

Can Temporary Wage Incentives Increase Formal Employment? Experimental Evidence from Mexico

Martin Abel, Eliana Carranza, Kimberly Geronimo and Maria Elena Ortega*

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Abstract

Entry level formal sector jobs for Mexican youths offer low starting salaries but substantial wages growth of almost 40% over the first year. We experimentally test whether a six-months wage incentive can increase formal employment among secondary school graduates. Combining survey and high-frequency social security data, we offer four main findings. First, the incentive does not distort short-run choices of graduates planning to continue their education. Second, formal employment rates among graduates planning to enter the labor market increase by 12% over the first year, which is driven by a 27% increase in jobs with permanent contracts. Third, we document short-term gains in retention. However, once the incentive expires, hazard rates start to converge. Fourth, treatment effects are largest for graduates with reservation wages just above starting salary levels of formal jobs. Combined with evidence for very high discount rates, this highlights the importance of short-term benefits for youths' career choices.

Keywords: youth employment, wage subsidy, formal employment, job tenure, job security.
JEL: J08, J24, J41, J46, J63

*Abel: Middlebury College (email: mabel@middlebury.edu); Carranza: World Bank (email: ecaranza@worldbank.org); Ortega: World Bank (email: mortegaheles@worldbank.org). The study was conducted in collaboration with the Mexican Government's Secretariat of Finance and Public Credit, the National Employment Services, the Secretariat of Education, the former PROSPERA National Coordination Office, and the State Government of San Luis Potosi. The Mexican Institute of Social Security provided access to data. We thank Ana Lucia Cardenas for excellent project management, and Daniel Jefe Garcia, Manuel Paredes and Alejandra Rogel for implementation support. Svetlana Pimkina provided superb research assistance. We thank the Jobs Umbrella Multidonor Trust Fund for funding. AEA RCT Registry ID: AEARCTR-0005061. All errors and omissions are our own.

1 Introduction

Governments across many developing countries try to allocate workers from the informal to the formal sector in an attempt to increase tax revenues and boost productivity and economic growth (Herrendorf et al., 2014). However, one of challenge often overlooked is how to *retain* people in jobs once they found formal employment (Levy, 2010). High turnover matters given the high costs of hiring and training people. It also impedes on-the-job learning, which is especially important for entry level positions in low-skill sectors (Adda et al., 2013). This problem is particularly relevant for developing countries, where job switching is twice as common and less likely to lead to wage increases (Donovan et al., 2020).

Low retention can be firm- and worker-induced. Firms may use the beginning of employment spells as an extension of the screening process to select high-ability workers, especially in contexts with weak labor force regulation (Donovan et al., 2020; Bick et al., 2018). Workers may quit jobs if they encounter challenges or have unrealistic expectations. They may also select into informal sector jobs or temporary formal sector employment, which are more flexible but are less stable and offer fewer benefits. These jobs are particularly attractive to young workers who may not aware of or discount benefits of future wage increases and access to social security programs.

In Mexico, like in other middle economy countries, youths represent a large and growing proportion of the labor-force. They are disproportionately affected by high unemployment rates, high levels of turnover and informality, and disadvantaged labor conditions. At present, Mexican youths face unemployment rates that are two to three times higher than for other age groups. One critical period is the school to labor market transition, which has long-lasting effects on confidence, work readiness, and earnings (Oreopoulos et al., 2012).

When young people enter the labor market, they choose between different career paths. Jobs in the informal sector may be easier to obtain and offer short-term benefits including relatively high starting wages and more flexibility. Among employed youth in Mexico, 67 percent work in the informal sector, which is 10 percentage points higher than for the working-age population (INEGI, 2017). This is concerning because informal work provides less job security, no access to social security programs and lower wage growth. It is also not a stepping stone to formal work (Levy, 2010). It is unclear to what extent the high rates of informality and turnover are choices of youths and, if so, whether active labor market policies can help them transition into more stable formal sector career paths.

In this paper, we test whether a temporary employment incentive encourages secondary school graduates to seek and stay in formal sector jobs. Entry-level wages in these jobs are relatively low and stand about 10% (25%) below the median (mean) reservation wages of school leavers. However, over the course of the first year, wages grow by almost 40%. To address the initial (wage) disincentive of formal sector jobs, we design an employment incentive that pays workers the equivalent of 20% of the average monthly wage for up to six

months if they hold a formal job. Given an average wage increase of almost 25% over the first six months in our setting, the majority of beneficiaries receive a higher wage *after* the bonus expires than the joint salary and bonus at the beginning of their employment spell. Temporary incentives may thus lead to long-run employment gains as they help youths to accept and retain formal sector jobs with low starting salaries.

We conduct an experiment in partnership with the Mexican Department of Education to test the effectiveness of this employment incentive in a sample of almost 2,000 graduating students across 13 secondary schools in San Luis Potosi, Mexico. Importantly, about 56% of our sample plans to work after graduating, while the remaining 44% plan to continue their studies. We randomly assign half of all students to be eligible for the wage incentive and test its effect on employment outcomes over two years using high frequency administrative and survey data.

We offer four main results. First, the employment incentive does not lead to (short-run) changes in employment for graduates planning to continue their education. This is an important finding for policymakers who are concerned that programs that offer (short-term) benefits to assist school leavers may have unintended consequences, especially among beneficiaries with high discount rates. By contrast, the incentive has large employment effects for graduates planning to enter the labor market. After one year 6.8 p.p. (12%) more likely to have been formally employed. Importantly, this effect is exclusively driven by a 10.4 p.p. (27%) increase in jobs with permanent contracts, while the share with of people with temporary contracts remains unchanged. These differences persist after two years.

Third, in addition to increasing job finding rates, the incentive also improves short-term worker retention. After six months, the hazard rate in the treatment group is 19% lower than in the control group. This reduction in turnover presents some of the first evidence on worker-induced gains in retention. However, we observe a convergence of hazard rates after the incentive expires.

These effects on job finding rates and retention translate into sizeable gains in work experience and income over the first two years. After one year, people in the treatment group intending to enter the workforce have accrued 0.63 more months (18%) of formal sector employment. After two years, this figure has increased to 1.01 months. Importantly, when people switch jobs they do not experience a drop in wages, suggesting that the gains from work experience are not tied to a specific employer. These employment effects lead to important income gains. The average daily income increased by 13.8% (9.6%) over the first (second) year.

Fourth, we provide evidence for the underlying mechanisms of these effects. We find evidence that high wage expectations are a binding constraints for graduates' career choices. The shift from temporary to permanent contracts is entirely driven by job seekers with reser-

vation wages just above formal sector starting salary levels. One explanation is that these people face more pressure to accept temporary jobs, which pay 10–15% higher wages in the first six months. Consistent with the importance of these short-term benefits, we find that people in our study population have very high discount rates.¹ The wage incentive program allows them to shift to lower-paying jobs with permanent contracts. This matters, not least because jobs with permanent contracts offer more long-run benefits. We also find evidence that these types of jobs help to protect workers from adverse income shocks like the COVID-19 pandemic.

By contrast, we find no evidence that the incentive affects firm selection. Comparing high school grades between employed youths in the control and treatment group shows no differences in who is hired, suggesting that the marginal student nudged into formal employment by the incentive is similar to average hires. In addition, there are no differences in wage trajectories of employed people in the control and treatment group suggesting that the incentive did not affect human capital accumulation or firm selection on the job.

