Discussion Paper Series

Minimum Wage and Job Transitions in Mexico

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Abstract

This paper analyzes the labor market effects of Mexico's 2019 minimum wage reform, which doubled wages in northern border municipalities. Using other northern municipalities with smaller wage adjustments as a comparison group, we examine changes in worker transitions across employment states. The reform lowered quit rates among formally employed workers but increased them for certain informal workers. Although the wage hike did not raise overall layoffs, it altered their composition: laid-off formal workers became more likely to transition into informal employment, while new formal hires increasingly came from previously employed informal workers.

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1 Introduction

A significant portion of the existing empirical research on the minimum wage examines its effect on employment levels and the wage distribution (see Dube and Lindner, 2024, for a recent review of the literature). Less attention, however, has been paid to the impact of this policy on labor dynamics.

This gap in the literature has begun to be filled by recent studies that examine the impact of minimum-wage increases on job turnover. In particular, this body of research has found that, for the most part, increases in the minimum wage reduce job turnover, either by reducing quits, layoffs, or hires in specific market segments (Dube and Lindner, 2024).

These findings can be rationalized by different models of the labor market, such as dynamic monopsonistic models (Manning, 2003), matching models (Brochu and Green, 2013), job ladder models (Dube et al, 2016), and efficiency wage models (Coviello et al, 2022). For example, job-ladder models predict that a rise in the minimum wage will reduce workers' willingness to quit their current jobs. Additionally, in matching models where the quality of a job match takes time to be revealed, employers may be less willing to hire workers at the new (higher) wage due to the risk of hiring a low-productivity worker. This slowdown in hires may be simultaneously accompanied by reduced layoffs of workers of known productivity.[1]

Average employment levels may thus show little policy response if both separations (quits and layoffs) and hires are reduced by a minimum wage increase. However, the lack of a response in average employment does not indicate that the welfare of workers and the profits of firms are unaffected by the new policy, as a reduction in turnover can affect both dimensions.

Most of the recent literature on the impact of minimum wages on employment dynamics has focused on labor markets in developed countries. For instance, studies have analyzed the US (Dube et al, 2007; Hirsch et al, 2015; Gittings and Schmutte, 2016; Liu et al, 2016; Dube et al, 2016; Gopalan et al, 2021; Coviello et al, 2022; Jardim et al, 2022; Wursten and

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[1]It is also possible to have the opposite effect, namely where higher minimum wages lead to a rise in firings if, as labor costs rise, employers seek to replace less productive workers with more productive ones. However, this scenario will occur in cases when the productivity of new hires is revealed upon hiring.

Reich, 2023), Canada (Brochu and Green, 2013; Brochu et al, 2023), the UK (Dickens et al, 2015; Dickson and Papps, 2016), and Portugal (Portugal and Cardoso, 2006).[2]

This paper examines the impact of a recent minimum wage hike in border municipalities in northern Mexico on job transitions, including layoffs, quits, and hires, across different population groups. For this, we compare exposed border municipalities with the rest of the municipalities in northern states of Mexico through a classic DiD and a Multinomial Logit model. The Mexican experience offers an interesting case for studying the impact of the minimum wage on labor turnover, since, unlike cases previously studied in the literature, the country has a large informal, uncovered sector, and this may affect the nature of employment transitions as a result of the minimum wage increase. In other words, unlike the previous literature on minimum wages and employment transitions, our study focuses on a country with lower per-capita income, higher poverty levels, and approximately half of the workforce in informal employment.

Overall, our results suggest that transitions into and out of employment are reduced by the minimum wage increase. The estimates suggest a significant decline in separation rates driven mainly by reductions in quits among formal workers, particularly among females and young workers. In formal employment, we don't find significant reductions in layoffs, but there are lower hiring rates among the less educated. This evidence is consistent with the literature on developed countries, which shows that minimum wage increases reduce turnover by lowering quits and hires (Dube and Lindner, 2024). In contrast, the results for the informal sector do not point to a reduction in job turnover. On the contrary, quits increase among prime-age workers (aged 25–54) and higher-earning informal workers (those earning more than two minimum wages). This is consistent with workers leaving informal jobs to seek better-paid opportunities in the formal sector following the minimum wage increase.

Further analysis of the formal workers who separated from their jobs indicate that while the higher minimum wage did not increase formal layoffs, it increased the transitions into informality following a layoff —especially among women and prime-age workers—. In con-

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[2]See Dube and Lindner (2024) for additional references and a discussion of the literature studying the impact of minimum wage hikes on job transitions in these countries.

trast, workers who quit formal employment were more likely to exit the labor force, with these effects concentrated among older workers and men.

At the same time, minimum wage hikes increase the likelihood that new formal hires come from informal employment rather than from other formal positions, pointing to a reallocation of workers across sectors. Together, these patterns suggest that minimum wage reforms operate through compositional and reallocation channels, reshaping workers' flows and the structure of formal employment rather than inducing net job destruction.

The rest of this paper is organized as follows. Section 2 offers more information on the 2019 minimum wage reform in Mexico. Section 3 describes the survey used in this research, and defines the transition variables capturing employment dynamics, and presents the main descriptive statistics from our sample. Section 4 describes the empirical strategy used, while Section 5 presents the effects of the minimum wage rise on labor market dynamics. Section 6 concludes.

2   Background

In Mexico, the general minimum wage is inscribed in the country's Constitution and applies uniformly to all formal workers, regardless of sector, occupation, or specific job. Constitutional provisions stipulate that the minimum wage must be sufficient to cover the material, social, cultural, and educational needs of heads of household and their families. Given regional cost-of-living differentials, the minimum wage has historically varied by geographic area, with higher wages in the country's northern states. Nonetheless, in October 2015, the wage zone system was abolished, standardizing the minimum wage nationwide. The new framework, called the Área Geográfica Única (Single Geographic Area), remained in effect until December 2018.

On December 31, 2018, the Government issued a Decree on Fiscal Stimuli for the Northern Border Region, establishing the Zona Libre de la Frontera Norte (ZFN). This decree introduced a series of measures to promote regional economic development, including reductions in VAT and income tax rates. Additionally, the decree mandated an adjustment to the

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minimum wage in line with local and cross-border economic conditions (Secretaría de Gobernación, 2018). The ZFN took effect on January 1, 2019, encompassing 43 municipalities in six northern Mexican states: Baja California, Sonora, Chihuahua, Coahuila, Nuevo León, and Tamaulipas.

In effect, this reform created an exogenous division into two wage regions: the ZFN and the rest of the country, referred to as the Área de Salario Mínimo General (ASMG). In 2018, the national minimum wage was 88.36 pesos per day (approximately USD 4.59 of 2018). By 2019, the minimum wage in the ZFN had doubled to 176.72 pesos (USD 9.18), while in the rest of the country it increased to 102.68 pesos (USD 5.34), reflecting a significant post-2018 difference between municipalities along Mexico's northern border and the rest of the country.

