Table 3. Estimated heteroskedastic Probit models (*continuation*)

	Model 1	*Model 2*	*Model 3*
High-skilled Non-Manual		-1.9471988***	-1.7010892***
		(.2571096)	(.2558354)
Female Parent (household head)	-0.0271291	-0.0043522	0.0004602
	(.0556732)	(.0529015)	(.053438)
Parent Informal Worker	0.8523214***	0.7533278***	0.7379346***
	(.1108381)	(.0899263)	(.0996594)
Parent Basic education	-0.0203261		
	(.0616704)		
Parent Low-skilled Manual	-0.563782***	-0.2779145**	-0.2702019**
	(.1270881)	(.113701)	(.1169804)
Parent High-skilled Manual	-0.8148499***	-0.4345053***	-0.4280405***
	(.130229)	(.1006209)	(.1064527)
Parent Commerce	-0.6429424***	-0.3564615***	-0.3614844***
	(.1192464)	(.1014119)	(.107024)
Parent Low-skilled Non-Manual	-0.8277009***	-0.4039645***	-0.4088476***
	(.1515308)	(.1218987)	(.125795)
Parent High-skilled Non-Manual	-0.6035372***	-0.1744778	-0.1673623
	(.1616113)	(.1396614)	(.1315726)
Intercept	5.69164***	5.2412481***	5.2216027***
	(.8087896)	(.6592549)	(.7492485)
Insigma			
High School/ Tech College	0.1306099*	0.094006	-0.1160977
	(.0707441)	(.0658669)	(.0730642)
University/Graduate	0.2820481***	0.3593583***	-0.040787
	(.0931087)	(.0919789)	(.0956415)
Age	0.0108664**	0.0102562***	0.0180478***
	(.0045556)	(.0037781)	(.0045198)
Female	0.1259824**	-0.0320599	-0.0562749
	(.0519266)	(.052099)	(.0548854)

Continue

Table 3. Estimated heteroskedastic Probit models (*continuation*)

	Model 1	*Model 2*	*Model 3*
LR test of lnsigma=0: chi2(4)	31 279.51***	30 973.89***	24 301.59***
Number of observations	23 667	23 390	22 973
Pseudo-R2	0.1851	0.2329	0.2574
Correctly Classified Predictions (%)	68.79	72.1	73.45

Notes: *** p<.01; ** p<.05; * p<.1 Standar Errors in parenthesis.

Source: estimation results.

Unlike Levy's (2016) findings for the case of Mexico, our results show evidence that more years of schooling reduce the probability of being an informal worker. Having at most a high school or a technical college degree reduces the probability of being an informal worker by 13 percentage points (with respect to those workers having no more than middle school, which is the base category), while having some or completed university degree reduces the probability by 19.4 percentage points. As found in other empirical studies, our results show that human capital is negatively related to labor informality (López, 2015; García *et al.*, 2019; Guillermo and Estrada, 2022), and it is the factor that most influences the probability of being an informal worker (as also found by García *et al.,* 2019); on average, individuals with higher educational level are less likely to end up working under informal labor conditions.

On average, the probability of being an informal worker reduces by 1.2 percentage points as the worker becomes one year older. However, the effect of aging depends on the worker's age. The estimated model predicts a U-shape behavior of the probability of being an informal worker as a function of age. Figure 3 shows, as expected, that young and elderly workers are more likely to be informal. As explained in section 2, the lack of human capital in young workers and human capital depreciation in older workers explains this behavior. The predicted probabilities also replicate the behavior of the fraction of informal workers by age, shown in figure 2. But the age-probability profile of being an informal worker also changes by occupational category.

