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Labor Market Consequences of Homicides: Evidence from Mexico

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ABSTRACT: This paper explores how fluctuations in crime rates influence labor market outcomes in Mexico. Using detailed survey data and an individual-fixed effect estimation, the analysis reveals distinct gender dynamics in response to rising homicide rates. Men are more likely to exit the labor market due to reduced demand for their labor, while women increasingly join the workforce, mainly in the informal sector, to offset this decline. This outcome is largely driven by the presence of drug trafficking organizations, which primarily employ men in their operations. Escalating violence also increases labor mobility, leading to higher job separations, particularly among women seeking safer employment. Our results highlight that while increasing crime in the form of homicides may not induce large changes in the aggregate level of employment, there is evidence of labor reallocation across and within sectors. This suggests an increase in labor market misallocation.

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WORKING PAPERS

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1 Introduction

The relationship between crime and economic performance is a core issue in development economics, particularly as crime undermines welfare and distorts market efficiency. Crime generates direct and indirect economic costs, such as increased security expenditures, reduced productivity, and distortions in firm and household behavior. Studies across various contexts have highlighted how crime negatively influences economic indicators such as foreign direct investment (FDI), firm dynamics, and labor market participation.[1] The labor market represents a critical channel through which crime affects economic outcomes, altering both labor demand and labor supply. On the supply side, fear of crime and increased insecurity can deter participation, particularly among vulnerable populations.[2] On the demand side, firms facing high crime rates often reduce hiring, relocate operations, or experience lower labor productivity.[3] These heterogeneous effects appearing in different settings illustrate the context-dependent nature of crime's impact on labor markets, emphasizing the need for an analysis to uncover the mechanisms driving these outcomes.

In Mexico, homicides constitute a defining feature of the crime landscape, with rates among the highest in the region and remaining persistently elevated since 2007.[4] This trend coincides with escalating conflicts among drug-trafficking organizations (DTOs), particularly following military interventions aimed at dismantling these groups (Castillo et al., 2020; Dell, 2015). The fragmentation of DTOs has intensified competition for illicit trafficking routes, exacerbating violence and its economic fallout.[5] At the same time, criminal organizations have emerged as significant economic agents, acting as employers in regions where legal employment opportunities are limited (Dell et al., 2019, Prieto-Curiel et al., 2023). This paradox underscores the complex interaction between violence and economic activity in Mexico, where homicides disrupt labor markets, and impose considerable costs on households and firms.

This paper examines the labor market effects of escalating homicide rates in Mexico, by provid-

[1] For instance, Tella et al. (2010) underscore that crime constitutes a "first-order impediment to development" in Latin America, where its prevalence stifles long-term growth and exacerbates inequality. Empirical evidence suggests that crime also deters human capital investment, disrupts market competitiveness, and generates persistent regional disparities, thus limiting opportunities for economic mobility (Gaviria and Velez, 2001). Rozo (2018) finds that higher levels of violence have been shown to negatively impact aggregate firm dynamics in Colombia.

[2] For example, Mishra et al. (2021) find that female labor force participation (LFP) declines significantly in high-crime regions of India, while Field and Vyborny (2022) observe similar impacts on job search activity in Pakistan. In contrast, Fernández et al. (2014) provide evidence of positive labor supply effects in Colombia, suggesting that crime may force individuals into the labor market to compensate for lost household income.

[3] See Bisca et al. (2024) for a discussion of the LAC context.

[4] Based on data from INEGI and the World Bank, Mexico's homicide rate reached its highest point in 2018 at 29.1 per 100,000 people, marking a sharp rise from 8.1 per 100,000 in 2007—a growth of 258 percent over roughly a decade. In comparison, the LA5 countries saw a decline in their homicide rate, dropping from a peak of 48.6 per 100,000 in 2002 to 12.9 per 100,000 by 2019.

[5] Aldeco et al. (2024) highlight the negative impacts of violence on labor supply, in particular through reduced internal migration.

ing estimates of the impact of homicides on labor force participation, employment, and job separations, with a particular focus on gender dynamics. We employ a fixed effect estimation strategy, which leverages individual-level panel data from a nationally representative survey covering the period 2005 to 2019 to address concerns about individual-level confounders and aggregate trends, while controlling flexibly for time-varying economic conditions at the local level. Building on prior research that highlights the labor market impact of violence (Coronado and Saucedo, 2019; Fernández et al., 2014; Mishra et al., 2021; Velásquez, 2020) or firm-level employment adjustments to it (Utar, 2024), this study investigates multiple dimensions of labor market adjustment, evaluates the gendered effects of DTOs-driven violence, disentangles labor market responses into supply- and demand-side effects, and analyzes sectoral reallocation patterns, offering insights on the multiple margins by which labor market outcomes respond to crime.