The effects of the January 2019 minimum wage reform on employment have been analyzed using data from the administrative census of formal employment and the National Employment Survey (ENOE) (described in the next section). The short-term effects on employment indicate no overall impacts. Using formal employment administrative records, Bujanda (2020) reports a short-term effect of a 0.6% decline in formal employment among workers earning less than three times the new minimum wage. On the contrary, Comisión Nacional de los Salarios Mínimos (CONASAMI) (2019), employing Difference-in-Differences (DiD) and the Synthetic Control Methods (SCM) on the same data, finds no significant effects on formal employment and a 6.7% increase in average wages.

Similarly, Campos-Vazquez et al (2020) combines administrative and ENOE data and report a 9% increase in formal wages; they also find no significant effects on total, female, or formal employment. More recent estimations using DiD and SCM for the universe of formal-sector workers suggest no significant employment effects and wage gains of approximately 7%, particularly among low-wage workers (Campos-Vazquez and Esquivel, 2021). Finally, Alvarado Pérez et al (2023), using an Event Study Design and the ENOE survey data, report that minimum wage increases did not significantly affect labor force participation or employment up to the fourth quarter of 2019. On the contrary, it raised the probability of formal employment among female wage earners by 2.3 points. Furthermore, hourly wages increased by 3.6% among formal female workers, with no significant effects for informal

workers or men, suggesting heterogeneous impacts across population groups.

3   Data and Descriptive Statistics

3.1   Data

The data used in this paper comes from the Encuesta Nacional de Ocupación y Empleo (ENOE), which is Mexico's labor force survey. This survey is conducted quarterly and tracks individuals for five consecutive periods. In addition to collecting standard labor market and sociodemographic variables, in the first quarter of each year, it collects retrospective information on workers' last job and the reasons for separation. We use the waves collected between 2016 and the first quarter of 2020 (before COVID-19 restrictions were implemented). We chose this period because, as noted in the previous section, there were no other reforms to the minimum wage during these years, prior to the wage increases in northern border municipalities in 2019.

Our main sample is restricted to salaried workers aged 18-65 who are not enrolled in school at the time of the interview. The exclusion of other workers, such as non-employed individuals, unpaid workers, or the self-employed, focuses our attention on a sample of workers who are more likely to be directly affected by the minimum wage change. However, we retain in the sample workers who were initially salaried employees and subsequently changed jobs to become unemployed, self-employed, or otherwise employed, to study their separations. Similarly, when studying hiring rates, we focus on salaried workers, but we keep in the sample workers who entered employment from positions other than salaried employment. The overall sample size is 145,098.

As explained in detail in section 4, our empirical strategy compares the labor outcomes of interest across border municipalities (i.e., municipalities in the ZFN) and other (non-border) municipalities in the northern states of Mexico. The estimations are performed for different sub-samples of the target population, distinguishing individuals by gender, age, schooling level, and low-earnings status, the latter being defined as workers who, at some point in the

sample period, earn wages less than or equal to two monthly minimum wages, based on the 2020 minimum wage outside the ZFN.[3]

The main variables of interest include job separations —distinguishing between layoffs and quits— and hires over the previous year. During the first quarter of each year, the survey collects retrospective information on the most recent former job held by individuals in the labor force. In particular, it collects information on the reason for leaving that job, as to distinguish between voluntary (quits) and involuntary separations (layoffs). With this information, we construct a series of separation dummies —i.e., layoffs, quits, and all separations (which include the previous two categories), where the baseline category comprises those salaried workers who remained with the same employer over the previous year.

Additionally, during the first quarter, the survey collects information on job tenure for employed workers. With this information, we identify individuals hired over the previous year to create a dummy variable of hiring. The reference category for the hire variable comprises individuals who, at the time of the interview, are unemployed, employed and searching for a job, out of the labor force but ready to work if an appropriate opportunity arises, or employed as a salaried worker for more than a year.

One limitation of relying exclusively on the data collected in the first quarter of each year is that it leaves us with only one period (the first quarter of 2020) to evaluate the hike of the minimum wage at Mexico's northern border before the COVID crisis disrupted the labor markets and the collection of the survey.[4]

In a final set of estimates, we examine job transitions of workers exiting and entering formal employment, and explore the impact of the minimum wage on these movements.

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[3]Around 30% of the target population is low-wage by this criterion (see Table 1 in the next subsection). The ENOE has a significant proportion of individuals who don't report their earnings at the time of the interview. For those individuals, we approximate their low-earning status using ancillary information on the range of their earnings (whenever this is collected in the survey), using earnings in other periods, and in a few cases through imputation.

[4]In an earlier version of this paper we also used information collected in other quarters to approximate layoffs, quits, and hires. However, this quarterly information is less complete than that of the first quarter; therefore, we don't report it. Results are available upon request.

3.2 Descriptive Statistics

As previously mentioned, our sample comprises salaried workers aged 18-65 who are not enrolled in school at the time of the interview. In Table 1 we present the descriptive statistics of this sample in the year 2018, both for the municipalities in the border region (ZFN) as well as for the other (non-border) municipalities. For non-border municipalities, we distinguish between those in border states (column 1), and those in the rest of the country (column 4).

In this table, we observe that municipalities in the control group (i.e., those outside the border area in border states) are rather similar to the ones in the ZFN in their gender composition, schooling levels, rates of employment, hours worked, informality rates, proportion of low and minimum wage workers, and average monthly labor income. However, when comparing these sociodemographic characteristics between border municipalities and the rest of the country (i.e., municipalities in non-border states), we find statistically significant differences across most of them. Hence, the strategy adopted in this paper is to compare only municipalities in states along the northern border.

4 Method

To identify the effects of doubling the minimum wage in the ZFN on labor transitions, we exploit the sharp increase observed in border municipalities and compare pre- and post-January 2019 individual labor outcomes in exposed versus non-exposed municipalities across six northern border states of Mexico. For this classical Difference-in-Differences strategy, we estimate the following fixed effects regression:

$$Y_{imt} = \nu_m + \theta_t + \delta ZFN_{mt} + \mu_{imt} \tag{1}$$

where Y_{imt} are individual layoffs, quits, separations and hires over the previous year in municipality m in period t; ν_m are municipality fixed effects; θ_t are period fixed effects; μ_{imt} is our residual.

Our variable of interest ZFN_{mt} indicates the exposure to the minimum wage increase in

municipality m starting in 2019. This binary variable takes the value of one if the individual resides in a municipality in the ZFN in 2020 and zero otherwise.[5] The coefficient δ identifies the average effect of doubling the minimum wage on labor transitions under standard parallel trends and no anticipation assumptions.

