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Informality and Pension Reforms in Bolivia: The Case of *Renta Dignidad*

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ABSTRACT How social protection programmes affect work choices is a question that has been at the centre of labour economics research for decades. More recently, a scant literature has focused on the effects of social protection on work choices and informal employment in the context of low and middleincome countries. This paper contributes to this scant literature by examining the effect of Bolivia's Renta Dignidad, a universal non-contributory old age pension that covers all Bolivians aged 60 years and older. We exploit the discontinuity introduced by the age eligibility criteria of the programme and the timing of the announcement of the programme, to implement a difference-in-differences approach. Overall, we find that Renta Dignidad has no detrimental effects on labour force participation and the intensity of labor of adult members of beneficiary households. Instead, we find that the pension reduces the intensity of work for girls aged 12–18 living with a pensioner, which indicates a positive effect on intra-household time allocation. In terms of work choices, Renta Dignidad reduces the probability of holding a salaried job in rural areas by about 8 percentage points, which denotes a shift from formal to informal employment.

JEL CLASSIFICATION: H55; I38; J21; J26

KEYWORDS: social protection; Bolivia; Informality; noncontributory pensions

1. Introduction

An important question related to the functioning of labour markets is the nature of informal employment and the mechanisms driving its expansion. According to the International Labour Organization (ILO), around half of the world's working-age population engages in the informal economy (ILO, 2019). This issue is particularly important among low- and lower middle-income countries, where informality is widespread—absorbing about 80–90 and 70–80 per cent of total non-agricultural employment, respectively—and characterized by low remuneration,

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precarious working conditions, and limited or no access to institutionalized forms of social protection (World Bank 2019).¹

Indeed, contributory old-age pensions, health insurance, and other contributory schemes cover just a fraction of the poor. In Latin America, for instance, only about 8.5 per cent of the population in the first quintile of the income distribution receive social insurance benefits, and this share goes down to 1.6 per cent among low-income countries (Niño-Zarazúa, 2019). Firms operating in the informal economy also face barriers to entry into consumer markets and value chains in industrial production due to low productivity and low-quality products (La Porta & Shleifer, 2014; Masatlioglu & Rigolini, 2008), credit rationing from formal lenders (Straub, 2005; Wellalage & Locke, 2016), and exclusion from tax benefits and other government schemes (Hoseini, 2020).

This paper contributes to the literature by assessing the effect of Bolivia's *Renta Dignidad*, a universal non-contributory old-age pension, on labour market outcomes and informal employment.² For identification, we exploit the discontinuity generated by the age eligibility criterion of the pension, as well the change in the *legal coverage* that resulted from a policy reform that reduced the pension's age eligibility from 65 to 60 years, to estimate intention-to-treat (ITT) estimators based on a Difference-in-Difference (DiD) framework. Bolivia has the largest share of informal employment to total employment in Latin America, with 86 per cent of workers employed in the informal economy (ILO, 2021). This makes the case of Bolivia relevant, as it can provide relevant information on how non-contributory pensions can influence work choices and informal employment.

The economic literature has traditionally emphasized the dual nature of labour markets in developing countries—the dual labour market hypothesis—whereby an excess supply of unskilled labour is the result of low human capital endowments and efficiency wages that are set above market clearing prices (Fields, 1975; Lewis, 1954; Stiglitz, 1976). Discriminatory norms against women, the elderly, minorities, and vulnerable groups are also expected to exacerbate labour market segmentation, making informal employment a strategy of last resort to avoid hunger and destitution (Chen, Vanek, & Heintz, 2006; Gulyani & Talukdar, 2010).

Critics of the dual labour market hypothesis argue that labour market segmentation may not exist if there is free entry movement from informal to formal labour markets (Heckman & Hotz, 1986; Pratap & Quintin, 2006; Rosenzweig, 1988). Informal employment is, from that perspective, not a choice made out of necessity, but the outcome of individual strategic decisions taken to maximize utility and exploit the comparative advantage that the informal employment offers to workers (Gindling, 1991; Magnac, 1991; Maloney, 2004). Adverse incentives in the tax and welfare-benefit systems, together with weak and ineffective legal frameworks and enforcement institutions, would exacerbate the level of informality (Dabla-Norris, Gradstein, & Inchauste, 2008; Kanbur, 2017), with far-reaching consequences for the functioning of labour markets and economic development.

These competing hypotheses can, however, be reconciled by considering the possibility of informal labour markets being heterogeneous and characterized by their own internal duality (Fields, 1990; Marcouiller, de Castilla, & Woodruff, 1997). Under this view, informal labour markets are made of a two-tier system in which a lower-tier informal sector—an easy-entry segment in Fields's (1990) terminology—would be the strategy of last resort for the poorest and least-endowed workers, with negligible marginal productivity of labour, whereas an upper-tier informal sector would reflect voluntary and strategic decisions (Canelas, 2019; Cunningham & Maloney, 2001; Günther & Launov, 2012).

While informal employment may be the most likely strategy of last resort among the poorest, at higher levels of capital endowments, workers' strategic choices could be influenced by the presence of social protection benefits. The effect that social protection programmes can have on work choices has become an important topic in the labour economics literature, in particular for the case of industrialised economies. The reviews by

Hoynes (1997) and Moffitt (2002) showed that changes in the eligibility for, and generosity of, welfare benefits can have significant effects on labour supply at the margin, by raising the reservation wage of beneficiaries.

In the context of developing countries, a growing literature that examines the effects of noncontributory social protection programmes on adult labour supply and work choices among the poor overwhelmingly finds evidence of positive (or insignificant) effects.³ Fewer studies that analyse the effects of social protection programmes on informal employment find contrasting results, with some studies reporting an increase in informal employment (Bobba, Flabbi, Levy, & Tejada, 2021; Bosch & Campos-Vazquez, 2014; Camacho, Conover, & Hoyos, 2013; Levy, 2018), while others reporting insignificant effects (Azuara & Marinescu, 2013; Campos-Vázquez & Knox, 2013; Cruces & Bérgolo, 2013).

The literature that specifically focuses on the effects of non-contributory old-age pensions on informality (Antón, Trillo, & Levy, 2012; Attanasio, Meghir, & Otero, 2011; Bosch & Guajardo, 2012; Bosch & Manacorda, 2012; Calderón-Mejía & Marinescu, 2012; Galiani, Gertler, & Bando, 2016; Hernani-Limarino & Mena, 2015) find that the presence of these schemes can affect work choices and expectations of the working-age population, although these effects are heterogeneous across contexts, income levels, and population subgroups. Our study contributes to this small literature by examining the effect of Renta Dignidad on labour market outcomes and informal employment. Overall, our results suggest that access to *Renta Dignidad*, either as a direct or indirect beneficiary, had no effects on labour supply or the intensity of labour, measured by the number of hours worked. However, we find evidence indicating that the pension increased the incidence of self-employment among household members of working age living with pensioners in rural areas, leading to a shift from formal waged employment to informal self-employment. We discuss in Section 5 the possible mechanisms underpinning these results.