Our findings reveal substantial gender-specific labor market responses to rising homicide rates in Mexico, emphasizing how crime distorts labor supply and reallocates workers. While overall employment levels remain stable, this masks critical shifts in labor force participation across genders. Unlike previous literature, we find that men are disproportionately likely to exit the labor market, reflecting a negative demand shock that reduces employment opportunities in high-violence areas. In contrast, women increase their participation, driven mainly by a supply-side response to offset household income losses caused by male job exits. This pattern aligns with the "income compensation mechanism" observed in other contexts (Mishra et al., 2021) but with gender roles reversed, a reversal that is crucially influenced by the nature of crime in Mexico, which is driven by DTOs (Castillo et al., 2020). The dominance of DTO-related violence, which disproportionately affects men both as victims and potential recruits, exacerbates the demand shock on male employment, particularly in areas with high DTO presence. This suggests that employers are especially reluctant to hire men, further reinforcing these negative effects. Additionally, rising homicide rates increase the likelihood of job-to-job transitions, particularly among women. These women report supply-side reasons for the separations (including worsened working conditions, safety concerns related to the job or insufficient compensation), indicating a labor reallocation response aimed at reducing exposure to violence. While such transitions may mitigate immediate risks, they also come at a cost: sectoral shifts can erode firm- or sector-specific human capital, disrupt career progression, and impose adjustment burdens. Importantly, this reallocation occurs even as aggregate employment remains stable, underscoring how violence distorts the composition and efficiency of labor markets rather than overall job levels. Together, these findings highlight the complex and gendered impacts of crime on labor supply, demand, and worker mobility, with particularly acute consequences in areas deeply affected by organized crime and homicide.

This paper makes several important contributions to the literature that studies the economic

effects of crime at the local level. First, it expands on the body of research examining the impact of crime on labor force participation. Building on the work of Mishra et al. (2021), we examine both entry and exit responses in the labor market to crime, with a particular emphasis on how these dynamics vary by gender. As noted, we observe a similar income compensation mechanism but with a reversal of gender roles. This difference is primarily driven by the unique nature of crime in Mexico, where men are the main victims of homicide. This contrasts with the crime patterns in India and therefore shapes labor force responses in ways that diverge from those found in previous studies. In finding that women enter the labor force in response to a negative shock on men, our work is also consistent with the well-known "added-worker effect" by which an individual enters the workforce to compensate the loss of income by another member of the household (Stephens, 2002; Lundberg, 1985). In this context, we are the first to document this pattern, offering new insights into the gendered effects of crime on labor market dynamics. Second, this study contributes to the growing literature on the broader impact of crime on labor markets. Previous research on the Mexican context has relied on household surveys with shorter time frames or state-level aggregates. In this context, our use of individual panel data from Mexico's national labor survey allows us to control for individual-level unobserved heterogeneity, thus addressing concerns about bias, while producing estimates that are representative of the country over a long period covering a decade and a half. Among existing studies, Velásquez (2020) is notable for exploring fear-induced labor market responses in self-employed individuals. Our analysis of job separations finds that workers are more likely to leave some jobs when homicides increase, citing that they feel insecure or at risk, consistent with this mechanism. We build on that work by studying other margins of adjustment in the labor market, including exits from the labor force and the aforementioned job separations. Coronado and Saucedo (2019) focus on employment outcomes, but their analysis is limited to state-level aggregates. Additionally, Fernández et al. (2014) investigate how labor markets in rural Colombia adjust to mitigate the impact of violent shocks. The richness of our data allows us to enhance the analysis by leveraging individual-level data to explore both supply-side and demand-side responses to violence across various labor market margins. This approach goes beyond sectoral analyses, offering a more comprehensive understanding of labor market adjustments. Other studies have examined the relationship between crime and labor markets by focusing on the factors that push individuals into criminal occupations (Sviatschi, 2022). Conversely, our analysis centers on the non-criminal labor market, leveraging our survey data to capture its dynamics and responses to violence. On the firm side, Rozo (2018) and Utar (2024) examine labor market responses—such as employment, wages, and productivity—using firm-level data in the contexts of Colombia and Mexico, respectively. In contrast, we rely on individual-level labor survey data, which allows us to capture a broader range of outcomes while accounting

for individual-level heterogeneity. Notably, while Utar's (2024) firm-level focus in Mexico differs from our approach, her findings of negative supply-side shocks to some firms are consistent with our evidence of increased job separations for supply-side reasons.

This paper is structured as follows. Section 2 provides a detailed description of the data. Section 3 outlines the empirical strategy employed in the analysis. Section 4 presents the main results. The final section offers concluding remarks.

2 Data

Our analysis uses data from Mexico's ENOE, a nationally representative, rotating household panel survey conducted by the National Institute of Statistics and Geography (INEGI). ENOE tracks individuals for five consecutive quarters and collects detailed information on demographics and labor market outcomes. This structure allows us to construct a longitudinal dataset to estimate models with individual and time fixed effects. The estimation uses ENOE probability weights to obtain country-level representation, ensuring the results reflect national labor market trends.