In addition to estimating the effects of the minimum wage increase on employment transitions, we estimate the probability of moving to a specific employment destination following separations, as well as of moving from a specific employment origin for recent hires. To calculate these probabilities, we estimate the following equation using a Multinomial Logit model:

$$s_{imt} = x_{imt}\beta + \delta ZFN_{mt} + \theta_t + \mathbb{1}(m \in ZFN) + \epsilon_{imt} \tag{2}$$

where the dependent variable s_{imt} is the employment status of origin or of destination, depending on whether the worker entered or exited a salaried job over the last year. The vector x includes categorical control variables of gender, age, education, and low-earnings status, and $\mathbb{1}(m \in ZFN)$ is a dummy indicator of municipalities in the ZFN.[6]

The destination categories for individuals who experienced separations from their job over the past year are formal employment, informal employment, unemployment, and inactivity, while the origin categories for individuals who got hired over the past year are: (previous) formal/informal employment, and non-employment for individuals who were not employed over the past year. The parameter reported for this exercise is the average marginal effect of the minimum wage on the probability of a given transition.

For both equations (1) and (2), in addition to estimating the models for the overall population, we run models where the treatment variable ZFN_{mt} is interacted with categorical variables of gender, age, education, and low-earnings status. All our estimations use survey weights and present robust standard errors.

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[5]Since the transitions analyzed correspond to the previous calendar year, this dummy effectively identifies the observations affected by the policy change since January 1st 2019.

[6]θ_t and ZFN_{mt} are defined as in equation (1).

5 Results

5.1 Entries into and Exits from Salaried Employment

Table 2 presents the results of our main estimation on retrospective transitions over the previous year. In particular, the estimates of δ from separate regressions based on equation (1) appear in different cells of the table. The columns distinguish across different dependent variables, namely separations (including layoffs and quits) and hires, while the rows distinguish the results for different groups of the population.[7]

The table shows that doubling the minimum wage caused a reduction in the probability of quitting salaried employment by 1.2 percentage points (pp). This reduction is observed for most population groups, and it is particularly large and statistically significant among females (-1.9 pp), young workers (-5 pp), and workers with low levels of schooling (-1.7 pp). Furthermore, the table indicates that for workers with low schooling levels, there is a reduction in layoffs (-1.5 pp), as well as in hires (-2.7 pp).[8]

The estimations in the previous table are further explored in Tables 3 and 4, which repeat the same estimations, but this time separating formal and informal workers. In particular, for separations, formality status is determined by social security coverage in the job from which the worker separated, while for hires, formality is determined by social security coverage in the job at which the worker entered.

The results for formal workers in Table 3 are very similar to those in Table 2, namely they indicate a reduction in quits, although larger in magnitude. It is interesting to note that in spite of the higher costs brought about by the higher minimum wage, there is no visible increase in layoffs nor a reduction in hirings in this sector, with the exception of low-educated workers, which saw a fall in hiring rates of 3 pp. One possible explanation is

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[7]In the Appendix Table A.1 we present the parameter of a similar DiD model estimated on hourly wages, which indeed shows that wages increased as a result of the minimum wage hike under study.

[8]To complement this exercise, we explore the existence of pre-trends in Figures A.1 to A.4, in the Appendix by implementing four Event Study Design (ESD) estimations using overall layoffs, quits, total separations, and hire rates as dependent variables. The models include municipality and period fixed effects. The coefficients of interest are estimated from a set of event-time indicators that capture the dynamic effects of a minimum wage increase in treated municipalities, relative to the omitted pre-treatment period ($t = -1$). The results show stable pre-trends in these variables at the 99% confidence level.

that this reform, in addition to raising the minimum wage, brought reductions in VAT and income taxes, thereby lowering firms' costs (Calderón et al, 2023).

In contrast, Table 4 does not indicate a reduction in quits for informal workers. On the contrary, there is an *increase* in this variable for workers aged 25-54, and for higher-earning workers. Among educated workers, there are more layoffs, but also an increase in hiring rates. Finally, an increase in hires is also observed for females.

All in all, these findings align with the corresponding results in the literature for developed countries, suggesting that increases in the minimum wage reduce job turnover by reducing quits and hires (Dube and Lindner, 2024). However, most of these effects are observed for specific market segments of formal employment. In informal employment, quits increase, which is consistent with informal workers leaving their informal jobs to seek higher wages elsewhere after the minimum wage hike. We explore more on the fluxes into and from formal employment in the next section.

Before that, it bears mentioning that one possible threat to our findings is cross-municipal migration responses to wage increases. In particular, higher wages may incentivize migration to treated municipalities, thereby affecting the labor supply in control municipalities. Figures A.5 and A.6 in the Appendix plot measures of household mobility using the rotating panel feature of the survey, separately for municipalities in the Northern Border region and in control areas. Figure A.5 shows the percentage of households that report a residential move at any point during the five-quarter panel, while Figure A.6 reports the percentage of households that receive at least one new member who declares having moved for work-related reasons. These figures show that migration rates are very low in magnitude under both definitions, remaining below roughly 5% in control municipalities, and 3% in border municipalities for household moves, and below 0.5% for work-related incoming residents. Furthermore, the trends are rather stable across time and after 2019 in treated and control municipalities, suggesting that our results are unlikely to be driven by differential migration responses to the minimum wage.

5.2 Employment transitions

In addition to analyzing the impact of the minimum wage increase on separation and hiring rates, we also examine the employment status to which workers moved after a separation and the employment status from which they came before being hired. These effects are analyzed using the Multinomial Logit model described in equation (2).

In Table 5 we display the average marginal effect of the minimum wage hike by employment status of destination (formal/informal employment, unemployment, and inactivity) for those workers who were laid off from formal jobs. There we observe that the increase in the minimum wage raises the probability of transiting into informal employment by 6.6 pp for workers laid-off from formal employment, and this effect is particularly marked among women (14.8 pp) and prime-age workers (8.9 pp).

It is important to emphasize what these numbers mean. In particular, Table 3 shows no statistically significant effect of the minimum wage on layoffs from formal jobs. Therefore, the estimators reported in Table 5 indicate that, while this minimum wage hike left the rate of layoffs from formal jobs unchanged, it altered the composition of the transitions made by laid-off workers, making it more likely for them to transit into informal employment, especially for women and prime-age workers.

In Table 6, we repeat the same exercise, this time for quits from formal employment. As we showed in Table 3, the minimum wage hike *reduced* said quits. Therefore, the effects presented in Table 6 refer to the reduced pool of workers who decided to quit their formal job despite the minimum wage increase. The table shows that older workers and males who quit their formal job are more likely to exit the workforce. We also observe that for low-educated and low-income workers who quit their formal jobs, the probability of reentering formal employment is lower as a result of the higher minimum wage.

Finally, in Table 7 we analyze the transitions associated with hirings in formal employment. There we observe that increases in the minimum wage raised the probability that workers hired in formal jobs come from an informal job by 2 pp, and reduced the probability that such workers come from a previous formal job by -3.4 pp. These effects are particularly

marked among women, prime-age workers, and higher-earning workers. Overall, these effects show an increase in the fluxes from informal to formal employment after the minimum wage reform.[9]

5.3 Key Takeaways

Some key findings arise from the previous results. In particular:

a) the increase of the minimum wage led to a reduction in quits from formal jobs, but to an increase in voluntary separations from informal jobs among certain population groups,

b) layoff and hire rates were largely unaffected by this policy change for most population groups.

c) While layoffs didn't increase in formal jobs on the net, those formal workers who got laid-off were more likely to move into informal employment.

d) In contrast, workers who transited into formal employment were more likely to come from informal employment.