Our study contributes to a growing literature on the effectiveness of active labor market policies (ALMPs). Programs addressing compensation can be categorized into firm subsidies seeking to boost employer demand or supply-side initiatives designed to encourage job seekers to find and retain employment (Bordos et al 2015). While the overall evidence on the effectiveness of ALMPs in developing countries is mixed (McKenzie, 2017), a recent meta-analysis suggests that simple programs like employment incentives that provide clear incentives seem to be most effective (Card et al., 2018). Existing evidence on employment incentives mainly stems from developed countries and finds mixed results.² Less is known about the effect of employment incentives in developing countries, where labor market frictions are particularly prevalent. Two important exceptions are Groh et al. (2016) and Abel, Hanna, and Pande (2021). Groh et al. (2016) find that in the context of Jordan, a six-month wage subsidy paid to firms increases employment but that these effects disappear once the incentive expires. In a large-scale experiment, Abel et al. (2021) find that offering a large employment bonus to welfare recipients in Saudi-Arabia leads to small increases in job search but does not affect employment. One explanation for these muted effects, similar to Klaaw and Ours (2011), is that beneficiaries receive the bonus only after they hold a job for a certain period of time.³

¹This explanation is consistent with Oreopoulos et al. (2012) who find that people from disadvantaged backgrounds are particularly adversely affected by graduating during recessions.

²In the US, cash bonus programs during the 1980s had mixed results (). The Earned Income Tax Credit (EITC), which provides monetary incentives to low-income working parents, led to ADD (Eissa Hoynes 2005, Wilson 2018, Rothstein 2008). In Canada, Card and Hyslop (2005) find that a program that provides subsidies for full-time work to single parents who were welfare recipients has short-term positive effects on employment, which faded out after 18 months. In the Netherlands, Klaaw and Ours (2011) show that offering cash bonuses to welfare recipients who find and keep a job for at least six months has no effect on employment.

³Other studies find no or small effects of wage subsidies in the context of Argentina (Galasso et al., 2004) and South Africa (Levinsohn et al., 2014). However, one reason for the muted effect is that firms failed to

We advance this literature in several ways. First, to the best of our knowledge, we are the first to test the effect of a wage incentive for school leavers for whom the transition to the labor market is particularly challenging. Targeting people *before* they enter the labor market is important given that the first job has important implications for long term career outcomes. Second, in contrast to other contexts, our study population experiences rapid wage growth over the first year on the job, which makes a (temporary) incentive scheme particularly promising. The incentive is paid monthly and thus addresses concerns that beneficiaries may heavily discount future payouts. Finally, in contrast to most studies, our analysis uses monthly social security data. High-frequency administrative data is important to trace out employment effects over time and address concerns related to attrition and surveyor demands effects, which may be particularly prevalent in studies of employment incentives (McKenzie, 2017).⁴

We also contribute to a nascent literature that explores the role of worker retention in developing countries. In line with Donovan et al. (2020) our findings suggest that high turnover does not represent a reallocation of workers to more productive jobs. Instead, we find that transitions between jobs are associated with a negligible or null increase in wages. A temporary wage incentive can induce workers to choose more stable career paths with larger wage growth. Donovan et al. (2020) and Bick et al. (2018) conclude that the steeper wage-tenure profiles in developing countries is less likely to be the result of human capital accumulation and more likely the effect of selection in the presence of uncertain match quality (Jovanovic, 1984). However, we show that at a very early career stage, a pure worker incentive lowers turnover. This is inconsistent with predictions from pure firm selection models since employers are unaware of the intervention suggesting that any effects must operate through behavior changes of applicants.

Overall, our study provides some of the first evidence on the importance of the first job in developing countries. Evidence from the U.S. shows that getting on the right career trajectory has long lasting positive effects on graduates' careers and income (Oreopoulos et al., 2012). We find that a temporary subsidy can nudge graduates to accept formal sector employment with permanent contracts leading to important gains in work experience.

process the benefits. This is an important rationale for paying incentives directly to workers.

⁴Survey demand effects refer to participants wanting to please researchers. This is particularly concerning if only the treatment group benefited from a program. Along similar lines, attrition can lead to biased results if beneficiaries use monetary resources to migrate for work (Baird et al., 2016) or if participants are less willing to complete surveys once they found a job.

2 Background

2.1 Mexican Labor Market

The Mexican labor force is comprised of just over 50 million people (ENOE 2017). The unemployment rate prior to the COVID pandemic was roughly 3.5% (INEGI 2017), and among the employed population, 56.5% worked informally. Youths are especially affected by unemployment, informal employment, and precarious work conditions. Employed youth receive lower salaries than the rest of the labor force (ENOE 2017). A survey of youth exiting high school found that roughly one-third received a lower salary than they expected when they starting working (INEGI 2013). In addition, youth unemployment was around 6% pre-COVID, close to double that of the general working population. Youth represent over half of the unemployed, which according to an INEGI survey is largely driven by a lack of experience and by youths' personal decisions to leave their job (INEGI 2017). Finally, informal employment is higher among employed youth (60.5%) (INEGI 2017; IMJUVE 2017). Informal employment is associated with lower wages, job instability, and exclusion from social security schemes.

2.2 Youths Unemployment and Transitions

Despite the disadvantages of informal employment, it is a dominant entry point into the labor market. Table 1 depicts transition probabilities between non-employment and formal / informal employment across quarterly panel data from 2018 and 2019 national labor surveys (ENOE) for youths aged 18-21. The figures estimate average transition probabilities from one quarter to the next, conditional on initial status type.

Table 1: Transitions among young (18-21 years old) between work statuses

	No work	Informal work	Formal work	Total
No work	78.93	15.43	5.64	100
Informal work	26.37	63.07	10.56	100
Formal work	15	14.92	70.07	100
Total	53.06	29.09	17.85	100

Notes: Author's calculations using panel data from 2018 and 2019 ENOE surveys. Table presents the average probability of maintaining or changing work status from one period to the next. The rows reflect the initial status, and the columns reflect the final status. Interpretation: on average, 78.93% of youth without work in period t remained without work in the next time period t+1. Youth are followed for four quarters (3 month periods) between 2018 and 2019 in staggered cohorts. Estimates are not weighted; no controls for cohort.

As can be seen in the table, youth without employment are almost three times as likely to be informally employed than formally employed in the following period (15.4% vs. 5.6%). At the same time, informal employment is less stable: informally employed youth are almost

twice as likely to no longer be employed in the following period than formally employed youth (26.4% vs. 15%). Finally, 10.6% of people transition from informal work to formal work. While this is larger than the probability of transitioning to formal work from non-employment (5.6%) it is small in magnitude and less than the likelihood of transitioning from formal to informal employment (14.9%).

In sum, evidence suggests that informal work is not a stepping stone to formal work for youth, and that the informally employed are prone to greater employment instability. These findings are in line with recent evidence by Donovan et al. (2020) who show that across developing countries transitions between jobs are more common and are less likely to lead to wage gains than in developed economies. Similar to other contexts, choices over career paths have long-lasting effects on employment prospects and earnings (Oreopoulos et al., 2012). This may be particularly important in the school to labor market transition. One reason is that different career paths offer different wage trajectories.