The remainder of the paper is organized as follows: Section 2 provides a review of the literature on labour supply and informal employment, paying attention to the scant literature on the effects of social protection programmes on informality, particularly in the case of social pensions. Section 3 provides an overview of *Renta Dignidad*, highlighting the central features of the old pension reform in terms of age eligibility and transfer size, whereas Section 4 discusses the data and identification and estimation strategies adopted in the study. Section 5 presents the results with regard to the impact of *Renta Dignidad* on labour supply in terms of (1) direct beneficiaries; (2) other family members, including children; and (3) the propensity to engage in informal employment. Section 6 concludes with an analysis of the implications of our findings for policy design.

2. Literature review

2.1. Social protection and labour supply

A growing literature has examined the effects of social protection programmes on labour supply and work choices in the context of developing countries, although a much more limited literature has specifically focused on the causal relationship between welfare benefits and informal employment.

In Mexico, for instance, Behrman and Parker (2013) report positive but small effects of the *ProgresalOportunidades* programme on labour supply, with women reporting larger effects than men. In Colombia, Barrientos and Villa (2015) find positive effects of *Familias en Acción* on labour supply, especially among single mothers and young adult men. In the Dominican Republic, Canavire Bacarreza and Vasquez Ruiz (2013) find positive effects of the *Solidaridad* cash transfer programme on labour force participation among adults. Fewer studies have reported negative effects. For example, Teixeira (2010) report statistically significant reductions in labour intensity resulting from Brazil's *Bolsa Família*.

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While most studies have not explicitly addressed the concern of informal employment, one can infer from the level of earnings and the type of work of most beneficiaries of poverty-targeted interventions that any sizeable effect is largely restricted to within the boundaries of the informal sector. This is particularly true for those studies that report a significant time reallocation away from casual and low-paid wage labour to self-employment, as in the cases of Macours, Schady, and Vakis (2012) analysis of Nicaragua's *Atención a Crisis*; Asfaw, Davis, Dewbre, Handa, and Winters (2014) study of Kenya's Cash Transfer for Orphans and Vulnerable Children; Covarrubias, Davis, and Winters (2012) analysis of Malawi's Social Cash Transfer programme; Daidone, Davis, Dewbre, and Covarrubias (2015) analysis of Lesotho's Child Grants programme; and Cheema et al. (2020) study on Pakistan's Benazir Income Support Programme.

In other contexts, however, studies have found a shift from self-employment to waged employment as a result of social protection interventions, as in the case of Mochiah, Osei, and Akoto (2014) study of Ghana's Livelihood Empowerment against Poverty (LEAP) programme. While the shift towards wage employment could in some contexts represent a positive outcome, it is unclear whether such a move leads to a transition from informal to formal employment.

2.2. Social protection and informal employment

A strand of the literature examines the causal relationship between social protection benefits and informal employment, mainly in the context of Latin America.⁴ de Holanda Barbosa and Corseuil (2014) analysed the case of Brazil's *Bolsa Família*, and found negative but insignificant effects. In Argentina, Garganta and Gasparini (2015) examine the impact of *Asignación Universal por Hijo*, a child allowance programme on informality, and find a significant and large disincentive effect to formalization, although this was constrained to programme beneficiaries who were already active in the informal labour market. The authors do not find evidence of switching choices from formal to informal employment. In Uruguay, Cruces and Bérgolo (2013) study the expansion of health insurance and its effects on formal workers' dependants. They find significant impacts on formal employment. In Colombia, Camacho et al. (2013) analyse the subsidised regime of public health insurance and find strong evidence of an increase in informal employment of approximately 4 percentage points.

Several studies have focused on Mexico's *Seguro Popular*, a non-contributory social health insurance scheme that was introduced in 2003 to expand access to health services among the poor and vulnerable, who had been excluded from contributory social insurance schemes. While these studies adopt similar identification strategies, they find contrasting results.⁵ For instance, Aterido, Hallward-Driemeier, and Pagés (2011) find that *Seguro Popular* impacted negatively the propensity to formal employment, with a 3.1 percentage point reduction in the inflow of workers into the formal economy. The impact was larger for those with less education and those whose household members had social security coverage. Similarly, Bosch and Campos-Vazquez (2014) find that *Seguro Popular* had a negative effect on formal employment among small and medium enterprises.

In contrast, using a similar identification strategy, Azuara and Marinescu (2013) find that *Seguro Popular* had insignificant effects on informality in the overall population, although they find a small increase in informal employment of about 1.7 per cent for less educated workers. Bosch and Campos-Vazquez (2014) restricted the analysis to large and prosperous cities, and found no evidence of a causal relationship between *Seguro Popular* and the propensity to formal or informal employment. Thus, the scarce evidence seems to suggest the presence of a segmented informal labour market with its own internal duality, whereby poorer and less educated workers are likely to be more responsive to social health insurance benefits.

2.3. Non-contributory pensions and informal employment

In the specific case of non-contributory old-age (or social) pensions, there has been a very considerable expansion of these programmes in the developing world, from just 31 social pensions operating in 2000, up to more than 50 programmes in 2018, with a coverage of approximately 200 million direct beneficiaries (Niño-Zarazúa, 2019).

While evidence suggests that social pensions have been effective at reducing poverty and vulnerability in old age (Azeem, Mugera, & Schilizzi, 2019; Barrientos, 2015; Kakwani & Subbarao, 2007; Zhang, Luo, & Robinson, 2020), there are concerns about the adverse effects that they might generate in labour supply, and work choices (Antón et al., 2012; Bosch & Manacorda, 2012). By guaranteeing an income source in old age regardless of workers' contributions to a pension fund, social pensions could *de facto* influence workers' expectations and occupational choices that ultimately affect informal employment, with important implications for economic efficiency (Levy, 2009).

The literature that focuses on the effects of non-contributory pensions on informal employment suggests that these schemes can indeed increase informal employment, although their effects are heterogeneous across contexts and population subgroups. In Argentina, Bosch and Guajardo (2012) examine the effect of *Moratorium*, a scheme that provides pension income to workers regardless of whether they had completed their full social security contributions through formal employment. They find that the programme led to a 2.5 percentage point decrease in formal employment among women aged 60–64, and a large increase in the share of workers in the informal sector receiving a pension. In Colombia, Calderón-Mejía and Marinescu (2012) study the impact of a series of reforms that consisted of unifying the payment of health insurance and pension systems. Using the progressive roll-out of the payment system as an identification strategy, the authors find that the benefit bundling increase in formality was concentrated among salaried workers, while the increase in informality was concentrated among the self-employed.

In Mexico, Galiani et al. (2016) studied the case of *Adultos Mayores*, a poverty-targeted noncontributory pension scheme that covered adults over 70 years of age. They find that beneficiaries reduced participation in formal employment by about 5 per cent in exchange for an increase of 6 per cent in informal unpaid work within the household. In Chile, Attanasio et al. (2011) examine the impact of the 2008 Chilean pension reform that was introduced to guarantee a minimum level of consumption upon retirement, especially among those who had been employed in the informal sector. They found that the reform reduced the participation in the formal labour market by 4.1 per cent among workers older than 40 years old.