We examine the impact of homicides on labor force participation, employment and informality status, and the underlying reasons for these effects.[6] Using detailed survey questions, we classify non-participation into demand- and supply-driven motives. A worker is categorized as "non-participating due to demand factors" if they report: (1) a lack of jobs in their profession, (2) a general unavailability of jobs, or (3) other market-related reasons as defined by the survey. Conversely, non-participation is classified as driven by supply factors if respondents report: (1) pursuing education or training, (2) believing themselves unfit to work due to age or appearance, (3) are feeling discouraged by public insecurity or excessive bureaucracy, (4) having family caregiving responsibilities, or (5) not working for other personal reasons. This classification is guided by the economic framework in which individuals may leave the labor force either because they perceive insufficient demand for their labor or due to personal constraints influencing their willingness to work. ENOE further provides information on employment status and informality, allowing us to assess these outcomes comprehensively. To study the effects of violence on job separations and sectoral reallocation, we use ENOE's data, which captures separations initiated by either the worker or the employer. The survey also records the reasons for separation, which we categorize into demand- and supply-driven factors. Additionally, the detailed sectoral classifications in ENOE allow us to analyze shifts in employment across economic sectors.

[6] Informal employment is defined following these categories: unprotected work in agricultural activities, unprotected paid domestic work, and subordinate workers who, although they work for formal economic units, they work without social security

Homicide data are drawn from municipal-level statistics published by INEGI. We calculate quarterly homicide rates per 100,000 inhabitants using population estimates from CONAPO, the Mexican Population Council. To identify regions with elevated violence, we incorporate data on the presence of drug-trafficking organizations from Sobrino et al. (2019). Given the evidence that violence may have gender-differentiated effects on labor market outcomes (e.g., Mishra et al., 2021; Velásquez, 2020; Dell et al., 2019), we conduct analyses for the full sample as well as separately for men and women.

We include a range of control variables to account for non-homicide factors influencing labor supply and demand. Household characteristics, such as marital status and number of children, account for family composition changes, while receipt of government transfers captures potential income effects on labor supply. To control for labor demand shocks at the local level, we construct pre-study sectoral labor shares at the municipality level using ENOE 2005 data. These shares are interacted with quarter dummies and included as controls in the regressions. Our primary sample consists of 16,530,279 individual-quarter observations spanning 2005–2019, a period marked by several episodes of heightened violence, particularly during 2006–2010 and 2015–2019. This extensive panel allows us to analyze how changes in homicide rates shape labor market outcomes and individual labor force decisions over time.

To study job separations, we rely on data from the first quarter of each year in the study period, in which the survey includes a specialized module describing whether the worker has ever separated from a job, along with the reasons for the separation.[7] Reasons include both demand and supply-side reasons, which we group along those dimensions in the analysis. Among the demand-side reasons are layoffs, employer-initiated termination of the work relationship, and non-renovation of temporary work contracts. Supply reasons instead include the deterioration of workplace conditions, perceived insecurity, the perception that the job does not pay enough, and other personal reasons. The survey captures the sector code of the former employer firm if there was a separation, and that of the current employer if the individual is employed when surveyed.[8]

[7] Data for the date when a worker most recently separated is in general not available in the survey. For this reason, we use ever-separated as an outcome, and effects can be interpreted as the separations among workers who had never separated from their jobs.

[8] Sector coding follows the North American Industry Classification System (NAICS), the standard framework for classifying industries in Mexico.

3 Empirical Strategy

The main estimation equation includes individual and time fixed effects, along with controls for supply and demand. The following is the main estimation equation:

$$y_{im,t} = \gamma_i + \delta_t + \beta_1 HomicideRate_{m,t} + \beta_2 HomicideRate_{m,t-1} + \Gamma' X_{m,t} + I' Z_{i,t} + \epsilon_{im,t} \quad (1)$$

where $y_{im,t}$ is the outcome variable, including labor force participation, employment, and job separations. Individual i and quarter t fixed effects, γ_i and δ_t, are included, taking advantage of the survey's rotating panel structure where each individual is followed for five consecutive quarters. $HomicideRate_{m,t}$ is the natural logarithm of the homicide rate at quarter t in municipality m, while $HomicideRate_{m,t-1}$ represents the natural logarithm of lagged homicide rates. $X_{i,t}$ is a vector of individual characteristics that influence labor supply, including marital status, number of children, and whether the individual receives transferences from the government. $Z_{m,t}$ is a vector of control variables in municipality m, in particular the 2005 shares of sectorial employment in agriculture, manufactures, construction, and services interacted with quarter dummies, which control flexibly for changes in local economic conditions, in particular those driven by sectoral trends.[9] The equation is estimated for the whole sample as well as for male and female subsamples. Standard errors are clustered at the individual level. A number of existing works use a similar equation with ENOE data to study the labor market in Mexico. Some recent examples include studies of the labor supply effects of family composition (Talamas Marcos, 2023) and air pollution (Hoffmann and Rud, 2024), and the effects of violence on international migration (Orozco-Aleman and Gonzalez-Lozano, 2018). Other work that studies the labor market effects of violence in Mexico with data different from ours also implements individual fixed effects regressions (Velásquez, 2020).

