The Part-time Premium Enigma: An Assessment of the Chilean Case *

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Abstract

Chile has one of the lowest female labor force participation (LFP) rates among Latin American countries, and part-time work is emerging as a way to raise it. Even though hourly earnings are higher in part-time work than in full-time, using the Klein and Vella (2009, 2010) technique, we show that after controlling for sample selection and endogeneity in the part-time work decision, females have significant earnings penalties. This paper has important policy implications: if such part-time LFP implies an additional cost for females, it may be suboptimal in terms of market efficiency and gender equality to promote part-time jobs.
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1 Introduction

Working part-time has been seen by some researchers, public policy advisors, and politicians as a way for women to reach a balance between home and paid work. However, there is no agreement on the actual optimality of such balance. Indeed, there are contrasting views on the subject. Those in favor suggest that in the absence of part-time jobs, female labor force participation would be substantially lower (Sundström, 1991; Dekker, 2008). According to this belief, women, confronted with the choice between a full-time job and not working at all, would opt for the latter. On the other hand, detractors state that part-time jobs imply a waste of resources and the under-utilization of investments in human capital, since many part-time working women are highly educated and, largely, make a downward occupational move when they switch from full-time to part-time work (Gregory and Connolly, 2008; Manning and Petrongolo, 2008). Furthermore, part-time jobs have adverse repercussions for the economic well-being of part-time working women, given the fact that public social welfare benefits, wage increases and professional development might be scarce for these women (Leiva, 2000; Warren, 2008; Fernández-Kranz et al., 2011; Fernández-Kranz and Rodríguez-Planas, 2010). Finally, data from OECD countries show that hourly earnings in part-time jobs are lower than in full-time jobs (Manning and Petrongolo, 2008), while employer-provided training is less common in part-time jobs than in full-time jobs (Gregory and Connolly, 2008; Connolly and Gregory, 2009). Furthermore, in those countries, while the hourly earnings gap between women and men in full-time work has been narrowing, the same is not the case for female part-time workers and male in full-time jobs (Manning and Petrongolo, 2008). More specif-

ically, part-time work among women after the birth of their first child is currently responsible for the pay gap between men and women (Kanji, 2011).[1]

Chile's rate of female labor force participation is one of the lowest in Latin American countries (CEPAL/UN-ECLAC, 2011). In order to increase female labor force participation, the Chilean government is promoting part-time (and home-based) work. It is worth noting that even though part-time work is not as extensive as in other countries, the proportion of women working part-time has tripled in the last ten years, and now exceeds 20 percent of female employment.

Given the international evidence, it seems important to explore whether part-time work will exacerbate negative features of the Chilean labor market. The analysis of the possible effects of a policy oriented to promote these kinds of jobs in Chile becomes more relevant once acknowledging that there is international agreement on the fact that part-time work is usually 'women's work' (Gregory and Connolly, 2008; Bardasi and Gornick, 2008).

Chilean women's educational attainment is similar or higher than that in other Latin American countries; it is not obvious why female labor force participation is so low, given that as Contreras et al. (2005) show, female labor participation is positively correlated with education.

The poor performance of women in the Chilean labor market constitutes a puzzle for researchers, political actors – including equal gender rights advocates, and interna-

[1]It is worth noticing that, for women, working in part-time jobs might be a stepping stone between not working at all and working full-time when their children attend school. In such a scenario, the unfavorable effects of working part-time for a period would be moderate since these would only occur during a transitionary stage, and would be better than the alternative option of not working at all. If this is the case, then through part-time jobs women may acquire experience (or at least avoid depreciation of their human capital) during a life phase in which they are balancing home and some sort of paid work. However, part-time work might not be a transitionary stage, as well as it is likely that the alternative for part-time work is not actually non-work, but rather full-time work.

tional organizations. Contreras and Plaza (2010) find that cultural factors may affect female labor force participation. For those that have internalized *machista* values, their likelihood to participate in the labor market is lower. Despite concerns of endogeneity due to data limitations, Contreras and Plaza (2010) find a negative relationship between female labor force participation and conservative values. Ruiz-Tagle and Puentes (2011), using the Voz de Mujer survey,[2] analyze the same phenomenon while controlling for possible endogenous relationships. They find that cultural factors are not endogenously determined by a woman's work participation decision; on the contrary it seems that the fact that women work or don't work has little effect on cultural factors in the short term. According to their study, values develop in early childhood rather than during a woman's working life. Interestingly, the same 2002 survey that Contreras and Plaza (2010) used was reapplied by Centro de Estudios Públicos (CEP) and released in April 2012.[3] Both in 2002 and 2012, 48 percent of interviewees answered that the most desirable choice for women with one child at a pre-school level was working part-time, while her partner's employment was full-time. In 2002, 42 percent of interviewees considered that women should not work, while 31 percent gave that answer in 2012. Between survey waves a new answer option was also added: both partners in a family working part-time, which attracted 9 percent of the responses. These survey results suggest that Chilean society's preference towards part-time for women has been stable over the preceding ten years, reinforcing the importance of the present analysis.

[2]The Voz de Mujer survey was carried out by the NGO ComunidadMujer (`http://www.comunidadmujer.cl/`). The sampling method was randomized and probabilistic in each of the three stages (block-home-interviewee). Precision was estimated at approximately 2 percent, considering maximum variance and 95 percent confidence levels.

[3]This survey, both in 2002 and 2012, was carried out by CEP. The sampling method was randomized and probabilistic in each of the three stages (block-home-interviewee). Precision was approximately 3 percent, considering maximum variance and 95 percent confidence level.