The fall in quits from formal jobs and the increase in quits from informal employment is consistent with a job ladder model, where higher wages in the formal sector positively affect the workers' willingness to stay at a formal job, and reduces the willingness of informal workers to remain in their current uncovered job (see Dube et al, 2016, for a discussion of the impact of the minimum wage in a one-sector job-ladder labor market model).[10]

Furthermore, our findings highlight an interesting interaction between formal and informal employment where, besides the net effect of separations and hires, the policy change brings forth a reshuffling of workers across sectors, as indicated by findings c) and d) above. These results reaffirm that policies that affect covered jobs will also have an impact on uncovered employment. While previous studies on the minimum wage in Mexico have also found

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[9]In Tables A.2-A.4 in the Appendix we present the corresponding results for workers who entered or exited informal employment.

[10]These findings are not consistent with the match quality model of Brochu and Green (2013), which in turn predicts a reduction in layoffs and hires as a result of the policy change.

that this policy has impacts on the informal sector (e.g., Kaplan and Pérez Arce Novaro, 2006), our results add new evidence on the interaction between these segments of the labor market.

6   Conclusions

This paper studies the impact of the 2019 minimum wage hike in Mexico's northern border region on employment transitions. In particular, we analyze the impact on the rate of quits, layoffs and hires, as well as the associated transitions across different employment states as a result of this policy change. We use data from the Mexican National Employment Survey between 2016 and early 2020, to analyze the natural experiment generated by the sharp minimum wage increase in the Zona Libre de la Frontera Norte (ZFN) relative to other northern municipalities through a Difference-in-Differences linear model and a Multinomial Logit applied to different population groups.

The paper's main contribution is to extend the literature on the impact of the minimum wage on job transitions to a developing-country context. This is important because labor markets in the developing world have the distinguishing feature of having a large informal sector, and this generates dynamics not observed in labor markets in richer countries.

Compared with prior literature, our findings align with studies from developed countries that show that minimum wage increases reduce labor market turnover. However, we provide new insights into how these dynamics differ in economies with a large informal sector. Also, while earlier work in Mexico has documented limited effects of this minimum wage hike on aggregate employment, our paper shows that the reform affected the underlying job dynamics and sectoral transitions.

Our results show a consistent pattern: the 2019 minimum wage increase led to a decline in voluntary job separations from formal employment, especially among young and female workers, both skilled and unskilled, while the opposite is found in informal employment, where quits for prime-aged and higher earnings workers increased. The minimum wage increase also changed the composition of flows across covered and unconvered employment.

In particular, workers laid-off from formal jobs were more likely to transit into informal employment, and some informal workers got hired instead in formal jobs as a result of the policy change.

These findings underscore the importance of accounting for the indirect impacts that policy changes in the formal sector might have on informality and worker mobility in developing countries. An interesting line of future research will be to develop formal models of the labor market that can reproduce the findings reported in this paper.

Table 1: Descriptive Statistics

	(1) Control	(2) ZFN Municipality	(3) Diff (2)-(1)	(4) Rest of Country	(5) Diff (2)-(4)
Women	0.43	0.43	0.00	0.43	-0.00
Age	39.16	38.22	-0.94***	38.86	-0.64***
High School	0.50	0.47	-0.03	0.43	0.03 *
Employed	0.88	0.88	0.00	0.87	0.01 *
Unemployed	0.03	0.03	-0.00	0.03	-0.00
Monthly hours worked	175.02	177.99	2.97	175.94	2.05
Informal employment	0.41	0.40	-0.01	0.65	-0.25***
Monthly minimum wage	2651.00	2651.00	0.00	2651.00	0.00
Earns minimum wage	0.25	0.24	-0.00	0.32	-0.07
Low Earners	0.30	0.28	-0.02	0.46	-0.18***
Monthly labor income	7614.03	7376.26	-237.78	5972.27	1403.98***
N	65,136	20,522		359,280	

Notes: Authors' elaboration with data from the Encuesta Nacional de Ocupación y Empleo (ENOE) 2018/Q1–2018/Q4. "Rest of the country" are municipalities located outside states in the northern border. Monthly earnings are reported in 2018's MXP. *, **, and *** denote significance at the 10%, 5%, and 1% levels for robust t-stats.

Table 2: Effect of the Minimum Wage on Entries into and Exits from Employment

	Layoffs	Quits	Separations	Hires
Overall	0.002	-0.012*	-0.011	-0.005
	(0.006)	(0.007)	(0.007)	(0.007)
By Gender				
Female	0.003	-0.019**	-0.016	0.014
	(0.008)	(0.010)	(0.011)	(0.010)
Male	0.001	-0.006	-0.006	-0.018**
	(0.007)	(0.007)	(0.009)	(0.008)
By Age				
Young	-0.016	-0.050***	-0.049***	-0.026
	(0.017)	(0.019)	(0.018)	(0.016)
Prime age	0.003	0.001	0.001	0.003
	(0.006)	(0.007)	(0.008)	(0.007)
Older	0.014	-0.011	-0.001	-0.007
	(0.013)	(0.012)	(0.016)	(0.013)
By Schooling Level				
Middle School	-0.015**	-0.017*	-0.028***	-0.027***
	(0.008)	(0.009)	(0.010)	(0.009)
High School +	0.016**	-0.010	0.003	0.016*
	(0.007)	(0.008)	(0.009)	(0.009)
By Earnings Level				
Mid/High Earners	0.008	0.001	0.007	0.007
	(0.006)	(0.007)	(0.008)	(0.008)
Low Earners	0.001	-0.016	-0.017	-0.011
	(0.013)	(0.014)	(0.015)	(0.014)

Notes: This table reports the average effect of minimum wage increases on job transitions on a sample of salaried workers. Each entry in the table reports the parameter δ from separate Difference-in-Differences regressions based on equation (1), where the dependent variable differs across columns and the population group differs across rows. Young workers are aged 15–25, while older workers are those aged 55–65. Workers in the "Middle School" category are those with less than a high school education. "Low-earners" are workers who, at some point in the sample period, earn wages less than or equal to two monthly minimum wages, based on the 2020 minimum wage outside the ZFN. Robust standard errors in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table 3: Effect of the Minimum Wage on Entries into and Exits from Formal Employment