[9] Dell et al. (2019) point out that shocks to local labor markets that originate in aggregate manufacturing trends matter for organized criminal activity. Our specification accounts for these factors by including time varying sectoral composition effects as controls.

4 Results

This section presents the main findings and examines the interplay between rising homicide rates and labor market dynamics, with a focus on LFP, employment, job separations, and sectoral shifts.

4.1 Impact of Homicides on Labor Force Participation and Employment

Table 1 presents the main findings on the relationship between homicide rates, employment, and labor force participation (LFP), with a focus on gender differences in labor market responses. The dependent variables are dummies equal to one if the individual is employed (Panel A), in the labor force (Panel B), and employed in the informal sector (Panel B). These outcome variable dummies are multiplied by 100 so that the estimated coefficients can be interpreted as percentage points. Panels A and B examine employment and LFP outcomes respectively, revealing that while aggregate employment appears largely unaffected by contemporaneous or lagged increases in homicide rates, this stability conceals significant gender-specific effects. These findings suggest that increases in violence drive a gendered recomposition of employment even as overall em-

TABLE 1: IMPACT OF HOMICIDES ON EMPLOYMENT, LABOR FORCE PARTICIPATION AND INFORMALITY

	Total	Men	Women
Panel A. Employment			
$HomicideRate_t$	0.008	-0.009	0.021
	(0.015)	(0.020)	(0.022)
$HomicideRate_{t-1}$	0.007	-0.035*	0.045**
	(0.015)	(0.020)	(0.022)
R^2	0.744	0.706	0.714
Mean of dependent variable	57.3	75.3	41.2
Panel B. Labor Force Participation			
$HomicideRate_t$	0.007	-0.004	0.015
	(0.014)	(0.018)	(0.022)
$HomicideRate_{t-1}$	0.005	-0.037**	0.043**
	(0.014)	(0.018)	(0.022)
R^2	0.759	0.737	0.714
Mean of dependent variable	59.8	78.6	43.1
Panel C. Informality			
$HomicideRate_t$	0.014	0.000	0.025
	(0.017	(0.025)	(0.022)
$HomicideRate_{t-1}$	0.017	-0.023	0.053**
	(0.017)	(0.025)	(0.022)
R^2	0.656	0.672	0.604
Mean of dependent variable	33.2	46.3	24.1
Observations	16,530,279	7,797,059	8,733,220

Notes: ***< 0.01 ** p$<$0.05, * p$<$ 0.1.
Standard errors are clustered at the individual level.

ployment levels remain stable. We find coefficients of a magnitude that aligns with the broader literature (Mishra et al., 2021), reinforcing the significant impact of crime on labor market dynamics. Specifically, for the case of Mexico, where homicide rates increased by 247 percent during the study period (2005–2019), we find that this rise corresponds to a nationwide decline in LFP of approximately 0.22 percentage points for men and a 0.25 percentage point increase for women.[10] These shifts underscore the pervasive effects of violence on labor market behavior, and highlight how such shocks can disrupt the equilibrium between male and female participation in the labor force. In addition, this pattern supports the "income-compensation mechanism" already found in the literature that studies labor responses to crime (Mishra et al., 2021), where individuals of one gender increase their labor force participation to counteract the economic consequences of declining participation from the other sex. Notably, the magnitude of the effects on labor force participation is comparable to that of employment, indicating that changes in employment are predominantly driven by shifts in labor force entry and exit. Further, Panel C shows the effects of homicides on informal employment, revealing that the increase in female labor force participation and employment in response to homicides is driven by a movement of women into informal labor. In our setting, it is common for workers affected by a negative shock in the labor market to take up informal labor, marked by low costs of entry and no formal contracts or worker benefits (Leyva and Urrutia, 2020). The lagged nature of these effects suggests that individuals and households adopt a gradual, "wait-and-see" approach in adapting to heightened violence. Shifts in labor force participation can be the reflection of movements in labor supply or demand, with different policy and welfare implications. The next section delves into the underlying demand- and supply-side factors driving these shifts.

Shifts in LFP have distinct economic implications depending on whether they originate from changes in labor demand or supply. We leverage detailed survey questions from the ENOE to classify individuals' reasons for non-participation into demand- or supply-side categories and construct dummy variables indicating each motive. We reestimate Equation 1 and define the outcome variables as dummies equal to one if the respondend reports separating from the labor force for the stated reasons, again multiplied by 100 so effects can be interpreted as percentage points. Table 2 presents the results, focusing on gendered responses to shifts in homicide rates. On the demand side, the findings reveal a significant gender disparity. While there are no statistical effects for women, for men, there is a statistically significant increase in the proportion citing demand-side constraints to participation, such as a lack of available jobs. This suggests that the

[10]This represents approximately 6.6 percent of the overall change in LFP for men and 7 percent for women during this period, with significant regional variation, concentrated largely in areas affected by DTO activity (see Table 3 below and the relative discussion).