Rau (2010), in studying the main characteristics of part-time work in Chile concludes that certain features imply that it is a "precarious" work type for those involved. Even though in his study he acknowledges that part-time work in Chile is viewed as a way to increase female labor force participation, a high proportion of his analysis examines the issue without making a distinction by gender. However, it is important to make such distinction. First of all, because female part-time workers represent a higher, an increasing, proportion of those that work. Second, women and men seem to look for part-time jobs because of different reasons (women because of household chores and care activities; men in order to afford their studies). On the other hand, in Chile, as in other developing countries (López-Bóo et al., 2010), part-time work might be an option for women that aim to reach a balance between family and paid work or may be a consequence of a lack of full-time and formal jobs for them. In this sense, 53 percent of female part-time workers say that they want to work more hours (Casen 2009). This suggests that a significant proportion of female part-time workers are involuntarily working less than full-time.

A particularly notable feature of part-time work in Chile is that these part-time workers earn higher hourly wages on average that those working full-time, seeming to suggest a part-time premium. Indeed, this pattern has been documented by Rau (2010) for the case of Chile, and also by López-Bóo et al. (2010) using data from Honduras. Using an ordinary least squares analysis (OLS), we present evidence indicating that there seems to be a part-time premium for females in several Latin American Countries (see Table 1).[4] The possible existence of a part-time premium

[4]We also find through ordinary least squares analysis a part-time premium for males, although in what remains of this paper we focus on females since part-time work is growing fast in this group, already exceeding 20 percent of the total female labor force. In the case of male workers we do not observe such dynamism or relevance in terms of total employment. Although in absolute numbers about 5000 males in our sample work part-time, this makes up only 9 percent of total male labor force participation. The premium at mean levels is larger for males only in Bolivia, Chile and Paraguay.

in hourly earnings deserves further study, since in OECD countries the opposite is detected; there a part-time penalty is found. It is worth investigating whether this special pattern in Latin American countries results from an endogeneity in the decision of choosing between part-time or full-time work and their corresponding hourly earnings.

Given that Chile provides an example of this intriguing pattern, in this paper we undertake a more comprehensive analysis of it by using Chilean data and aiming to causally identify a link between the part-time decision and the hourly earnings for the female population. While we are aware that we are not addressing the reasons behind the penalty, we consider that at this stage it is important to document that part-time work implies a penalty. According to our results, when the endogeneity of women's decision between part-time and full-time work is considered, a part-time penalty is found. This suggests—using the Chilean example— that developing countries may be no different from OECD in that part-time is penalized in both.

2 Data and Description of Key Variables

The econometric analysis presented in this paper is based on the main and most recent public household survey available in Chile: Casen 2009 (Encuesta de Caracterización Social Económica). This survey contains information from 151,595 Chilean women and men 16 years of age and older. Of these, 62,617 do not participate in the labor market, 9,924 are unemployed and 79,054 are employed and have labor income, as presented in Table 2. Female labor force participation is 42 percent, which is low by international standards; male's participation rate is higher at 75 percent. It is worth noting that female unemployment is higher than male's with these reaching

14 percent and 9 percent respectively and that the rate of employment for women is 36 percent. Table 2 shows that more than a fifth of employed women work part-time whereas only one tenth of the male labour force is employed in part-time work.

Table 3 reports descriptive statistics for our database of the working population; 27,164 women and 51,890 men. We report average weekly hours for women (41) and men (45). As can be seen, men work significantly more than women. These descriptive statistics also show that on average working men earn almost 30 percent more than working women each month with this difference being statistically significant. The third row shows the logarithm of hourly earnings (from labor income), significantly higher for men.

Informality, as is the case in other Latin American countries, is high in the Chilean labor market. In this paper, informality is constructed by assigning a value of one whenever a worker is either self-employed, or despite being a salaried employee has no contract and, therefore, no social benefits. The proportion of informal workers is high in the sample with more than 36 percent of workers being classified as such. Informality is sometimes accepted by governments and international organizations because of the idea that it favors those at the left tail of the wage distribution, who would be unable to earn enough to contribute through taxes to the social benefit system and, if formality were enforced, such workers would be excluded from the labor market. However, if informality permits those in the right tail of the wage distribution to extract extra rents from their work instead of contributing to the system, informality would be accentuating wage differences and also may promote myopic behavior, as in Chile the pension system is one of individual capitalization. In this paper, we deeply analyze the relationship between part-time work and hourly earnings, as well as we acknowledge that there is an interaction between informality

and part-time work. Nevertheless, a deep study of the determinants and effects of informality on female labor force falls outside the scope of this paper and deserves further research.

The data show that among working people, women have more years of schooling (11) than men (nearly 10) (see Figure 1), but that they are younger (38 years old on average in comparison with 40 years old for men). Table 3 includes a further description of demographic variables. The proportion of women living with a partner (married or not) in the female sub-sample is lower than in the male sub-sample. This reflects the fact that partnered women are more likely to remain out of labor market in order to do household chores and take care of their families. Due to cultural factors this option is not yet common for men. As could be expected, divorced, widowed and separated women work or look for work in a higher proportion than those with a partner. The proportion of workers with children between 5 and 14 years old in the household is higher for women (67 percent) than for men (61 percent); in the case of children younger than 4 years old the difference is not significant. A higher proportion of male workers (8 percent) than female workers (7 percent) live in a household where income per capita is below the poverty line. This is not strange, nor contradictory with the fact that women on average earn less than men, given that when women work the probability of being poor is on average lower. This owes to the fact that in families where women work in many cases there are two persons working and also due to selection into the Chilean labor market (the working women are not a random sample of the whole female population). We also present the amount (in logs) of other household monthly income; whenever such income is zero it is likely that the woman in such a household is forced to participate in the labor market. The final demographic variable detects whenever the worker lives in an urban zone. The proportion of rural workers is higher among men.

Throughout the empirical exercise we control for geographical factors. In order to do so we construct three variables: north, center, south. These are binary variables that take a value of one whenever the person lives in this area. The base category for the analysis is the capital of the country (and its surroundings); one third of the population lives in this region called "Metropolitana". These regional dummies reflect the intrinsic characteristics of Chile, where the mining activities are mainly concentrated in the North (for males); the South's main activities are agriculture and forestry; while in the Center agriculture, industry and tourism are developed.

Given that part-time work comprises more than 20 percent of total female labor force participation and only 9 percent of male participation, we concentrate our analysis on the determinants of the female's working decision. We adopt the OECD definition of part-time work: 30 hours or less in a week. Table 3 presents the proportion of part-time workers (in the fourth row). Additionally, in Figure 2 we show the distribution of the hourly earnings for females conditional on working part- or full-time. As can be seen, the part-time distribution appears more concentrated to the right than the full-time distribution. In addition, in Table 4 we present descriptive statistics for working females.

It is worth noting that, as shown in Table 4, part-time female workers have significantly lower levels of schooling; Manning and Petrongolo (2008) find the same in developed countries. We return to this point when analyzing the endogeneity of the part-time work decision.

3 Econometric Approach

In order to assess the robustness of different OLS specifications, our analysis begins with the estimation of a mincerian equation for the female sub-sample of chilean workers, and the sequential addition of our key variables of interest: a binary variable indicating part-time work; a binary variable indicating informal work; and their interaction. We are interested in documenting the sign of the part-time coefficient in the chilean case. We consider first the sample of 27,164 working women, where Y is the log of hourly earnings, X is a vector of human capital characteristics (education, experience and their polynomials up to the third degree, plus a set of regional dummies), part-time, PT, is a binary variable that takes the value of one when the hours worked in a week are less than or equal to 30 and takes the value of zero when the hours worked in a week are greater than 30. Informal, INF, is a binary variable that equals one whenever the worker is either self-employed, or despite being a salaried employee she has no contract and, therefore, no social benefits.

Our equation of interest is:

$$Y_i = \alpha + \beta \mathrm{PT}_i + \gamma \mathrm{INF}_i + \psi(\mathrm{PT}_i \times \mathrm{INF}_i) + X_i'\delta + \varepsilon_i \tag{1}$$

In a second step we acknowledge the fact that there may be selection in the female labor market (the working women might not be a random sample of the female population). Following Heckman (1979), we run a 2-step estimation procedure where in the first stage we estimate the probability of working (called LF, either full-time or part-time) using human capital characteristics (X_i) and demographic variables (W_i: marital status, number of children, number of dependents and other household income (if present)), and in the second step estimate the wage earnings for the whole

sample of females, using a transformation of the predicted probability of working as an additional explanatory variable (the inverse Mill's ratio, (MILLS)).[5] The equations estimated are:

$$\begin{aligned} \mathrm{LF}_i &= \theta + X_i'\kappa + W_i'\varphi + \nu_i \quad (2) \\ Y_i &= \alpha + \eta\mathrm{MILLS}_i + X_i'\delta + \varepsilon_i \quad (3) \end{aligned}$$

We also augment equation (3) to account for part-time, informality and their interaction in the explanation of earnings. Thus the earnings equation becomes:

$$Y_i = \alpha + \eta\mathrm{MILLS}_i + \beta\mathrm{PT}_i + \gamma\mathrm{INF}_i + \psi(\mathrm{PT}_i \times \mathrm{INF}_i) + X_i'\delta + \varepsilon_i. \quad (4)$$

Following Kingdon et al. (2008), Hou (2010) and Bourguignon et al. (2002), our last specification incorporates into the participation decision (equation 2) the four j options that females face: out of the labor market (base outcome), unemployed ($j = 1$), employed in part-time work ($j = 2$) and employed in full-time work ($j = 3$), estimated through a multinomial logit:

$$\mathrm{P}(\text{activity} = j) = \frac{\exp^{X_i'\beta_j}}{\sum_{k=0}^{k=3} \exp^{X_i'\beta_k}} \quad (5)$$

For each activity ($j \in \{1,2,3\}$) we construct a selection correction term (inverse Mill's ratio) as:

$$\mathrm{MILLS}_j = 3 \times \ln(P_j) + \sum_{k \neq j} \mathrm{trnsp}_k \quad (6)$$

[5]The inverse Mill's ratio is defined as $\mathrm{MILLS}_i = \frac{\phi(H_i)}{\Phi(H_i)}$, where $H_i = \Phi^{-1}(P_i)$, $\phi(\cdot)$ is the standard normal density function, $\Phi(\cdot)$ the normal distribution function and P_i is the estimated probability of participation for the i^{th} female.

where $\text{trnsp}_j = \frac{P_j \times \ln(P_j)}{1-P_j}$.

Thus, the earnings equation that accounts for selection into each activity (unemployment (1), part-time (2) and full-time (3)) becomes:

$$\begin{aligned} Y_i &= \alpha + \eta_1 \text{MILLS}_{i1} + \eta_2 \text{MILLS}_{i2} + \eta_3 \text{MILLS}_{i3} \\ &+ \beta \text{PT}_i + \gamma \text{INF}_i + \psi(\text{PT}_i \times \text{INF}_i) + X_i'\delta + \varepsilon_i \end{aligned} \tag{7}$$

3.1 Addressing Both Endogeneity of Hours Worked and Selection into the Labor Market:

So far we have conducted our analysis without considering the fact that the part-time/full-time decision might be endogenous, depending on many unobserved factors (different productivity levels between full-time and part-time workers; discrimination; presence of segmented labor markets); reverse causality (the hourly earnings being the reason that workers choose to work part-time); or that there might be measurement error in the report of hours worked.

The stylized problem we face is the following: we want to estimate the effect of working part-time on hourly earnings, but the plausible endogeneity of the part-time decision renders the estimates from OLS invalid. The standard solution to the endogeneity problem is to apply instrumental variables in order to estimate the causal effect from working part-time on hourly earnings.

The first challenge is thus to find a suitable instrument for the female decision of working part-time that is not correlated with earnings. Manning and Petrongolo (2008) discuss some assumptions under which it might be reasonable to consider part-time status as an endogenous variable, but they do not pursue the analysis

for lack of a suitable instrument. López-Bóo et al. (2010) also state that they have been unable to find strong instruments for part-time work, and suggest that by better accounting for the endogeneity of part-time work the results they found may be reinforced.

In this paper we overcome the problem of lack of a suitable instrument, by applying the novel technique developed by Klein and Vella (2009, 2010), Farré et al. (2010), which shows that in the absence of an exclusion restriction, one can use the heterogeneity present in the data as a valid instrument to obtain causal effects.[6]

Consider the following model:

$$Y_i = \alpha + X_i'\delta + \beta \mathrm{PT}_i + \varepsilon_i \tag{8}$$

$$\mathrm{PT}_i = \mathbb{1}\{X_i'\pi + \nu_i > 0\} \tag{9}$$

where again, as described above, Y is (log of) hourly earnings; X is the set of exogenous human capital characteristics; PT is the probability of working part-time (i.e. PT =1 if working part-time and = 0 if working full-time). As it can be seen on the model, it is not possible to identify our parameter of interest, β unless there is an exclusion restriction.

In fact, Rigobón (2003) and Klein and Vella (2009) noted that if the errors in equation (9) are heteroskedastic, this effectively induces an exclusion restriction and it is thus possible to identify the model. Even though the model allows for the presence of heteroskedasticity in each equation, we follow Klein and Vella (2009) and model it

[6]This technique was initially developed by Rigobón (2003) for continuous simultaneous equation models and was implemented for the continuous outcome/binary treatment case by Klein and Vella (2009). Recent implementations of the technique can be found in Rigobón (2003), Rigobon and Rodrik (2005), Farré et al. (2010), Schroeder (2010), Millimet and Tchernis (2012), Emran and Sun (2011), Emran and Shilpi (2012), Berg et al. (2012), Chowdhury et al. (2012), Emran and Hou (2012), Mallick (2012) and Emran et al. (2012).

only for the binary response equation:

$$\nu_i = S(X_i'\gamma)\nu_i^* \tag{10}$$

$$\mathbb{E}(\nu_i|X_i) = 0 \tag{11}$$

where $S(\cdot)$ is an unknown function; γ is an unknown parameter vector and ν_i^* is a homoskedastic random disturbance independent of X_i but dependent on ε_i.[7] The probability of working part-time is thus:

$$\Pr(\text{PT} = 1|X_i) = \Pr(\text{PT} = 1|X_i'\pi; X_i'\gamma) \tag{12}$$

$$\equiv \text{P}\left(\frac{X_i'\pi}{S(X_i'\gamma)}\right) \tag{13}$$

where $P(\cdot)$ is the distribution function for ν^*. For the specification of the $S(X_i'\gamma)$ we follow the parametric approach developed in Farré et al. (2010) which is based on the model of a heteroskedastic probit due to Harvey (1976): $S(X_i) = e^{X_i'\gamma}$

A limitation of the heteroskedasticity-based identification is that the estimates are likely to be less efficient than the usual IV estimates, because identification here relies on information about the second moment of the data (Lewbel (2012)).

Our novel technique solves the *endogeneity* problem in the part-time decision. This endogeneity assumes in the underlying model that the decision of working part-time is correlated with unobservables that affect earnings. However, this might not be the sole problem we face. We have assessed the possibility that there is *selection* into the female labor market. In our context, the selection issue assumes that the part-time

[7] If errors were homoskedastic, because the probability is non linear, it would still be possible to identify the model, but using data only from the tails. When errors are heteroskedastic, $S(\cdot)$ is a non-constant function and it is possible to also exploit data from the region where Pr (PT = 1) is linear, and thus the predicted probability of working part-time becomes a valid instrument.

work decision has an effect also on the other covariates in the earnings equation. The proposed solution in the literature is thus, to estimate the probability of participation and then include the appropriate inverse Mill's ratio in the earnings equation instrumenting for part-time. As a result we need an additional exclusion restriction for the decision of whether or not to participate in the labor market. The literature ((Buchinsky, 1998) for the US, (Contreras et al., 2005; Contreras and Plaza, 2010) for the Chilean case), suggests instrumenting the female labor market participation decision with demographic characteristics (such as marital status, number of children, number of elderly dependents).

Therefore, the augmented earnings equation that accounts for both the presence of selection and endogeneity in the part-time work decision is:

$$Y_i = \alpha + X_i'\delta + \eta \text{MILLS}_i + \beta \text{PT}_i + \varepsilon_i \tag{14}$$

when the selection correction only accounts for the probability of participation in the labor market (estimated as described above in (2)-(3)) and part-time is instrumented as described in (9)-(11).

Alternatively, we implement the selection correction taking into account the probability of participation in each activity (estimated as described in (5)) where part-time is instrumented as described in (9)-(11), with the technique developed by Klein and Vella (2009).

$$Y_i = \alpha + \eta_1 \text{MILLS}_{i1} + \eta_2 \text{MILLS}_{i2} + \eta_3 \text{MILLS}_{i3} + \beta \text{PT}_i + \gamma \text{INF}_i + \varepsilon_i \tag{15}$$

Having successfully addressed the potential endogeneity and selection problems, equation (15) becomes our preferred earnings specification and we concentrate on the sign, magnitude and significance of β.

4 Results

4.1 Baseline estimations

The usual Mincer equation (column 1 of Table 5) for the sample of working females shows positive and significant effects of years of schooling and experience. As we stated, we use dummies to control for geographical effects. The last control variable is urban, which is significant and positive, as expected. The coefficients for years of schooling, experience and the regional dummies are robust to the five specifications.

In column 2, we consider a dummy that takes a value of one whenever the worker works less than 30 hours a week. In this case, we find a positive and significant premium of 60 percent (0.47 log points). A similar result is documented in López-Bóo et al. (2010) for Honduras and in Rau (2010) for Chile. This is the opposite to what is found in OECD countries, where one of the concerns is that beyond lack of prospects, greater informality, and lower future pensions, part-time workers earn less per hour (i.e., there is a penalty instead of a premium).

If instead of controlling for part-time status we included a dummy which detects informality (column 3), we observe that this latter albeit positive, is not significant and its magnitude is very different from the part-time premium observed in column 2. Such difference is an example of the different aspects that these two variables

measure and of the importance of controlling for both of them in the analysis, as we do in subsequent columns.

In column 4, we include at the same time, informality and part-time dummies. We find that the informality premium of 1 percent becomes a penalty of 12 percent and that the part-time premium grows, reaching 68 percent (0.52 log points). In column 5, we run the same regression but we also include an interaction variable: informality with part-time. Here, the OLS analysis shows the existence of a part-time premium and the presence of an informality penalty, which may be masked if a part-time term is not included.

Finally, it is worth stating that those results are not driven by women who are studying, as we obtained the same results for a restricted subsample of population in the age bracket of 25-59 year olds.

4.2 Female Selection Correction

Following the standard in the literature, we test whether there is selection into the female labor market. We use first Heckman's two-stage method in order to get plausibly unbiased estimates for our extended Mincer equation and then implement suggestions from Kingdon et al. (2008) and Bourguignon et al. (2002) of incorporating an appropriate selection correction for each activity. We present the results in Table 6. In the first column we apply the Heckman procedure without controlling for part-time or informal status. It is worth noting that in terms of the part-time dummy, the informality dummy and their interaction, no important differences are detected between the OLS estimates (column 5 of table 5) and the Heckman two-stage estimates for these variables (column 2 of table 6). However, there is evidence of a

selection bias, as demonstrated by the positive and significant coefficient on the inverse Mill's ratio. Furthermore, it can be seen that the resultant coefficients on the urban dummy are higher than the OLS estimates.[8]

4.3 Addressing Endogeneity in the Part-time/Full-time Work Decision

We estimate the causal effect of working part-time on hourly earnings. Strikingly, once we account for the endogeneity in the decision to work part-time, the impact on hourly wages becomes negative and significant (i.e., there is a penalty instead of a premium). Results are presented in Table 7.

For the sake of comparison, in column 1 of Table 7 we present the estimates from instrumenting the part-time decision with demographic characteristics (number of children 0-4, number of children 5-14 and other household income). Even though using such instruments is not our preferred methodology given that these are unable to distinguish between the decision of whether or not to work versus the part-time/full-time decision, we show that what was a premium on the part-time coefficient becomes a penalty of 96 percent, which is implausibly high in absolute value. As Klein and Vella (2010) discuss, whenever errors are heteroskedastic, ordinary IV estimates are inconsistent. This column seems to be an example of such specification problem.

Columns (2) and (3) show the results of applying the novel technique developed by Klein and Vella (2009, 2010), Farré et al. (2010) while also incorporating the selection

[8]We present in table A.1 the participation equation used in the Heckman's two-stage procedure. As can be seen, the variables that are usually assumed as a disincentive to female labor participation are significant and have the expected sign. Education and experience are positive, and the demographic variables related to care duties (presence of children and the elderly) are negative, while being divorced or separated seems to be the only category that shows a positive effect on a woman's labor decision relative to the single group.

correction terms. Column (2) presents the inverse Mill's ratio from the probit participation equation (described in (2)) and column (3) presents the selection correction terms from the multinomial logit, as described in equation (5).

5 Conclusion

The motivation of this paper was the existence of a part-time hourly earnings premium as detected in previous literature for developing countries, and the application of this to the case of Chilean women. We have shown that this premium interacts with informality, determining that whenever part-time work is included, a non-significant effect of informality on female hourly earnings becomes significant and negative. These results are robust to different OLS specifications and to several selection correction procedures (Heckman, 1979; Bourguignon et al., 2002).

Strikingly, when we address the presence of unobserved factors (omitted variables, reverse causality and measurement error) in the part-time work decision, the observed premium (OLS) becomes a *penalty*. On the other hand, the informality penalty (OLS) appears to positively affect hourly earnings.

In this case, when focusing on hourly earnings the result once controlling for endogeneity and selection problems is very different than those from a OLS analysis: in the case of women, beyond lack of prospects, informality and lower levels of protection, there is an earnings penalty in the decision of working part-time.

This paper has key policy implications for countries that see part-time work as a way to increase female labor force participation and for those with higher levels of women's participation in labor market that see part-time as an opportunity for women (and their families) to reach a balance between home and paid work.

As further research, it would be important to address the reasons behind the part-time penalty, as well as analyzing whether this penalty has different impacts when vulnerable or more favored workers are considered. When examining along the income distribution, a number of possible patterns may be observed: it may be that for poor workers the part-time penalty is greater than for those at the right tail, that the opposite pattern is observed, or that a flat penalty is observed along the entire distribution. Nevertheless, the former possibility seems to be the most likely, given that among workers to the right tail there are professionals and technicians who are likely to have the strongest bargaining power and may elect for self-employment and part-time work in an informal framework to avoid social security contributions.

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Table 1: The Part-time Premium in Latin America

	Female	Male
Argentina	0.16	0.10
	0.02	0.02
Bolivia	0.55	0.67
	0.08	0.08
Brazil	0.25	0.22
	0.01	0.01
Costa Rica	0.35	0.24
	0.03	0.03
Chile	0.34	0.48
	0.01	0.01
Honduras	0.43	0.44
	0.02	0.02
Mexico	0.31	0.29
	0.02	0.02
Paraguay	0.28	0.32
	0.03	0.03
Peru	0.50	0.39
	0.08	0.08
Uruguay	0.22	0.12
	0.01	0.01
Venezuela, RB	0.12	0.12
	0.03	0.03

Source: Household surveys circa 2005, MECOVI Program.

Point estimates and their standard errors from OLS regressions for the coefficient on part-time work (less than 30 hours a week); dependent variable is log of hourly wage, independent variables are polynomials (3^{rd} degree on education and experience.

Table 2: Descriptive Statistics for Chile

	Female	**Male**	**Total**
Inactive	43815	18802	62617
Unemployed	4533	5391	9924
Part-time	5826	5568	11394
Full-time	21338	46322	67660
Total	75512	76083	151595
Unemployment Rate	0.14	0.09	0.11
as percentages of the total			
$LFPR_{PT}$	0.08	0.07	0.08
$LFPR_{FT}$	0.28	0.61	0.45
LFPR	0.42	0.75	0.59

Source: Authors' calculations based on CASEN 2009.

Note: (1) Age bracket for females is 15-59; for males is 15-64.
(2) Unemployment rate is calculated as the ratio of unemployed to unemployed plus employed (either part-time or full-time).

Table 3: Descriptive Statistics, working population in Chile

	Female	Male	Difference	Std. Error
Weekly hours	41.08	45.25	4.16***	(0.10)
Monthly wage	254479.66	328089.45	73609.79***	(2979.58)
Ln hourly wage	7.11	7.22	0.11***	(0.01)
Part-time	0.21	0.11	-0.11***	(0.00)
Informal work	0.37	0.36	-0.01*	(0.00)
Years of schooling	11.02	9.78	-1.24***	(0.03)
Age	38.08	40.29	2.22***	(0.09)
With partner	0.50	0.67	0.17***	(0.00)
Proportion of children 0-4	0.29	0.29	0.00	(0.00)
Proportion of children 5-14	0.67	0.61	-0.06***	(0.01)
In poverty	0.07	0.08	0.01***	(0.00)
Ln Income of other household members	11.39	10.98	-0.42***	(0.01)
Urban	0.74	0.63	-0.11***	(0.00)
Number of observations	27164	51890		

Source: Authors' calculations based on CASEN 2009.

Notes: (1) Age bracket is 15-59 for females and 15-64 for males.

(2) Poverty line per capita was set at $63.134 for urban and $43.242 for rural households.

(3) Informal work comprises the self-employed workers and the workers without countracts.

(4) Stars denote statistical significance at 1%

Table 4: Female Working Population, descriptive Statistics

	Part-time	Full-time	Difference
Hours worked	19.11	47.09	-27.98***
			(0.14)
Monthly earnings	172436.11	276880.34	-104444.23***
			(4411.63)
Hourly earnings	2879.00	1432.71	1446.29***
			(41.96)
Ln of hourly earnings	7.42	7.02	0.40***
			(0.01)
Urban	0.77	0.74	0.03***
			(0.01)
Poor	0.13	0.05	0.08***
			(0.00)
Years of schooling	10.32	11.21	-0.89***
			(0.05)
Age	38.88	37.86	1.02***
			(0.16)
Married/with partner	0.52	0.49	0.03***
			(0.01)
Presence of children 5-14	0.73	0.65	0.07***
			(0.01)
Presence of children 0-4	0.30	0.29	0.01
			(0.01)
Number of observations	5826	21338	

Table 5: OLS regressions, Hourly Earnings - Females

	(1)	(2)	(3)	(4)	(5)
Years of schooling	0.07	0.06	0.07	0.07	0.07
	(0.01)***	(0.01)***	(0.01)***	(0.01)***	(0.01)***
Years of schooling squared	-1.29	-1.11	-1.29	-1.15	-1.16
	(0.16)***	(0.15)***	(0.16)***	(0.15)***	(0.15)***
Years of schooling cube	8.12	7.51	8.12	7.54	7.57
	(0.56)***	(0.53)***	(0.56)***	(0.53)***	(0.53)***
Experience	0.11	0.12	0.11	0.11	0.11
	(0.01)***	(0.01)***	(0.01)***	(0.01)***	(0.01)***
Experience squared	-0.26	-0.28	-0.26	-0.26	-0.26
	(0.04)***	(0.04)***	(0.04)***	(0.04)***	(0.04)***
Experience cube	0.21	0.22	0.21	0.21	0.21
	(0.03)***	(0.03)***	(0.03)***	(0.03)***	(0.03)***
North	-0.06	-0.06	-0.06	-0.06	-0.05
	(0.01)***	(0.01)***	(0.01)***	(0.01)***	(0.01)***
Center	-0.16	-0.16	-0.16	-0.16	-0.16
	(0.01)***	(0.01)***	(0.01)***	(0.01)***	(0.01)***
South	-0.17	-0.18	-0.17	-0.18	-0.18
	(0.01)***	(0.01)***	(0.01)***	(0.01)***	(0.01)***
Urban	0.07	0.04	0.07	0.04	0.04
	(0.01)***	(0.01)***	(0.01)***	(0.01)***	(0.01)***
Part-time		0.47		0.52	0.45
		(0.01)***		(0.01)***	(0.02)***
Informal			0.01	-0.13	-0.16
			(0.01)	(0.01)***	(0.01)***
Interaction of Informal and Part-time					0.12
					(0.03)***
Intercept	5.13	4.90	5.12	5.02	5.04
	(0.17)***	(0.16)***	(0.17)***	(0.16)***	(0.16)***
R-squared	0.23	0.29	0.23	0.30	0.30
Number of observations	27164	27164	27164	27164	27164

Note: (1) Dependent variable is natural log of hourly earnings. Subsample of working females.

(2) Authors' calculations based on CASEN 2009.

(3) Stars denote statistical significance at 1 percent. Alternate specifications with standard errors clustered at the regional level were estimated, and don't change t-statistics significantly. These are available upon request.

Table 6: OLS regressions with selection correction for females, ln of hourly wage

	heckman (1)	heckman (2)	mlogit (3)
Years of schooling	0.08	0.08	0.10
	(0.01)***	(0.01)***	(0.01)***
Years of schooling squared	-1.28	-1.16	-1.44
	(0.14)***	(0.14)***	(0.16)***
Years of schooling cube	8.20	7.68	6.36
	(0.52)***	(0.49)***	(0.58)***
Experience	0.23	0.23	0.05
	(0.02)***	(0.02)***	(0.02)**
Experience squared	-0.53	-0.52	-0.27
	(0.04)***	(0.04)***	(0.05)***
Experience cube	0.41	0.40	0.28
	(0.04)***	(0.03)***	(0.04)***
North	-0.07	-0.07	-0.21
	(0.01)***	(0.01)***	(0.02)***
Center	-0.18	-0.18	-0.21
	(0.01)***	(0.01)***	(0.01)***
South	-0.22	-0.23	-0.05
	(0.01)***	(0.01)***	(0.02)***
Urban	0.10	0.08	0.22
	(0.01)***	(0.01)***	(0.02)***
Part-time		0.44	0.45
		(0.02)***	(0.02)***
Informal		-0.16	-0.17
		(0.01)***	(0.01)***
Interaction of informal and Part-time		0.12	0.12
		(0.02)***	(0.03)***
MILLS	0.29	0.28	
	(0.02)***	(0.02)***	
MILLS (1)			-0.21
			(0.01)***
MILLS (2)			-0.04
			(0.01)***
MILLS (3)			0.18
			(0.02)***
Intercept	3.18	3.13	5.46
	(0.22)***	(0.21)***	(0.30)***
Wald-χ^2	5124.66	8385.68	
R-squared			0.31
Number of observations	75018	75018	75018

Note: (1) Results in columns (1) and (2) are from Heckman's second-stage procedure; column (3) uses the methodology described in Kingdon et al. (2008).

(2) Authors' calculations based on Casen 2009.

(3) Stars denote statistical significance at 1 percent. Alternate specifications with standard errors clustered at the regional level were estimated, and don't change t-statistics significantly. These are available upon request.

Table 7: Causal effects from working part-time on hourly earnings

	lnw_instr (1)	lnw_heck (2)	lnw_mlogit (3)
Part-time	-3.23	-1.17	-1.25
	(0.65)***	(0.40)***	(0.38)***
Years of schooling	0.10	0.09	0.09
	(0.03)***	(0.02)***	(0.02)***
Years of schooling-sq	-2.07	-1.55	-1.43
	(0.37)***	(0.21)***	(0.21)***
Years of schooling-cube	11.49	9.41	6.75
	(1.39)***	(0.81)***	(0.79)***
Age	0.10	0.23	0.06
	(0.03)***	(0.02)***	(0.03)**
Age-sq	-0.27	-0.55	-0.29
	(0.09)***	(0.06)***	(0.07)***
Age_cube	0.24	0.43	0.30
	(0.08)***	(0.05)***	(0.05)***
North	-0.05	-0.07	-0.21
	(0.03)	(0.02)***	(0.02)***
Center	-0.16	-0.18	-0.20
	(0.03)***	(0.02)***	(0.02)***
South	-0.12	-0.20	-0.06
	(0.03)***	(0.02)***	(0.02)***
Urban	0.24	0.17	0.23
	(0.04)***	(0.03)***	(0.02)***
Informal	0.90	0.33	0.35
	(0.18)***	(0.11)***	(0.11)***
Inverse mills ratio from probit		0.30	
		(0.03)***	
Inverse mills ratio from mlogit (1)			-0.21
			(0.02)***
Inverse mills ratio from mlogit (2)			0.04
			(0.02)*
Inverse mills ratio from mlogit (3)			0.11
			(0.02)***
Constant	5.77	3.32	5.95
	(0.41)***	(0.30)***	(0.44)***
Observations	26858	75018	75018
F	118.21	334.41	286.11
Underidentification Test	39.94	34.91	39.28
Underid-pvalue	0.00	0.00	0.00
APchi-Weakid-RK	13.33	34.94	39.32
Hansen-J	69.80	0.00	0.00
J-pval	0.00		
Endog	211.02	37.45	47.06
Endog-pval	0.00	0.00	0.00

Note: (a) Estimates from IV regressions at mean levels. Column (1) uses as instrument other household earnings and number of children (0-4 and 5-14) present at home. Columns (2) and (3) use the Klein and Vella (2009) identification through heteroskedasticity technique; column (2) corrects from selection in the labor force participation decision with a probit model (participate or not) and column (3) correct from selection with a multinomial logit, where 0=out of the labor force; 1=unemployed; 2= employed in part-time; 3=employed in full-time jobs.

(b) Dependent variable is log of hourly earnings from labor income.

(c) Authors' calculations based on Casen 2009.

(d) Stars denote statistical significance at 1 percent.

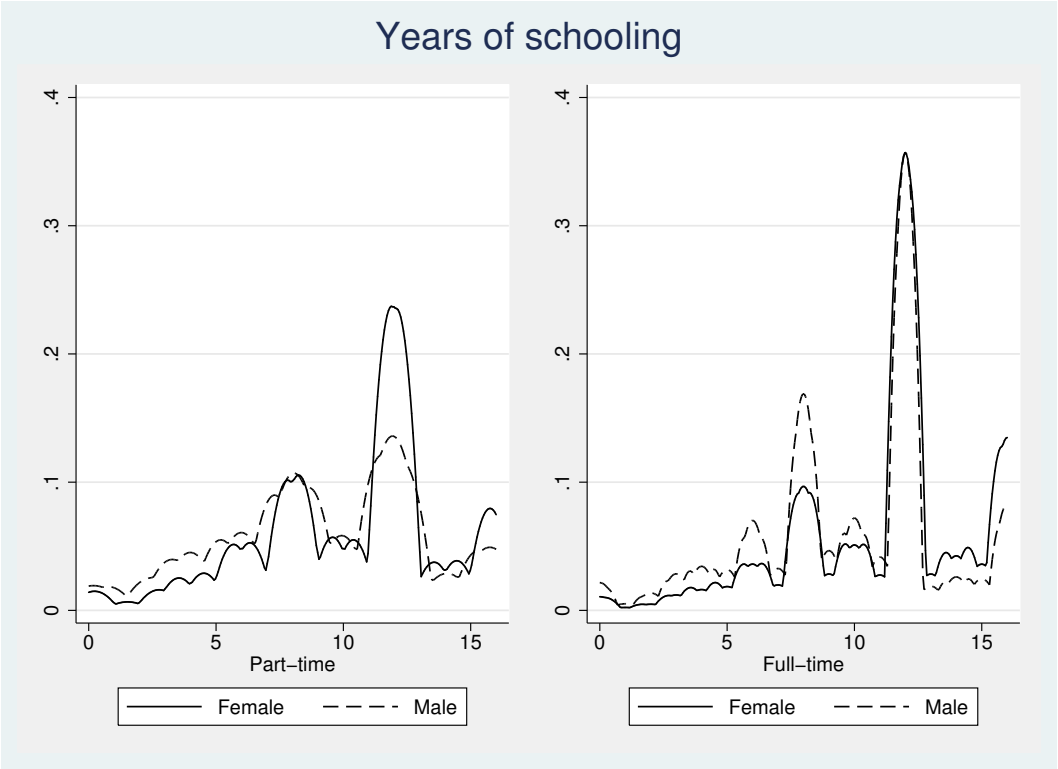

Figure 1: Years of Schooling of Chilean Working Population, by gender

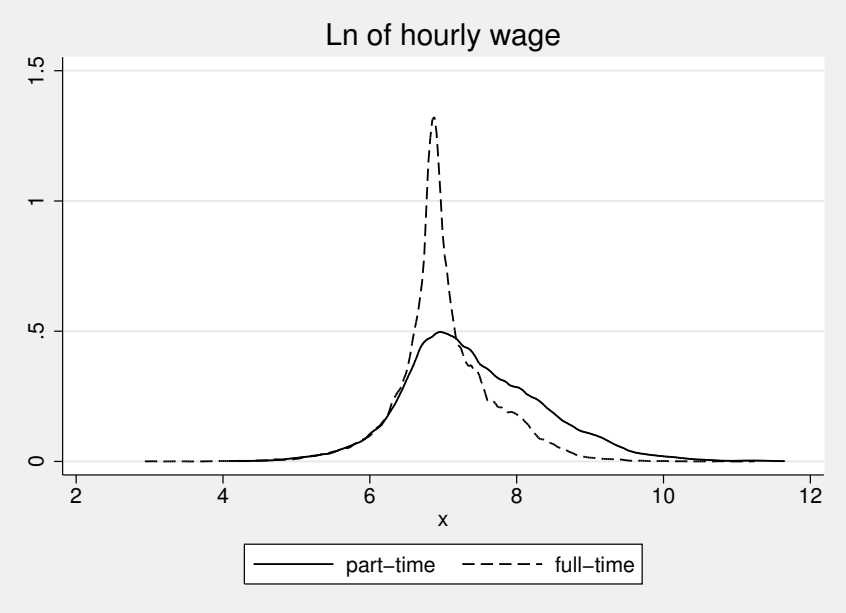

Figure 2: Female Hourly Earnings

6 Appendix

Table A.1: Participation equation, females

Children 5-14	-0.06
	(0.01)***
Children 0-5	-0.09
	(0.01)***
Men older than 65	-0.10
	(0.02)***
Women older than 60	-0.07
	(0.01)***
With partner	-0.45
	(0.01)***
Separated/Divorced	0.23
	(0.02)***
Widow	-0.12
	(0.04)***
Other HH income (ln)	-0.07
	(0.01)***
Years of schooling	0.06
	(0.01)***
Years of schooling squared	-0.20
	(0.16)
Years of schooling cube	1.92
	(0.61)***
Experience	0.62
	(0.01)***
Experience squared	-1.41
	(0.04)***
Experience cube	1.03
	(0.03)***
North	-0.11
	(0.02)***
Center	-0.12
	(0.01)***
South	-0.27
	(0.01)***
Urban	0.17
	(0.01)***
Constant	-8.19
	(0.17)***
Number of observations	75018

Note: (1) Results from Heckman's first-stage procedure, participation decision equals one when the woman is working either full-time or part-time and equals zero if the woman is not working.
(2) Authors' calculations based on Casen 2009.
(3) Stars denote statistical significance at 1 percent.