	Layoffs	Quits	Separations	Hires
Overall	-0.001	-0.016**	-0.016**	-0.008
	(0.006)	(0.007)	(0.008)	(0.009)
By Gender				
Female	-0.000	-0.020*	-0.019*	0.001
	(0.008)	(0.011)	(0.012)	(0.012)
Male	-0.002	-0.013	-0.013	-0.013
	(0.007)	(0.008)	(0.009)	(0.010)
By Age				
Young	0.008	-0.054**	-0.043*	-0.030
	(0.021)	(0.023)	(0.023)	(0.022)
Prime age	-0.003	-0.005	-0.008	-0.001
	(0.006)	(0.007)	(0.008)	(0.009)
Older	0.010	-0.018	-0.007	0.008
	(0.014)	(0.013)	(0.018)	(0.017)
By Schooling Level				
Middle School	-0.007	-0.018*	-0.023**	-0.031***
	(0.009)	(0.010)	(0.011)	(0.012)
High School +	0.002	-0.018**	-0.014	0.009
	(0.007)	(0.008)	(0.009)	(0.010)
By Earnings Level				
Mid/High Earners	0.001	-0.010	-0.008	0.007
	(0.006)	(0.007)	(0.008)	(0.009)
Low Earners	0.017	0.020	0.020	-0.032
	(0.017)	(0.019)	(0.020)	(0.020)

Notes: This table reports the average effect of minimum wage increases on job transitions on a sample of formal workers. For layoffs, quits, and separations, formality status is determined by the social security coverage in the job from which the worker separated. For hires, formality is determined by social security coverage in the current job. Each entry in the table reports the parameter δ from separate Difference-in-Differences regressions based on equation (1), where the dependent variable differs across columns and the population group differs across rows. Young workers are aged 15–25, while older workers are those aged 55–65. Workers in the "Middle School" category are those with less than a high school education. "Low-earners" are workers who, at some point in the sample period, earn wages less than or equal to two monthly minimum wages, based on the 2020 minimum wage outside the ZFN. Robust standard errors in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table 4: Effect of the Minimum Wage on Entries into and Exits from Informal Employment

	Layoffs	Quits	Separations	Hires
Overall	0.015	0.007	0.012	0.007
	(0.015)	(0.016)	(0.017)	(0.017)
By Gender				
Female	0.028	-0.003	0.014	0.038*
	(0.019)	(0.023)	(0.024)	(0.023)
Male	0.008	0.012	0.011	-0.014
	(0.017)	(0.018)	(0.020)	(0.020)
By Age				
Young	-0.036	-0.047	-0.047	-0.033
	(0.032)	(0.034)	(0.033)	(0.032)
Prime age	0.024	0.030*	0.034*	0.027
	(0.016)	(0.018)	(0.019)	(0.019)
Older	0.033	0.005	0.023	-0.022
	(0.024)	(0.025)	(0.031)	(0.030)
By Schooling Level				
Middle School	-0.006	0.001	-0.007	-0.015
	(0.016)	(0.018)	(0.019)	(0.019)
High School +	0.065***	0.025	0.057**	0.054**
	(0.024)	(0.026)	(0.026)	(0.026)
By Earnings Level				
Mid/High Earners	0.022	0.035*	0.042**	0.002
	(0.016)	(0.018)	(0.020)	(0.020)
Low Earners	0.006	-0.032	-0.026	0.015
	(0.021)	(0.023)	(0.024)	(0.023)

Notes: This table reports the average effect of minimum wage increases on job transitions on a sample of informal workers. For layoffs, quits, and separations, formality status is determined by social security coverage in the job from which the worker separated. For hires, formality is determined by social security coverage in the current job. Each entry in the table reports the parameter δ from separate Difference-in-Differences regressions based on equation (1), where the dependent variable differs across columns and the population group differs across rows. Young workers are aged 15–25, while older workers are those aged 55–65. Workers in the "Middle School" category are those with less than a high school education. "Low-earners" are workers who, at some point in the sample period, earn wages less than or equal to two monthly minimum wages, based on the 2020 minimum wage outside the ZFN. Robust standard errors in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table 5: Average Marginal Effects of the Minimum Wage on Post-Layoff Transitions from Formal Employment

Destination:	Formal	Informal	Unemployed	Inactive
Overall	-0.065	0.066*	0.014	-0.016
	(0.043)	(0.035)	(0.042)	(0.032)
By Gender				
Female	-0.045	0.148**	-0.028	-0.075
	(0.056)	(0.060)	(0.055)	(0.064)
Male	-0.072	0.030	0.032	0.010
	(0.047)	(0.049)	(0.053)	(0.025)
By Age				
Young	-0.055	0.049	-0.023	0.029
	(0.067)	(0.067)	(0.072)	(0.067)
Prime age	-0.087*	0.089*	0.036	-0.039
	(0.045)	(0.050)	(0.050)	(0.029)
Older	0.081	-0.039	-0.100	0.058
	(0.106)	(0.079)	(0.106)	(0.127)
By Schooling Level				
Middle School	-0.090*	0.089	0.059	-0.058*
	(0.049)	(0.056)	(0.055)	(0.034)
High School +	-0.037	0.049	-0.049	0.037
	(0.051)	(0.050)	(0.053)	(0.043)
By Earnings Level				
Mid/High Earners	-0.062	0.049	0.009	0.004
	(0.049)	(0.044)	(0.050)	(0.031)
Low Earners	-0.069	0.118	0.015	-0.063
	(0.050)	(0.072)	(0.060)	(0.051)

Notes: This table reports the average marginal effect of minimum wage increases on the probability that workers fired from a formal job transition to a given employment status. The models are estimated using the Multinomial Logit in equation (2). Each row corresponds to a different population subgroup. Young workers are aged 15–25, while older workers are those aged 55–65. Workers in the "Middle School" category are those with less than a high school education. "Low-earners" are workers who, at some point in the sample period, earn wages less than or equal to two monthly minimum wages, based on the 2020 minimum wage outside the ZFN. Robust standard errors in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table 6: Average Marginal Effects of the Minimum Wage on Post-Quit Transitions from Formal Employment

Destination:	Formal	Informal	Unemployed	Inactive
Overall	-0.032	-0.004	0.018	0.017
	(0.026)	(0.020)	(0.023)	(0.026)
By Gender				
Female	-0.018	0.002	0.021	-0.005
	(0.028)	(0.019)	(0.032)	(0.040)
Male	-0.049	-0.012	0.016	0.045*
	(0.038)	(0.031)	(0.034)	(0.026)
By Age				
Young	-0.020	-0.044*	0.057	0.006
	(0.036)	(0.024)	(0.050)	(0.044)
Prime age	-0.032	0.012	0.006	0.014
	(0.030)	(0.025)	(0.025)	(0.029)
Older	-0.154**	0.062	-0.093***	0.185*
	(0.070)	(0.098)	(0.020)	(0.104)
By Schooling Level				
Middle School	-0.055*	0.015	0.043	-0.003
	(0.031)	(0.027)	(0.034)	(0.033)
High School +	-0.008	-0.025	-0.008	0.040
	(0.033)	(0.022)	(0.029)	(0.033)
By Earnings Level				
Mid/High Earners	-0.013	-0.022	0.003	0.032
	(0.033)	(0.021)	(0.025)	(0.027)
Low Earners	-0.060**	0.026	0.046	-0.012
	(0.029)	(0.032)	(0.043)	(0.043)