In the specific context of Bolivia, Hernani-Limarino and Mena (2015) study is to our knowledge the only impact analysis of *Renta Dignidad* that focuses on labour supply and informal employment. Using difference-in-differences (DD) and changes-in-changes (CIC) to estimate average treatment effects (ATE), they find that Renta Dignidad reduced labour market participation by 4 percentage points, which was largely explained by a decline in women's share in both the formal and informal sectors. They also find an increase of 6 percentage points in informal non-salaried employment among male social pension beneficiaries. Our study, complements Hernani-Limarino and Mena's analysis by reporting intention-to-treat (ITT) estimates based on DD and matching DD for informal employment and labour market outcomes in both rural and urban areas. ITT estimators preserves the prognostic balance generated from the pension reform, which is particularly informative for policy.

In the next sections, we describe *Renta Dignidad*, Bolivia's non-contributory pension scheme, and the identification strategy that is adopted to assess its effect on labour supply and informality.

3. Background of Renta Dignidad

Bolivia is the country with the largest share of informal employment in total employment in Latin America. In 2007, about 85 per cent of the working age population was employed in the informal economy (ILO, 2021), and as a consequence just about 10 per cent of all people in old

age receive a contributory pension. In order to mitigate the level of vulnerability in old age, on 28 November 2007, the Bolivian Legislative Assembly passed Law 3791, which established that all Bolivian citizens aged 60 and older, irrespective of their income or whether they received a contributory pension, were eligible to receive a universal (non-contributory) pension 'Rental Universal de Vejez—Renta Dignidad'. *Renta Dignidad* began operations in February 2008 to distribute benefits in two schemes. The first scheme distributed pension benefits to individuals who were not beneficiaries of contributory pensions (*no rentistas*). This group of *no rentistas* represented 83.6 per cent of the eligible population and were entitled to receive a monthly pension of Bs.200 (equivalent to US\$2.1 PPP a day). The second scheme distributed lower benefits, about Bs.150 per month (approximately US\$1.58 PPP per day), to those who already benefited from a retirement pension (*rentistas*), which was approximately 16.4 per cent of the eligible population (Arauco, Molina, Aguilar, & Pozo, 2013). The pension is paid monthly, although pensioners can choose the frequency of payments.⁶

Renta Dignidad replaced *Bono Solidario* (more commonly known as *BonoSol*), a universal non-contributory pension that was introduced in 1997 to cover people aged 65 and older. Thus, the main policy change that we examine in this study is the lowering of the eligibility age from 65 to 60 years old. By the time of its introduction in 2008, Renta Dignidad covered 753,704 beneficiaries or approximately 67 per cent of the eligible population, and by 2011 (the end of the period covered in this analysis) the pension had already reached 823,602 beneficiaries, or approximately 81 per cent of the elderly population in Bolivia.

The introduction of Renta Dignidad was part of a wider structural reform that included the nationalization of the extractive industries in 2006, which has since then largely financed the pension via a tax on hydrocarbons (Barrientos & Niño-Zarazúa, 2011).⁷ The pension represented about 1.4 per cent of GDP in 2008 and that share decreased to 1.1 per cent by the end of 2011. The universal approach of Renta Dignidad made Bolivia the only country in Latin America (apart from Guyana and Surinam) to have a universal—rather than a poverty targeted—non-contributory pension scheme at the time of its introduction (Escobar Loza, Martínez Wilde, & Mendizábal Córdova, 2013).

4. Data and empirical strategy

The data used in this study come from the Bolivian National Living Standards Survey MECOVI (*Encuesta Nacional de Condiciones de Vida*) for the period 2005–11, which was conducted by Bolivia's National Statistics Institute (*Instituto Nacional de Estadística Bolivia*). The MECOVI is a nationally representative household survey of the Bolivian population. The survey collects detailed information on household demographics, health, education, occupations and labour force participation, housing and asset ownership, household food and non-food expenditures, and income, including contributions from social assistance. It also collects information on whether the individual has participated in paid or unpaid market activities for a private and/or family business and the number of hours allocated to these activities. Unfortunately, it does not collect information on domestic tasks and leisure time.

We are interested in labour market outcomes that could have been affected by Renta Dignidad. From 2007 to 2011 there is an average of 19 thousand individuals per year in the MECOVI surveys. Since we focus on household members living with an eligible or soon-to-be eligible elder whose age is close to the age of 60, we restrict the sample to the households in which the eldest member is in the 55–65 age range. We focus the analysis on this age cohort as this is the group, which is directly affected by the reform.

4.1. Identification strategy

As pointed out earlier, Renta Dignidad targets all Bolivians aged 60 years and older. We exploit the discontinuity in *legal coverage*, i.e. the share of the population, which according to Law

3791, is eligible to receive the pension, to compare them with those households that were just below the eligibility threshold at different points in time, and therefore did not benefit from the programme throughout the entire period covered in the analysis. A second source of variation comes from the *timing* of the announcement and subsequent implementation of the pension reform—that is, before and after 2008. We exploit this exogenous variation to estimate differences in outcomes between those eligible to receive the pension and those under that threshold before and after the programme implementation to obtain intention-to-treat (ITT) estimators under a differences-in-differences (DD) framework.

While in 2008 every individual aged 60 and older became in principle eligible to receive Renta Dignidad, in practice the *effective coverage* of the programme, which measures the extent to which statutory entitlements are actually distributed among the eligible populations, was just in the order of 67%. Even when compliance increased to 81% by 2011 (our end-line period), still one-fifth of the eligible population remained untreated. Since registration is a requirement to receive the pension, compliance is likely to be contaminated by selection bias. In this case, average treatment effects on the treated (ATET) would yield biased estimates (Angrist, Imbens, & Rubin, 1996). Our ITT estimates minimize the risk of bias and preserve the prognostic balance generated from the pension reform, which is most informative for policy.⁸ In the next section, we present our DD strategy.

4.2. Estimation strategy

Our empirical strategy relies on the following DD equation:

$$Y_{igt} = \beta_0 + \beta_1 T_{ig} + \gamma T_{ig} * P_{it} + \sum_{j=1}^J X_{ij} \theta_j + \delta_t + \varepsilon_{igt}$$
(1)

where *i* indexes individual, *g* indexes group, and *t* indexes time. *Y* is the outcome of interest—that is, labour force participation, and hours worked. *T* is a dummy variable equal to 1 for eligible persons (households with at least one person aged 60 years or older) and 0 otherwise; *P* is a dummy variable equal to 1 for the years when the transfer was paid (2008–11), and γ is the parameter of interest yielding the ITT estimates. X_i is a vector of socio-demographic characteristics, including gender, ethnicity, the household structure, and years of education. We also include in X_i controls for rural households, and geographical dummies for the nine departments in Bolivia, whereas δ_t controls for potential time-varying effects of each round of survey data. The specification includes robust standard errors clustered at the household level.