Table 4. Estimated average marginal effects

Variable	*Delta-method*					
	dy/dx	*std. Err.*	*T*	*P>t*	*[95% conf. Interval]*	
High School/ Tech College	-0.128836	0.013643	-9.44	0.0000	-0.155578	-0.102095
University/Graduate	-0.194201	0.019341	-10.04	0.0000	-0.232111	-0.156292
Age	-0.011879	0.000984	-12.07	0.0000	-0.013808	-0.009951
Working student	0.095398	0.012278	7.77	0.0000	0.071332	0.119463
Urban	-0.075815	0.010175	-7.45	0.0000	-0.095758	-0.055872
Female	-0.031646	0.009453	-3.35	0.0010	-0.050174	-0.013118
Single	-0.013225	0.011972	-1.10	0.2690	-0.036691	0.010241
wage-income-difference	0.028321	0.001924	14.72	0.0000	0.024549	0.032093
Occupation						
Low-skilled Manual	-0.136329	0.027710	-4.92	0.0000	-0.190644	-0.082014
High-skilled Manual	-0.325683	0.028482	-11.43	0.0000	-0.381511	-0.269855
Commerce	-0.087798	0.025757	-3.41	0.0010	-0.138284	-0.037312
Low-skilled Non-Manual	-0.333865	0.028177	-11.85	0.0000	-0.389094	-0.278637
High-skilled Non-Manual	-0.364697	0.034167	-10.67	0.0000	-0.431668	-0.297727
Female Parent (household head)	0.000091	0.010604	0.01	0.9930	-0.020692	0.020875
Parent Informal Worker	0.153561	0.010662	14.40	0.0000	0.132663	0.174459
Occupation Parent						
Low-skilled Manual	-0.053180	0.021948	-2.42	0.0150	-0.096200	-0.010161
High-skilled Manual	-0.084895	0.018375	-4.62	0.0000	-0.120911	-0.048878
Commerce	-0.071481	0.019313	-3.70	0.0000	-0.109336	-0.033626
Low-skilled Non-Manual	-0.081022	0.022929	-3.53	0.0000	-0.125964	-0.036080
High-skilled Non-Manual	-0.032739	0.025385	-1.29	0.1970	-0.082495	0.017018

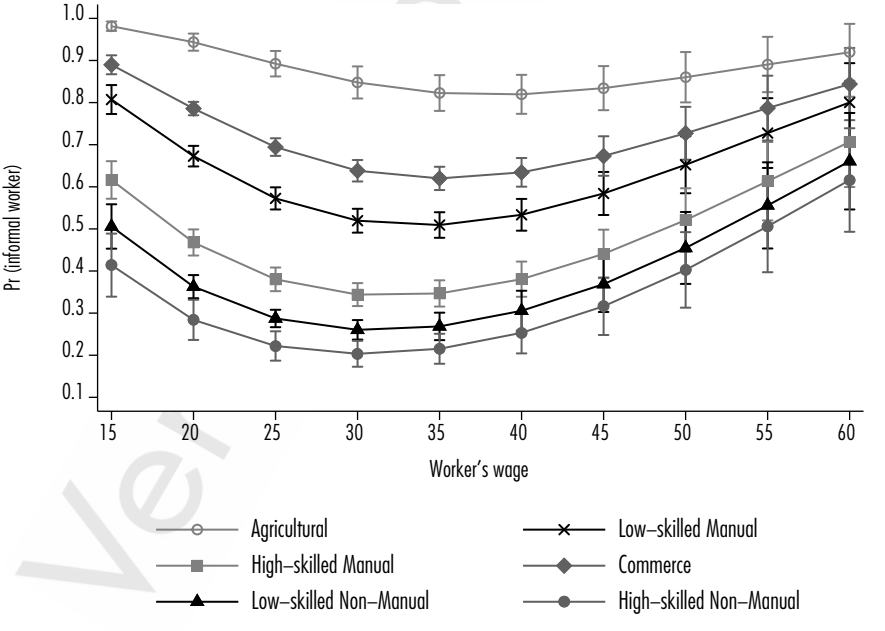
Note: dy/dx for factor levels is the discrete change from the base level.

Source: own elaboration using Model 3 estimation results.

Figure 3 shows that, for agricultural workers, the probability of being informal slightly changes through the worker's lifespan, which may be explained by no significant changes in human capital for these workers. In contrast, the probability profile for a worker with a high-skill and non-manual occupation drastically changes with age; at age 60, it is 2.8 times more likely for this worker to work under informal labor conditions than at age 25. Figure 3 also shows that, in general, workers having a non-manual occupation, human capital accumulation (lack of experience, for young workers), or human capital depreciation (lack of knowledge update, for older workers) may significantly change their probability of being an informal worker.

Including occupational categories as explanatory variable improved the model's accuracy and predictive power (as shown in table 3). The estimated average marginal effects based on model 3 (see table 4) show that having a non-agricultural occupation reduces the probability of being an informal worker. In particular, workers with non-manual occupations are less likely to

Figures 3. Predicted probabilities and 95% confidence intervals of being an informal worker by age and occupational category



Source: own elaboration.

work under labor informality conditions. Compared to agricultural occupations (base category), having a non-manual occupation, low-skilled or high-skilled, reduces, on average, the probability of being an informal worker by 33.4 and 36.5 percentage points, respectively. This factor variable is the one that reduces the probability of being informal the most; jobs requiring intellectual human capital are more likely to be formal.