Notes: This table reports the average marginal effect of minimum wage increases on the probability that workers who quit a formal job transition to a given employment status. The models are estimated using the Multinomial Logit in equation (2). Each row corresponds to a different population subgroup. Young workers are aged 15–25, while older workers are those aged 55–65. Workers in the "Middle School" category are those with less than a high school education. "Low-earners" are workers who, at some point in the sample period, earn wages less than or equal to two monthly minimum wages, based on the 2020 minimum wage outside the ZFN. Robust standard errors in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table 7: Average Marginal Effects of the Minimum Wage on Transitions into Formal Employment

Initial status:	Formal	Informal	Not employed
Overall	-0.034*	0.020*	0.014
	(0.018)	(0.010)	(0.019)
By Gender			
Female	-0.043**	0.032**	0.010
	(0.019)	(0.014)	(0.022)
Male	-0.023	0.012	0.011
	(0.022)	(0.016)	(0.025)
By Age			
Young	-0.034	-0.002	0.036
	(0.022)	(0.015)	(0.026)
Prime age	-0.032	0.036**	-0.004
	(0.020)	(0.016)	(0.023)
Older	-0.028	-0.002	0.030
	(0.057)	(0.041)	(0.066)
By Schooling Level			
Middle School	-0.035	0.030	0.004
	(0.023)	(0.019)	(0.026)
High School +	-0.031	0.015	0.017
	(0.019)	(0.012)	(0.022)
By Earnings Level			
Mid/High Earners	-0.034*	0.029**	0.005
	(0.018)	(0.013)	(0.021)
Low Earners	-0.030	-0.006	0.036
	(0.027)	(0.019)	(0.031)

Notes: This table reports the average marginal effect of minimum wage increases on the probability of the employment status of origin for a sample of workers hired into formal employment. The models are estimated using the Multinomial Logit in equation (2). Each row corresponds to a different population subgroup. Young workers are aged 15–25, while older workers are those aged 55–65. Workers in the "Middle School" category are those with less than a high school education. "Low-earners" are workers who, at some point in the sample period, earn wages less than or equal to two monthly minimum wages, based on the 2020 minimum wage outside the ZFN. Robust standard errors in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Disclosure Statement

There are no potential conflict of interests to declare.

No funding was received for this research.

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Appendix

Table A.1: Minimum wage effects on log-hourly income

|	Log(wage/hr)	Imputed Log(wage/hr)
Overall	0.044***	0.043***
	(0.010)	(0.008)
Observations	93,847	123,768

Notes: This table reports the average effect of minimum-wage increases on the logarithm of hourly wages. Each column corresponds to a separate difference-in-differences regression as defined in equation (1). Column (2) uses wages imputed via *hot-deck* methods based on quarterly ENOE cells defined by sex, age, education (above vs. below high school), informality status, and urban/rural location. Robust standard errors are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Figure A.1: ESD: Minimum Wage Effects on Yearly Layoffs
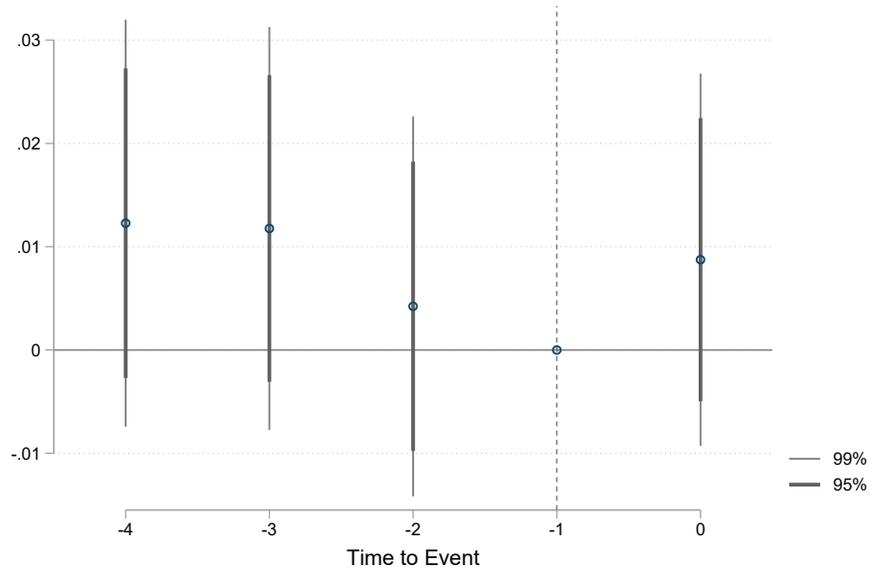
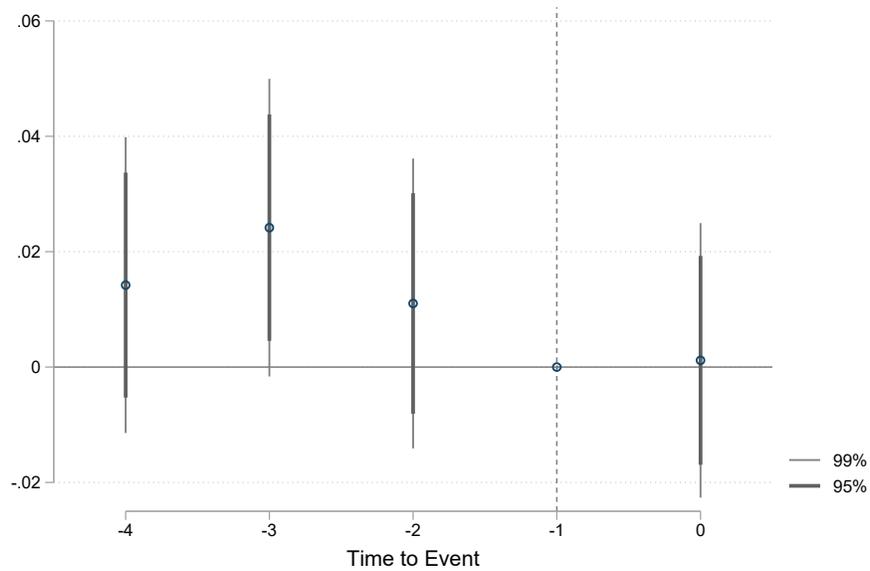Notes: This figure reports event-study coefficients and the corresponding 99% and 95% confidence intervals from a specification including municipality and period fixed effects. Coefficients are estimated from a set of event-time indicators that capture the dynamic effects of a minimum wage increase in treated municipalities, relative to the omitted pre-treatment period ($t = -1$). Confidence intervals are constructed using heteroskedasticity-robust standard errors. Pre-treatment coefficients provide a visual test of parallel trends.