2.3 Formal Sector Wage Growth

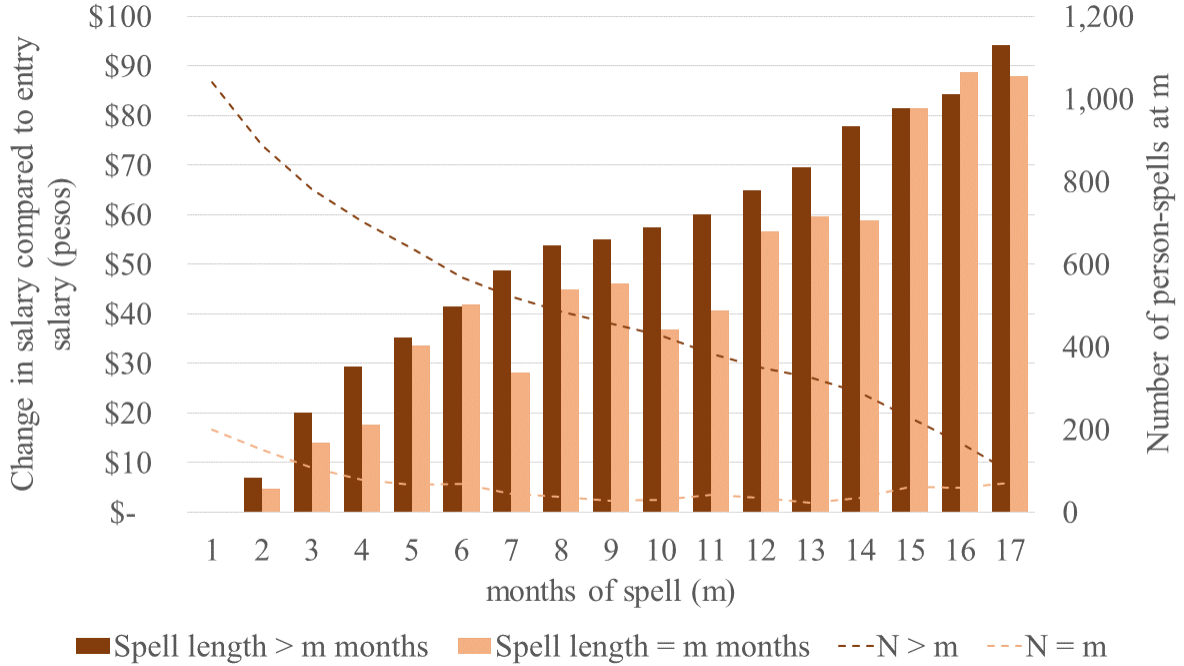
Using data from a national employment survey, Figure A1 shows that entry level wages for young job seekers are comparable for the informal and formal sector. Results (not reported) show that starting wages in the informal sector are larger than those in the formal sector once we control for job seeker characteristics like education. One potential reason for why firms are able to offer higher starting wages is that they do not need to pay social security contribution for informally hired workers. In addition to eligibility for social security benefits, wages in the formal sector increase over time while those in the informal sector stay constant (Figure A1).

Figure 1 shows the average wage growth for formally employed people in our study population of school leavers. In order to test how much of the observed wage growth is driven by firm selection over time, we show wage increases separately for people who exit in a given month (light) versus those that retain their job (dark). There are several stylized facts. First, there is substantial wage growth at the beginning of school leavers' careers. After six months, wages have increased by 25%. While the wage growth slows down slightly afterwards, we still see large gain of 35% after 12 months and 45% after 18 months.

Second, we find that the marginal person leaving the job in a given month experiences less job growth than the average person at that point. This pattern is consistent with selection models. Either firms screen hired workers as proposed by Donovan et al. (2020) or workers with lower match quality select to exit the employment relationship. However, while wage gains for leavers tends to be only 50-80% of workers' staying on the job, it is still sizable.

This pattern suggests that temporary may be effective in increasing retention by making formal sector more attractive at the early career stage when salary levels are low but quickly increasing. In the next section, we will describe our intervention, which pays beneficiaries a wage increase of about 20% for up to six months. Figure 1 shows that after six months the

Figure 1: Formal Sector Wage Growth



Notes: Notes: Graph depicts mean salary change from entry salary for formal employment spells lasting exactly m months compared to spells lasting more than m months. Formal employment spells continue counting through smooth transitions between formal work employers. N reflects person-spells: many youth have multiple spells of varying lengths. Total youth with $N \geq m$ is 845, total youth with $N = m$ is 924. Total youth with at least one month of formal employment is 924. Full sample of formally employed youth (both treatment and control) .

average wage increase is 25% thus exceeding the starting the average compensation *inclusive* of the incentive.

In sum, these results highlight two important objectives for labor market policies. First, reduce the flow of low-income youth into more precarious informal employment by supporting their transition from school to formal employment. Second, within the formal sector, policies need to address low retention to facilitate on the wage learning and allow youths to experience wage growth that may thus induce more stable employment relationships.

3 Experimental design

3.1 Sample

Our study population includes schools that meet the following requirements: they are located within 80km of the industrial zone of San Luis Potosi, had beneficiaries of the Prospera con-

ditional cash transfer program, and had in the previous year more than half of the 12th-grade students who reported that they planned to work (either full or part-time) after graduation. The research team gave the list of 13 eligible schools to the Ministry of Education, which informed selected schools about the program and invited them to participate. Schools that agreed to participate then informed parents and legal guardians about the study in order to authorize their children’s participation. The research team then scheduled activities together with each school principal to avoid conflicts with exam dates and other events.

In the last months of the school year, students enrolled in 12th grade are asked for consent and surveyed one-to-one to learn about their baseline sociodemographic characteristics, employment trajectory, career expectations, socioemotional skills, among others. Table 2 shows baseline characteristics of our sample: 50% of participants are female. The average age is 17.8 years and only 2.2% are married. Approximately half have internet at home, and live in households with on average on care. Over half (56%) planned to work or work and study after high school and 37% had a job at baseline.

3.2 Randomization Design

Figure 2: Experimental Design and Timeline

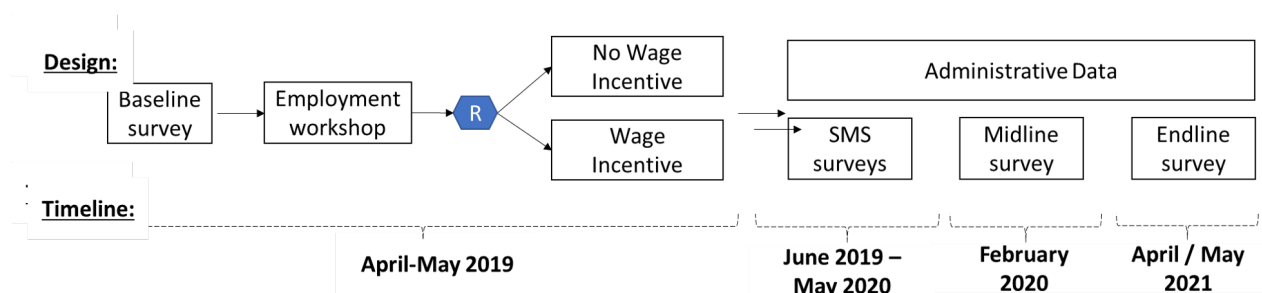


Figure 2 shows the overall experimental design. Of the 1,924 individuals for whom baseline data was collected, 970 were randomly assigned (stratified by gender and school type) to the wage bonus treatment and 954 individuals to the control group. Table 2 shows average baseline characteristics for the control and treatment group. Of the 20 variables, one difference is significant at the 5% level and one at the 10% level suggesting that randomization was successful. This evaluation design provides us with a minimum detectable effect size of 0.11 standard deviations, which is sufficient to detect treatments that are small to moderate in magnitude.

