would the taxi operator.

5. Robustness Checks

In this section, we address a variety of potential concerns about our primary outcome measures and about omitted variables that could bias our estimates.

5.A. Skill Heterogeneity

Several papers have documented the duality of the microenterprise sector, in which some firms are run by highly skilled entrepreneurs for whom self-employment is an optimal labor force outcome ("high-tier") while others are run by low-skill entrepreneurs for whom informal self-employment is the only option ("low-tier") (Cunningham and Maloney 2001, Fajnzylber et. al. 2009). Given the large size of the latter group, our concern is that changes in the spatial distribution of low-skill enterprises may explain our results. For example, we could find a negative relationship between home robbery rates and expansion plans if the share of low-skill entrepreneurs, who are less likely to expand, is increasing more rapidly in states experiencing rising robbery rates.

To determine whether our results are driven by changing proportions of high- and low-skill entrepreneurs, we limit our sample to "high-tier" enterprises- defined as those that are more likely to survive and grow. Since entrepreneurial skill and a firm's growth potential are difficult to observe, we follow other authors in using the work and education experience of the entrepreneurs to classify "high-tier" enterprises. This is based on the assumption that enterprises are more likely to survive and grow if their owners have higher levels of education and experience and entered self-employment voluntarily. We therefore consider several classifications of "high-tier" entrepreneurs. The first are entrepreneurs with a secondary education or above. The second are those who entered self-employment from a salaried position and did so voluntarily (they do not report being laid off or that their previous employer closed). The third are all entrepreneurs with at least a secondary education whose currently monthly income is higher than the average for salaried workers with the same gender, education level, age bracket, industry and state[9]. The fourth group are entrepreneurs who, when asked why they entered entrepreneurship, said they did so to increase their earnings or due to family tradition (in contrast to entrepreneurs who said they entered due to lack of alternative

[9] This information comes from the ENEU and ENOE.

employment). Finally, we consider only formal enterprises and enterprises that have any employees, as these are more likely to be established firms with greater survival and growth potential[10]. Overall these sub-samples likely contain fewer low-productivity enterprises that have limited growth prospects.

The results of the estimation of equation (1) on the different sub-samples of "high-tier" enterprises are shown in Table 7. In all cases the coefficient on home robbery remains negative and significant, showing that the results are not being driven exclusively by firms with lower growth potential. Even among firms that are more likely to survive and grow, microenterprises are significantly less likely to expand in states where robbery rates have increased.

5.B. Microenterprise age

We separately estimate expansion plans for firms based on their age, as older firms may be larger in size, more visible, and therefore more obvious targets for criminals. We divide firms into two categories: (1) "new" firms that have been in operation for less than two years; (2) "established" firms that have been in operation for two or more years. We separately estimate outcomes for each group. Results are shown in Columns (1) and (2) of Table 8. The coefficient on home robbery is slightly higher for established firms than for new ones, in line with the theory that firms with greater longevity likely are more visible to criminals. For both groups, however, the robbery effect is negative and significant, suggesting that robbery negatively affects both new and established firms.

5.C. Sensitivity to Dropping States

[10] We recognize, however, that the growth potential of established firms depends upon where they are in their life cycle. For example, established firms are more likely to have reached their steady state size, in which case they are less likely to grow than new firms that have yet to reach steady state.

Our identification strategy relies on state- and time-level variation in crime rates and other observed factors. There may be concerns, however, that our results are driven by other differential trends in particular states, like changes in drug market activity and violence or economic changes along the US-Mexico border. As we discuss below, we consider the robustness of our estimates to these phenomena by sequentially dropping groups of states from our analysis.

5.C.1. Mexico City

We first consider the sensitivity of our results to removing Mexico City from the sample. Mexico City, which is a federal district and exists as a separate entity, is an outlier in terms of size and crime incidence, particularly robbery. To ensure that our results are not driven by a "Mexico City" effect, we re-estimate the model on a sample that excludes Mexico City. Results are shown in Column (3) of Table 8. The results are robust to the exclusion of Mexico City, as the size of the coefficient is relatively unchanged, and remains negative and significant. We also note that we repeat this exercise for all states, removing one at a time from the estimation. In all cases the results are robust, confirming that our finding of a robbery effect is not driven by one particular state. Results are available upon request.