TABLE 2: LABOR DEMAND AND SUPPLY EFFECTS ON LABOR FORCE PARTICIPATION

	Total	Men	Women
Labor Demand Reasons			
Panel A. No jobs or other market reasons			
$HomicideRate_t$	-0.00048	0.0014	-0.0102
	(0.0047)	(0.003)	(0.008)
$HomicideRate_{t-1}$	0.0036	0.0082**	0.000
	(0.0047)	(0.003)	(0.008)
R^2	0.296	0.251	0.301
Mean of dependent variable	0.52	0.15	0.86
Labor Supply Reasons			
Panel B. Other Personal Reasons			
$HomicideRate_t$	-0.0019	-0.0006	-0.0030
	(0.0034)	(0.0040)	(0.0053)
$HomicideRate_{t-1}$	-0.0056*	0.0015	-0.0121**
	(0.0034)	(0.0039)	(0.0055)
R^2	0.286	0.289	0.284
Mean of dependent variable	0.56	0.36	0.73
Panel C. Caretaking Reasons			
$HomicideRate_t$	-0.0112	0.00467	-0.0254*
	(0.0077)	(0.0046)	(0.01401)
$HomicideRate_{t-1}$	-0.0110	-0.0002	-0.0206
	(0.0077)	(0.0047)	(0.0139)
R^2	0.369	0.292	0.364
Mean of dependent variable	2.58	0.42	4.51
Panel D. Public insecurity			
$HomicideRate_t$	0.0004	0.00005	0.0007
	(0.0003)	(0.0002)	(0.0006)
$HomicideRate_{t-1}$	-0.0002	-0.0002	-0.0001
	(0.0004)	(0.0003)	(0.0007)
R^2	0.265	0.253	0.268
Mean of dependent variable	0.00007	0.00003	0.00011
Panel E. Age or Appereance			
$HomicideRate_t$	-0.0097**	-0.0056	-0.0134**
	(0.0039)	(0.0045)	(0.0062)
$HomicideRate_{t-1}$	-0.0009	-0.0003	-0.0015
	(0.0039)	(0.0046)	(0.0062)
R^2	0.286	0.290	0.283
Mean of dependent variable	0.67	0.48	0.85
Panel F. Education or Experience			
$HomicideRate_t$	0.0007	-0.0001	0.00134
	(0.0016)	(0.0017)	(0.0025)
$HomicideRate_{t-1}$	0.0012	0.0020	0.0005
	(0.0015)	(0.0016)	(0.0025)
R^2	0.274	0.287	0.267
Mean of dependent variable	0.11	0.07	0.14
Observations	16,530,279	7,797,059	8,733,220

Notes: ***< 0.01 ** p<0.05, * p< 0.1.
Standard errors are clustered at the individual level.

decline in male LFP is partially driven by a contraction in labor demand triggered by rising violence. In contrast, there is no significant relationship between homicide rates and demand-side constraints for women, indicating that labor demand factors play a minimal role in shaping the change in their participation decisions. On the supply side, gender differences are even more pronounced. For women, higher levels of lagged homicide rates are associated with a notable reduction in supply-side non-participation, particularly for reasons related to personal constraints that otherwise prevent labor force entry. This finding suggests that women are more likely to enter the labor market in response to violence shocks, potentially as a strategy to stabilize household income amid declining male participation. As mentioned above, this mirrors the "income compensation mechanisms" discussed in Mishra et al. (2021) for crime in the Indian context. By contrast, men's supply-side non-participation remains unchanged, reinforcing the interpretation that reductions in male LFP are primarily driven by demand-side shocks rather than household or personal factors, such as caregiving responsibilities or health-related constraints. Notably, neither men nor women report public insecurity or caregiving responsibilities as significant reasons for their withdrawal from the labor force in response to higher homicide rates. Crucially, the absence of self-reported insecurity effects on labor market participation suggests that rising crime does not directly affect labor supply, reinforcing our interpretation that crime primarily operates as a negative labor demand shock for men. Instead, the evidence points to women's increased labor market participation as a key mechanism for mitigating the adverse economic consequences of homicide-related demand shocks. Female LFP thus appears to play a dual role: stabilizing household income during periods of heightened violence and contributing to broader economic resilience in affected regions.