The odds ratio analysis in table 5 sheds light on understanding the relative probabilities by occupational category (all of them are statistically different from 1). At the age of 30, for example, it is 2.5 times more likely to be an informal worker if having an occupation in Commerce than a Low-skilled Non-Manual occupation, and these odds decrease as the worker ages. At 30, a worker is 1.5 times more likely to be informal if he/she has a Low-skilled occupation than a High-skilled Manual occupation and 1.3 times more likely if the comparison is between Low-skilled and High-skilled Non-Manual occupations. In all cases, the odds decrease with age.

Continuing with the analysis of average marginal effects (see table 4), we may observe that having a household head parent informally working increases the adult child's probability of being an informal worker by 15.3 percentage points on average. This means that there is an intergenerational transmission or inheritance effect of labor decisions as children have a propensity to stay working under informal labor conditions as their parents. Figure 4 shows predicted probabilities by age for workers with informal and formal household head parents. The average predicted probability of being an informal worker if the worker's parent is working under informality is 0.67, while if the worker's parent is a formal worker, the average probability is 0.4; that is, on average, it is 1.7 times more likely for a worker to be informal if his/her household head parent is also an informal worker. The estimated odds ratios change with the worker's age, reaching 1.8 at age 30.

Our results also show that, on average, the probability of being an informal worker is reduced by 3.2 percentage points for female workers. This result is reasonable given the sample used for the model estimation. Figure 5 shows the sample proportion of female and male workers by labor condition, which may be interpreted as conditional probability; in this sense, the probability of being informal, given that the worker is female, is 0.489, while if the worker is male, the probability goes to 0.591. In addition, this estimated marginal effect for female workers coincides with the observed times series behavior of employment rates in the informal sector; on average, female employment rates have been three percentage points below the corresponding rates for males

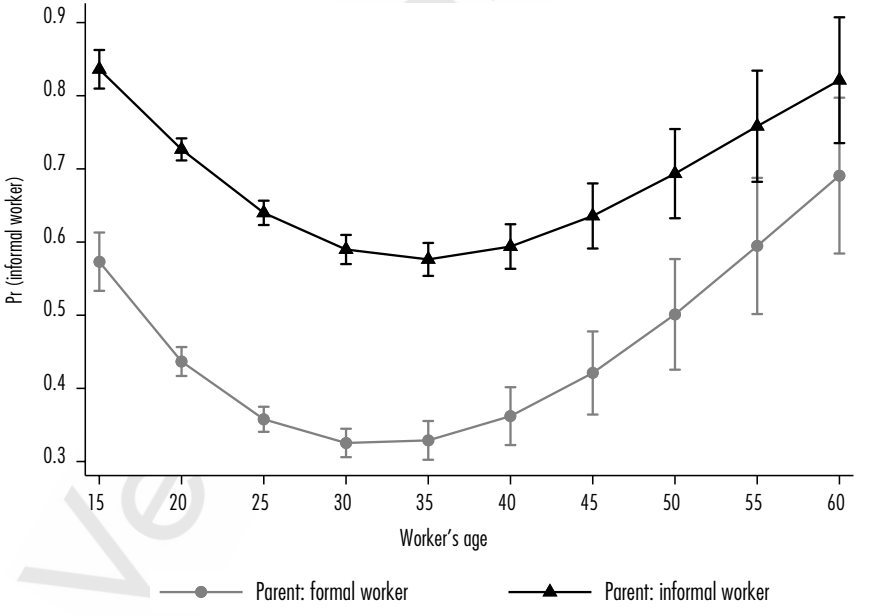
Table 5. Odds ratios: Comparing probabilities of being an informal worker by occupation and age

Odds-ratios	*Age*							
	25	*30*	*35*	*40*	*45*	*50*	*55*	*60*
Commerce / Low-skilled Manual	1.2***	1.2***	1.2***	1.2***	1.2***	1.1***	1.1***	1.1***
Commerce / Low-skilled Non-Manual	2.4***	2.5***	2.3***	2.1***	1.8***	1.6***	1.4***	1.3***
Low-skilled Manual / High-skilled Manual	1.5***	1.5***	1.5***	1.4***	1.3***	1.3***	1.2***	1.1***
Low-skilled Non-Manual / High-skilled Non-Manual	1.3***	1.3***	1.3***	1.2***	1.2***	1.1***	1.1***	1.1**

Notes: *** p<.01; ** p<.05; * p<.1

Source: own elaboration.

Figure 4. Predicted probabilities and 95% confidence intervals by age and worker's parent labor condition



Source: own elaboration using estimation results.