5.C.2. Drug Violence

We next consider the sensitivity of our results to removing states that have been most affected by drug violence. Sensitivity to drug violence is a natural concern given that the time frame of our study coincides with the dramatic rise in drug-related crime in Mexico. This rise could affect our estimates if changes in drug-related crime are differentially correlated with robbery rates (more so than with homicide rates, for example), and if drug-related crimes affect the demand for microenterprise goods and services (rather than their risk of property loss or damage). We attempt

to control for these concerns by excluding states most affected by drug-related violence. We consider three specifications of this group. First, we exclude all Northern border states (6 states). Second, we exclude states with the highest degree of drug entry, determined by the Washington Post's Mexico at War series (7 states). Third, we remove states with the highest number of drug related deaths over the 2006-2008 period (6 states). The data on drug-related deaths come from the Crime Indicator Database for the Justice in Mexico Project at the Trans-Border Institute[11]. Results are shown in columns (4)-(6) of Table 8. The results are robust to removing border, drug entry states and high drug death states, as the coefficient on home robbery remains negative and significant in all cases. We take this as evidence that our results are not completely driven by changes in drug related violence.

5.D. Local Institutional Quality

An important potential source of omitted variable bias is the quality of local institutions, as changes in these institutions may simultaneously explain changes in robbery rates and microenterprise behavior. For example, states with improved judicial institutions may have reduced the explicit and implicit costs to microenterprises by lowering registration requirements or graft, while simultaneously reducing overall crime rates. We attempt to control for these differences using a variety of strategies. We start with measures of local police and judicial effectiveness; measures that were first used by Laeven and Woodruff (2007) in their study of firm size and local institutional quality in Mexico. The measures come from surveys of lawyers on the effectiveness of local courts in enforcing commercial code governing bank debt (for example, seizing collateral). The surveys began in 1998 and are conducted every two to three years by the Consejo Coordinador Financiero

[11] The dataset contains the unofficial tally of drug-related homicides per state per year as reported by the Mexican newspaper Reforma from 2006 through 2008.

under the direction of the Center for the Study of Law at the Instituto Tecnologico Automono de Mexico (ITAM). The focus on a specific commercial code comes from the fact that while bank debt laws largely are set at the national level, since judicial proceedings must take place in courts where the debtor is located, the implementation and enforcement of the laws varies at the state level. In the surveys approximately 500 lawyers who either work for banks or act as outside counsel are asked a series of questions regarding the effectiveness of local legal institutions. Responses are ranked from 5 (best) to 1 (worst) and the averages show a high degree of variation across states.

We use the 2002 and 2009 surveys to create measures of local institutional quality. We recognize concerns regarding the ability to capture institutional changes over a seven year time frame. We argue, however, that these years cover a period of dramatic political change in Mexico, following the end of 71 years of single party rule by the PRI (Institutional Revolutionary Party) in the year 2000. Given the tremendous increase in political competition at both the federal and state level stemming from the dismantling of single-party rule, we argue that is reasonable to expect institutional change at the local level over the time period considered.

We create three measures of local institutional quality from the ITAM surveys. The first is a measure of judicial effectiveness. Following Laeven and Woodruff (2007), it is an average of the questions relating to: (1) the quality of judges; (2) the impartiality of judges; (3) the adequacy of judicial resources; (4) the efficiency of the execution of sentences; and (5) the adequacy of local legislation related to contract enforcement[12]. The second is a measure of the support of public forces (such as the police) in executing judicial sentences. The third is a measure of the efficiency of actuaries, notaries and executors. Since the survey does not deal with criminal code, we include the

[12] Laeven and Woodruff (2007) also include responses on the efficiency of the public property registries, but this question was discontinued in 2006 (CCF 2009). To ensure the comparability of the averages, we do not include it.

second two measures as we anticipate they may relate more directly to police presence and other commercial codes which impact microenterprises. As shown in Table 9, the inclusion of these variables does not alter the sign or significance of the original estimates.

We next consider two alternative measures of institutional quality. First, we consider average reporting rates for home robbery. This variable comes from the ENSI and is the average percentage of the last home robbery that was reported to the authorities[13]. We expect that in states in which police forces, court proceedings, or other institutions have improved, households may be more likely to report crimes to the authorities (Soares 2004). Second, we consider perceptions about insecurity. This measure, also taken from the ENSI, takes the average number of adults in urban areas of the state who responded that they consider living in the state to be "insecure". Public perceptions of insecurity are likely to reflect risks associated with a broader set of institutions and thus would capture local institutional variation over time.

