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**Wage differentials within a female dominated occupation:
Domestic workers in informal and flexible jobs in Portugal**

Fátima Suleman^a

Instituto Universitário de Lisboa (ISCTE-IUL), DINAMIA'CET, Lisboa, Portugal

Avenida das Forças Armadas, 1649-026 Lisboa

Telef. 217 903 434

Fatima.Suleman@iscte-iul.pt

Maria da Conceição Figueiredo

Instituto Universitário de Lisboa (ISCTE-IUL), BRU-IUL, Lisboa, Portugal

Avenida das Forças Armadas, 1649-026 Lisboa

Telef. 217 903 439

Conceicao.Figueiredo@iscte-iul.pt

^aCorresponding Author

Fatima.Suleman@iscte-iul.pt

Abstract

We use an original dataset to examine the impact of informal and flexible contractual arrangements on wages of a sample of domestic workers hired by private employers in Portugal. All arrangements should be formal involving declaration of employment relationship to social security authorities. Our results suggest formality benefits workers whether they have stable or flexible contract. However, social and labour market processes help shape and maintain inequality, especially for migrant workers. Specific and general skills are undervalued and are unable to generate rewards. Compensation was identified for contingent work, multiple employers and elderly caregivers but this hides exploitation and insecurity.

Keywords

Domestic work; endogenous selection; informality; Portugal; social security; wage differentials.

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Introduction

The Employment Relationship Recommendation (198) (ILO, 2006) and the Decent Work Agenda (ILO, 2002; 2010) are illustrations of efforts to guarantee the protection of workers' rights in labour laws and other regulations, including collective agreements. These initiatives also strive to bring more hidden types of employment relationship under the protection of the law. However, an assessment of the impact of such initiatives has not yet been made in the literature. Our article attempts to fill this gap and offers empirical evidence on how the compliance with regulations affects the outcomes of the labour market of domestic workers in Portugal.

Domestic work is economically and socially relevant and there has been an effort to guarantee protection of these workers' rights in labour laws and other regulations. Portugal is among the European countries that has regulated domestic work through specific labour law and entitled domestic workers to the minimum wage. Portuguese government has ratified the ILO Convention 189 in 2015, while national bodies have taken active steps to develop and disseminate information on legal rights and legislations in domestic work in the line with ILO Recommendation 201 (e.g. GAMI, 2012).

Nevertheless, their working conditions are still far from satisfactory. A number of questions remain. More specifically, how the characteristics of contractual arrangements affect the wages of domestic workers? Does the compliance with labour market regulations impact the working conditions, especially the wages of domestic workers? Is there a wage gap between formal/informal jobs? Are there differences within formal and informal jobs, namely related to flexible arrangements?

We examine the impact of contractual arrangements on the wages of a sample of domestic workers in Portugal ($n = 684$). Domestic workers are hired by private families

through a variety of arrangements. We combine two relevant features of this specific labour market, namely, declaration (formality), i.e. the registration of the employment relationship to social security authorities vs. no declaration; and job stability vs. flexibility.

In Portugal, hourly and daily payments make flexibility a regular feature of contractual arrangements, while the monthly payment system may be used to develop a stable (lasting or continuous) relationship. Furthermore, all employers and employees are required to declare their employment relationship to social security authorities, i.e. should formalise that relationship. This article therefore focuses on four types of arrangement: declared and stable, undeclared and stable, declared and flexible, and undeclared and flexible.

Our strategy paralleled that of Mocan and Tekin (2003) and Tansel and Kan (2012) which assumed multiple dimensions of contracts. Empirical analysis adopts the treatment effect model (Wooldridge, 2010) to deal with imprecise and inconsistent estimates arising from the OLS (Ordinary Least Squares) earnings model. We assume that domestic workers themselves can select, or at least accept, the contractual arrangement; therefore, we follow Deb and Trivedi (2006a, 2006b) and use a treatment-outcome model for the multinomial choice of contractual arrangements.

It is thus possible to determine whether good (bad) working conditions, proxied by the characteristics of contracts, correlate with higher (lower) wages. However, it is argued that social and labour market processes have shaped inequality and that wage differentials reflect the structural disadvantages in domestic work. Domestic work is a female-dominated occupation and this implies lower wages than jobs typically filled by men (England, 1992; Perales, 2013). Gender is not, however, the only issue to be addressed; the intersectional approach has underlined how race, citizenship, social

origin and migration interconnect to reinforce disadvantage (Milkman, Reese and Roth, 1998).