These findings show that the impact of homicides on the labor market operate not from changes to aggregate levels of employment or labor force participation, but rather through shifts in their composition. By inducing men to leave the labor force and women to take up informal jobs, rising homicides can be viewed as a force reallocating labor - reducing demand for existing jobs and driving a shift towards informality. Given the low productivity that is associated with informal jobs (La Porta and Shleifer, 2014; Leyva and Urrutia, 2020; Anton and Gutierrez, 2016), our evidence highlights labor market misallocation as a critical channel through which crime undermines labor productivity, consistent with recent findings by Bisca et al. (2024) and earlier insights from Misch and Saborowski (2020). Decreased demand for male labor is striking in a context where the perpetrators and victims of crime are overwhelmingly men. Our negative male demand result suggests that when crime follows this pattern, employers can perceive risks associated with hiring men. In our setting, homicides frequently are a sign of the presence of drug-trafficking organizations, to which a significant number of males may be affiliated (Prieto-Curiel et al., 2023). Consequently,

TABLE 3: IMPACT OF HOMICIDES ON LABOR FORCE PARTICIPATION IN DTOS VS. NON-DTOS AREAS

	Total	Men	Women
Panel A. DTO Areas			
$HomicideRate_t$	0.024	-0.035	0.077
	(0.033)	(0.042)	(0.050)
$HomicideRate_{t-1}$	0.0075	-0.102**	0.107**
	(0.033)	(0.042)	(0.049)
R^2	0.771	0.761	0.734
Mean of dependent variable	60.9	77.3	46.1
Panel B. Non-DTO Areas			
$HomicideRate_t$	-0.005	0.005	-0.015
	(0.016)	(0.021)	(0.025)
$HomicideRate_{t-1}$	0.0045	-0.021	0.027
	(0.016)	(0.021)	(0.025)
R^2	0.755	0.719	0.701
Mean of dependent variable	58.7	79.8	40.0
Observations	16,530,279	7,797,059	8,733,220

Notes: ***< 0.01 ** p<0.05, * p< 0.1.
Standard errors are clustered at the individual level.

firms may strategically reduce their demand for male workers to mitigate the risk of employing individuals affiliated with DTOs or those who are disproportionately exposed to the risk of victimization through homicide. In this context, we reestimate Equation 1, across areas characterized by the presence or absence of DTOs.[11] Table 3 presents the results, which show evidence on the heterogeneous effects of homicide rates on LFP. In DTO areas (Panel A), the results reveal the same pattern described above, with significant gender asymmetries in the response to lagged homicide rates. Specifically, an increase in the homicide rate in these areas during the period 2005–2019 corresponds to a decline in labor force participation of approximately 0.58 percentage points for men, while for women, it is associated with an increase of 0.61 percentage points. Notably, this increase for women accounts for 26.7 percent of the total rise in female LFP in DTO areas over the same period, highlighting a substantial and gender-specific labor market response to violence. By contrast, the decline in male LFP explains 17.5 percent of the total reduction in labor force participation for men. These findings emphasize the distinct mechanisms by which violence disrupts labor market dynamics, with women's participation responding differently than men's. The significant increase in female LFP underscores the disproportionate economic changes women experience in response to conflict. By comparison, Panel B shows no significant LFP responses for either gender in non-DTO areas, indicating that, in Mexico, the labor market effects of violence are contingent on the institutional and economic conditions prevalent in cartel-dominated

[11] DTO areas are defined as the municipalities where cartel presence were higher than the historical median weighted by employment. Cartel presence is calculated using the data from Sobrino et al. (2019).

regions. This divergence underscores the amplifying influence of DTO presence in shaping the gendered labor market consequences of violence, highlighting the need to account for local structural conditions in evaluating the economic impacts of conflict.

4.2 Impact of Homicides on Job Separations

This section investigates the impact of rising local homicide rates on job separations, with particular attention to the mechanisms driving these outcomes and their gender-specific dimensions. Job separations have gained in prominence recently as an indicator of the state of a given labor market, as they reflect shifts in worker productivity and firm costs, and labor demand and supply across firms more generally (Moscarini and Postel-Vinay, 2024, Birinci et al., 2024). In particular, violence can influence job separations by shifting the desirability of a given job for a worker, or the productivity of that worker. In this sense, as in our above analysis, it is central to the economic interpretation of the effects of violence to tell apart shifts in job separations sourced in demand versus supply movements, as we do below.

Our data allows us to study the effects of violence on job separations, by means of an annual survey module that includes questions on whether the worker recently separated from a job along with information about the reasons for the separation and some characteristics of the firm the worker left. This data is richer but is available only in the first quarter of each calendar year. In the case of job separations, we reestimate Equation 1, where individual fixed effects are substituted for Mexican state-level fixed effects, and clustering is performed at the level of the municipality.