Figure A.2: ESD: Minimum Wage Effects on Yearly Quits
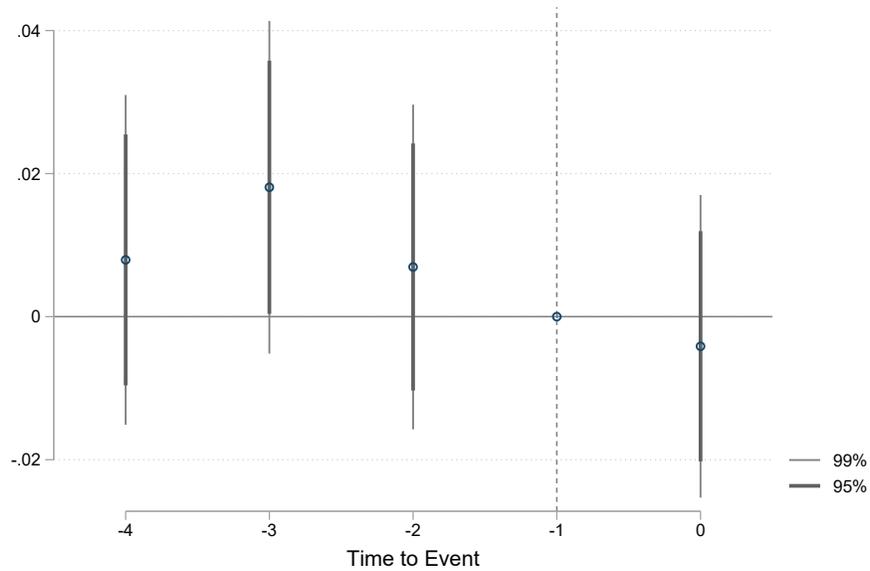
Notes: This figure reports event-study coefficients and the corresponding 99% and 95% confidence intervals from a specification including municipality and period fixed effects. Coefficients are estimated from a set of event-time indicators that capture the dynamic effects of a minimum wage increase in treated municipalities, relative to the omitted pre-treatment period ($t = -1$). Confidence intervals are constructed using heteroskedasticity-robust standard errors. Pre-treatment coefficients provide a visual test of parallel trends.

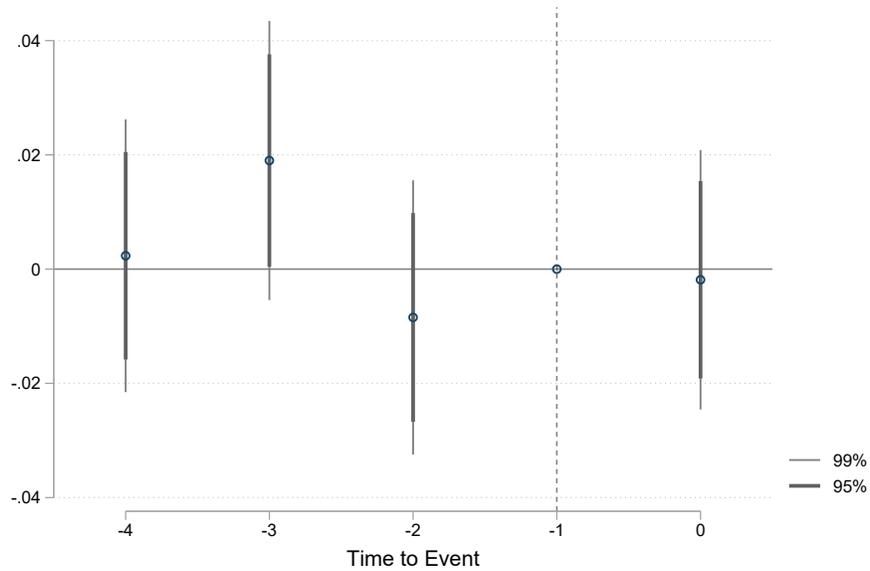Figure A.3: ESD: Minimum Wage Effects on Yearly Separations

Notes: This figure reports event-study coefficients and the corresponding 99% and 95% confidence intervals from a specification including municipality and period fixed effects. Coefficients are estimated from a set of event-time indicators that capture the dynamic effects of a minimum wage increase in treated municipalities, relative to the omitted pre-treatment period ($t = -1$). Confidence intervals are constructed using heteroskedasticity-robust standard errors. Pre-treatment coefficients provide a visual test of parallel trends.

Figure A.4: ESD: Minimum Wage Effects on Yearly Hires

Notes: This figure reports event-study coefficients and the corresponding 99% and 95% confidence intervals from a specification including municipality and period fixed effects. Coefficients are estimated from a set of event-time indicators that capture the dynamic effects of a minimum wage increase in treated municipalities, relative to the omitted pre-treatment period ($t = -1$). Confidence intervals are constructed using heteroskedasticity-robust standard errors. Pre-treatment coefficients provide a visual test of parallel trends.

Figure A.5: Percentage of households that moved: Northern border vs. control areas
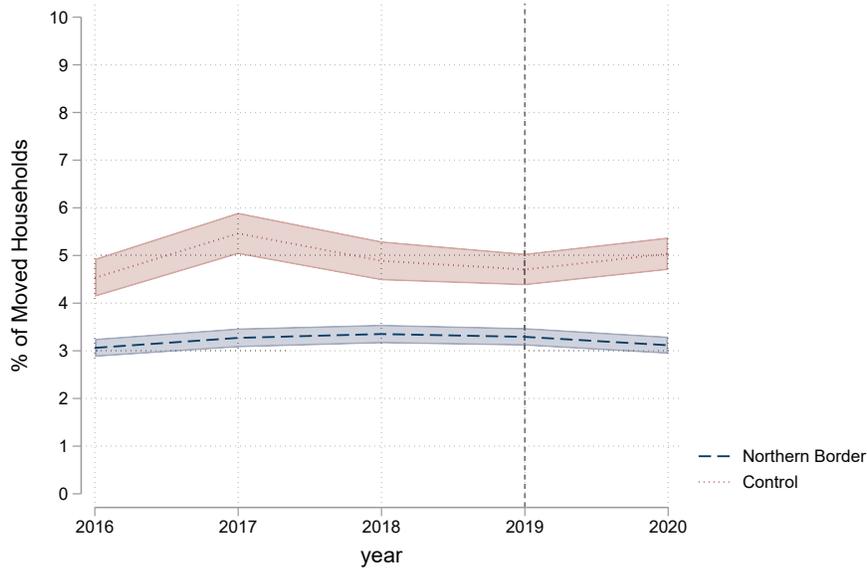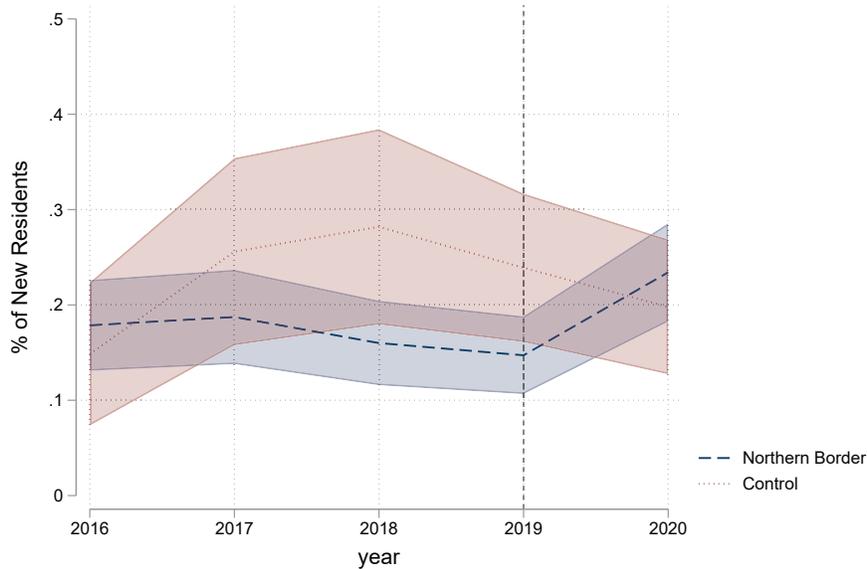

Notes: The figure reports the percentage of households that report a residential move in the ENOE panel, separately for municipalities in the Northern Border region and in control areas. A household is classified as having moved if, at any point during the five-quarter rotating panel, it reports either the arrival of a new family or a change in the resident household. Shaded areas represent 95% confidence intervals. Year 2020 includes data only through the first quarter (Q1).