Table 2: Balance Table

Variable	Total		Wage bonus treatment (1)		Wage bonus control (2)		Difference (1)-(2)
	N	Mean/SE	N	Mean/SE	N	Mean/SE	
Female	1924	0.501 [0.011]	970	0.499 [0.016]	954	0.503 [0.016]	-0.004
Age (mean)	1924	17.811 [0.017]	970	17.781 [0.023]	954	17.842 [0.026]	-0.060*
Married	1924	0.022 [0.003]	970	0.026 [0.005]	954	0.019 [0.004]	0.007
Caregiver	1924	0.221 [0.009]	970	0.223 [0.013]	954	0.220 [0.013]	0.003
Home internet	1924	0.484 [0.011]	970	0.476 [0.016]	954	0.493 [0.016]	-0.016
Number of bathrooms in household	1923	1.147 [0.013]	970	1.140 [0.018]	953	1.153 [0.019]	-0.013
Number of bedrooms in household	1924	3.145 [0.024]	970	3.121 [0.034]	954	3.170 [0.034]	-0.049
Number of cars in household	1924	1.031 [0.021]	970	1.044 [0.031]	954	1.018 [0.028]	0.027
Household SES well-being score (mean)	1924	139.606 [0.932]	970	139.024 [1.316]	954	140.197 [1.321]	-1.173
Number of earners in household	1914	1.990 [0.024]	964	1.971 [0.034]	950	2.008 [0.033]	-0.037
GRIT Score	1924	3.536 [0.012]	970	3.574 [0.017]	954	3.498 [0.016]	0.076***
Attends mixed school (tecnologica)	1924	0.597 [0.011]	970	0.601 [0.016]	954	0.593 [0.016]	0.008
Attends vocational school (tecnico)	1924	0.203 [0.009]	970	0.200 [0.013]	954	0.205 [0.013]	-0.005
Attends academic school (general)	1924	0.200 [0.009]	970	0.199 [0.013]	954	0.201 [0.013]	-0.002
Commute time from home to downtown	1924	0.759 [0.010]	970	0.748 [0.014]	954	0.771 [0.015]	-0.023
Plans to work after high-school (<i>incl. work and study</i>)	1924	0.557 [0.011]	970	0.553 [0.016]	954	0.561 [0.016]	-0.008
Plans to study only after high-school	1924	0.435 [0.011]	970	0.438 [0.016]	954	0.432 [0.016]	0.006
Has a job at baseline	1924	0.372 [0.011]	970	0.371 [0.016]	954	0.372 [0.016]	-0.001
Has held a formal job (contract and benefits)	1924	0.182 [0.009]	970	0.177 [0.012]	954	0.188 [0.013]	-0.010
Reservation wage (mean)	1924	4678.810 [74.817]	970	4635.237 [99.897]	954	4723.114 [111.617]	-87.877
F-test of joint significance (F-stat)							1.203
F-test, number of observations							1913

Notes: The value displayed the Difference column are differences in the means across the groups. *, **, *** indicate t-test significance at the 10, 5, and 1 percent critical level. The value displayed for F-tests are the F-statistics. Standard errors are robust. Household vulnerability score is based on the national Mexican AMAI measure which considers the number of bathrooms, bedrooms, cars, and employed persons in the household, as well as internet access and head of household education level. Lower scores indicate greater vulnerability

3.3 Intervention

Two to four weeks after the baseline survey, all 12th-grade students in our sample were invited to a “Labor Market Information Workshop” (LMLW) during regular school hours within the school premises. The three-hour workshop led by the staff of the National Employment Service covers basic tools for job search and information about the local labor market context. Overall, 1,971 students participated in the workshop.⁵ At baseline (prior to the workshop), only 29% of the participants had any knowledge regarding the benefits offered by a formal job.

At the end of the workshop, based on the random assignment, students receive a package with different documents. Students either receive a personalized letter informing him/her whether he/she is eligible or not to receive financial support for employment in the formal labor market, as well as the instructions to register for this benefit (Annex D.2). All envelopes contained a prepaid Sí Vale gift card, by which students could receive a small monetary compensation for completing surveys. Before the end of the LMLW, students received instructions to open their envelopes and read their respective letter. The same day in school, immediately after the LMLW, individuals in the treatment group received a 15-minute talk delivered by The World Bank team to further explain the instructions about how to collect the wage bonus.

The amount of the wage bonus offered (\$900 MXN, around \$47 USD) is equivalent to 24 percent of the Mexican minimum wage and to 20 percent of the average monthly wage in an entry-level formal job. This bonus was paid on a monthly basis as a top-off to their salary for up to six months conditional on placement and permanence in a formal job. Beneficiaries need to provide identification documents and proof of formal employment before receiving payments.⁶ Importantly, the incentive was transferred directly to beneficiaries (using the Sí Vale card) and was not observable by potential or actual employers.

⁵Those that do not want to attend are assigned another activity by the school principal (like studying, completing classwork, etc.). The impact of the workshop will not be evaluated; however, process data and a participant’s survey was collected. Among participating students, 76% reports the LMLW was useful.

⁶Several actions were implemented to encourage wage bonus take-up. First, participants could claim the payment of the economic incentive remotely and could electronically certify their formal employment status each month by sending a digital copy of the documentation requested. The project team put a digital mechanism in place to validate this documentation using public records. Second, the project designed and implemented a communications strategy to attend information requests, provide clarifications, share announcements regarding job openings and job fairs, and send reminders to participants through different channels such as SMS, WhatsApp, phone calls, and emails. Third, prepaid cards were distributed during the LMLW as a behavioral nudge to increase the salience of the wage bonus offer, as well as to improve the efficiency and reduce the costs associated with the distribution of subsidies. Take-up rates can be seen in Table A2

3.4 Data sources

We undertake two main rounds of data collection: a baseline survey (i.e. SES characteristics, professional trajectory, career expectations, socioemotional skills, etc.) prior to the workshop and a final follow-up survey to be completed in May 2021 to estimate effects of the program on various outcomes. Periodic two-way SMS messages are used to monitor participants' status and collect high-frequency information about employment trajectories of target youth. A midline survey was administered via phone to a randomized half of the sample in January and February 2020, with a 50 percent response rate. This draft focuses on administrative employment data.⁷

Our analyses employs administrative data that tracks whether employers register social security contributions on behalf of individual workers, which is required for formal work arrangements. The data are reported monthly and includes information on the type of contract the worker holds (temporary or permanent) and the daily salary reported by the employer. The administrative data is comprehensive of most private sector employees (with a few exceptions), but it excludes public sector employees' social security contributions as these are managed through a different agency. Given that the public sector is small in San Luis Potosi and less than 5% of the study sample report a public sector job, we do not anticipate that this omission substantially alters program impacts. We consider the use of administrative data as an important contribution of this paper. Most existing studies from developing countries in this literature rely on self-reported employment data, which are prone to surveyor demand effects and recall biases. High-frequency administrative data also allows us to accurately estimate cumulative treatment effects on work experience and income.

3.5 Empirical specifications

Our main specification allows us to identify the effects of the offer of a wage bonus on entry into and stability of formal employment, as well as job tenure, contract type, and salary among those with formal employment.

Our preferred specification is:

$$y_{it} = \beta treat_i + \theta_i + \epsilon_i \quad (1)$$

where y_i is the outcome of interest during a specified time period t for worker i . $treat_i$ is equal to one if worker i received the offer of a wage bonus at baseline. θ_i is a set of stratifying covariates. As the randomization design included stratification by gender and school type (academic, vocational, or mixed), full-sample models include these variables in the model specification. Standard errors are robust.

⁷All the instruments are written in Spanish; they have been translated to English for IRB review purposes (Annex B) and fidelity of translation can be attested by the principal researchers who are bilingual.

We vary the specified time period so as to examine both cumulative effects of the wage bonus treatment (for example, cumulative gains in formal work experience over the study period) as well as the evolution of treatment effects across time (for example, wage trajectories across employment spells). The panel format of the administrative social security dataset allows for both such approaches.

To analyze job retention we apply an extension of the Cox proportional hazards model that accounts for recurrent events and discontinuous risk intervals associated with multiple entries into and exits from formal work. In this specification, the hazard of exiting formal work is:

$$h(m) = \beta \text{treat}_i + \epsilon_i \quad (2)$$

where $h(m)$ is the hazard of exit at month m . The data are structured to account for multiple discontinuous risk periods per individual, and standard errors are clustered at the individual level.

4 Results

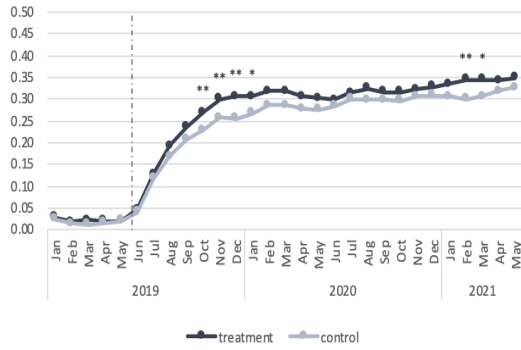
4.1 Employment

The top panel of Figure 3 shows formal sector employment rates in aggregate (Panel A) and split by whether students plan to enter the labor market or continue to study at the time of baseline (Panel B). We find that large and statistically significant formal employment effects appear starting in October 2019, approximately four months after students graduate, and are maintained through January 2020. During this four-month period, youth in the wage incentive arm are 4-5 p.p. (18-20%) more likely to be formally employed than youth in the control group. However, by February 2020, employment rates start to converge and treatment effects on formal employment are smaller (1-3 p.p.) and no longer significant.

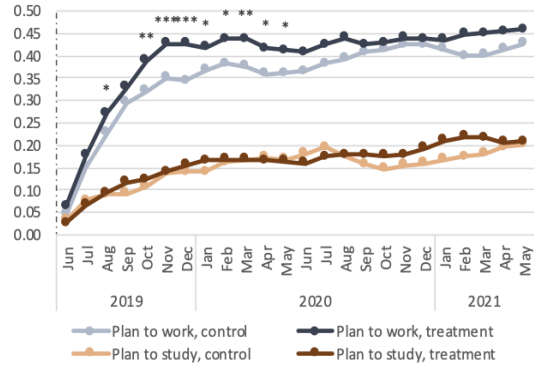
These aggregate results mask important differences by the type of formal employment. Panel (c) and (d) of Figure 3 show that the increase in overall formal employment is exclusively driven by an increase in employment with permanent contracts. Statistically significant positive effects on employment with permanent contracts appear as early as August 2019 (just two months after high school graduation), and persist through the middle of 2021. The effects range from 2.6-5.2 p.p., indicating that across this period, youth in the wage bonus treatment group are anywhere from 21% to 34% more likely to be formally employed with a permanent contract than control group youth. By contrast, Panel (e) and (f) show that jobs with temporary contracts do not differ between the treatment and control group over this period (Figure 3).

Table 3 reports average treatment effects on ever having formal employment (Col. 1), permanent contract (Col. 2-3), and temporary contracts (Col. 4-5) over the first six, twelve, 18 and 24 months after the intervention. The effect of the incentive on the share that ever held

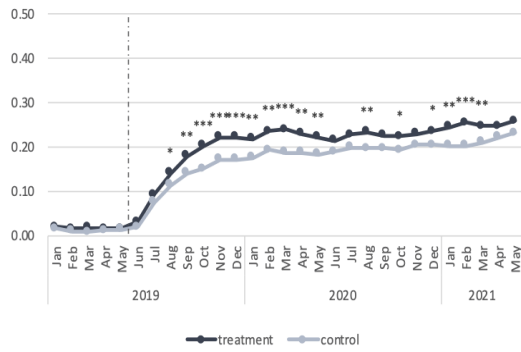
Figure 3: Employment impacts of wage bonus treatment, overall and by baseline plans



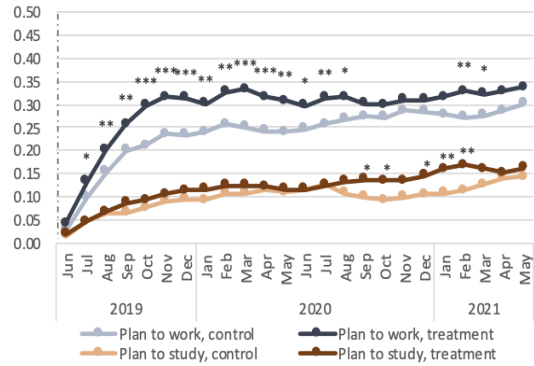
(a) Share with formal work by treatment



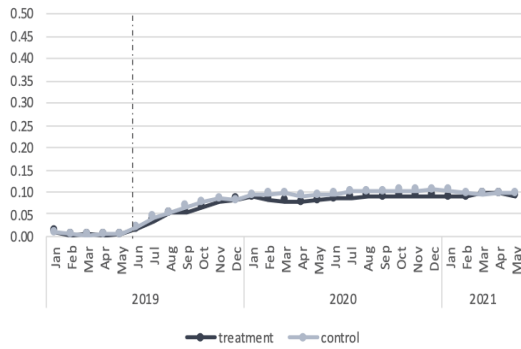
(b) Share with formal work by treatment and baseline plans



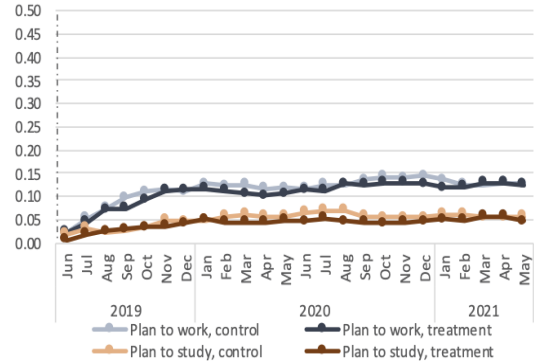
(c) Share with permanent contract by treatment



(d) Share with permanent contract by treatment and baseline plans



(e) Share with temporary contract by treatment



(f) Share with temporary contract by treatment and baseline plans

Notes: Source: Administrative data from the Instituto Mexicano del Seguro Social (IMSS). Universe includes all treatment and control youth who had formal work for at least one month during the study period. Note that while the IMSS covers most most workers with formal employment, it does not include public sector workers or workers in the XX industries. Baseline plans to work refer to those who at baseline planned to work or work and study after June 2019. Baseline plans to study refer to those who at baseline planned to only study. The vertical dotted line in panels (a), (c), and (e) indicates the start of the wage bonus intervention.

formal work is relatively stable, ranging between 5.7 and 6.8 p.p. (11–14%). This is driven by a 7.8 to 10.4 p.p. (19–27%) increase in the share of jobs with permanent contracts. By contrast, the share with temporary contracts is not affected over this period.

The next two sections look at the two most commonly used measures of match quality: retention and wages. These measures are important to both workers and firms. For workers they present stability and income. For firms, longer employment spells lead to cost reductions and increases in worker productivity as reflected by steady wage increases.

4.2 Retention and Work Experience

To analyze the effect of the wage incentive on job retention, we estimate a Cox proportional hazards models for discrete recurrent events, such as losing employment. Figure 4 shows hazard rates for the treatment and control group pooled across temporary and permanent jobs. We find that the treatment has modest positive effects on employment for the first eight months on the job. The share still in employment after three and six months is about 8 p.p. (11-15%) higher in the treatment group. Afterwards, the rates start to converge and hazard rates are only marginally larger in the wage incentive group.

Figure 5a shows divides the hazard analysis into jobs starting with permanent contracts (Panel A) and temporary contracts (Panel B). There is no discernible difference for the treatment group for permanent contracts. By contrast, among youths who started working with a temporary contract, those who were offered the wage bonus have a statistically significant 36% lower risk of recurrent exits from employment during the study period. This is partly explained by the fact that treatment youths are more than twice as likely to transition from temporary to permanent contracts. In sum, we find that the wage incentive both shifts people into jobs with permanent contracts and increases retention among those with temporary contracts, possibly because youths have more discretion on whether they hold on to these temporary work arrangements.

Column 4-6 in Table 3 shows that the wage incentive increases the time in formal employment for people with plans to enter the labor market by about 0.7 months or 20% over the first year. This is driven by a 0.8 months (30%) increase in time the treatment group spends in jobs with permanent contracts (Column 5). By contrast, work experience in temporary employment is unchanged (Column 6). These differences slightly increase by the 24 month mark suggesting that even though job employment rates converge, the incentive leads to meaningful differences in work experience over time.

In sum, the wage bonus treatment effects leads to an increase in work experience, which is driven by both an increase in the share of people with employment and a modest reduction on turnover (conditional on being employed). Gaining labor market experience is particularly important for the critical stage of the school to work transition, which may have long-run benefits that we will explore with administrative data in future work.

Table 3: Cumulative Employment Effects

Period: June 2019-November 2019								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Ever had formal work	Ever had perm contract	Ever had temp contract	Months with formal work	Months with perm contract	Months with temp contract	Avg daily wage	Avg change in daily wage
Incentive	0.061** (0.030)	0.087*** (0.029)	-0.015 (0.022)	0.268** (0.118)	0.321*** (0.107)	-0.048 (0.073)	12.928** (6.573)	3.647** (1.786)
Control group mean	0.046 0.432*** (0.021) 0.000	0.003 0.297*** (0.020) 0.000	0.496 0.166*** (0.016) 0.000	0.024 1.393*** (0.081) 0.000	0.003 0.925*** (0.071) 0.000	0.518 0.469*** (0.053) 0.000	0.049 85.457*** (4.510) 0.000	0.041 8.978*** (1.149) 0.000
Observations	1071	1071	1071	1071	1071	1071	1071	1071
R-squared	0.004	0.008	0.000	0.005	0.008	0.000	0.004	0.004
Period: June 2019-May 2020								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Ever had formal work	Ever had perm contract	Ever had temp contract	Months with formal work	Months with perm contract	Months with temp contract	Avg daily wage	Avg change in daily wage
Incentive	0.068** (0.030)	0.104*** (0.030)	-0.021 (0.024)	0.626** (0.263)	0.753*** (0.238)	-0.109 (0.173)	14.646** (7.207)	4.477 (2.951)
Control group mean	0.025 0.514*** (0.022) 0.000	0.001 0.379*** (0.021) 0.000	0.385 0.202*** (0.017) 0.000	0.017 3.581*** (0.183) 0.000	0.002 2.393*** (0.160) 0.000	0.530 1.191*** (0.125) 0.000	0.042 110.671*** (5.029) 0.000	0.130 21.686*** (2.224) 0.000
Observations	1071	1071	1071	1071	1071	1071	1071	1071
R-squared	0.005	0.011	0.001	0.005	0.009	0.000	0.004	0.002
Period: June 2019-November 2020								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Ever had formal work	Ever had perm contract	Ever had temp contract	Months with formal work	Months with perm contract	Months with temp contract	Avg daily wage	Avg change in daily wage
Incentive	0.057* (0.030)	0.078** (0.030)	-0.014 (0.026)	0.810** (0.410)	0.983*** (0.372)	-0.159 (0.273)	11.971 (7.428)	5.252 (4.068)
Control group mean	0.057 0.578*** (0.021) 0.000	0.011 0.447*** (0.022) 0.000	0.603 0.243*** (0.019) 0.000	0.048 5.964*** (0.288) 0.000	0.008 3.998*** (0.255) 0.000	0.562 1.978*** (0.199) 0.000	0.107 129.392*** (5.242) 0.000	0.197 33.821*** (2.918) 0.000
Observations	1071	1071	1071	1071	1071	1071	1071	1071
R-squared	0.003	0.006	0.000	0.004	0.006	0.000	0.002	0.002
Period: June 2019-May 2021								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Ever had formal work	Ever had perm contract	Ever had temp contract	Months with formal work	Months with perm contract	Months with temp contract	Avg daily wage	Avg change in daily wage
Incentive	0.068** (0.029)	0.091*** (0.030)	-0.014 (0.027)	1.012* (0.549)	1.226** (0.500)	-0.194 (0.369)	13.836* (7.701)	3.941 (4.712)
Control group mean	0.020 0.617*** (0.021) 0.000	0.003 0.482*** (0.022) 0.000	0.615 0.271*** (0.019) 0.000	0.065 8.445*** (0.388) 0.000	0.014 5.697*** (0.345) 0.000	0.600 2.764*** (0.268) 0.000	0.073 144.730*** (5.485) 0.000	0.403 46.007*** (3.375) 0.000
Observations	1071	1071	1071	1071	1071	1071	1071	1071
R-squared	0.005	0.008	0.000	0.003	0.006	0.000	0.003	0.001

Notes: Standard errors are robust, *** p<0.01, ** p<0.05, * p<0.1. Source: Administrative data from the Instituto Mexicano del Seguro Social (IMSS). Universe includes youth with baseline plans to work or to work and study. Note that while the IMSS covers most most workers with formal employment, it does not include public sector workers or workers in the XX industries. * p < 0.10, ** p < 0.05, *** p < 0.01

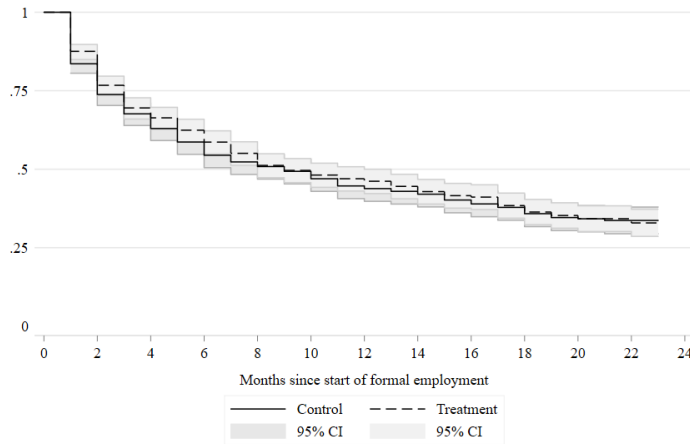
Table 4: Wage bonus treatment effect on survival in employment

Panel A. Discrete recurrent hazard models of employment outcomes, follow-up through May 2021, capped spell length			
	Exited formal employment (1)	Exited formal employment initiated with a permanent contract (2)	Exited formal employment initiated with a temporary contract (3)
Wage bonus treatment	-0.187** (0.092)	-0.073 (0.108)	-0.494*** (0.174)
Observations (person-spells)	1213	861	352
Universe	Youth with formal employment by Nov 2020	Youth with perm contract by Nov 2020	Youth with temp contract by Nov 2020

Panel B. Discrete recurrent hazard models of employment outcomes, follow-up through May 2021, NO capped spell length			
	Exited formal employment (1)	Exited formal employment initiated with a permanent contract (2)	Exited formal employment initiated with a temporary contract (3)
Wage bonus treatment	-0.054 (0.075)	-0.018 (0.088)	-0.261* (0.137)
Observations (person-spells)	1413	1008	405
Universe	Youth with formal employment in study period	Youth who started a spell with a perm contract	Youth who started a spell with a temp contract

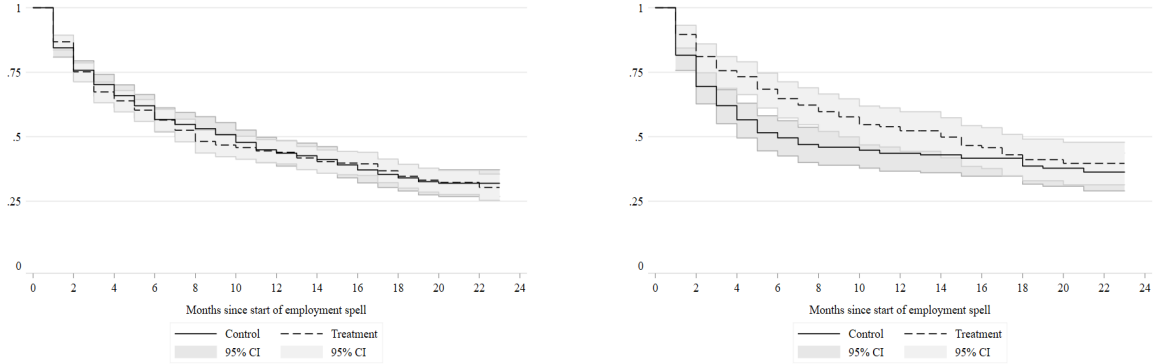
Notes: Panel A. Standard errors clustered by ID are in parentheses. Coeff/(SE)/PVAL. *** p<0.01, ** p<0.05, * p<0.1. Only employment spells beginning on or before November 2020 are included. Spells are truncated at month 7, allowing for 6 months of tenure after the initial month. Panel B. Clustered standard errors in parentheses. Coeff/(SE)/PVAL. Data source: IMSS administrative data. * p < 0.10, ** p < 0.05, *** p < 0.01

Figure 4: Employment stability: Hazard rates for formal employment



Notes: Source: Administrative data from the Instituto Mexicano del Seguro Social (IMSS). Kaplan-Meier survival function with discrete discontinuous recurrent events. Discrete discontinuous recurrent hazard model allows for individuals to experience multiple discrete events (i.e. a youth may have several discrete employment spells ending in an exit from employment). Observations person-spells. The graph depicts survival in a continuous spell of formal employment. The universe includes 924 youth who had formal work for at least one month during the study period (June 2019-Dec 2020). Total youth sample is 1,924. Note that while the IMSS covers most most workers with formal employment, it does not include public sector workers.

Figure 5: Formal work stability by contract type: Survival in employment



(a) Survival in formal employment spell initiated with a permanent contract (b) Survival in formal employment spell initiated with a temporary contract

Notes: Source: Administrative data from the Instituto Mexicano del Seguro Social (IMSS). Kaplan-Meier survival function with recurrent events. Recurrent hazard model allows for individuals to experience multiple exit events. Observations are person-spells. The universe for (a) includes 705 youth who initiated at least one employment spell with a permanent contract during the study period (June 2019-Dec 2020), while the universe for (b) includes 359 youth who initiated at least one employment spell with a temporary contract during the study period. Total youth sample is 1,924. Note that while the IMSS covers most most workers with formal employment, it does not include public sector workers or workers in the XX industries.

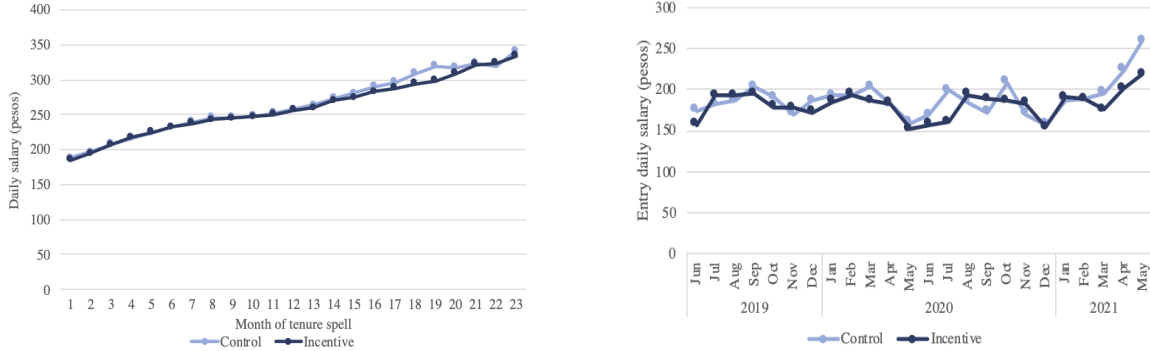
4.3 Wages

Figure 6a shows the wage trajectory for formal sector workers in the control and treatment group. Two things stand out. First, wage increases are almost identical between treatment and control groups over the first twelve months on the job.⁸ However, there are substantial monetary benefits from having a permanent contract that are not captured in the IMSS data.

Table 3 shows that people in the incentive group earn on average about 15% higher wages in the first year (Col. 7). Figure 6b decomposes these aggregate effects into changes in wage growth on the job versus changes in starting salaries over the study period. Panel (a) shows a steep salary-tenure gradient: after six months on the job, wages have increased by more than 20%. After nine and twelve months, wages have grown by 30% and almost 40%, respectively. By contrast, Panel (b) shows that the average starting wages for jobs found do not vary over the study period and do not differ significantly by treatment assignment. These results imply that the earning income for the treatment group is based on the increase in employment experience, which brings people further along the steep salary-tenure gradient. This is confirmed by Col. 8 of Table 3 showing that the on the job wage change is about 20-30% larger for the treatment group.

⁸There is a slight divergence afterwards. However, this is driven by a very small group of people employed in the control group for this long period.

Figure 6: Salary growth vs entry salaries over time for youth with formal employment, by treatment group



(a) Average daily salary across months of tenure by treatment group (b) Average daily entry salary across month of entry by treatment group

Notes: Source: Administrative data from the Instituto Mexicano del Seguro Social (IMSS). Universe includes all treatment and control youth who had formal work for at least one month during the study period. Note that while the IMSS covers most most workers with formal employment, it does not include public sector workers or workers in the XX industries.

4.4 Mechanisms

This section explores several mechanisms for why the bonus is effective in increasing formal employment and shifting people to jobs with permanent contracts.

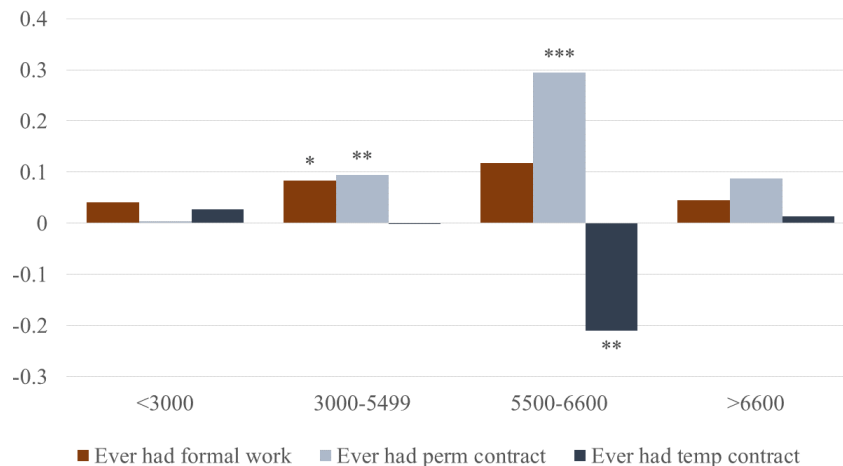
4.4.1 Reservation Wages

According to job search models, job seekers' reservation wage is the key parameter that determines whether they apply for and accept certain jobs (see e.g. Jovanovic (1984)). It has been speculated that high reservation wages may present one barrier for labor market entrants and explain why youths may not pursue careers with low starting wages, even if these are more stable and lucrative in the long-run.

We find supportive evidence for this explanation in our study population. At baseline, the average (median) reservation wage is 25% (10%) above the average starting wage of formal sector jobs. Youths may thus decide to either stay unemployed or accept jobs in the informal sector. If they decide to pursue formal sector work, they may opt for jobs with temporary contracts, which offer wages that are 10-15% higher in the first six months, but may not be as stable and offer fewer benefits to workers.

Figure 7 shows how treatment effects differ when we divide our sample by participants' baseline reservation wages. The lowest tercile with a reservation wage under 3,000 pesos shows

Figure 7: Wage bonus treatment impacts on employment outcomes of youth with baseline plans to work by reservation wage range



Notes: Standard errors are robust, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Source: Administrative data from the Instituto Mexicano del Seguro Social (IMSS), June 2019-May 2021. Reservation wages are monthly at in pesos. Universe is limited to youth who at baseline planned to work (including work and study) in June 2019. Note that while the IMSS covers most most workers with formal employment, it does not include public sector workers.

no aggregate treatment effect nor a switching between jobs with temporary and permanent contracts. The second group with reservation wages up to the average starting salary of 5,500 pesos has aggregate treatment effects of 8 p.p. driven exclusively by an increase in jobs with permanent contracts. The third group comprises participants with reservation wages of up to 20% above the average starting salary level, since this group should be most affected by the incentive if reservation wages are binding. We indeed find an aggregate employment effect of 12 p.p.. Strikingly, this masks a large switching from jobs with temporary to permanent contracts. By contrast, we do not observe the same pattern for people with higher reservation wages. Overall, this presents some of the first evidence that high reservation wages present a (binding) constraint for people’s career choices and that a temporary wage incentive can nudge people to accept work with permanent contracts.

4.4.2 Firm Selection

Last, it is notable that the wage growth is very similar for workers in the treatment and control group, suggesting that the incentive itself did not affect salary levels. This is unsurprising given that firms were never informed of the incentive (and thus could not offer lower wages in response) and because we observe similar wage growth in formal jobs with both temporary permanent and temporary contracts.

To further test whether the incentive operates through a firm selection mechanism, we analyze whether formal sector hires in the treatment and control group differ by their secondary school grades. Table 5 shows results from a regression in which we interact grades with a treatment dummy. The coefficient is close to zero and insignificant suggesting that the incentive does not operate through a screening mechanism.

Table 5: Firm Selection by Worker Ability

Outcomes	Ever had formal work		Ever had permanent contract		Ever had temporary contract	
	(1)	(2)	(3)	(4)	(5)	(6)
Incentive	0.028 (0.023)	-0.154 (0.267)	0.062*** (0.022)	0.067 (0.266)	-0.020 (0.019)	-0.265 (0.229)
High school grade		-0.069*** (0.024)		-0.056** (0.024)		-0.055** (0.021)
Incentive * High school grade		0.005 (0.033)		0.019 (0.033)		0.011 (0.028)
Constant	0.508*** (0.016)	1.111*** (0.196)	0.388*** (0.016)	0.871*** (0.193)	0.218*** (0.013)	0.686*** (0.176)
	0.000	0.000	0.000	0.000	0.000	0.000
Observations	1924	1357	1924	1357	1924	1357
R-squared	0.001	0.011	0.004	0.016	0.001	0.007

Notes: High school grade measures participants' performance during their final year of schooling. Standard errors are robust. Incentive refers to the wage bonus treatment offer * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

5 Concluding Remarks

We study the effect of a temporary wage incentive in a population of secondary school graduates. One potential concern for policies that offer immediate incentives is that it may distort decision making among agents, especially for investments for which returns only accrue in the more distant future. In the context of our study, the incentive may nudge youths to forego their plans to continue their education and instead enter the labor market directly. This may have adverse effects, especially in contexts with high returns to tertiary education.

We instead find that the incentive only affects the choices of students who intended to enter the labor market after graduation. We document large increases in formal employment driven by gains in jobs with permanent contracts. We are currently collecting survey data to learn more about whether people leave informal sector work or unemployment to fill these

positions.

Results in this paper point to the importance of high reservation wages in determining people’s career choices. Additional survey data will allow us to test for the importance of other mechanisms that may also explain our results. For example, youths may be unaware of the benefits of (permanent) formal employment, including social security benefits and large on-the-job wage growth. Alternatively, they may be aware of these facts, but may heavily discount future benefits. A deeper understanding of these mechanisms will inform how to best design employment incentives and other programs aimed at increasing (retention in) formal sector employment.

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A Appendix

Table A1: ADD TITLE

	Ever Employed			Experience (months)		
	(1) Formal	(2) Permanent	(3) Temporary	(4) Formal	(5) Permanent	(6) Temporary
Incentive	0.064** (0.033)	0.089*** (0.004)	-0.012 (0.648)	0.780** (0.031)	0.934*** (0.004)	-0.136 (0.572)
Observations	1071	1071	1071	1071	1071	1071
R square	0.00	0.01	0.00	0.00	0.01	0.00
Control Mean	0.56	0.42	0.23	5.13	3.44	1.70
Std Dev	0.50	0.49	0.42	5.87	5.18	4.04
Sample	PlanWork	PlanWork	PlanWork	PlanWork	PlanWork	PlanWork

P-values in parantheses. Standard errors clustered ...

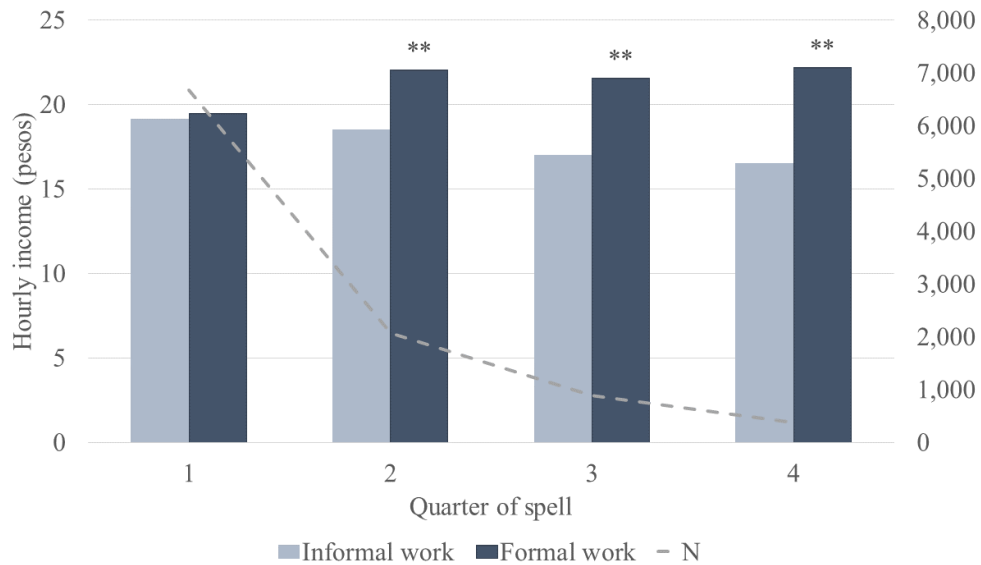
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A2: Take-up of the Incentive in the Treatment Group

Take-up by subgroups	Wage bonus treatment group		Wage bonus treatment group and baseline plans to work after high school		Wage bonus treatment group and had formal employment (IMSS)	
	No.	%	No.	%	No.	%
Initiated wage bonus registration by Aug 2021	366	37.7	265	49.4	287	55.2
Completed wage bonus registration by Aug 2021	274	28.2	207	38.6	240	46.2
Sent at least one paystub for wage bonus by Aug 2021	213	22.0	167	31.2	199	38.3
Received all 6 wage bonus payments by Aug 2021	147	15.2	114	21.3	137	26.3
Total	970	100	536	100	520	100

Notes: Table presents different measures of take-up depending on the universe considered eligible: (1) youth offered the wage bonus, (2) youth offered the wage bonus who had plans to work after graduation, or (3) youth offered the wage bonus who actually were eligible to claim it because they found a formal job at some point during the study period

Figure A1: Youth average hourly income across employment spell length, by type of employment



Notes: Clustered standard errors in brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Data source: ENOE. Sample includes all youth ages 17-20 from the first to last trimester of 2018 of the ENOE with either formal or informal employment at some point in 2018/2019 BUT who were not employed in the first survey. Employment spell length refers to the number of quarters a youth has been continuously employed in either formal or informal employment in the four quarters the youth is followed, regardless of whether the youth was employed prior to or after this period. Youth may have multiple spells, separated by gaps in employment or a change in employment type. Observations refer to the number of person*spell-segment observations in the sample, but the table output is weighted according to the ENOE expansion factor for the 1st observed quarter for each person. There are 4 cohorts which flag which of the 4 quarters in the period corresponds to a youth's first survey.