Table 4 presents the primary findings on the effects of homicide rates on job separations, and offers insights into workers' behavioral responses to increased violence. Panel A presents the overall impact of heightened homicide rates on job separations, measured as the percentage of workers who ever separated from a job, showing a clear link between rising homicide rates and increased job separations. Our estimates imply that the observed increase in the homicide rate in these areas during the period 2005–2019 corresponded to an increase in job separation by about 1.4 percentage points. However, this average effect conceals notable gender disparities: women experienced a larger increase, with job separations rising by 1.6 percentage points, compared to a 1.0 percentage point increase for men. These findings suggest that women are more sensitive to the risks and disruptions associated with local violence, consistent with previous studies documenting heightened vulnerability among women in violent environments (Velásquez, 2020, Fernández et al., 2014).[12] Panel B and C provide a breakdown of separations by motives, distinguishing be-

[12]Job separations and labor force participation capture distinct labor market margins. While job separations reflect transitions within employment—such as job-to-job moves or temporary exits into unemployment—labor force participation measures entry into or exit from the labor market. Following an increase in violence, female labor force par-

TABLE 4: EFFECT OF HOMICIDES ON JOB SEPARATIONS

	Total	Men	Women
Panel A. All separations			
$HomicideRate_t$	0.185**	0.164	0.207***
	(0.072)	(0.102)	(0.056)
$HomicideRate_{t-1}$	0.242***	0.172*	0.279***
	(0.072)	(0.099)	(0.057)
R^2	0.384	0.383	0.354
Mean of dependent variable	67.2	55.4	76.3
Panel B. Separation for Supply Reasons			
$HomicideRate_t$	0.195***	0.195**	0.179***
	(0.068)	(0.088)	(0.067)
$HomicideRate_{t-1}$	0.229***	0.233***	0.226***
	(0.067)	(0.087)	(0.065)
R^2	0.195	0.227	0.141
Mean of dependent variable	50.9	36.0	61.4
Panel C. Separation for Demand Reasons			
$HomicideRate_t$	-0.036	-0.031	-0.036
	(0.027)	(0.033)	(0.032)
$HomicideRate_{t-1}$	-0.060**	-0.073**	-0.061**
	(0.025)	(0.031)	(0.031)
R^2	0.095	0.174	0.064
Mean of dependent variable	6.9	7.5	6.5
Observations	6,322,760	2,759,926	3,562,834

Notes: ***< 0.01 ** $p<0.05$, * $p< 0.1$.
Standard errors are clustered at the municipality level.

tween supply- and demand-driven factors. The results show that supply-side factors dominate, suggesting that homicides may induce a reallocation of labor supply across firms in the face of increased perceptions of risk. An increase in the homicide rate enhances the likelihood of job separations driven by supply-side factors, such as safety concerns, worsening workplace conditions, or insufficient compensation. Notably, these effects appear consistent across genders. Conversely, separations stemming from demand-side factors, including layoffs or employer-initiated terminations, show an overall decline, again with no significant gender differences. These contrasting patterns suggest that workers—particularly women—proactively adjust their labor supply to mitigate exposure to violent environments.

Table 5 presents a detailed decomposition of separations by origin and destination sectors, offering a closer look at how rising homicide rates influence workers' sectoral transitions and exposing pronounced gender-specific patterns. We define an "origin" sector as the sector of the firm that a worker reports having separated from, and a "destination" sector as that where workers who report having separated from a job are currently employed in. For the total sample, height-

ticipation may rise alongside job separations, as some women enter the workforce to offset household income losses, while others seek safer employment, increasing mobility within employment.

TABLE 5: EFFECT OF HOMICIDES ON JOB SEPARATIONS BY SECTORS

	Total		Men		Women	
	Origin	*Destination*	*Origin*	*Destination*	*Origin*	*Destination*
Panel A. Construction						
$HomicideRate_t$	-0.0101	-0.0106	-0.0191	-0.0200	-0.0005	0.0033**
	(0.0072)	(0.0101)	(0.0159)	(0.0224)	(0.0013)	(0.0016)
$HomicideRate_{t-1}$	-0.0124*	-0.0022	-0.0295*	-0.0070	0.0021	0.0023
	(0.0069)	(0.0106)	(0.0152)	(0.0232)	(0.0013)	(0.0018)
R^2	0.0093	0.0202	0.0136	0.0311	0.0008	0.0013
Mean of dependent variable	0.26	0.48	0.53	0.99	0.02	0.03
Panel B. Manufacturing						
$HomicideRate_t$	-0.010	0.003	-0.012	0.004	-0.007	0.007
	(0.009)	(0.017)	(0.012)	(0.028)	(0.009)	(0.012)
$HomicideRate_{t-1}$	0.001	0.026	0.005	0.024	-0.002	0.029**
	(0.008)	(0.018)	(0.011)	(0.028)	(0.010)	(0.014)
R^2	0.013	0.035	0.012	0.043	0.015	0.024
Mean of dependent variable	0.40	0.90	0.45	1.34	0.36	0.50
Panel C. Trade						
$HomicideRate_t$	0.021***	0.067***	0.028***	0.111***	0.016	0.035**
	(0.008)	(0.019)	(0.010)	(0.028)	(0.010)	(0.016)
$HomicideRate_{t-1}$	0.023***	0.050***	0.039***	0.064**	0.010	0.041***
	(0.008)	(0.018)	(0.010)	(0.027)	(0.011)	(0.015)
R^2	0.011	0.029	0.008	0.029	0.016	0.026
Mean of dependent variable	0.47	1.02	0.42	1.31	0.51	0.75
Panel D. Services						
$HomicideRate_t$	0.017	0.020	0.032**	0.037	0.005	0.014
	(0.011)	(0.030)	(0.014)	(0.043)	(0.014)	(0.024)
$HomicideRate_{t-1}$	0.035***	0.086***	0.019	0.113***	0.048***	0.067***
	(0.011)	(0.030)	(0.014)	(0.042)	(0.014)	(0.025)
R^2	0.021	0.067	0.017	0.073	0.028	0.056
Mean of dependent variable	0.85	2.03	0.78	2.71	0.91	1.41
Panel F. Agriculture						
$HomicideRate_t$	-0.028**	-0.002	-0.053***	-0.033	-0.005	0.023**
	(0.011)	(0.021)	(0.020)	(0.041)	(0.009)	(0.010)
$HomicideRate_{t-1}$	0.007	0.004	-0.004	-0.008	0.015*	0.005
	(0.011)	(0.020)	(0.020)	(0.040)	(0.009)	(0.009)
R^2	0.025	0.069	0.028	0.100	0.022	0.024
Mean of dependent variable	0.23	0.51	0.38	0.98	0.10	0.09
Observations	6,322,760	6,322,760	2,759,926	2,759,926	3,562,834	3,562,834