We found that the wage setting inside domestic work is far from straightforward. Our results show how multiple dimensions, namely economic and social factors, intersect and influence wages and ultimately contribute to maintaining poor employment conditions in domestic work.

Non-pecuniary characteristics and wage differentials

It is generally assumed that the regulations for domestic work are different from those in other jobs in the economy and that the employment relationship between private households and domestic workers is often of an exploitative nature (Meagher, 2002). Moreover, domestic workers are usually vulnerable to various types of abuse and are engaged in unequal power relationships (Chen, 2011; Meagher, 1997). A brief report by the ILO (2011) summarises some relevant hypotheses to explain wage differentials, namely undervaluation, pay discrimination, bargaining power, or minimum wage legislation and coverage. However, it fails to examine whether wages vary among employment relationship models.

The literature documents the multiple contractual arrangements of domestic workers, namely, working for single or multiple employers; on a part-time or full-time basis; within an informal or formal situation; and hired for a single or multiple tasks (Chen, 2011). However, informality has been the main focus of international bodies because it invariably leads to a lack of social protection and other substandard employment conditions.

Available research offers a variety of definitions of the informal economy (see Hussmanns, 2004 and Williams, 2014 for a discussion). We suggest domestic work fits

into the category of “informal jobs” because of the non-declaration of the jobs or the workers (Hussmanns, 2004) or ‘wholly informal waged employment’ defined as an employment relationship “*wholly unregistered by or hidden from, the state for tax, social security and labour law purposes, and can be temporary or permanent and relatively low- or high-paid*” (Williams, 2014, p. 740). This is not surprising because informal salaried workers are usually penalised and represent a disadvantaged segment in the labour market (Arias, 2007).

In contrast, research on the impact of job flexibility on wages shows quite broad consensus on compensating wages for flexible arrangements (e.g. Hamersma, Heinrich and Mueser, 2014; Graaf-Zijl, 2012; Weeden, 2005). However, flexible arrangements have received less attention in the literature on domestic work.

In light of the reported literature, we expect a variation in wages among contractual arrangements in domestic work. It is thus interesting to examine whether undeclared and flexible domestic workers suffer a wage penalty in the labour market.

The studies exploring multiple dimensions of contractual arrangements are scarce, however. Tansel and Kan (2012) explored wage differentials in formal/informal and wage/self-employment, while Mocan and Tekin (2003) focused on full-time/part-time employment in the for-profit and non-profit sectors. These strategies have not yet been applied in the literature to examine wage differentials in domestic work, characterised by informal and flexible contracts.

Other job characteristics may affect the wages of domestic workers. Research suggests that caring occupations generally involve lower pay (e.g. Budig and Misra, 2010; Razavi and Staab, 2010; Barron and West, 2013), while other studies report a wage penalty for some categories within domestic work, namely caregivers and full time workers in the US. (e.g. Shierholz, 2013). In other words, domestic workers

generally have lower wages, fewer benefits, and less legal or social protection than other workers (Shierholz, 2013; Chen, 2011; Tijdens and Van Klaveren, 2011). Nevertheless, some segments within domestic work, notably caregivers, are more severely penalised.

There are many reasons for caregivers having lower wages. Razavi and Staab (2010) and Budig and Misra (2010) suggest explanations associated with the characteristics of job, work, and workers. For example, caring is labour-intensive and less likely to accommodate technological innovation; and there is a complex trade-off between efficiency and quality of care. Consequently, employers hire workers from disadvantaged groups, namely on the basis of gender and race, to contain labour costs (Budig and Misra, 2010).

Literature describes non-economic factors that impact wages in domestic work, especially social and labour market processes (England, 1992). Occupational segregation by sex is undoubtedly a source of inequality and the literature reveals that wages are lower in female-dominated occupations than male jobs (England, 1992). Furthermore, rewards in society are gender-driven and a higher value is attached to the skills of male-dominated occupations (McGrath and DeFilippis, 2009).