The results of estimations incorporating these controls are shown in Columns (3)-(4) of Table 9. The coefficients on home robbery reporting rates and perceptions of insecurity are negative, which is consistent with our expectations and suggests that reporting rates do reflect variation in institutional quality. However, neither coefficient is statistically significant, and in both cases, home robbery rates remain negative and significant.

Finally, since the time period between the two ENAMIN surveys include notable reforms of the business registration process, we consider a measure of institutions that comes from these reforms. In 2002 the federal government enacted legislation that reduced the federal requirements for registering some businesses and encouraged the reduction of registration requirements at the

[13] Given the way the ENSI is designed, we cannot construct a measure of total home robberies that were reported. Victims are only asked details about the last crime.

municipal level. To inform the public about the reforms and promote similar steps by municipalities, the agency charged with enacting the reforms, COFEMER (Federal Commission for Improving Regulation), began opening business registration centers, known as SAREs (Rapid Business Opening System), in major municipalities (Bruhn 2010). The SARE program was launched in March 2002, and as of 2008, there were 169 SAREs in operation (COFEMER).

Despite the goal of standardizing the registration process there still is significant variation in registration requirements across states. As of 2009, the number of days it takes to register a business ranges from 12 to 57, while the cost ranges from 7.4% of income per capita to 25.6% of income per capita (Doing Business in Mexico 2009). Furthermore, some states have progressed more rapidly than others in reducing registration requirements. This variation in registration requirements, if linked with local institutional quality, and specifically the promotion of microenterprises, could capture underlying institutional factors that jointly impact enterprise expansion and crime rates. We therefore test whether the introduction and timing of the SARE program affect our results.

We create two measures of the SARE program. The first is the change in the number of SARE offices by state from year end 2001 to November 2008 (COFEMER). The second is the maximum number of months any SARE office in the state had been open as of November 2008 (COFEMER website). Results of the model that include the SARE variables are shown in columns (5)-(8) of Table 9. The size and significance of the coefficient on home robbery is unchanged, suggesting that the effect of home robbery is not being driven by SARE related regulatory changes. To the extent that the judicial quality, crime reporting, security perception, and registration reform variables effectively control for local institutional features, these results indicate that the robbery effect we find is not simply a reflection of broader institutional changes underlying crime and microenterprise decisions.

6. Conclusions

This paper highlights a new dimension of the costs of weak property rights. Most of the focus in assessing these costs to firms and households has been on the threats posed by the state itself and on the insecurity of land and real estate. There has been much less focus on the threat of robbery by private citizens or groups against moveable assets, particularly on the effects of this threat on microenterprises. One reason that this dimension has been largely uninvestigated is the difficulty of identifying credible, disaggregated data on both crime and microenterprises collected over time. We overcome this hurdle by linking datasets on these two distinct issues that jointly provide a rich information set in which to test hypotheses about the nature of the effects of property crime on a variety of microenterprise decisions.

Our strategy relies on variation in property crimes across states and over time in Mexico, controlling for state and year fixed effects and a variety of observable time-varying factors, including non-property crimes, judicial efficiency, and business registration requirements. Admittedly, we cannot eliminate the possibility that other unobserved factors which vary across states and time could be correlated with property crimes and microentrepreneur expansion decisions. As such, we view our results as a strong indication, rather than proof of, of a causal relationship between property crimes and microenterprise expansion.

Our findings have a number of implications for policymakers. First, microenterprise growth is dependent on the social context in which these enterprises operate, and entrepreneurs clearly respond to risks in this environment. Growth among these enterprises may thus remain limited in settings with high crime, even when public programs offer these enterprises training on business practices, improved access to credit, or other services aimed at enterprise expansion. In such

settings, investing in protections of private property rights—particularly protection for individuals in lower socioeconomic categories—may prove more effective in raising microenterprise growth trajectories than would investment in the aforementioned programs.

Second, our results help explain why enterprise formalization may not generate substantial growth among microenterprises. There are, potentially, two competing links between formalization and robbery risk. On one hand, formalization may improve the protection by and recourse to public authorities for an enterprise. On the other hand, formalization may raise the visibility and subsequent targeting of an enterprise by criminals. These dual channels make the net effect of formality on robbery risk ambiguous, suggesting that in some cases enterprises may not face substantial incentives to grow even after becoming formally registered. Additional work on this link between robbery and formalization may help policymakers better understand the benefits of formality as perceived by entrepreneurs when the former design programs aimed at raising formalization rates.

Finally, while we identify an important link between property crime rates and microenterprise behavior, linking changing crime rates to explicit features of the local institutional environments remains a useful area for further research. For example, it would be useful to determine which dimensions of the local settings have most directly influenced variations in property crime rates over the past decade, and the degree to which these dimensions are actionable by public entities.

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Table 1: Urban Microentrepreneurs, 2008

	All	Formal	Informal	P-value
Victim of given crime in past year:				
Fines/ Bribes	8.14%	11.42%	6.41%	0.000***
Robbery	9.58%	14.05%	7.23%	0.000***
Private Extorsion	1.19%	2.12%	0.70%	0.000***
Fraud	8.79%	13.15%	6.50%	0.000***
Natural Causes/ Accident	2.53%	4.64%	1.42%	0.000***
Of victims of given crime, Estimated loss/monthly profits				
Fines/ Bribes	0.53	0.73	0.34	0.004***
	(2.19)	(3.06)	(0.73)	
Robbery	1.72	2.43	1.03	0.001***
	(7.34)	(10.15)	(2.07)	
Private Extortion	0.56	0.47	0.72	0.229
	(1.32)	(1.24)	(1.44)	
Fraud	0.62	0.68	0.57	0.660
	(4.50)	(6.15)	(1.62)	
Natural Causes/ Accident	0.90	0.88	0.93	0.825
	(2.24)	(1.88)	(2.75)	
Monthly Profits (US$)	387.8	610.3	275.7	0.000***
	(695.6)	(1058.6)	(354.0)	
Of victims of given crime, % who reported to authorities				
Robbery	22.0%	27.5%	16.5%	0.000***
Private Extortion	24.9%	27.8%	20.3%	0.229
Fraud	3.4%	5.3%	1.3%	0.000***
Observations	16,398	5,959	10,439	

Coefficients are weighted averages. Standard deviations are in parentheses
We restricted the 2008 ENAMIN sample to urban microentrepreneurs. This population is comparable to earlier ENAMIN samples

Table 2: Summary Statistics, ENAMIN

Urban Microentrepreneurs	Total Sample	By Survey Year	
		2001	2008
Entrepreneur a woman	35.9%	31.7%	40.3%
Entrepreneur married	72.8%	73.7%	71.9%
Average Age (in years)	44.0	43.1	45.0
	(12.9)	(12.7)	(13.1)
Primary Education or Less	38.5%	41.5%	35.4%
Secondary Education	36.6%	36.2%	37.0%
College Education	24.9%	22.2%	27.5%
Experience (in years)	9.77	9.60	9.96
	(9.18)	(9.01)	(9.36)
Monthly Profits (USD)[14]	419.4	414.7	424.9
	(695.8)	(674.8)	(719.3)
Has any employees	22.3%	21.8%	22.8%
Employees, total	0.40	0.41	0.39
	(1.02)	(1.11)	(0.90)
Employees, paid	0.26	0.28	0.25
	(0.89)	(0.99)	(0.78)
Employees, unpaid	0.14	0.14	0.15
	(0.48)	(0.49)	(0.48)
Enterprise has a fixed location	34.7%	36.2%	33.2%
Enterprise located in individual's home	18.6%	16.1%	21.1%
Keeps Accounts	43.6%	49.3%	38.2%
Enterprise Informal	65.9%	65.9%	65.9%
Industry:			
Manufacturing/Production	10.9%	11.1%	10.6%
Construction	7.2%	6.4%	7.9%
Commerce	36.3%	34.6%	38.2%
Services	40.2%	42.5%	37.7%
Transportation & Communications	5.4%	5.2%	5.5%
Plan to Expand	11.7%	14.3%	9.1%
Of enterprises <2 years	15.5%	17.1%	12.9%
Of enterprises >=2 years	10.7%	13.2%	8.3%
Observations	24,834	14,742	10,092

[14] All values converted to December 2001 Mexican pesos using the CPI and converted to US dollars using the December 30, 2001 exchange rate of 9.16 pesos per US$.

Table 3: Expansion and Other Variables

Population weighted averages	Expansion Plans	No Expansion Plans	Difference
Working Capital Investment [1]			
Average	3,197	2,331	866***
Median	546	180	
Moved to a Fixed Location			
One quarter after	23.57%	20.50%	0.031***
Two quarters after	21.58%	23.20%	-0.016
Three quarters after	23.47%	23.20%	0.003
Changed from zero employees to any employees			
One quarter after	7.72%	6.37%	0.013**
Two quarters after	7.40%	7.12%	0.002
Three quarters after	10.45%	6.16%	0.043***
Exits self-employment			
One quarter after	19.86%	18.90%	0.009
Two quarters after	19.18%	21.40%	-0.022**
Three quarters after	15.99%	21.70%	-0.057***
Income growth (%change)			
One quarter after	2.94%	1.38%	0.015
Two quarters after	30.74%	3.64%	0.271***
Three quarters after	22.54%	-5.26%	0.278***
Observations			
One quarter after	2173	19157	
Two quarters after	1634	14107	
Three quarters after	1061	9202	

***, **, *; Difference significant at the 1%, 5%, or 10% level

[1] Working capital investment includes investment in primary materials, packaging, merchandise and products for sale. Values in December 2001 Mexican pesos using the CPI and converted to US dollars using the December 30, 2001 exchange rate of 9.16 pesos per US$.

Table 4: Crime Rates

Population weighted state level averages, for urban areas	2004	2008
Home Robbery	2.75%	2.33%
Min	0.54%	1.06%
Max	7.63%	4.37%
Partial Vehicle Robbery	1.89%	5.18%
Min	0.47%	0.91%
Max	4.47%	10.54%
Full Vehicle Robbery	0.57%	0.83%
Min	0.00%	0.00%
Max	3.71%	3.38%
Physical Assault	1.08%	0.41%
Min	0.04%	0.05%
Max	2.50%	1.77%
Sexual Assault	0.25%	0.11%
Min	0.00%	0.00%
Max	0.97%	0.33%
Homicide (per 100,000)	28.5	28.0
Min	9.0	14.0
Max	56.0	70.0
Mugging	3.77%	3.35%
Min	1.03%	0.59%
Max	12.1%	9.49%
Last home robbery reported	30.4%	33.6%
Min	4.14%	1.02%
Max	53.93%	68.55%

Correlations	Home Rob	PartVehRob	Full VehRob	PhyAssault	SexAssault
Home Robbery	1.0000				
Partial Vehicle Robbery	0.1055	1.000			
Full Vehicle Robbery	0.3328	0.3479	1.000		
Physical Assault	0.2022	-0.3339	-0.0676	1.000	
Sexual Assault	0.0465	-0.0987	-0.1367	0.3236	1.000

Population weighted averages by state. Source for home robbery, partial vehicle robbery, full vehicle robbery, physical assault, and sexual assult, ENSI. Values are percent of adults age 18 or older living in urban areas of the state who report were victims of a specific crime at least once last year. Source of homicide data, ICESI.

Table 5: Expansion Plans

	Full Sample					Transport Only
	(1)	(2)	(3)	(4)	(5)	(6)
Home robberies	-1.127***	-1.091***	-1.098***	-1.108***	-1.001***	-1.277
	(0.241)	(0.224)	(0.286)	(0.228)	(0.360)	(0.972)
Homicides		0.006	0.004	0.008*	0.005	
		(0.004)	(0.004)	(0.004)	(0.003)	
Assaults		-0.526				
		(1.082)				
Sexual Assaults			-0.986			
			(2.113)			
Muggings				-0.437		
				(0.310)		
Vehide Robberies (Full)					-1.558	-4.304**
					(1.162)	(1.996)
Vehide Robberies (Partial)					-0.012	0.731
					(0.236)	(0.812)
State FEs	Y	Y	Y	Y	Y	Y
Time FEs	Y	Y	Y	Y	Y	Y
Sub-sector FEs	N	Y	Y	Y	Y	N
State-time controls (Unemployment,	N	Y	Y	Y	Y	Y
Individual controls (age, age squared,	Y	Y	Y	Y	Y	Y
Observations	24,793	24,793	24,793	24,793	24,793	1,115

Estimated using survey weights, standard errors dustered by state. Homicides rescaled to # per million inhabitants.

Table 6: Income Growth

Dependent Variable	Income growth Q1-Q4		Income growth in top 50%?		Income growth in top 5%?		
Model	OLS		Probit		Probit		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Home robbery	-4.019*	-1.414	-1.603**	-1.291*	-0.737***	-0.493**	
	(2.287)	(2.120)	(0.764)	(0.660)	(0.229)	(0.213)	
Homicide	0.000	0.050	-0.000	0.007	0.001	0.002	
	(0.029)	(0.031)	(0.012)	(0.012)	(0.003)	(0.004)	
Assault	15.693***		2.319		0.753		
	(4.991)		(1.776)		(0.464)		
Vehicle Robbery (Full)		-		-0.447		-1.706*	
		(7.336)		(2.821)		(0.920)	
Vehicle Robbery (Partial)		2.356		0.213		0.099	
		(1.695)		(0.608)		(0.123)	
Non-transport x Home robbery							-0.470**
							(0.223)
Transport x Home robbery							0.434
							(0.786)
Non-transport x Vehicle robbery (full)							-1.379
							(0.910)
Transport x Vehicle robbery (full)							-6.969***
							(2.518)
Non-transport x Vehicle robbery (partial)							0.127
							(0.120)
Transport x Vehicle robbery (partial)							0.206
							(0.416)
Non-transport x Homicide							0.003
							(0.003)
Transport x Homicide							0.008
							(0.007)
Observations	6,861	6,861	6,857	6,857	6,827	6,827	6,827
R-squared	0.052	0.051					

Standard errors clustered by state in parenthesis. *** p<0.01, ** p<0.05, * p<0.1. All regressions include individual and state-time controls, as well as state, year, and industry fixed effects.

Table 7: Heterogeneity

Expansion Plans	Secondary Education or Above (1)	Entered Entrepreneurship from Salaried work (2)	Monthly Income higher than mean salaried (3)	Entered entrepreneurship to increase income or family tradition (4)	Enterprise Formal (5)	Enterprise has Any Employees (6)
Home robbery	-1.530***	-1.186***	-1.234***	-1.088***	-0.704***	-1.532***
	(0.337)	(0.298)	(0.380)	(0.361)	(0.249)	(0.433)
Homicide	0.007	0.009**	0.001	0.012**	0.006	-0.000
	(0.005)	(0.003)	(0.005)	(0.005)	(0.004)	(0.006)
Physical Assault	-0.851	-0.013	-1.075	-0.788	-0.642	-1.203
	(1.144)	(1.111)	(1.123)	(0.864)	(0.975)	(1.309)
State-year unemployement & GDP	X	X	X	X	X	X
State-year education & males 16-19	X	X	X	X	X	X
Observations	14,692	11,308	9,850	6,414	8,719	5,873

Coefficients are average marginal effects from a probit model.
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1
Estimated using survey weights, standard errors clustered by state
Other controls include gender, age, age squared, education, experience, industry, year and state fixed effects
Linear projection for 2001 crime rates. Homicides rescaled to # per 1million inhabitants

Table 8: Robustness Checks, Expansion

EXPANSION	Duration		Removing States			
	>=2 yrs	<2 yrs	Mexico City	Border	Drug entry	Drug death[1]
	(1)	(2)	(3)	(4)	(5)	(6)
Home robbery	-0.881***	-1.819***	-1.022***	-1.209***	-1.159***	-1.294***
	(0.260)	(0.388)	(0.208)	(0.336)	(0.234)	(0.347)
Homicides	0.005	0.009	0.003	0.007	0.011**	0.013***
	(0.005)	(0.007)	(0.004)	(0.005)	(0.005)	(0.004)
Assault	-0.387	-1.990	-0.102	-0.213	-1.527	-1.235
	(1.098)	(1.311)	(1.055)	(1.164)	(1.204)	(1.036)
Observations	19,178	5,556	23,892	20,327	19,112	20,482

Coefficients are average marginal effects from a probit model

Standard errors in parentheses

Estimated using survey weights, standard errors

Controls include gender, age, age squared, education, experience, state-year unemployment, real GDP per capita growth, state, year and industry fixed effects. Linear project for 2001 crime rates. Homicides rescales to # per 1 million inhabitants

[1] Drug death states are those with highest drug-related deaths in 2009: Baja California, Chihuahua, Durango, Guerrero, Michoacan and Sinaloa, Data from the Crime Indicator Database for the Justice in Mexico Project at the Trans-Border Institute.