Figure A.6: Percentage of households receiving new members who report moving for work

Notes: The figure reports the percentage of households that receive at least one new resident during the five-quarter ENOE rotating panel, where the incoming member declares having moved for work-related reasons. Trends are shown separately for municipalities in the Northern Border region and in control areas. Shaded areas represent 95% confidence intervals. Year 2020 includes data only through the first quarter (Q1).

Table A.2: Average Marginal Effects of the Minimum Wage on Post-Layoff Transitions from Informal Employment

Destination:	Formal	Informal	Unemployed	Inactive
Overall	-0.029	0.028	-0.022	0.023
	(0.033)	(0.052)	(0.048)	(0.044)
By Gender				
Female	0.023	-0.012	-0.076**	0.064
	(0.037)	(0.063)	(0.033)	(0.077)
Male	-0.054*	0.047	0.005	0.003
	(0.033)	(0.067)	(0.062)	(0.045)
By Age				
Young	-0.077***	0.144*	-0.049	-0.019
	(0.027)	(0.080)	(0.066)	(0.071)
Prime age	-0.005	0.009	-0.027	0.024
	(0.039)	(0.062)	(0.054)	(0.047)
Older	-0.017	-0.137	0.060	0.094
	(0.031)	(0.116)	(0.123)	(0.155)
By Schooling Level				
Middle School	-0.013	-0.036	0.040	0.009
	(0.033)	(0.060)	(0.059)	(0.054)
High School +	-0.052	0.128*	-0.120**	0.044
	(0.040)	(0.072)	(0.050)	(0.062)
By Earnings Level				
Mid/High Earners	-0.032	0.061	-0.016	-0.013
	(0.050)	(0.072)	(0.062)	(0.045)
Low Earners	-0.028	-0.008	-0.027	0.063
	(0.025)	(0.064)	(0.052)	(0.065)

Notes: This table reports the average marginal effect of minimum wage increases on the probability that workers fired from an informal job transition to a given employment status. The models are estimated using the Multinomial Logit in equation (2). Each row corresponds to a different population subgroup. Young workers are aged 15–25, while older workers are those aged 55–65. Workers in the "Middle School" category are those with less than a high school education. "Low-earners" are workers who, at some point in the sample period, earn wages less than or equal to two monthly minimum wages, based on the 2020 minimum wage outside the ZFN. Robust standard errors in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table A.3: Average Marginal Effects of the Minimum Wage on Post-Quit Transitions from Informal Employment

Destination:	Formal	Informal	Unemployed	Inactive
Overall	0.040	-0.001	-0.014	-0.024
	(0.034)	(0.038)	(0.030)	(0.040)
By Gender				
Female	0.084^{**}	-0.061^*	0.009	-0.033
	(0.042)	(0.034)	(0.036)	(0.058)
Male	0.005	0.045	-0.036	-0.014
	(0.051)	(0.056)	(0.034)	(0.038)
By Age				
Young	0.042	0.057	-0.008	-0.091^*
	(0.049)	(0.056)	(0.044)	(0.054)
Prime age	0.047	-0.036	-0.014	0.004
	(0.045)	(0.044)	(0.030)	(0.044)
Older	-0.024	0.005	-0.031	0.051
	(0.083)	(0.117)	(0.025)	(0.128)
By Schooling Level				
Middle School	0.037	0.038	-0.046^{**}	-0.029
	(0.041)	(0.048)	(0.021)	(0.044)
High School +	0.050	-0.071^*	0.040	-0.019
	(0.052)	(0.040)	(0.053)	(0.056)
By Earnings Level				
Mid/High Earners	0.080	-0.022	-0.010	-0.048
	(0.056)	(0.049)	(0.031)	(0.038)
Low Earners	-0.001	0.017	-0.022	0.007
	(0.037)	(0.048)	(0.035)	(0.053)

Notes: This table reports the average marginal effect of minimum wage increases on the probability that workers who quit an informal job transition to a given employment status. The models are estimated using the Multinomial Logit in equation (2). Each row corresponds to a different population subgroup. Young workers are aged 15–25, while older workers are those aged 55–65. Workers in the "Middle School" category are those with less than a high school education. "Low-earners" are workers who, at some point in the sample period, earn wages less than or equal to two monthly minimum wages, based on the 2020 minimum wage outside the ZFN. Robust standard errors in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table A.4: Average Marginal Effects of the Minimum Wage on Transitions into Informal Employment

Initial status:	Formal	Informal	Not employed
Overall	0.021	0.027	-0.048[*]
	(0.018)	(0.021)	(0.025)
By Gender			
Female	0.032	-0.028	-0.004
	(0.023)	(0.018)	(0.028)
Male	0.013	0.074[**]	-0.087[**]
	(0.027)	(0.034)	(0.036)
By Age			
Young	-0.040[*]	0.018	0.021
	(0.021)	(0.033)	(0.037)
Prime age	0.065[**]	0.027	-0.091[***]
	(0.028)	(0.028)	(0.033)
Older	-0.040	0.077	-0.038
	(0.033)	(0.067)	(0.071)
By Schooling Level			
Middle School	0.028	0.022	-0.050
	(0.023)	(0.027)	(0.031)
High School +	0.013	0.036	-0.049
	(0.030)	(0.031)	(0.038)
By Earnings Level			
Mid/High Earners	0.029	0.075[**]	-0.103[***]
	(0.028)	(0.034)	(0.037)
Low Earners	0.017	-0.014	-0.003
	(0.023)	(0.025)	(0.030)

Notes: This table reports the average marginal effect of minimum wage increases on the probability of the employment status of origin for a sample of workers hired into informal employment. The models are estimated using the Multinomial Logit in equation (2). Each row corresponds to a different population subgroup. Young workers are aged 15–25, while older workers are those aged 55–65. Workers in the "Middle School" category are those with less than a high school education. "Low-earners" are workers who, at some point in the sample period, earn wages less than or equal to two monthly minimum wages, based on the 2020 minimum wage outside the ZFN. Robust standard errors in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively