Willingness to Pay for Formal Job Attributes: A Discrete Choice Experiment In Colombian Mom-and-Dad Stores*

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October 3, 2024

Abstract

Informal workers are vulnerable to economic shocks since their jobs lack health and retirement benefits. Are workers informal because they do not value these benefits offered by formal jobs? Using a discrete choice experiment on a random sample of 2,900 "mom-and-dad" store owners and employees in Colombia, we estimate their willingness to pay (WTP) for formal employment benefits, namely health and retirement plans. We find that on average workers are willing to forego up to 28% and 37% of their earnings to access formal health and retirement benefits, respectively. In contrast to previous research, which suggests that workers' low WTP induced some of them to become informal under expansions of free or subsidized health insurance programs, our findings suggest that workers value these benefits and point to inflexibilities in the labor market and the rules governing the health and retirement systems as more important hurdles for workers to become formal.

JEL CODES: J46, J32, O17, O54
KEYWORDS: Informality, health, pensions, choice experiment

*We would like to thank Universidad del Rosario in Bogotá, Colombia and the Colombia Científica-Alianza EFI research program for generously including the experiment in the two rounds of the Estudio Nacional de Emprendimiento a Tenderos (ENET). In particular we thank Paul Rodríguez-Lesmes for his input at the design stage, Vincent Somville, Leonardo Garzón, and participants at the Bogotá Experimental Economics Conference 2020 and at the FAIR internal seminar at NHH Norwegian School of Economics for useful feedback. The IRB for this research was obtained under the umbrella of the ENET.

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1 Introduction

High levels of informality in an economy are associated with low productivity and growth. The International Labour Office (ILO) estimates that two billion or 61.2% of the world's workers work informally (ILO, 2018). Moreover, most of informal workers live in low- and middle-income countries, where informality rates reach almost 70%.[1] Having an informal job usually means that workers are unprotected when facing adverse economic shocks affecting their health or potential job losses, and when reaching retirement age. Workers are unprotected against these anticipated and non-anticipated events because informal jobs generally do not provide a work contract, or enrollment in health and retirement plans.

Some authors posit that social protection programs may shape marginal workers' decisions on whether to choose a formal or an informal job. Research on Latin American countries suggests that the introduction and expansion of non-contributory social protection programs may have generated perverse incentives in the labor market, including firms and workers choosing to be informal rather than formal (Levy, 2010). A handful of papers show that the introduction of free health insurance increases informality (Camacho et al., 2013), especially among the less educated workers (Azuara and Marinescu, 2013; Conti et al., 2018). If workers value health insurance most and they start receiving it for free, other formal job attributes may not be valued highly enough for workers to make them prefer working in a formal job.[2]

While we have a relatively good understanding of valuations of fringe benefits in developed economies (Eriksson and Kristensen, 2014), little is known about valuations of formal job benefits in contexts with high levels of informality. This is important because these valuations can influence the decision to choose a formal job over an informal one. Among the reasons why workers may want to choose an informal over a formal job are the greater independence and flexibility of informal jobs (Maloney, 2004; Perry, 2007), and a mismatch between their valuation of the benefits and services offered by a formal job and the value they pay for them through salary deductions (Maloney, 2004). Because in real jobs these benefits are usually bundled and some of the benefits may

[1] See ILO (2018) for the definition of informality across countries and regions.

[2] A fraction of formal workers' salaries must go to social protection contributions from which they receive health insurance, pension, and other formal job attributes. In contrast, there is no deduction from informal salaries.

be utilized directly by the worker while other contributions go to financing general programs, it is hard to know which benefits workers value more or less by directly observing their choices. It remains unclear to what extent workers perceive these attributes as desirable and are willing to forgo earnings in order to receive them.

This research aims to estimate workers' willingness to pay (WTP) for the main benefits offered by formal relative to informal jobs, which are directly deducted from a worker's paycheck, that is, for health and retirement plans. These valuations are hard to estimate from observed choices since job attributes are usually bundled in real labor markets and the choice set and salary that workers face may differ based on workers' unobservable characteristics. To circumvent these challenges, this study uses a discrete choice experiment among "mom-and-dad" store owners and employees in ten Colombian cities. Because contributing to retirement involves inter-temporal decisions and accumulating a certain number of capital or contribution periods,[3] in addition to studying whether and how much workers in Colombia are willing to pay to receive access to health and retirement plans, our design allows to disentangle if it is the lack of previous contributions that make it hard to fulfill the requirements to eventually receive a pension or if it is simply that workers do not value this type of benefit.

In a nutshell, participants in the experiment are presented a hypothetical situation and asked to choose among two job alternatives that vary the job attribute and the salary difference between the two jobs, while keeping other factors such as commute time and work hours similar to what they have in their current job and equal between the two alternatives. One of the jobs emphasizes one of the attributes of a formal job in the description while the other job does not display that attribute. To study heterogeneity, we estimate WTP by gender, education level, age, and proxies for risk and patience.

Our main finding is that workers have high valuations for the two main benefits offered by formal jobs. After correcting for inattention (Mas and Pallais, 2017), we estimate an average WTP of 28% of their salary for formal health insurance, 31% for a retirement plan, and 37% for a retirement plan that provides a subsidy allowing workers who have not been contributing long enough to earn a pension when they reach retirement age.

[3] According to Colombian law as of 2023, to receive an old-age pension, workers who contribute to the public pension fund need to have contributed over 1,300 weeks and be 57 years old (women) or 62 years old (men). Those in private pension funds can choose between accumulating a certain capital in the fund or a scheme similar to the public pension fund with 1,150 weeks and the same age requirements.

That is, on average, workers in our sample of mom-and-dad stores are willing to forgo a substantial fraction of their salary to obtain these formal job attributes. We find these results noteworthy since only around one-third of the workers in our sample are formal workers (i.e., contribute to health and pensions), and mom-and-dad stores account for 21% of commercial businesses in Colombia (Urueña et al., 2020), indicating that the sector we examine is economically important.

We mention two interesting nuances in our results. First, the higher WTP for the retirement plan with subsidy relative to without subsidy speaks to what has been identified as a first-order policy concern in Colombia. Given the strict contribution length and capital requirements, currently only about 37% of the elderly receive a pension (World Bank, 2018). Workers in our sample realize that they may not be able to fulfill the requirements; hence they are willing to forgo large fractions of their salaries to obtain a pension if a subsidy allowing them to fulfill the requirements is in place. Given that modifying the system to help those workers who will not fulfill the requirements can be politically and economically costly, it is useful for governments to know that workers have a high WTP for such a scheme.

Second, we perform heterogeneity analyses based on demographic characteristics and proxies for risk aversion and patience. While we lack sufficient power to detect statistically significant differences in most of these characteristics, we highlight two interesting dimensions: Gender and age before retirement. Women tend to have much higher WTP for the retirement plan with subsidy than men and than the retirement plan without subsidy. This possibly reflects the fact that women have lower attachment to the labor market than men, which make it harder for them to fulfill the minimum requirements for a pension. The heterogeneity in age is interesting because if individuals start contributing too late in life (after age 32 for women and 37 for men), it is not possible to fulfill the contribution time requirements for a pension when they reach the retirement age. We find that the WTP for both health and pensions is much higher for individuals above these age cutoffs.

Our main contribution is to connect the literature on WTP for job attributes to the ongoing academic and public discussion on how social protection systems disincentivize formal work or otherwise generate perverse incentives for employers and workers. The latter has specially flourished in the Latin American context in which many papers have found that introducing or increasing free benefits to workers such as health insurance

increases informality rates. For example, the introduction of free health insurance in Mexico led the less educated to become informal by between 1% (Azuara and Marinescu, 2013) and 4% (Conti et al., 2018).[4] Giving child allowance access to informal workers with children disincentivizes formalization in Argentina (Garganta and Gasparini, 2015). The expansion of the subsidized health regime in Colombia led to an increase in informality of 4 percentage points corresponding to a reduction of 3.8% of the GDP (Camacho et al., 2013). In the Colombian setting, we find that, on average, workers have large WTP for contributory health and especially for a pensions scheme. While this is inconsistent with previous findings showing perverse effects of expansions of social programs, we note that our WTP estimates are low and close to zero for the 25th percentile of the WTP distribution, suggesting that the informality inducing effects detected in the previous literature may primarily emerge from the left-tail of the WTP distribution. We discuss a series of hypotheses that can reconcile why there could be an increase of informality resulting from expansions of social programs even though our estimates indicate a high demand for formal job attributes.

Our second contribution is to the literature estimating workers' WTP for non-wage job attributes, specifically in the context of formal vs. informal jobs. Previous work infers valuations for formal job attributes from household search models (Conti et al., 2018), job satisfaction questions (Madrigal et al., 2016) or household characteristics (Camacho et al., 2013). However, these revealed-preference approaches likely give biased valuations of job attributes since unobservables such as worker productivity affect both the observed choice and the set of options that workers choose from. Recent work has randomized the set of options that workers see using choice experiments to elicit the WTP for different job attributes. The main focus of studies in developed countries and in labor economics has been on flexible work arrangements (Eriksson and Kristensen, 2014; Mas and Pallais, 2017; Wiswall and Zafar, 2018; He et al., 2021; Maestas et al., 2023). Our definition of informality involves lack of contributions to health and pension plans, and a handful of papers have examined the WTP for health insurance (Dey and Flinn, 2005; Eriksson and Kristensen, 2014). We build on these studies by focusing on

[4]The studies mentioned here are a non-exhaustive list. Conti et al. (2018) provide a thorough review of the literature studying the expansion of Seguro Popular in Mexico and mention that the range of findings oscillate between null effects on informality to the effects mentioned in the text above. More recent evidence shows that the reduction in the share of formal over total workers is driven by preventing informal workers from transitioning to inactivity and not by inducing formal workers to become informal (Del Valle, 2021).

a developing country context, characterized by high levels of informality and eliciting WTP for attributes such as pension contributions that are not necessarily a concern in developed countries.

Within the choice experiment literature, the study that is closest to ours is Mahmud et al. (2021). The authors ask respondents in Bangladesh to choose from two hypothetical jobs that randomize six different features: a written contract, termination notice, paid leave, working hours, a retirement fund, and monthly income. Our main departure from this study is to focus exclusively on health and retirement plans in a framework that is simpler to understand for workers with low levels of education. Our choice to focus on contributions to health and pensions stems from the fact that these are the most important costs for employers and employees if they decide to offer/take a formal job. In addition, this definition of informality corresponds to one of the main ways to identify and quantify formal work in household and other national surveys. We also differ from Mahmud et al. (2021) in that we only vary one attribute at a time in the choice that respondents make and correct our estimates for inattention following the design of Mas and Pallais (2017). We believe this design choice to be more suitable for populations with limited education and when the WTP question is embedded in a longer survey as in our case.

Taken together, our research speaks to the limitations that countries with high levels of informality face in their attempts to reduce the share of informal workers in the economy. We show that the main constraint does not seem to emerge from workers' low WTP for formal job benefits such as health and retirement plans.

2 Setting

2.1 Job Informality and Social Protection Systems in Colombia

Colombia is the fourth economy of the Latin America and the Caribbean (LAC) region. As most of the region, Colombia is well known for having informality rates above 60 percent (Peña, 2013; ILO, 2018). Research on informality in Colombia has found that informality is highest among the least educated, older and very young workers (Peña, 2013). Based on responses to a module on the national household survey asking about

preferences for employment, the low-educated, male and urban workers are those who prefer informal jobs (Bernal et al., 2009).

An informal worker is defined typically as someone who has a job but does not make social security contributions.[5] From the side of the employee, these contributions include deductions of 4% of the salary to the health system and 4% of the salary to the pension system. Employees earning more than 4 monthly minimum salaries pay an additional 1% to the pension solidarity fund.

From the side of the employer, contributions amount to 12% of the salary for pension, 8.5% for health, and 4% for a "Family Compensation Fund."[6] In addition, employers must set apart a fraction of the employee's salary for compulsory housing or education savings, interest payments on those savings, severance pay, bonuses, leave, vacations and taxes (see footnote 8). Employers must also pay between 0.35% to 8.7% to the "Occupational Risk Administrator" (ARL in Spanish), which is responsible for managing and preventing occupational risks and accidents in the workplace. For workers earning at least 10 monthly minimum salaries, employers must in addition pay 3% for financing early childhood programs (ICBF), and 2% to fund the national job training institution (SENA). It is estimated that, for an employer, the cost of hiring a formal employee amounts to over 1.5 times the salary that the worker receives (Peña, 2013; Alaimo et al., 2017).

Workers who are self-employed and contribute to the social protection system take the full contribution (including the part that the employer would contribute if they had one), which amounts to 12.5% of the salary for health and 16% for pension. Because these contributions are calculated over 40% of the earnings, the effective contributions rates are 5% for health and 6.4% for pensions for the self-employed.[7] In total, including

[5]There another definitions of informality based on the size of the firm or using whether the firm is registered with the tax or business authorities. Ulyssea (2018) defines informality in the extensive margin (firm registers or not) and the intensive margin (firm hires workers "off the books"). Gutierrez and Rodriguez-Lesmes (2023), for example, define formality in three levels using combinations of social security contributions and firm registration.

[6]These are entities in Colombia that are responsible for providing social welfare services and benefits to workers and their families. The Family Compensation Funds provide various programs and services, such as health care, education, job training, housing, and cultural activities, to workers and their families.

[7]An exception is that the minimum contribution to the social security system must be at least the statutory minimum monthly salary for full time workers. If a self-employed workers earns the equivalent of the minimum monthly salary, the contributions are over 100% of the earnings, and not

health, pension, occupational risks, pension solidarity fund and other taxes,[8] workers who contribute as self-employed and earn moderate amounts get a deduction of about 30% of their base salary.

Table 1 presents a summary of the benefits that workers get in formal and informal jobs. In formal jobs, we differentiate between salaried and self-emploed workers because paid vacations, family allowances or occupational health and safety are not mandatory for self employed workers but they are mandatory for salaried workers. These differences support the choice of studying the two elements that are mandatory for both self-employed and salaried workers, namely, contributions to health and pension plans.

Table 1: Example of benefits covered by formal and informal jobs

	Formal job		**Informal job**
	Salaried	Self-employed	
Health plan	Y	Y	Y (subsidized)
Retirement plan	Y	Y	N
Paid leave and vacations (15 days)	Y	N	N
Bonuses	Y	N	N
Worker welfare programs	Y	N	N
Flexible hours and schedule	N	Y	Y
No tax payments	N	N	Y

2.1.1 Health

Because many cannot afford to pay for health care and social security benefits on their own, the government provides access to health care through a subsidized regime. The healthcare system is hence divided into two regimes: the contributory regime, which covers those who are employed in formal jobs and their families, and the subsidized regime, which covers individuals who are unable to make contributions and their families. The subsidized regime is funded by taxes and contributions from the contributory

over 40%.

[8] Individuals earning more than 4 monthly minimum salaries get deducted a withholding tax ("retención en la fuente") credited against the employee's income tax liability at the end of the tax year. The percentage of withholding tax depends on the type of income, the amount earned, and the individual's tax status. Not all individuals in Colombia are required to pay income tax; only those earning roughly at least 4 monthly minimum salaries or have a net worth over a certain threshold are required to do so.

regime, while the contributory regime is funded by contributions from employers, employees, and the government. The subsidized regime serves as a safety net for vulnerable populations who would not otherwise have access to healthcare. In addition, there are private providers of health insurance serving about 10% of the population who can afford the average rates of about COP 319,000 per month, the equivalent to about one third of the monthly minimum salary per beneficiary (ACEMI, 2021). To access these private health policies, it is a requirement to be affiliated to the contributory regime.

In terms of service delivery, both the subsidized and contributory regimes are mandated to provide the same basic package of services, including preventive care, diagnostics, and treatment. However, in practice, as the institutions providing the services are private, they are free to establish their hospitals or clinics in their preferred locations, which may generate differences in the type and quality of services that the population has access to.

2.1.2 Pensions

For pensions, workers can choose to contribute to a public or a private fund. To qualify for a pension in the public fund, an individual must meet certain age and contribution requirements. The age requirement as of 2022 is 62 for men and 57 for women, and the worker must have contributed to the system for a minimum of 1,300 weeks (approximately 25 years) to be eligible for a full pension. In the private funds, a worker must choose a pension fund management company (AFP in Spanish) and enroll in their pension plan. The worker and their employer make regular contributions to the plan, which are invested to generate returns. The workers' pension benefits are based on the contributions made to the plan and the investment returns generated over the course of their working life. To be eligible for the most common type of private pension plan in Colombia, workers must make contributions to the plan for a minimum of 1,150 weeks, and must have accumulated a certain amount of funds in their individual pension account, calculated based on the worker's contributions and investment returns.

Given the high fractions of individuals reaching retirement age without a pension, Colombia has introduced two independent non-contributory old age programs. Beneficios Económicos Periódicos (BEPs) are voluntary pension savings accounts for people with incomes below minimum wage, which result in the lump-sum return of contri-

butions at the time of retirement, rather than in annuitized payments. The Pension Solidarity Fund has two programs: "Colombia Mayor" which covers a small monthly payment for poor elderly people, and the "Pension Contribution Subsidy Program" (PSAP in Spanish) which is intended to assist people over 40 years of age and other populations who have contributed in the past but will not meet the pension requirements. For people over 40 years of age, the requirements include being between 40 and 65 years old, having at least 650 weeks of contributions to the General Pension System, and being classified as poor. Beneficiaries must contribute a percentage of the total contribution amount, which usually ranges from 5% to 30%, depending on the population group to which they belong. The remaining percentage is subsidized by the Pension Solidarity Fund. These programs, however, tend to be small and lack financing. According to an official report from the Pension Solidarity Fund, across all categories, the PSAP has 142,125 beneficiaries (Fondo de Solidaridad Pensional, 2022), of over 4 million individuals who we estimate are between the target ages in Colombia and are not contributing to pension.[9]

Health and pensions are bundled in formal jobs; that is, workers cannot choose to contribute to one but not the other. While the health system gives access to both the worker and eligible dependents,[10] pensions are individual. Nevertheless, spouses are eligible to receive a partner's pension if their partner dies and was affiliated with a pension plan that offers survivor benefits. The survivor benefits typically provide the surviving spouse with a percentage of the partner's pension benefits for the rest of their life.

2.2 Experimental Setting: Mom-and-Dad Stores

Mom-and-dad stores are ubiquitous across the country. Many of these businesses are micro establishments with customers located within a neighborhood or smaller areas, they offer informal credit lines based on knowing and trusting neighbors, and most transactions are based on cash. According to a census of commercial activity conducted

[9]Based on own calculations based on population pyramid estimates from the Statistics National Department (DANE), as of 2022 there are approximately 7,000,000 individuals aged 45-64 in Colombia. About 60% of them or 4,2 million, according to informality figures, were not contributing to pension.

[10]Dependants are the spouse or partner and children under the age of 18, or under the age of 25 if they are full-time students.

in 2016, mom-and-dad stores represent 21% of commercial businesses in Colombia out of a total of 261,472 establishments (Urueña et al., 2020). More in general, 96.5% of all firms registered in Colombia in 2017 were microfirms (Ortiz et al., 2021).

Since these stores are very small and employ few people other than their owners, it is likely that they are informal in the sense that the business itself may not registered and does not pay taxes, and that any employees will likely not have a formal job with a contract and social security benefits. These characteristics make mom-and-dad stores an interesting setting for our study since they are widespread and we may find variability in how exposed have owners and employees been to the social protection system.

This study was embedded in the Estudio Nacional de Emprendimiento a Tenderos (ENET) within the framework of the Colombia Científica project whose aim is to analyze programs and policies to promote a formal economy (Urueña et al., 2020). The target population was shopkeepers of establishments that are not franchises, do not belong to large chains, and are outside the catchment area of large shopping malls and supermarkets. About 80% have up to 2 employees besides the respondent, 39% are uni-personal businesses, and 25% do not keep any type of accounting records. 36% of the sample correspond to grocery stores, butcher's shops, restaurants and fast food establishments. The rest include hair saloons, and clothing, retail and variety shops, among others.

The ENET survey was conducted in two waves. In the first wave, which took place between November and December of 2019, enumerators reached 3,194 establishments within a fixed radius around campuses of one of the participating universities in 10 cities: Bello, Barranquilla, Bogotá, Girardot, Soacha, Zipaquirá, Neiva, Pereira, Bucaramanga, and Ibagué. The cities range from mid-size to large in Colombia. Of the over 3,000 establishments, those who accept taking part in the survey get a paper questionnaire to fill at their own pace, within one week, without the help of an enumerator. 1,654 participants completed the surveys and got a small gift as appreciation. The main question used in this research eliciting the WTP for formal job attributes was one of the questions in the survey that took approximately 33 minutes to respond.

In the second wave (April and May 2022), the same establishments reached during wave one were approached. 37% of these establishments (1,192) no longer existed. These businesses were replaced by new ones for census and survey purposes. A total of

2,413 censuses and 1,222 surveys were completed. Of these surveys, 365 were conducted with businesses also surveyed during the first wave.

For the discrete choice experiment, we collected information from two waves of surveys. We collected 1,654 observations in the first and 1,222 in the second, for a total of 2,876 observations in our analytical sample.

3 Study Design

In the discrete choice experiment, a sample of owners and workers of mom-and-dad stores in ten Colombian cities make a choice regarding two hypothetical job options involving different earnings and benefits. Each participant sees only one pair of job options to choose from. This pair is randomly generated and was read by the enumerator as follows:

"Imagine that you cannot continue working in your current activity and you receive two job offers. Both jobs are the same as your current activity in terms of total number of hours, work schedule, and distance to the workplace, but may differ in the income and benefits they offer. Listen carefully to the description of the two job offers:"

Job 1	**Job 2**
Your earnings will be exactly the same as your current activity. You will NOT receive X.	*Your earnings will be $\Delta w\%$ relative to those of your current activity. You will receive X.*

"Which of the two jobs would you choose?"

In the question, X stands for the most important benefits that differentiate formal from informal jobs: contributory health and retirement plans. X is randomly chosen to be displayed as one of three possibilities: "health insurance through one of the providers (EPS)"[11], "a retirement plan", "a retirement plan plus a subsidy to satisfy the contribution period requirement in case you have not contributed in the past." We did not specify much more about what these schemes entail since we assume individuals

[11] EPS stands for Entidad Promotora de Salud. These are the main health care providers in Colombia and the equivalent to companies such as Blue Cross Blue Shield, Aetna, etc. in the United States.

are familiar with standard health and retirement plans.[12] We did not mention private health insurance policies since only a small fraction of the population has access to them and access is limited to those already making social protection contributions.

The distinction between the retirement plan with and without subsidy responds to the fact that some individuals may have not contributed to a retirement plan before and hence will not be able to complete the number of work weeks required to obtain a pension. In this scenario, they may opt for the job without the retirement plan not because they do not value it but because it is too late for them to complete the contribution period or capital requirement.

The values of Y are 10%, 20%, and 30% above or below the respondent's earnings in their current activity. The value of 10% is chosen based on what formal employees get deducted from their salary as contributions to health and retirement, and other taxes, which is close to 10%. That is, if a formal and an informal worker have the same gross salary, the formal worker receives around 10% less than the informal worker after contributions and taxes are deducted.[13] 30% is approximately the deduction that workers need to take if they decide to contribute as a self-employed worker. In total, there are six possible values of Y: -30%, -20%, -10%, +10%, +20%, and +30%. Zero was not included due to a mistake in the survey.

Overall, there are 18 possible situations (3 X times 6 Y). Each respondent sees only one of the 18 situations, which is randomly chosen at the time of the survey administration. The order in which job 1 and job 2 are presented to the respondent is also randomized.

4 Conceptual Framework and Methodology

In a simple model, a worker chooses an informal job if the salary and the benefits of the informal job are greater than the salary and the benefits of a formal job. Let f and i indicate whether the job is formal or informal, respectively. Let w_j be the wage in sector

[12] Even if not all respondents are familiar with these plans and there are some differences between the public and private retirement funds, by virtue of randomization the average knowledge of these plans should be equal across treatment arms.

[13] In general, however, salaries for informal workers are lower than for formal workers. In the experiment we are precise on what the difference in salary is between the two alternatives.

j, and b_j be the non-pecuniary benefits in sector j such as those presented in Table 1. Total earnings in job j are given by $W_j = w_j + \gamma b_j$, which include pecuniary and non-pecuniary benefits as well as $\gamma \leq 1$, the value that the worker gives to non-pecuniary benefits (Azuara and Marinescu, 2013; Madrigal et al., 2016).

A worker chooses a formal job if $W_f - W_i > 0$, i.e., $w_f - w_i + \gamma(b_f - b_i) > 0$. In other words, the worker will choose the job with the formal job attribute if the WTP for the attribute exceeds the price of the attribute: $\gamma(b_f - b_i) > -\Delta w$. This means that, if both types of jobs are available, the worker will choose the formal job if her WTP for health and retirement plans, as in our experiment, are higher than the price of these benefits.

We follow Mas and Pallais (2017), and allow participants to choose between two job alternatives that only differ in the presence of the formal job attribute and the wage ($\Delta w \in \{-30\%, -20\%, -10\%, 10\%, 20\%, 30\%\}$). To account for inattention, Mas and Pallais (2017) propose a model that assumes inattentive respondents select either job alternative with a 50% chance. If 2α of respondents are inattentive, then we can expect that half of them (α) will choose the dominated job alternative, i.e., the alternative that does not offer the attribute and pays a lower salary. The probability that decision maker i selects the alternative with the attribute is:

$$P_A = P_{\Delta w}(1 - \alpha) + (1 - P_{\Delta w})\alpha \tag{1}$$

As Mas and Pallais (2017), we assume a parametric form for the CDF of the $WTP_i = F(c + b\Delta w; \mu, \sigma)$ that follows a logistic distribution. We estimate this model by maximum likelihood and our results characterize the WTP distribution, with the mean of the WTP being $\hat{\mu} = -\hat{c}/\hat{b}$. $\hat{\alpha}$, in our case, is the share of respondents who choose the job without the formal attribute when that job pays less (10%, 20%, or 30%) than the alternative including the attribute. We assume that no attentive respondent chooses the job alternative without the attribute in these scenarios. However, we argue that in the context where our experiment takes place, these measures of inattention may be reflecting a distaste for formality. In particular, some individuals in the subsidized health regime may prefer not to choose a job that includes the attribute, even when it pays more, for fear of losing other government subsidies. Thus, we present our results with and without inattention correction. Note that in the absence of inattention, we

are simply estimating a Logit model.

5 Results

5.1 Descriptive Statistics of Mom-and-Dad Store Owners and Workers

Table 2 presents the summary statistics for the observable characteristics of respondents by treatment (age, female, secondary education complete or below, contribution to health and/or retirement plans in the past year,[14] whether the respondent has any type of insurance[15], a measure for risk aversion[16], and a measure for perseverance[17]). The information on age, sex, and education is known exclusively for the business owners[18] in the first wave and for all respondents in the second wave. The remaining characteristics are available to all participants.

[14]The questions on contributions to the health and pension systems were modified between survey rounds. In the first wave, respondents were asked whether they had contributed to the health or pension systems during the last 12 months. We coded those who answered yes to these questions as a one in the contribution to health and/or retirement in the past year variable. The second wave asked about their health affiliation (contributor, beneficiary, or non-affiliated) and pension affiliation (regular contributor, occasional contributor, or non-affiliated) at the time of the survey. We coded those contributing to the health system and regular contributors to the pension system as a one in the contribution to health and/or retirement in the past year variable.

[15]Here we include the answer to the following question: "Do you currently have any type of insurance for your family, yourself or your business?"

[16]Both waves include the following question: "I never try something I'm not sure about". They are classified as risk averse if they respond "strongly agree" to this statement.

[17]Both waves include the following question: "I continue to work on difficult projects even when others object". This question asks how much one agrees with the statements on a scale of 1 to 5. Subjects are classified as persevering if they respond "strongly agree" to this statement.

[18]As a result, we have fewer observations for these variables.

Table 2: Summary statistics

	Health Insurance (N=918)	Retirement Plan (N=1,243)	Retirement Plan + Subsidy (N=715)
Business owner	0.58	0.56	0.57
Age	43.41	44.06	42.36
Female	0.52	0.56	0.54
Secondary education complete or below	0.58	0.58	0.61
Contribution to health and retirement in past year	0.30	0.30	0.26
Contribution to health or retirement in past year	0.50	0.50	0.44
Has insurance for family, himself or business	0.20	0.16	0.22
Risk aversion	0.34	0.36	0.33
Perseverance	0.47	0.48	0.45

Notes: We report the summary statistics, by treatment (health insurance, retirement plan, and retirement plan + subsidy). During the first survey wave, the information on age, sex, and education was only collected for the business owners.

More than 55% of the respondents across treatments are business owners. On average, participants are in their early forties. Over half of them are women, and almost 60% of them have, at most, completed secondary education. Across treatments, at most 30% of participants had contributed to health and retirement plans in the past year, and no more than 22% had any type of insurance. About a third of respondents are risk averse and about half of them believe they are persevering.

Table A.1 in the Appendix presents randomization balance tests across wage gaps by treatment. We run regressions for the same nine characteristics in Table 2 on dummies for each wage gap level. Each cell reports the p-value of the joint significance of the regressors. Consistent with random assignment, the observable characteristics appear generally balanced as none of the p-values reported in table is below the 5% threshold.

5.2 WTP for Formal Job Attributes Estimates

We now present our main estimates of WTP for health and pensions corrected and not corrected for inattention. Mas and Pallais (2017) argue that inattention may be problematic for obtaining WTP estimates that are reliable and close to the true. We use one of their inattention measures, namely looking at the share of respondents that select a dominated option.[19] In our case, we define dominated options to be the jobs that do not offer the attribute and at the same time pay less than the alternative job

[19]The share of respondents who choose the job with the formal attribute for a given Δw is $Y_{\Delta w} = P_{\Delta w}(1-\alpha) + (1-P_{\Delta w})\alpha + \epsilon_{\Delta w}$, with $\epsilon_{\Delta w}$ a sampling error. Using $\hat{\alpha}$, we obtain an unbiased estimate of the share of respondents: $\tilde{Y}_{\Delta w} = \frac{Y_{\Delta w} - \hat{\alpha}}{1-2\hat{\alpha}} = P_{\Delta w} + \tilde{\epsilon}_{\Delta w}$. Note that the shares with the inattention correction can be below 0 or above 1.

which includes the attribute. For example, inattentive individuals would be those who choose the job without the attribute when the comparison is between a job offering 10% higher salary and a health plan vs. a job without the attribute.

Given that most of the respondents must be aware about the subsidized regime, we are careful in classifying them as inattentive when they choose a dominated option. In the case of health, in which the subsidized regime is widespread, individuals may choose the dominated option because they value the free health insurance more than the plan offered by formal jobs, and hence they will look inattentive according to our measure. To mitigate this concern, we include three measures of inattention that consider the cases where the wage premium (wage in the job with the formal attribute minus wage in the job without the attribute) is 10% or more, 20% or more, and 30%.[20] We believe that choosing the dominated option when the job with the formal attribute pays 30% more is the most conservative measure as probably few people will decline such a large wage premium even if they highly value the subsidized health regime. We note that no matter which definition of inattention we use, the estimates are very similar.

Table 3 reports the WTP distribution by formality attribute obtained from a mixture model. On average, after correcting for inattention, respondents are willing to forgo around 28% of their current earnings to access health insurance and over 30% to obtain a retirement plan. The WTP for a retirement plan, including a subsidy to satisfy the contribution period requirement in case they have not contributed in the past, is even higher (around 37%). Without the inattention correction, the mean results are slightly larger. As we will show in the figures below, the inattention correction gives some curvature to the fitted line of the model so the non-corrected estimates tend to be higher for larger values of the cost of the formal attribute.

[20] We create variables that take the value of 0 for people who choose the alternative with the formality attribute when the wage gap is 10% or above, 20 % or above, or 30%, and of 1 when respondents choose the alternative without the attribute in these cases.

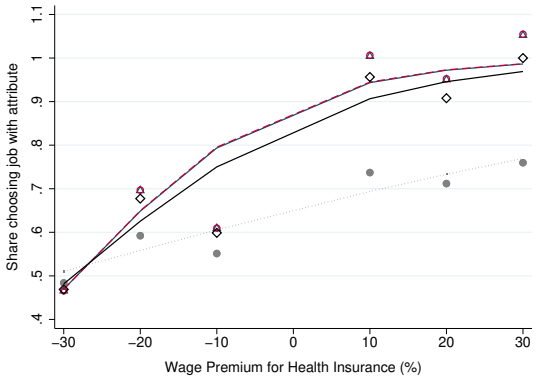
Table 3: Willingness to pay for formal job attributes (percent of wages)

	Inattention	Mean	SD	Quantiles		
				25th	50th	75th
Health insurance	No	32.12	93.43	-24.50	32.12	88.74
		(7.31)	(17.56)	(5.96)	(7.31)	(17.25)
	> 10%	28.34	24.70	13.38	28.34	43.31
		(3.78)	(5.41)	(3.61)	(3.78)	(6.09)
	> 20%	28.33	24.47	13.50	28.33	43.16
		(3.81)	(6.90)	(4.36)	(3.81)	(6.71)
	30%	28.75	30.91	10.01	28.75	47.48
		(4.37)	(9.98)	(5.76)	(4.37)	(8.84)
Retirement plan	No	35.29	122.09	-38.69	35.29	109.27
		(8.76)	(27.90)	(10.15)	(8.76)	(24.94)
	> 10%	31.34	33.78	10.87	31.34	51.81
		(5.81)	(5.43)	(3.77)	(5.81)	(8.66)
	> 20%	31.42	36.59	9.24	31.42	53.59
		(5.91)	(6.95)	(4.21)	(5.91)	(9.36)
	30%	31.44	29.20	13.75	31.44	49.14
		(5.77)	(7.69)	(5.32)	(5.77)	(9.04)
Retirement plan + subsidy	No	47.32	108.72	-18.56	47.32	113.20
		(14.45)	(31.65)	(7.91)	(14.45)	(33.02)
	> 10%	37.68	32.47	18.00	37.68	57.35
		(7.72)	(6.97)	(5.04)	(7.72)	(11.38)
	> 20%	37.72	32.84	17.83	37.72	57.62
		(7.84)	(8.50)	(5.48)	(7.84)	(12.08)
	30%	37.76	33.09	17.71	37.76	57.81
		(7.99)	(11.03)	(6.25)	(7.99)	(13.34)

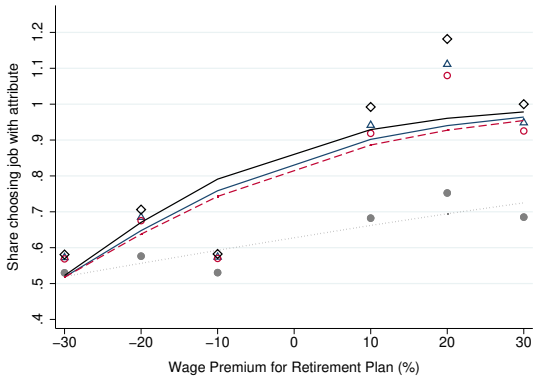
Notes: We follow the procedures from Mas and Pallais (2017) and estimate a logit model corrected and uncorrected for inattention. Inattentive participants are the ones who choose the alternative without the formal attribute when it pays less (-10% or below, -20% or below, and -30%) than the alternative including the attribute. Bootstrapped standard errors clustered at the business level based on 500 samples of the data in parenthesis.

We also report estimates for the 25th and 75th percentiles of the WTP distribution in Table 3. When we examine the results without correction for inattention, we find that the respondents in the bottom 25% of the distribution prefer the job without the formal attribute, regardless of its nature. With the inattention correction, for health insurance and retirement plans without a subsidy the 25th percentile estimates are relatively low and close to 10%. For the retirement plan with subsidy, these get closer to 20%, suggesting that even individuals with the lowest WTP are willing to forgo a substantial fraction of their salary to obtain a pension if the government would provide a subsidy to fulfill pension requirements. The 75th percentile estimates go up to 47% for health, 54% for retirement, and 57% for retirement plan with subsidy.

To benchmark our results, we compare with the WTP estimates reported by Mahmud et al. (2021). They find large WTP for having a contract and getting access to a pension fund. Respondents in Bangladesh are willing to forgo 43.5% of their income to obtain a long-term contract, and 18% of their income to access a pension plan. Our higher WTP estimates for pension plans may reflect country differences in terms of life expectancy, institutional frameworks for pensions, and other features.



(a) Health Insurance



(b) Retirement Plan

(c) Retirement Plan + Subsidy

Figure 1: Willingness to pay by formal attribute

Notes: This figure depicts the share of respondents who choose the job alternative that includes (a) health insurance, (b) retirement plan, and (c) retirement plan + subsidy against the wage premium (wage in the job with the formal attribute minus wage in the job without the formal attribute). It also includes the fitted maximum likelihood model. The results are available without (in gray) and with inattention correction. In the latter case, inattention is considered when the wage premium is 10% or more (in blue), 20% or more (in red), and 30% (in black). Due to a mistake in the survey, the wage premium equal to zero was not asked to any respondent.

In addition to the model results, we present scatterplots of the share of respondents choosing the job with the formal attribute against the wage premium in Figure 3. The fitted maximum likelihood models are shown as lines in the figure. We present both the scatterplots and the fitted lines corrected and uncorrected for inattention with the three definitions given above. Figure 3 presents scatterplots and fitted lines for health insurance in Panel (a), retirement plan in Panel (b), and retirement plan with subsidy in Panel (c).

There is a positive relationship between the wage premium and the probability that workers choose the job with the formal attribute regardless of whether it is health or retirement plans. Reading from the shares uncorrected for inattention in Figures 1a, 1b and 1c, it appears that a significant proportion of participants do not value any of the attributes of formality. When the job alternative that includes the formal attribute pays 10% to 30% more than the alternative without it, more than 20% of respondents still choose the dominated option. The figures also show that the median WTP is higher in all cases when there is no inattention correction. This is demonstrated by the fact that the fitted model without inattention correction (gray line) intersects the y-axis at 0.5 at higher points than the models with inattention correction in all three cases (health insurance, retirement plan, and retirement plan + subsidy).

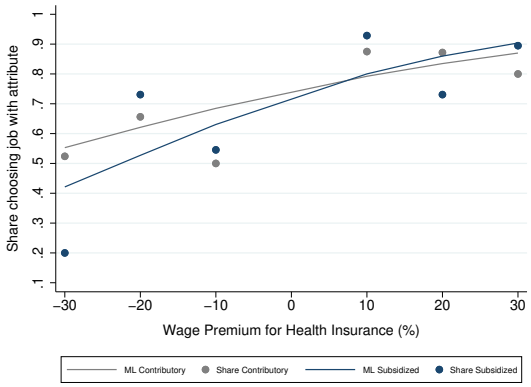
Correcting for inattention, even for deductions of 30% of the salary, at least 50% of the respondents choose the job with the attribute. For positive wage premiums, all workers choose the job with the attribute. Moreover, the adjustment computed by the inattention correction is similar across formality attributes, so the inattention correction likely reflects inattention and not something else.[21]

Next, we discuss if our measures of inattention are not capturing failures in respondents' information processing, but instead, whether they reflect that some individuals may prefer not to lose the benefits of the subsidized health regime. To explore this, we use the responses to a question only available in the second survey wave to identify if participants are part of the subsidized or contributory health regime. If what the inattention measure is capturing is not inattention but rather a conscious choice of

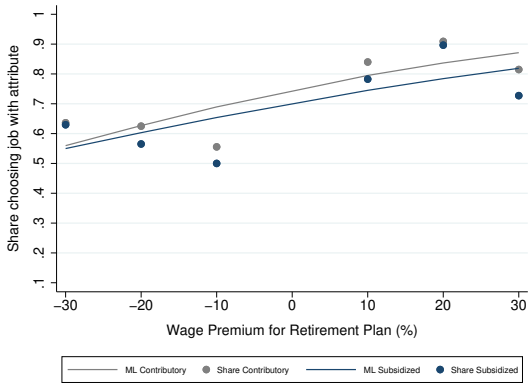
[21]Recall that since the respondents are likely familiarized with the subsidized regime, it was not ex-ante clear that inattention would be truly inattention or simply a real preference for the subsidized regime. The subsidized regime is widespread in health but not in pensions, so the fact that we see a similar correction for both health and pensions likely indicates that what we are capturing with the correction is in fact inattention.

selecting the dominated option to prevent losing the benefits of the subsidized regime, we would expect that the WTP of those in the subsidized regime vs. those in the contributory regimen would be substantially different.

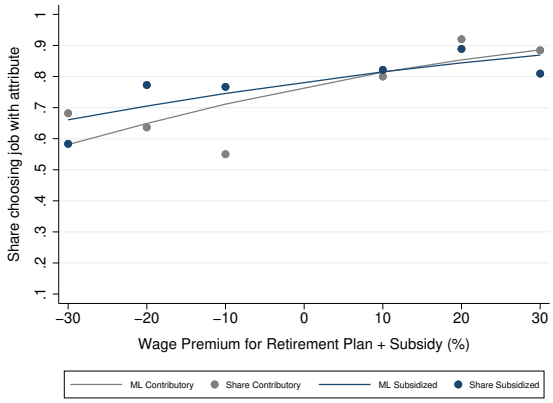
Of 881 respondents in the health system, 47,56% are part of the subsidized regime. We estimate the WTP for the three formality attributes in the absence of inattention for participants in both regimes in Figure 2. We find that the median WTP for health insurance of respondents in the subsidized regime is 22.55% (39.18% and 62.62% for



(a) Health Insurance



(b) Retirement Plan



(c) Retirement Plan + Subsidy

Figure 2: Willingness to pay by formal attribute, subsidized vs contributory regimes

Notes: This figure depicts the share of respondents who choose the job alternative that includes (a) health insurance, (b) retirement plan, and (c) retirement plan + subsidy against the wage premium (wage in the job with the formal attribute minus wage in the job without the formal attribute). It also includes the fitted maximum likelihood model. Results are available for those in the subsidized and contributory health care regimes, as per the responses in the second wave of the survey. Estimates not corrected for inattention.

the retirement plan without and with subsidy, respectively), while for respondents in the contributory regime is 37.55% (38.61% and 41.39% for the retirement plan without and with subsidy, respectively). While the levels are different, these WTP are not statistically different in either case ($p = 0.29$ for health insurance, $p = 0.98$ for retirement plan, and $p = 0.53$ for retirement plan + subsidy).

While not statistically different, the WTP for health among those in the subsidized regime is lower than for those in the contributory regime. In fact, the largest difference appears to be when the wage gap is 30% (-30 in the graph). In this case, only 20% of respondents in the subsidized regime choose the alternative with health insurance, compared to over 50% of respondents in the contributory system. This evidence suggests that an "endowment effect" may be taking place by which those having access to free health may not want to let go of that benefit. However, for the remaining wage gaps and the rest of the formality attributes, the decisions between those in the contributory and subsidized regimes do not appear to be significantly different. This contradicts the premise that inattention is unimportant in this context.

5.3 Heterogeneity by Demographics and Behavioral Measures

We now explore whether our results are heterogeneous in demographic and behavioral variables. For the demographic variables, we include the sex of the decision maker, the education level, and whether the respondent is below or above the cutoff age for being able to access a pension.[22] For the behavioral variables we include proxies for risk preferences (risk aversion measure and whether respondent has any type of personal, family or business insurance) and patience (perseverance).

Tables 4 and 5 present the estimated WTP by treatment for each of these categories, correcting for the inattention when the wage premium is 30%. It also includes the p-value for the difference between both categories of each characteristic.

Women have a higher valuation for all formality attributes than men (Panel A of Table

[22]For this variable, we use the 1300-week threshold needed to qualify for a pension in Colombia and the age criteria for both sexes. Based on this, we consider that surveyed women under 32 years old and surveyed men under 37 years old still have enough time to accumulate the required number of weeks for their pension and are at or below the cutoff age for retirement. However, those who exceed these age limits may have missed the opportunity to fulfill the requirements.

4). In particular, women are willing to forgo 9.3 pp more of their income than men to access health insurance and 22.8 pp more than men to contribute to a retirement plan with subsidy. We lack power to detect these differences as statistically significant, but they are economically meaningful. These results are consistent with women being less attached to the labor market and having larger WTP for flexibility (Wiswall and Zafar, 2018; Bustelo et al., 2021). Demanding flexibility in an institutional framework such as the one in Colombia may be costly in terms of pension prospects since the requirements for a pension involve a 25 years of contributions in a formal job. The norm in Colombia is that jobs are full time and there is little flexibility in general, except in informal jobs. In addition, when their spouses contribute to health and pension in a formal job, women obtain health benefits as beneficiaries but they can only receive a pension if their retired spouse dies. Therefore, the subsidy may be the only way for these women to obtain a pension, which is consistent with women having a high WTP for the retirement plan with subsidy.

Table 4: Willingness to pay for formal job attributes (percent of wages) by demographic characteristics

	Health Insurance	Retirement plan	Retirement plan + subsidy
Panel A: Sex			
Male	24.97	28.72	30.69
	(6.41)	(6.62)	(5.54)
Female	34.30	29.42	53.44
	(5.76)	(6.65)	(26.27)
$p-value$ of Difference	0.28	0.94	0.40
Observations	692	889	580
Panel B: Education			
Above secondary education	30.43	25.61	62.01
	(5.23)	(4.98)	(25.12)
Secondary education or below	33.40	32.70	25.96
	(8.82)	(8.30)	(5.76)
$p-value$ of Difference	0.77	0.46	0.16
Observations	691	888	579
Panel C: Cutoff age for retirement			
Above the cutoff age	44.97	37.97	29.82
	(13.53)	(8.06)	(7.05)
At or below the cutoff age	17.63	14.74	31.23
	(4.29)	(7.15)	(4.71)
$p-value$ of Difference	$p = 0.05$	$p < 0.05$	0.87
Observations	690	887	578

Notes: We present the results for an inattention corrected maximum likelihood (when wage premium is 30%). Bootstrapped standard errors clustered at the business level based on 500 samples. We include participants above and below the cutoff age for retirement. We calculate this cutoff by subtracting 25 years from the respective retirement age for men and women.

The level of education can impact retirement planning priorities. For instance, highly

educated individuals may put more weight on saving money for retirement because they can afford to do so if they earn higher salaries than less-educated individuals and because they may be more aware of the importance of retirement. We do not have many respondents with high education levels in our sample. Only around 30% report having some technical or college education, including vocational training. Our results in Panel B of Table 4 indicate that respondents with more than secondary education tend to place more value on retirement plans that offer subsidies for non-contributory periods since their WTP is much higher than for those with lower education levels. The difference is not statistically significant.

Finally, in Panel C of Table 4 we split the sample by whether respondents are above or below the cutoff age that will allow them to obtain a pension when they reach the retirement age. We expect that younger people do not care much about contributing because they can start doing so later in life. Conversely, those who are above the cutoff may care much more because as people age they may start thinking more about late life. Agreeing with this hypothesis, our results show that the youngest people in the sample, below the age limit for meeting the time requirements for retirement, have a significantly lower willingness to pay for health and pension attributes (27.33 pp and 23.23 pp lower, respectively). This difference disappears when we include a subsidy for the retirement plan. Any conjecture for why there is no difference here would be pure speculation. Perhaps receiving subsidies is so ingrained in the culture that people are willing to pay for anything that offers a subsidy.

Regarding our proxies for risk and temporal preferences, in Table 5 we find that people who are more risk averse and those with personal, family or business insurance have a higher willingness to pay for health insurance (Panel A). Even though the differences are not significant, this result is consistent with the idea that risk averse individuals must have higher WTP to cover themselves against risks such as illness. The results for retirement plans are not so clear directionally.

Table 5: Willingness to pay for formal job attributes (percent of wages) by proxies for behavioral measures

	Health Insurance	Retirement plan	Retirement plan + subsidy
Panel A: Risk aversion			
Not risk averse	27.46	31.94	41.47
	(4.03)	(6.18)	(10.82)
Risk averse	35.17	30.86	33.51
	(12.56)	(8.86)	(8.69)
$p-value$ of Difference	0.56	0.92	0.56
Observations	910	1,235	707
Does not have insurance	26.81	33.33	33.17
	(4.57)	(6.67)	(6.92)
Has insurance	35.02	25.27	63.39
	(9.10)	(6.11)	(27.90)
$p-value$ of Difference	0.42	0.37	0.29
Observations	916	1,242	715
Panel B: Patience			
Not persevering	26.20	32.86	44.81
	(4.42)	(9.46)	(12.91)
Persevering	34.14	31.69	32.11
	(8.63)	(6.43)	(7.35)
$p-value$ of Difference	0.41	0.92	0.39
Observations	910	1,236	707

Notes: We present the results for an inattention corrected maximum likelihood (when wage premium is 30%). Bootstrapped standard errors clustered at the business level based on 500 samples. Risk averse individuals are the ones who respond "strongly agree" to the statement "I never try something I'm not sure about". We also include another proxy for risk preferences after the question "Do you currently have any type of insurance for your family, yourself or your business?". Persevering respondents "strongly agree" to the statement "I continue to work on difficult projects even when others object". This last variable is a proxy for patience.

In Panel B of Table 5 we report the WTP for individuals who exhibit high vs. low levels of patience, as measured by their perseverance. Contributing to health and pensions requires some degree of forward-looking behavior and perseverance given the institutional framework that rewards individuals who are consistent in their contributions. However, we do not find any strong indications that more persevering individuals have higher WTP. It is possible that this outcome is due to the variable not being an accurate indicator of patience. The correlation between this indicator and a time preference measure, only available in the first survey wave,[23] is 0.03.

[23]The time preference measure comes from the answer to "How willing are you to give up something beneficial to you now in order to gain greater benefits in the future?" in a scale from 0 to 10. In this case, we classify a patient individual if the response is above 6.

6 Discussion: Reconciling High WTP for Formal Job Attributes and High Prevalent Levels of Informality

To some degree, the magnitude of our WTP estimates is surprising in light of the findings from several papers showing that the expansion of social protection systems increases informality. These findings, in particular for the case of free health insurance in Mexico, have been recently challenged. Del Valle (2021) replicates the result from previous papers indicating that the share of formal over total workers decreases as a result of the expansion of Seguro Popular. Nevertheless, this reduction is not due to workers transitioning from formal to informal jobs but because having free health insurance increased the labor force participation, especially among women, and hence the denominator of the formal/total ratio is larger. The author highlights the fact that higher health access decreased responsibilities related to care-giving of dependents for women so they could increase their participation in the labor market. This story is consistent with people having a high demand for health services, which is a conceptually different one from the crowding out of formal jobs alluded to in the previous literature.

One additional piece of evidence for the case of Mexico is provided by Duval-Hernández (2022). Using a special supplement of the Mexican Labor Force Survey, the author tabulates responses to a question about workers' preferences to have a job with social security even if they have to pay for it. Over 80% of all workers regardless of their formality status, respond positively to this question, suggesting that most workers may have a high WTP for formal job attributes, as we find in our study.

It seems, then, based on our findings and these recent papers, that the academic literature is moving away from explanations of workers' decisions to choose an informal job as a voluntary decision. In the following subsections we provide a series of hypotheses attempting to explain why there are still high levels of informality if the WTP for formal job attributes is high. The institutional details correspond to Colombia but we note that similar institutional arrangements exists across the whole of Latin America (Alaimo et al., 2017).

6.1 WTP across the distribution

The discussion of Table 3 emphasized the mean WTP for each of the three formal job attributes. However, the same table reports the 25th and the 75th percentiles of the WTP distribution from which we can know how variable the WTP is across the distribution.

One potential reason why previous work finding increases in informality due to expansions of social protection systems is that those who are induced to become informal are those with the lowest WTP for formal job benefits. If the WTP is not too compressed and there is enough difference between the 25th and 75th percentiles, it would suggest that this hypothesis may be behind the apparent inconsistency between our results and the previous literature.

We find large differences between the 25th and 75th percentile of the WTP distribution for all three attributes (see Table 3). For the case of health insurance, the one most closely related to previous research, when we do not correct for inattention, the WTP is even negative, which indicates that respondents in this quantile must in fact get paid extra in order to accept a job with contributory health insurance. When we correct for inattention the WTP is between 10 and 13%. Similarly, for retirement plans with and without subsidy, the 25th percentile estimates are negative without correcting for inattention, and vary between 9 and 14% for retirement without subsidy, and are around 18% for the retirement plan with subsidy.

All in all, the evidence from our quantile analysis shows that WTP can be very low and close to zero for a fraction of the population, i.e., those who have WTP below the 25th percentile. Hence, we argue that workers with low WTP for health insurance are those who would be on the margin of being induced to become informal from expansions of free or subsidized health programs. These workers are probably the ones that were captured as becoming informal by the Camacho et al. (2013), Azuara and Marinescu (2013) and Conti et al. (2018) studies. These workers also probably coincide with those who have very low levels of education. Our heterogeneity estimates, however, do not provide the way to test this because our education measure is defined rather coarsely (above/at or below secondary) to have maximum power in the heterogeneity tests.

6.2 Workers' income unpredictability and volatility

The type of businesses and jobs in our sample may be subject to great degrees of seasonality that affect the predictability of income. When income is not predictable or volatile, having a commitment to contribute to health and pensions is more difficult than in the case of workers who can fully anticipate their streams of income. In some cases, the expected unpredictability of income may even discourage some workers from even starting to make social security contributions. When contributions are stopped, users who would like to enroll again must incur some administrative and time costs, which may further discourage workers from contributing when the do not know their future streams of income.

In our experiment, we asked about the choice between two hypothetical jobs, but did not mention anything about the predictability of the streams of income derived from these jobs. We expect our respondents to vary in terms of what they assume with respect to income predictability, but these differences should be similar across treatments by virtue of randomization. If respondents understand the formal job attributes as a proxy for income stability, another attribute related to formal jobs (Mahmud et al., 2021), our WTP would be capturing the willingness to pay for stability or predictability rather than for the attribute we vary in the experiment. Reassuringly, the WTP is not the same across the three job attribute we randomize, so we believe that respondents were thinking about the attributes we vary rather than income predictability when they answered the question.

6.3 Lack of information on the costs of contributing or on how to contribute

Our mean WTP estimates indicate that, on average, workers are willing to forgo 28% and 31% of their salary to obtain health and retirement plans, respectively. In subsection 2.1, we mentioned that the cost for self-employed workers who want to contribute without an employer to obtain health and retirement plans is about 30% of their base salary. If the estimated WTP is so close to this value, why informal workers do not contribute as self-employed?

Even if their income is completely predictable, individuals may face barriers more behavioral in nature such as lacking information on how much it costs to contribute and what are the benefits of contributing. Another barrier could be that they find difficult to navigate the systems where the contributions are made if they lack the skills or time to learn how to navigate these systems. These hypothesized barriers are in line with the research in education finding that helping individuals fill out complex financial aid forms and providing information about tuition costs increases their access to higher education (Bettinger et al., 2012; French and Oreopoulos, 2017).

6.4 Structural issues in the labor market

Less than 40% of the labor force in Colombia is able to obtain a pension due to the country's high level of informality. Additionally, stringent eligibility conditions are expected to cause a decrease in the proportion of pension recipients among the elderly, dropping from the 37% as of 2018 to only 17% expected a couple of decades later (World Bank, 2018).

A World Bank report on the situation of pensions in Colombia states that structural issues in the labor market in Colombia often make it challenging for workers to meet the minimum requirements for receiving annuities (World Bank, 2018). As a result, many people who are affiliated with the pension system end up receiving lump-sum benefits at retirement, which is not the main goal of the pension system. In what follows we summarize the three main structural issues identified in the report.

First, there is unfair competition between the public and private pension schemes because the public pension fund is highly subsidized, while the private funds are not. The unfair competition creates fiscal pressures and fosters regressive income distribution as those with long tenure in the formal sector obtain highly subsidized pensions. Moreover, unfair competition may also prevent the development of annuities markets in the long run so few individuals will be able to obtain an annuitized pension.

Second, the salary structure in Colombia is heavily skewed towards lower wages, with the minimum wage set at approximately 70 percent of the average wage. This creates a significant distortion that hinders the formalization of the labor market.

Third, the constitution mandates that the minimum pension should equal the minimum salary. Paradoxically, the attempt to safeguard workers from inadequate retirement funds by establishing a high minimum pension threshold drives a significant proportion of contributors out of the system, depriving them of any retirement benefits.

6.5 Hypothetical bias

Hypothetical bias is an important concern in discrete choice experiments. The reason is the lack of real consequences for respondents, as their answers in hypothetical scenarios do not affect their well-being, finances, or lead to real-world outcomes. Additionally, if participants thought that the socially desirable answer to our hypothetical questions is to state that they value health and pension benefits, we would obtain WTP rates that are higher than the real rates.

While we cannot entirely rule out the possibility that some of our results are influenced by hypothetical bias, we believe it does not fully explain the findings for two reasons. First, Mas and Pallais (2017) do not find large differences between the results in their discrete-choice experiment and their experiment with real workers and jobs. Although there are several differences between our and their study, the similarity in the hypothetical and real estimates suggests that extreme discrepancies between real and hypothetical responses in our study (set in Colombia) are unlikely. Second, we present estimates that are adjusted for inattention, which partially addresses the issue of hypothetical bias. Inattentive respondents may not carefully consider the scenarios or real-world constraints, and by correcting for inattention, we reduce the potential influence of hypothetical bias.

7 Conclusion

We conduct a discrete choice experiment among owners and employees of Colombian mom-and-dad stores to elicit their willingness to pay for health and retirement plans, two of main attributes of formal jobs. Workers' valuations for these benefits are important given that previous research has suggested that workers' valuations of formal job attributes may be lower than their actual cost. These valuations are hard to estimate

from observed choices since job attributes are usually bundled in real labor markets and the choice set workers face may differ based on workers' unobservable characteristics. Our experiment overcomes these hurdles by asking respondents to choose between two hypothetical job options involving randomized levels of earnings and job attributes.

We find that, on average, workers are willing to forego up to 28% and 37% of their earnings to get access to formal health and retirement, respectively. This finding suggests that workers highly value these benefits, which is inconsistent with previous findings suggesting that the introduction of free or subsidized substitutes induces workers to become informal. However, we note that the lower quartile of the WTP distribution for formal health is not different from zero, suggesting that those induced to become informal by expansions of free health likely were drawn from this portion of the WTP distribution.

Obtaining a pension in Colombia involves fulfilling requirements in terms of contribution capital and time, and currently the share of people who fulfill them is low. One feature of our design allows to compare whether the WTP is higher for the typical retirement plans relative to an option including a subsidy that helps individuals fulfill the requirements to receive a pension. We find that workers tend to have higher WTP for the retirement plan with subsidy than without subsidy, and this is particularly the case for women and individuals who are above the age at which it is recommended to start contributing. This type of subsidy is already in place but only covers about 3% of the potential beneficiaries, which may reflect the fact that these non-contributory pension schemes are limited by budget constraints.

All in all, we find that workers highly value having access to health and retirement plans. However, there may be other regulatory, behavioral and labor market restrictions that prevent workers from becoming formal.

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A Appendix

Table A.1: Randomization balance

	Health Insurance	Retirement plan	Retirement plan + subsidy
Business owner	0.924	0.173	0.930
Age	0.988	0.704	0.749
Female	0.636	0.419	0.503
Secondary education complete or below	0.082	0.427	0.161
Contribution to health and retirement in past year	0.136	0.630	0.337
Contribution to health or retirement in past year	0.268	0.591	0.797
Has insurance for family, himself or business	0.206	0.705	0.884
Risk aversion	0.972	0.496	0.140
Perseverance	0.631	0.385	0.372

Notes: We report the p-values of an F-statistic of the regression of each characteristic on dummy variables for each wage gap level, by treatment (health insurance, retirement plan, and retirement plan + subsidy. During the first survey wave, the information on age, sex, and education was only collected for the business owners.

B Survey Instructions

We use the responses to two survey waves included in the Estudio Nacional de Emprendimiento a Tenderos (ENET) within the framework of the Colombia Científica project. Below is a list of the questions used for the analysis.

- Imagine that you cannot continue working in your current activity and you receive two job offers. Both jobs are the same as your current activity in terms of total number of hours, work schedule, and distance to the workplace, but may differ in the income and benefits they offer. Listen carefully to the description of the two job offers.
  - Job 1: Your earnings will be exactly the same as your current activity. You will NOT receive (health insurance/retirement plan/retirement plan plus a subsidy to satisfy the contribution period requirement in case you have not contributed in the past).
  - Job 2: Your earnings will be (-30%, -20%, -10%, 10%, 20% 30%) relative to those of your current activity. You will receive (health insurance/retirement plan/retirement plan plus a subsidy to satisfy the contribution period requirement in case you have not contributed in the past).

Which of the two jobs would you choose?

- The person interviewed is: (1) One of the business owners (2) Family member of the business owner (3) Business manager (4) Other.

- *Wave 1:* What is the sex of the business owner? *Wave 2:* What is your sex?

- *Wave 1:* How old is the business owner? *Wave 2:* How old are you?

- *Wave 1:* What is the highest level of education attained by the business owner? (1) Some years of elementary school (2) All elementary school (3) Some years of high school (4) All high school (5) One or more years of technical or technological school (6) Complete technical or technological school (7) University without a degree (8) University with degree (9) Postgraduate (10) None (11) Don't know/no answer. *Wave 2:* What is your current educational level? (3) Less than high school (4) High school graduate (6) Graduated from a technical or technological career or an undergraduate program (9) Postgraduate studies (specializations, master's degrees, etc.) (11) Don't know/no answer.

- *Wave 1:* During the past twelve months, have you made any of the following types of contributions? (1) Health (affiliated to an EPS) (2) Pensions (affiliated to a pension fund or COLPENSIONES). *Wave 2:* How is your health affiliation? (1) Affiliated to health in the subsidized regime (2) Affiliated to health in the contributory regime as a contributor (you or the employee pays) (3) Affiliated to health in the contributory regime as a beneficiary (your spouse or parents pay) (4) Not affiliated to health. What is your pension affiliation like? (1) You do not contribute regularly to pensions (2) You contribute regularly to a pension fund (3) Your employer or someone else contributes for you to pensions (4) You do not contribute regularly, but you do from time to time with BEPS.

- Do you currently have any type of insurance for your family, yourself or your business?

- The following expressions describe you more or less accurately. How much do you agree with the following statement: "I never try something I'm not sure about" (1) Strongly disagree (2) Slightly disagree (3) Neither agree nor disagree (4) Slightly agree (5) Strongly agree.

- The following expressions describe you more or less accurately. How much do you agree with the following statement: "I continue to work on difficult projects even when others object" (1) Strongly disagree (2) Slightly disagree (3) Neither agree nor disagree (4) Slightly agree (5) Strongly agree.

- *Wave 1:* Now I would like to ask you about your willingness to act in a certain way. You can use any number between 0 and 10 to indicate where you are on the scale, using 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10. "How willing are you to give up something beneficial to you now in order to gain greater benefits in the future?