Table 9: Additional Robustness Checks, Expansion

EXPANSION	Local Institutional Quality		Reporting & Perceptions		SARE Presence			
	Jud. Effect.	Pub. Forces	Report	Perception	# offices	# offices	months	months
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Home robbery	-1.085***	-0.874***	-1.057***	-1.064***	-1.023***	-0.971***	-0.988***	-0.905***
	(0.229)	(0.309)	(0.189)	(0.220)	(0.336)	(0.296)	(0.359)	(0.322)
Homicides	0.006	0.007	0.005	0.006		0.005		0.006
	(0.005)	(0.005)	(0.005)	(0.005)		(0.004)		(0.004)
Assault	-0.590	-0.842	-0.584	-0.476		-0.482		-0.598
	(1.228)	(1.023)	(1.067)	(1.106)		(1.034)		(1.045)
Judicial efficiency	-0.008							
	(0.032)							
Support of public forces		-0.018*						
		(0.010)						
Adequacy of judicial resources		-0.017						
		(0.017)						
Last home robbery reported			-0.017					
			(0.040)					
Perception state insecure				-0.014				
				(0.035)				
SARE, # offices					0.001	0.001		
					(0.002)	(0.001)		
SARE, months open							0.000	0.000
							(0.000)	(0.000)
Observations	24,793	24,793	24,793	24,793	24,793	24,793	24,793	24,793

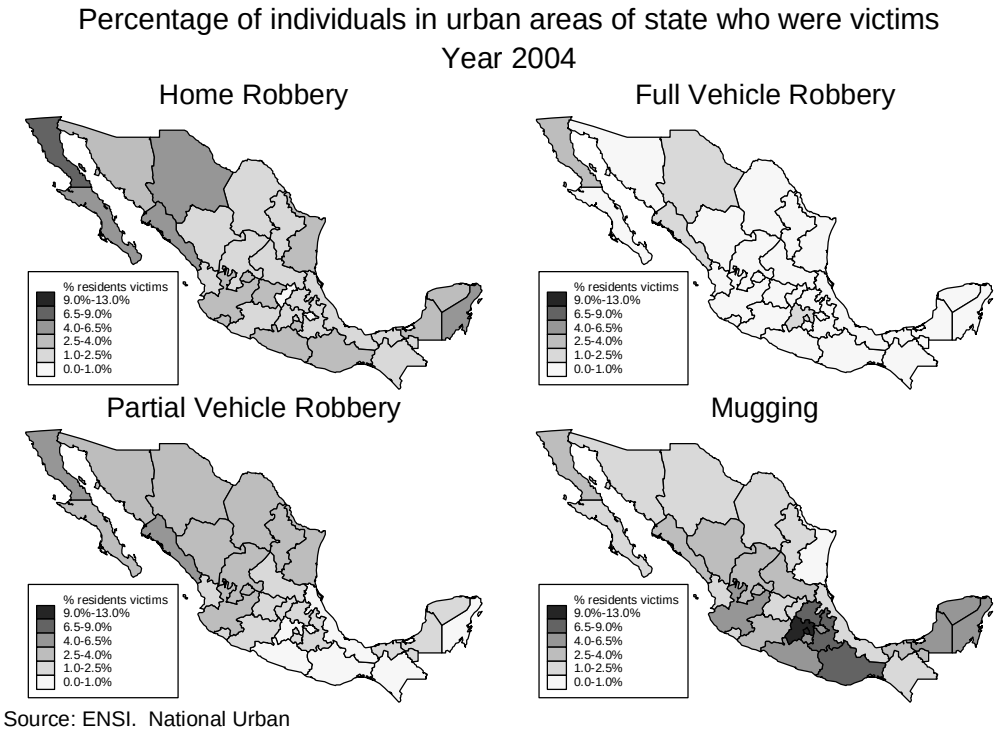
Coefficients are average marginal effects from a probit model

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Estimated using survey weights, standard errors clustered by state