The DD estimates provide unbiased ITT estimators under the assumption of 'parallel trends'—that is, in the absence of the treatment, the outcomes of the two groups would have followed similar trends. While this assumption cannot be tested formally, one can compare trends in outcomes between treatment and control groups before the programme started. If they are similar, it is likely they would have been the same in the post-treatment period in the absence of the programme (Attanasio et al., 2010). We check this assumption by re-estimating the model using data from 2005–07 (the pretreatment period) and present the results in Tables A7–A13 in the Appendix. Based on these results we cannot reject the hypothesis that the pre-programme year dummies (and hence time trends) are the same for treatment and controls at the 5% level of statistical significance.⁹

It is also possible that an unbalanced distribution of observed characteristics between the treatment $(Z_i = 1)$ and control $(Z_i = 0)$ groups affects the outcomes of interest Y_{it} and thus bias the results. To address this problem, we first match treatment and control observations using a kernel propensity score matching, impose a common support, and then calculate the

DD matching (DDM) estimator proposed by Blundell and Dias (2009) as follows:¹⁰

$$DDM = \{ E(Y_{it=1}|D_{it=1} = 1, Z_i = 1) - w_{it=1}^c * E(Y_{it=1}|D_{it=1} = 0, Z_i = 0) \}$$

-w_{it=0}^t * \{ E(Y_{it=0}|D_{it=0} = 0, Z_i = 1) - w_{it=0}^c * E(Y_{it=0}|D_{it=0} = 0, Z_i = 0) \} (2)

where D_{it} is the treatment indicator, equal to 1 for the treatment group in the follow-up period and 0 otherwise; $w_{it=0}^c$, $w_{it=1}^c$, and $w_{it=0}^t$ are the kernel weights for the control and treatment groups in the baseline (t=0) and follow-up (t=1) periods, respectively. The common support is composed of members of the treatment group for whom a counterfactual is found in each of the control samples.¹¹ Tables A2–A6 in the Appendix show the characteristics of the matched samples at baseline and the *p*-values of the mean differences for each of the observed characteristics we are controlling for. As seen in these tables, we were able to remove any source of observed heterogeneity through our matching strategy. In the next section we present the ITT results based on DDM estimators. We present in the Appendix the ITT results based on the DD estimators.

5. Results

In this section, we report the effects of the transfer on labour market outcomes of direct beneficiaries, as well as on other household members. We report the results first for the full sample and then by different sub-population groups. The first column of the tables reports the DDM estimates on the full sample. Columns 2 and 3 present the results of the DDM estimates by area of residence, and the last two columns of the tables show the results by gender.

5.1. Labour market effects

One of the main concerns about non-contributory pensions is the potential perverse incentives that they can generate in the labour market. In this section, we look first at the effects of Renta Dignidad on labour supply. Tables 1-3 report the results for labour force participation. Overall, the ITT estimators indicate that Renta Dignidad has no significant impact on labour

		0	1	1 (8	,
	National sample	Rural	Urban	Male	Female
Effect Observations	-0.016 (0.023) 6,547	-0.032 (0.029) 2,652	-0.016 (0.029) 3,875	0.006 (0.024) 3,376	-0.050 (0.036) 3,159

Table 1. ITT estimates of Renta Dignidad on labour force participation (age 55-65)

Notes: coefficients are estimated using kernel propensity score matching using a DD approach. In all specifications we use control variables and time- and department-fixed effects. Robust standard errors are clustered at the household level in parentheses. Significance level at *p < 0.10; **p < 0.05; ***p < 0.01.

Source: authors' calculations.

Table 2. ITT estimates of Renta Dignidad on la	labour force participation (age 19-54)
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	National sample	Rural	Urban	Male	Female	
Effect	-0.032 (0.028)	-0.015 (0.045)	-0.031 (0.033)	-0.018 (0.039)	-0.043 (0.037)	
Observations	6,568	1,756	4,753	2,953	3,613	

Notes: coefficients are estimated using kernel propensity score matching using a DD approach. In all specifications we use control variables and time- and department-fixed effects. Robust standard errors are clustered at the household level in parentheses. Significance level at *p < 0.10; **p < 0.05; ***p < 0.01.

Source: authors' calculations.

	National sample	Rural	Urban	Male	Female
Effect	-0.009 (0.046)	-0.066 (0.077)	0.059 (0.046)	0.007 (0.062)	-0.005 (0.062)
Observations	2,687	1,078	1,582	1,371	1,294

Table 3. ITT estimates of *Renta Dignidad* on labour force participation (age 12–18)

Notes: coefficients are estimated using kernel propensity score matching using a DD approach. In all specifications we use control variables and time- and department-fixed effects. Robust standard errors are clustered at the household level in parentheses. Significance level at *p < 0.10; **p < 0.05; ***p < 0.01.

Source: authors' calculations.

Table 4. ITT estimates of Renta Dignidad on hours worked (age 55-65)

	National sample	Rural	Urban	Male	Female
Effect	0.056 (0.170)	0.045 (0.217)	0.142 (0.307)	0.083 (0.197)	0.055 (0.256)
Observations	5,091	2,406	2,666	2,960	2,121

Notes: coefficients are estimated using kernel propensity score matching using a DD approach. In all specifications we use control variables and time- and department-fixed effects. Robust standard errors are clustered at the household level in parentheses. Significance level at *p < 0.10; **p < 0.05; **p < 0.01.

Source: authors' calculations.

Table 5. ITT estimates of *Renta Dignidad* on hours worked (age 19-54)

	National sample	Rural	Urban	Male	Female
Effect	0.036 (0.189)	-0.007 (0.297)	0.042 (0.247)	-0.232 (0.255)	0.327 (0.266)
Observations	4,558	1,492	3,037	2,252	2,300

Notes: coefficients are estimated using kernel propensity score matching using a DD approach. In all specifications we use control variables and time- and department-fixed effects. Robust standard errors are clustered at the household level in parentheses. Significance level at *p < 0.10; **p < 0.05; ***p < 0.01.

Source: authors' calculations.

Table 6.	ITT	estimates	of	Renta	Dignidad	on	hours	worked	(age	12 - 18)
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	National sample	Rural	Urban	Male	Female
Effect Observations	$-0.673 (0.470) \\ 1.017$	0.032 (0.537) 668	-1.566* (0.927) 298	-0.178 (0.554) 553	-2.095^{***} (0.698) 441

Notes: coefficients are estimated using kernel propensity score matching using a DD approach. In all specifications we use control variables and time- and department-fixed effects. Robust standard errors are clustered at the household level in parentheses. Significance level at *p < 0.10; **p < 0.05; ***p < 0.01.

Source: authors' calculations.

force participation. The pension is universal and the only eligibility criteria is age. Thus, it is important to analyse other mechanisms through which the scheme may have affected labour market outcomes. Tables 4–6 report the effects of Renta Dignidad at the intensive margin, captured by total hours worked.

Our results indicate that the pension has not affected labour force participation or the number of hours worked for adult members of the household. It has had, however, a positive effect at intensive margin for girls aged 12–18 living with an eligible member. The reduction is around

	National sample	Rural	Urban	Male	Female
Effect	-0.009 (0.036)	0.077** (0.031)	-0.027 (0.044)	-0.009 (0.049)	-0.017 (0.047)
Observations	4,558	1,492	3,037	2,252	2,300

Table 7. ITT estimates of Renta Dignidad on informal employment (age 19-54)

Notes: coefficients are estimated using kernel propensity score matching using a DD approach. In all specifications we use control variables and time- and department-fixed effects. Robust standard errors are clustered at the household level in parentheses. Significance level at *p < 0.10; **p < 0.05; ***p < 0.01.

Source: authors' calculations.

two hours of work per week.¹² We also find a reduction of hours worked in urban areas. These results are in line with those reported by Alzúa, Cruces, and Ripani (2013) for Mexico, Nicaragua, and Honduras.

5.2. Effects on informal employment

In this section, we test whether Renta Dignidad has impacted informal employment. A conventional method to measure informal employment relies on the share of workers employed without formal contractual arrangements or not subject to social security benefits (Galli & Kucera, 2004; La Porta & Shleifer, 2014; Williams & Lansky, 2013). Unfortunately, because of the absence of data on social security contributions in some rounds of the MECOVI surveys, we were unable to adopt this method. Therefore, we adopted an alternative approach, which consists of measuring informal employment as the share of self-employment in total employment, following previous studies including *inter alia* Bennett and Rablen (2015), Bargain and Kwenda (2011), Canelas (2019), and Yamada (1996).

In 2008, 66.7% of those reported as self-employed worked in the informal economy in Bolivia, and that shared increased to about 85% in rural areas (ILO, 2021). This means that our results should be treated as upper-bounds of, and close approximations to, the actual effects of the pension on informal employment. In Table 7 we report the effects of Renta Dignidad on informal employment among individuals aged 19–54 years old. We focus on this group of workers because formal employment rates are particularly low for younger and older individuals.

Our results indicate that Renta Dignidad has had a sizeable effect on the probability of informal employment in rural areas. Rural workers who have *indirect* access to Renta Dignidad, by means of living with a pensioner in the same dwelling, were around 8 percentage points more likely to work in the informal economy. The results indicate that the positive income shock that the pension generated on households' budgets, together with other factors associated with the structure and functioning of labour markets in rural Bolivia, seem to have influenced work choices towards informal employment.

In 2007, prior to the pension reform, Bolivia had a life expectancy at birth of 64 years for men and 69 years for women (UNPD 2021), thus, the average Bolivian was unlikely to benefit from the social pension. The results suggest that a reduction in the age eligibility from 65 to 60 years influenced the expectations of a segment of the rural working age population that led to a shift from formal to informal employment. Monthly per capita labour and non-labour income was approximately 745 Bolivian pesos in rural areas in 2008, which means that for an average household with two working adults living with one (or two) recipients of *Renta Dignidad*, the pension contributed *regularly* to approximately 13% (or 27%) of household income for at least 5 to 10 years, which is not negligible. We should keep in mind that Bolivia is one of the poorest countries in Latin America, with a poverty rate of 45.1% in 2011. The incidence of poverty is more acute in rural areas, at almost 62 per cent compared to 37 per cent in urban areas in 2011.

Poverty rates are higher among agricultural workers, for whom agriculture is mostly a subsistence activity. In this context, rural workers have strong incentives to look for job opportunities outside subsistence agriculture.

Over 80 percent of those with salaried jobs (about 17% of the working age-population in rural areas) are employed as farm, forestry and fishery workers, or as machine operators and assemblers in the mining industries, which are often characterised by their exploitative and precarious conditions (Francescone, 2015; Prentice & Trueba, 2018). Thus, it is plausible to expect that the sudden reduction in households' budget constraints due to the presence of the pension, triggered the small shift from salaried work to self-employment. The fact that our results point to a reallocation of work rather than a reduction of labour force participation among rural workers support this argument, which is also in line with the findings reported by Galiani et al. (2016) in the context of Mexico. Furthermore, the fact that at the national level, the contribution of the pension to household income is more modest, between 6% and 12%, and that more than half of the working age population are employees in a wider spectrum of occupations and working conditions, help explain the insignificant effect of Renta Dignidad on informal employment when focusing on the nation-wide sample. Our results are in line with previous findings by de Brauw, Gilligan, Hoddinott, and Roy (2015) in the context of Brazil, Bosch and Schady (2019) in Ecuador, Galiani et al. (2016) in Mexico, and Bergolo and Cruces (2021) in Uruguay.

5.3. Anticipation effects

One final concern about non-contributory pension schemes is the possibility that they may induce changes in labour supply of prospective beneficiaries, or a switch to non-paid work or leisure in anticipation of receiving a pension (Galiani et al., 2016). Such anticipation effects could be observed in contexts where prospective pensioners have access to savings or credit to finance current spending, under the expectation that the pension would cover future liquidity requirements. We test this hypothesis by estimating Equations 1 and 2 with prospective beneficiaries, i.e., individuals aged 55 to 59 years as our treatment group, and those aged 50 to 54 years as our control group.

Interestingly, and contrary to the conventional expectation, the ITT estimates presented in Tables 8-10 show positive and statistically significant effects of the pension on labour supply at the 5% level for the whole sample as well as for the urban and male samples. The effects on the female sample are significant at the 10% level. There are at least two possible mechanisms underpinning these results.

First, in the Bolivian context, where the national poverty headcount ratio was in the order of 57 percent in 2008 (and up to 74 percent in rural areas), it is unlikely that many prospective beneficiaries have liquid savings. Thus, in anticipation of a drastic drop in future income due to reaching retirement age, they could decide to increase labour supply in time t to accumulate savings and partly finance future consumption in time t + 1. While Renta Dignidad does indeed

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	National sampl	Rural	Urban	Male	Female
Effect Observations	0.048** (0.019) 6,878	0.022 (0.023) 2,502	0.065** (0.026) 4,356	0.034** (0.016) 3,610	0.062* (0.033) 3,231

Table 8. ITT estimates of *Renta Dignidad* on labour force participation (age 50-59)

	National sample	Rural	Urban	Male	Female
Effect	-0.367** (0.156)	-0.372* (0.21à)	-0.387* (0.222)	-0.330* (0.182)	-0.358 (0.249)
Observations	5,841	2,318	3,501	3,426	2,387

Table 9. ITT estimates of *Renta Dignidad* on hours worked (age 50-59)

Notes: coefficients are estimated using kernel propensity score matching using a DD approach. In all specifications we use control variables and time- and department-fixed effects. Robust standard errors are clustered at the household level. Significance level at *p < 0.10, **p < 0.05, ***p < 0.01. *Source:* authors' calculations.

Table 10. ITT estimates of Renta Dignidad on informal employment (age 50-59)

	National sample	Rural	Urban	Male	Female
Effect	0.009 (0.023)	0.023 (0.021)	0.003 (0.035)	0.017 (0.030)	-0.001 (0.031)
Observations	5,843	2,318	3,502	3,426	2,387

Notes: coefficients are estimated using kernel propensity score matching using a DD approach. In all specifications we use control variables and time- and department-fixed effects. Robust standard errors are clustered at the household level. Significance level at *p < 0.10, **p < 0.05, ***p < 0.01. *Source:* authors' calculations.

provide a fraction of pensioners' labour income, we do not find evidence of a reduction in labour supply as a result of the pension.

A second, and in our view, more likely channel underpinning the positive anticipation effects relates to investment decisions. In contexts of severe liquidity constraints, the expectation of receiving an exogenous income owned to receipt of the pension, would relax future budget constraints and give incentives to the prospective pensioners to borrow and invest in income generating activities. This channel is consistent with the increase in self-employment activities that we find in rural areas, and also with the differences that we observe in average incomes from self-employment between those aged 55–59 in 2007 (approximately 13,051 Bolivian pesos at constant prices) and those aged 55–59 in 2009 (18,894 Bolivian pesos). Thus the evidence suggests that Renta Dignidad generated positive anticipation effects on the labour supply among prospective beneficiaries via investment decisions, which materialise mostly in the form of informal self-employment.

5.4. Robustness checks

5.4.1. Standard DD. We rely on repeated cross-sectional data and a DDM procedure as our prefer empirical strategy. We adopt a matching approach to mitigate observe heterogeneity and achieve a covariate balance between the treatment and control groups, both before and after the policy change. In order to verify the validity of the results, we estimate Equation 1 based on a standard DD strategy. The estimates, presented in Tables A17–A23 in the Appendix, confirm the results from the DDM estimators.

5.4.2. Age effects. Since the age profile of our control and treatment groups differ, it is possible that the results may be driven by an age effect and thus do not reflect the actual impact of Renta Dignidad on the outcomes of interest. In order to test for possible age effects, we re-estimate Equations 1 and 2 using pretreatment data. The results, which are presented in Tables A7–A13 in the Appendix, reject the presence of age effects, thus validating the main findings.

6. Conclusion

An important question related to the functioning labour markets is the nature of informal employment and the mechanisms that drive its expansion. This question is even more pressing in low-and middle-income countries, where informality is widespread and characterised by low remuneration, precarious conditions, and limited access to institutionalised forms of social protection.

In this paper, we have analysed the effects of Bolivia's *Renta Dignidad*, a universal noncontributory old-age pension, on informal employment and labour market outcomes. One of the main concerns about non-contributory pensions is that they can generate perverse incentives in the labour markets and lead to reductions in labour supply and increases in informal employment. However, the results from our analysis point to a mixed picture. Overall, we find that: (1) Renta Dignidad has no detrimental effects on labour force participation among adult members of beneficiary households; (2) the pension has no adverse effects on the intensity of labour, measured by the number of hours worked per week, for any adult member of the household. Rather, the pension shows a significant reduction at the intensive margin for girls aged 12–18 living with an eligible member, which reveals positive intra-household trickle-down effects from the pension. (3) In terms of work choices, pension has increased the probability of informal employment in rural areas by about 8 percentage points, which reflects a reallocation of work from the formal to the informal economy, rather than a reduction of labour supply.

While the ITT estimates minimise the risk of bias and preserve the prognostic balance generated from the pension reform, they should be treated with caution and as lower-bound estimates of the actual effects of the pension. All in all, our results show that the effect of the pension on informal employment is small and this should be weighted in light of the protection that the pension provides to the elderly population. The fact that we find positive anticipation effects on labour supply among prospective beneficiaries via investment decisions and that we do not find a reduction in labour supply among pensioners, indicates that first, the pension is contributing to financing productive activities, which could be strengthened with credit and saving policies, and second, that the size of the pension is insufficient to satisfy the basic needs of the elderly population. The question of how to facilitate the transition from informal to formal employment while extending protection to the elderly and working-age population is key for future research and policy.

Notes

- 1. The ILO (2004), p.2 defines social protection as' a set of public measures that a society provides for its members to protect them against economic and social distress caused by the absence or a substantial reduction of income from work as a result of various contingencies...'. These 'public measures' include distinctive policy strategies within social insurance and social assistance policies. Social insurance includes contributory schemes designed to protect workers against life-course and work-related contingencies, while social assistance programmes include tax-financed, and also donor-funded, policy instruments designed to address poverty and vulnerability.
- 2. Renta Dignidad was the only non-contributory pension scheme in Latin America that embraced a universal, rather than a poverty targeting, approach by the time of the 2007 reform (Escobar Loza et al., 2013).
- 3. For reviews of the literature on the impact of social protection programmes on labour supply, see Barrientos and Niño-Zarazúa (2010), Bastagli et al. (2019).
- 4. For an earlier review on the topic, see Bosch and Manacorda (2012).
- 5. For technical and policy discussions on the implications of *Seguro Popular* for informal employment, see Antón et al. (2012), Levy (2010), and Levy (2018).
- 6. Sixty per cent of pensioners receive monthly payments, and nearly 90 per cent choose to be paid either monthly, bimonthly, or quarterly.
- 7. In 2008, taxes on hydrocarbons contributed 63 per cent of the costs of Renta Dignidad, and by 2011 this share had increased to 77.5 per cent.
- 8. In an ideal world, an instrumental variable would have solved the endogeneity problem by implementing the Bloom procedure (Bloom, 1984). We tried to implement an IV method, but unfortunately could not find valid instruments that satisfied the exclusion restriction.

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- 9. For papers using the same method see Attanasio et al. (2010); Canelas and Niño Zarazúa (2019).
- 10. This method was also used by Canelas and Niño Zarazúa (2019) in a similar context.
- 11. See Blundell and Dias (2009) for more details on the estimation and Villa (2016) for a software implementation.
- 12. The surveys do not have data on the time spent on schooling, domestic activities, and leisure, thus we were unable to account for the substitution effects between different activities. We did check, however, whether there was any increase in school enrolment for this group of the population, but found no significant effects.

Disclosure statement

No potential conflict of interest was reported by the authors.

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Appendix:

Extra tables

This Section presents descriptive statistics followed by the results for parallel trends and age effects, along with robustness checks.

Descriptive statistics

	Tuble Mi. Telecinage of submers by age group							
Year	All	55-65	19–54	12–18				
2005	19.79%	13.91%	25.49%	8.38%				
2006	23.47%	14.06%	29.98%	13.25%				
2007	22.11%	14.33%	29.02%	8.91%				
2008	25.12%	13.80%	32.04%	13.58%				
2009	27.11%	16.63%	33.62%	13.45%				
2011	24.28%	17.47%	30.42%	11.12%				

Table A1. Percentage of salaried workers by age group

Notes: formal workers are salaried workers. Self-employed and unpaid workers are considered informal workers

Source: authors' calculations.

Characteristics across matched and unmatched samples

Table A2. Characteristics across matched and unmatched samples, group 1

	Ν				
Weighted variable(s)	Mean control	Mean treated	Diff.	t	p > t
Male	0.473	0.471	-0.002	0.150	0.881
Rural	0.423	0.431	0.008	0.560	0.575
Indigenous	0.624	0.630	0.007	0.530	0.599
Years of education	4.753	4.521	-0.232	1.800	0.0720*
Chuquisa	0.085	0.083	-0.002	0.220	0.828
Cochabamba	0.168	0.167	-0.001	0.100	0.922
Oruro	0.115	0.115	0.001	0.110	0.911
Potosi	0.117	0.118	0.001	0.130	0.897
Tarija	0.075	0.074	-0.001	0.200	0.843
Santa Cruz	0.130	0.129	-0.001	0.170	0.862
Beni	0.053	0.055	0.002	0.240	0.807
Pando	0.022	0.022	0.000	0.020	0.984

Notes: group 1 refers to the sample at the national level. Significance level *p < 0.10. *Source:* authors' calculations.

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	r				
Weighted variable(s)	Mean control	Mean treated	Diff.	t	p > t
Male	0.457	0.458	0.001	0.030	0.973
Indigenous	0.740	0.744	0.004	0.200	0.840
Years of education	2.450	2.317	-0.133	1.010	0.311
Chuquisa	0.093	0.089	-0.003	0.250	0.802
Cochabamba	0.142	0.140	-0.002	0.120	0.905
Oruro	0.139	0.142	0.004	0.230	0.819
Potosi	0.195	0.197	0.003	0.140	0.885
Tarija	0.077	0.078	0.001	0.040	0.967
Santa Cruz	0.090	0.088	-0.002	0.140	0.885
Beni	0.037	0.036	0.000	0.040	0.967
Pando	0.019	0.017	-0.002	0.290	0.773

Table A3. Characteristics across matched and unmatched samples, group 2

Notes: group 2 refers to the sample at the rural level. Significance level *p < 0.10. *Source:* authors' calculations.

Table A4. Characteristics across matched and unmatched samples, group 3

	1				
Weighted variable(s)	Mean control	Mean treated	Diff.	t	p > t
Male	0.486	0.492	0.006	0.340	0.735
Indigenous	0.538	0.543	0.005	0.270	0.787
Years of education	6.371	6.202	-0.169	0.980	0.325
Chuquisa	0.068	0.070	0.002	0.250	0.804
Cochabamba	0.180	0.181	0.001	0.090	0.928
Oruro	0.108	0.109	0.000	0.030	0.979
Potosi	0.061	0.062	0.001	0.170	0.863
Tarija	0.077	0.073	-0.004	0.420	0.674
Santa Cruz	0.163	0.162	-0.001	0.080	0.940
Beni	0.069	0.071	0.002	0.240	0.811
Pando	0.023	0.023	0.000	0.050	0.962

Notes: group 3 refers to the sample at the urban level. Significance level *p < 0.10. *Source:* authors' calculations.

Table A5. Characteristics across matched and unmatched samples, group 4

	r				
Weighted variable(s)	Mean control Mean treated		Diff.	t	p > t
Indigenous	0.614	0.625	0.011	0.570	0.569
Rural	0.403	0.412	0.009	0.460	0.644
Years of education	5.982	5.803	-0.179	0.990	0.324
Chuquisa	0.071	0.067	-0.004	0.380	0.705
Cochabamba	0.161	0.162	0.001	0.040	0.967
Oruro	0.110	0.114	0.004	0.310	0.754
Potosi	0.109	0.110	0.001	0.090	0.931
Tarija	0.082	0.080	-0.002	0.170	0.869
Santa Cruz	0.150	0.145	-0.005	0.320	0.747
Beni	0.062	0.062	0.001	0.060	0.954
Pando	0.028	0.030	0.001	0.180	0.854

Notes: group 4 refers to the sample of males. Significance level p < 0.10, p < 0.05, p < 0.01. *Source:* authors' calculations.

	Ν				
Weighted variable(s)	Mean control	Mean treated	Diff.	t	p > t
Indigenous	0.641	0.647	0.007	0.350	0.727
Rural	0.436	0.442	0.006	0.310	0.760
Years of education	3.567	3.354	-0.213	1.260	0.206
Chuquisa	0.086	0.085	-0.001	0.080	0.934
Cochabamba	0.175	0.173	-0.002	0.130	0.897
Oruro	0.122	0.125	0.003	0.200	0.840
Potosi	0.126	0.126	0.000	0.020	0.986
Tarija	0.071	0.069	-0.001	0.140	0.885
Santa Cruz	0.113	0.111	-0.002	0.190	0.850
Beni	0.047	0.048	0.001	0.090	0.926
Pando	0.016	0.016	0.000	0.000	1.000

Table A6. Characteristics across matched and unmatched samples, group 5

Notes: group 5 refers to the sample of females. Significance level p < 0.10, p < 0.05, p < 0.01. *Source:* authors' calculations.

Parallel trends/age effects

	Table A7. Pre-programme	time trends in	work, hours	worked, and informa	l work (age 55–65 - all)
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	Poverty	Work participation	Hours worked	Informal work
Treatment group * 2007	-0.028 (0.049)	0.024 (0.039)	-0.082 (0.283)	0.001 (0.034)
Observations	1973	2,577	1,930	1,930

Notes: coefficients are estimated using kernel propensity score matching using a DD approach. In all specifications we use control variables and time- and department-fixed effects. Robust standard errors are clustered at the household level. Significance level at p < 0.10, p < 0.05, p < 0.01. *Source:* authors' calculations.

Table A8. Pre-programme time trends in work, hours worked, and informal work (55–65 -rural)

	Poverty	Work participation	Hours worked	Informal work
Treatment group * 2007	0.054 (0.460)	0.022 (0.048)	-0.174 (0.384)	-0.035 (0.020)
Observations	760	975	892	892

Notes: coefficients are estimated using kernel propensity score matching using a DD approach. In all specifications we use control variables and time- and department-fixed effects. Robust standard errors are clustered at the household level. Significance level at *p < 0.10, **p < 0.05, ***p < 0.01. *Source:* authors' calculations.

Table A9. Pre-programme time trends in work, hours worked, and informal work (55-65 -urban)

	Poverty	Work participation	Hours worked	Informal work
Treatment group * 2007	-0.117*(0.062)	0.035 (0.053)	0.341 (0.466)	-0.015 (0.020)
Observations	1208	1558	995	995

	Poverty	Work participation	Hours worked	Informal work		
Treatment group * 2007 Observations	-0.083 (0.066) 1132	0.068 (0.043) 1307	0.080 (0.323) 1104	0.024 (0.047) 1104		

 Table A10. Pre-programme time trends in poverty, work, hours worked, and informal work (55–65 -male)

Notes: coefficients are estimated using kernel propensity score matching using a DD approach. In all specifications we use control variables and time- and department-fixed effects. Robust standard errors are clustered at the household level. Significance level at *p < 0.10, **p < 0.05, ***p < 0.01. *Source:* authors' calculations.

Table A11. Pre-programme time trends in work, hours worked, and informal work (55–65 -female)

	Poverty	Work participation	Hours worked	Informal work
Treatment group * 2007	0.013 (0.077)	-0.015 (0.061)	-0.351 (0.436)	-0.047 (0.041)
Observations	838	1265	818	818

Notes: coefficients are estimated using kernel propensity score matching using a DD approach. In all specifications we use control variables and time- and department-fixed effects. Robust standard errors are clustered at the household level. Significance level at p < 0.10, p < 0.05, p < 0.01. *Source:* authors' calculations.

Table A12. Pre-programme time trends in work, hours worked, and informal work (19-54 -rural)

	Work participation	Hours worked	Informal work
Treatment group * 2007	-0.084 (0.203)	-0.170 (0.528)	-0.070 (0.042)
Observations	690	578	578

Notes: coefficients are estimated using kernel propensity score matching using a DD approach. In all specifications we use control variables and time- and department-fixed effects. Robust standard errors are clustered at the household level. Significance level at p < 0.10, p < 0.05, p < 0.01. *Source:* authors' calculations.

Table A13. Pre-programme time trends in work and hours worked, and informal work (12–18-female)

	Work participation	Hours worked	Informal work
Treatment group * 2007	0.035 (0.116)	-2.055 (1.285)	0.168 (0.179)
Observations	541	149	149

Anticipation effects

	National sample	Rural	Urban	Male	Female
Effect	0.043** (0.017)	0.013 (0.020)	0.059** (0.016)	0.031** (0.024)	0.057* (0.030)
Observations	6,883	2,519	4,364	3,633	3,250

Table A14. ITT estimates of Renta Dignidad on labour force participation (age 50-59) Standard DD

Notes: coefficients are estimated using kernel propensity score matching using a DD approach. In all specifications we use control variables and time- and department-fixed effects. Robust standard errors are clustered at the household level. Significance level at *p < 0.10, **p < 0.05, ***p < 0.01. *Source:* authors' calculations.

Table A15. ITT estimates of Renta Dignidad on hours worked (age 50-59)Standard DD

	National sample	Rural	Urban	Male	Female
Effect	-0.336** (0.148)	-0.228 (0.191)	-0.394* (0.212)	-0.315* (0.177)	-0.355 (0.236)
Observations	5,847	2,337	3,510	3,448	2,399

Notes: coefficients are estimated using kernel propensity score matching using a DD approach. In all specifications we use control variables and time- and department-fixed effects. Robust standard errors are clustered at the household level. Significance level at p < 0.10, p < 0.05, p < 0.01. *Source:* authors' calculations.

Table A16. ITT estimates of Renta Dignidad on informal employment (age 50-59) Standard DD

	National sample	Rural	Urban	Male	Female	
Effect	0.003 (0.019)	0.008 (0.019)	0.001 (0.030)	0.009 (0.026)	-0.009 (0.026)	
Observations	5,848	2,337	3,511	3,449	2,399	

Notes: coefficients are estimated using kernel propensity score matching using a DD approach. In all specifications we use control variables and time- and department-fixed effects. Robust standard errors are clustered at the household level. Significance level at p < 0.10, p < 0.05, p < 0.01. *Source:* authors' calculations.

Robustness checks Standard difference in differences

Table A17.	ITT	estimates of	Renta	Dignidad	on	labour	force	participation	(age 55	5-65)
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	National sample	Rural	Urban	Male	Female
Effect	-0.020 (0.020)	-0.017 (0.022)	-0.017 (0.030)	0.012 (0.023)	-0.051 (0.032)
Observations	6,552	2,662	3,890	3,390	3,162

	National sample	Rural	Urban	Male	Female	
Effect Observations	-0.022 (0.025) 6,579	-0.012 (0.034) 1,804	-0.028 (0.031) 4,775	-0.009 (0.033) 2,957	-0.035 (0.034) 3,622	

Table A18. ITT estimates of Renta Dignidad on labour force participation (age 19-54)

Notes: coefficients are estimated using kernel propensity score matching using a DD approach. In all specifications we use control variables and time- and department-fixed effects. Robust standard errors are clustered at the household level. Significance level at *p < 0.10, **p < 0.05, ***p < 0.01. *Source:* authors' calculations.

Table A19. ITT estimates of *Renta Dignidad* on labour force participation (age 12–18)

	National sample	Rural	Urban	Male	Female
Effect	0.006 (0.039)	-0.078 (0.067)	0.053 (0.045)	-0.001 (0.053)	0.005 (0.050)
Observations	2,696	1,096	1,600	1,396	1,300

Notes: coefficients are estimated using kernel propensity score matching using a DD approach. In all specifications we use control variables and time- and department-fixed effects. Robust standard errors are clustered at the household level. Significance level at p < 0.10, p < 0.05, p < 0.01. *Source:* authors' calculations.

Table A20. ITT estimates of Renta Dignidad on hours worked (age 55-65)

	National sample	Rural	Urban	Male	Female	
Effect	0.032 (0.160)	0.03 (0.194)	-0.018 (0.253)	0.064 (0.190)	0.024 (0.249)	
Observations	5,095	2,423	2,672	2,974	2,121	

Notes: coefficients are estimated using kernel propensity score matching using a DD approach. In all specifications we use control variables and time- and department-fixed effects. Robust standard errors are clustered at the household level. Significance level at p < 0.10, p < 0.05, p < 0.01. *Source:* authors' calculations.

Table A21. ITT estimates of Renta Dignidad on hours worked (age 19-54)

	National sample	Rural	Urban	Male	Female
Effect	0.081 (0.179)	-0.044 (0.281)	0.125 (0.230)	-0.198 (0.234)	0.339 (0.253)
Observations	4,567	1,522	3,045	2,262	2,305

Notes: coefficients are estimated using kernel propensity score matching using a DD approach. In all specifications we use control variables and time- and department-fixed effects. Robust standard errors are clustered at the household level. Significance level at *p < 0.10, **p < 0.05, ***p < 0.01. *Source:* authors' calculations.

Table A22. ITT estimates of Renta Dignidad on hours worked (age 12-18)

	National sample	Rural	Urban	Male	Female
Effect	-0.566 (0.420)	0.122 (0.491)	-1.772* (0.815)	0.371 (0.508)	-1.585** (0.628)
Observations	1,020	682	338	578	442

	National sample	Rural	Urban	Male	Female
Effect	-0.006 (0.028)	0.046* (0.028)	-0.036 (0.038)	-0.007 (0.039)	-0.001 (0.035)
Observations	4,567	1,522	3,045	2,262	2,305

Table A23. ITT estimates of Renta Dignidad on informal employment (age 19-54)