Notes: ***< 0.01 ** $p<0.05$, * $p< 0.1$.
Standard errors are clustered at the municipality level.

ened homicide rates drive increased turnover within particular industries, including trade and services. Panel A demonstrates that transitions out of construction exhibit minimal sensitivity to changes in violence, likely due to the sector's structural rigidity or the limited flexibility of its labor market. In contrast, Panels C and D reveal significant increases in separations into trade and services. An increase in the homicide rate results in a rise in transitions into the trade sector, during periods of local violence, while at the same time increasing the probability of workers taking new jobs in those same sectors. Breaking down the effects by gender reveals significant differences. For men, elevated homicide rates are associated with both a higher likelihood of leaving trade jobs and an increased likelihood of taking new jobs within the trade sector, indicating labor reallocation within firms in this industry. These shifts highlight the strategic adjustments men make in response to violence-induced labor market disruptions. For women, however, separations are concentrated in service-oriented transitions, where the effects are both larger and more pronounced. As with the trade sector described above, homicides increase both the likelihood of separating from a service job and the likelihood of taking a new job in services, indicating a reshuffling of labor within the sector and across firms. As Panel D shows, a rise in the homicide rate leads to an increase in women's transitions into the service sector, suggesting some jobs in this sector may provide higher perceived safety and stability. This divergence across sectors aligns with a broader body of evidence documenting gender-specific vulnerabilities to violence, with women disproportionately seeking employment environments that minimize exposure to risk. Moreover, the service sector's comparatively flexible work conditions and higher perceived safety may enhance its attractiveness for women navigating violent environments.

These findings provide further evidence that violence triggers labor market reallocation, offering a micro-level foundation to the well-documented negative effects of violence and crime on labor productivity (Bisca et al., 2024). Specifically, we show that rising homicide rates reallocate labor across firms, driven by shifts in workers' preferences for employers. A well-established literature underscores the importance of efficient worker-job matching in determining aggregate productivity, while also recognizing that job choices are frequently influenced by non-pecuniary job characteristics (e.g., Guvenen et al., 2020; Taber and Vejlin, 2020). A key implication of this literature is that when workers prioritize non-pecuniary attributes—particularly in response to safety concerns—the resulting mismatches between workers' skills and job preferences reduce overall labor productivity. Our analysis shows that homicides prompt workers to shift across firms based on preference considerations rather than skill alignment, suggesting a possible mechanism through which homicides may be blunting efficient worker-employer matching and therefore dampening productivity. The relationship between crime and productivity remains a central question in development economics, with substantial implications for growth in the developing

world (Bisca et al., 2024). By highlighting labor market misallocation as a critical channel, our results suggest that violence exacerbates inefficiencies in labor markets, reinforcing its role as a barrier to productivity growth.[13]

5 Conclusion

This paper showed that the impact of homicides on labor force participation at the local level in Mexico reveals distinct gender dynamics. Men tend to withdraw from the labor market due to decreased demand for their labor, while women increasingly enter or remain in the workforce to compensate for this decline. This compensatory mechanism helps to mitigate the economic disruptions caused by violent crime, as women play a crucial role in maintaining household stability. However, the reallocation of labor towards the informal sector suggests negative effects of homicides on labor productivity. In the same sense, the rise in violence leads to a significant increase in job separations, particularly among women, who are more likely to leave their jobs due to worsening work conditions and increased risks. This movement across firms further suggests that violence may induce misallocation in the labor market.

[13] That violence induces misallocation is also consistent with the ideas of Banerjee and Duflo (2005), and Hsieh and Klenow (2009), where misallocation of resources is a central cause of income differences across countries.

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