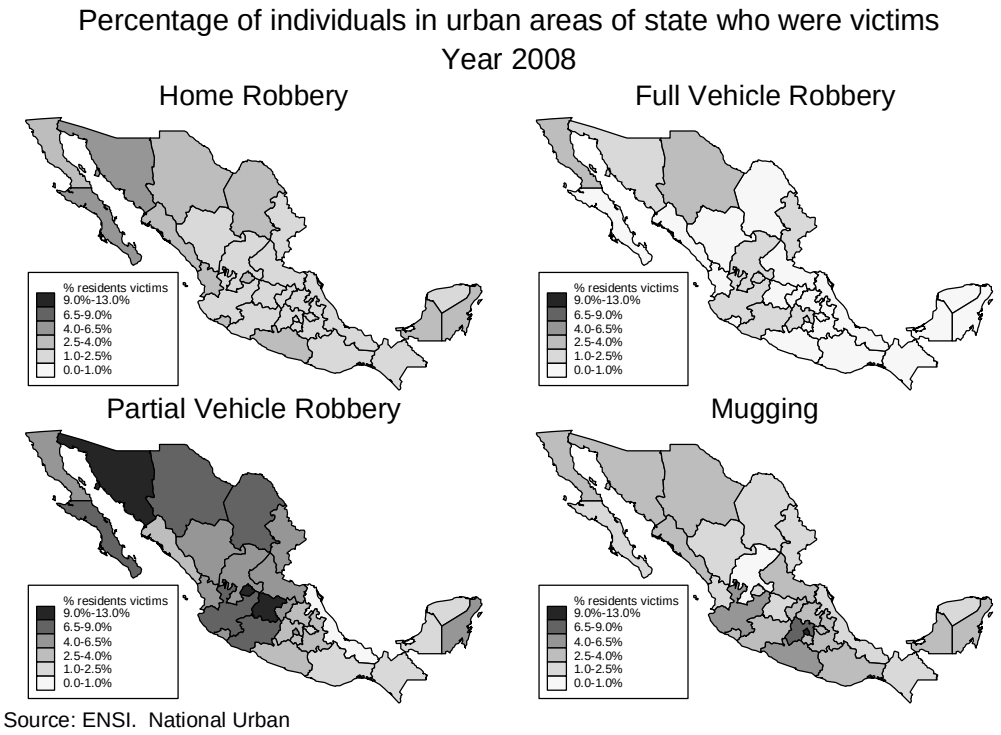
Controls include gender, age, age squared, education, experience, state-year unemployment, real GDP per capita growth, state, year and industry fixed effects. Linear project for 2001 crime rates. Homicides rescales to # per 1 million inhabitants

Figure 1A: Percentage of individuals in urban areas of state who were victimized, by crime type



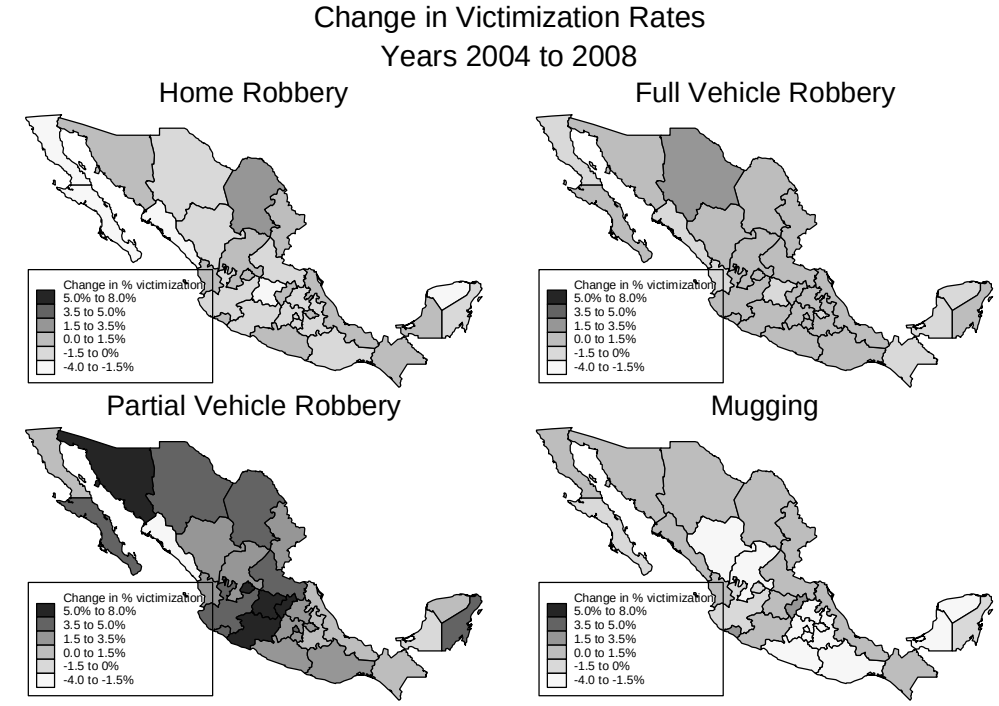
Source: ENSI. National Urban

Figure 1B: Percentage of individuals in urban areas of state who were victimized, by crime type



Source: ENSI. National Urban

Figure 1C: Changes in Crime Rates



Source: ENSI. National Urban