Scholars raised an important issue in domestic work in this regard because both domestic workers and their employers are typically women (Rollins, 1985). They insist that the employment is based on an asymmetric relationship, the mistress-maid relationship, where often one woman exploits another (Rollins, 1985; Arat-Koc, 1989). Paid domestic work has therefore become a space for growing inequality among women (Milkman, Reese and Roth, 1998) leading to an ideological distinction between the work performed by domestic workers – “woman’s work” – and the so-called “real job”

of their employers (McGrath and DeFilippis, 2009). Employers may, therefore, undervalue the skills of domestic workers.

In addition, scholars have highlighted not only that migrants suffer from greater disadvantages, but, more importantly, that gender, race, ethnicity and citizenship interact in paid domestic work (Glenn, 1992; Romero, 1992; Anderson, 2001). There is a link with gender, migration and ethnicity issues that increases the vulnerability of domestic workers (Anderson, 1997; Duffy, 2005).

Some work has been conducted to explore this issue through the concept of the double-negative effect (e.g. Shamsuddin, 1998; Piazzalunga, 2015). These studies compared wage differentials between native and foreign-born men and women. Piazzalunga found sizeable evidence on ethnic-based discrimination for female migrants, while the results of Shamsuddin underlined the gender-based discrimination. Accordingly, we expect an ethnic wage gap in domestic work.

Finally, domestic workers' substandard conditions have been severely aggravated by their workplace. Working in a private household fosters social isolation, invisibility and lack of regulation, making domestic workers even more vulnerable to exploitation (Milkman, Reese and Roth, 1998).

In sum, while there is some consensus among scholars on poor working conditions, another stream of literature addresses the particularities of domestic work and examines how employers can offer these conditions without endangering their home and family members. In addition to performing flexible tasks, such as cleaning and housekeeping, which may be performed in anytime, domestic workers also do inflexible chores that include caring for children, the elderly and sick or disabled people, and cooking, which require a timely performance (De Ruijter and Van der Lippe, 2007). Furthermore, caregivers tend to develop personal relationships with their

employers (Chen, 2011), which makes them extremely difficult to replace (Anderson, 2007).

Trust is also an issue (De Ruijter, van der Lippe, and Raub, 2003) because employers entrust their home, family members and often the keys of the house to people they scarcely know. As a result, employers often rely on references and recommendations from their network of friends, family and neighbours when making the decision to hire domestic workers from the informal labour market (Moras, 2008). Domestic work is economically and socially relevant (see Abrantes, 2014 for domestic workers in Europe) because it enables productive workers, especially women, to have their own jobs. Employers may, however, be unaware of the complexity of this work, especially when it involves care provision.

Domestic work in Portugal

Paid domestic work is of the utmost importance in the Portuguese labour market. Although Portugal has the highest rate of female employment in Southern European countries, the traditional gender culture persists and welfare systems supporting women's participation in the labour market are lacking (Tavora and Rubery, 2013). Indeed, families in Southern European countries rely almost exclusively on women (Bettio and Plantenga, 2004) and foreign workers to assist in the provision of care (Simonazzi, 2009). In 'familial' models of welfare, families purchase care services directly from the market and often employ migrant domestic workers to support their elderly members in need of care (Shutes and Chiatti, 2012) and for home-based child-care (Williams, 2012).

Female employment patterns and a familial society make Portugal an interesting case study to examine the relevance of domestic work performed by both native and

migrant women, especially from Portuguese speaking ex-colonies and European countries (Abrantes, 2012). Domestic workers have helped women reconcile work and family life and to maintain the labour division within families (Crompton, 2006) at a low cost (Torres, 2008). They have also been a solution for the care of the elderly and disabled at home; in fact, private households are the largest employers of care workers in Portugal (Cangiano, 2014).

Portugal is one of the European countries that have regulated domestic work through specific labour law since the 1980s, and domestic workers have been entitled to the minimum wage since 1978. The legislation on domestic work in Portugal dates back to 1980 but progress was made particularly in the early 1990s. The Decree-law 235/92 stipulates the working conditions that employers must give workers, namely, the tasks to be performed, the pay and pay components including paid holidays and Christmas bonus, and other working conditions. According to this Decree-law, employment contracts are legally valid even if they are not in writing (Martins, 2009). Formal (written) contracts are only obligatory in the case of fixed term contracts and to obtain or renew the visas of foreign workers. In all other relationships, domestic workers are advised to formalise their contracts in order to enjoy more favourable social protection (GAMI, 2012).

Like other paid workers in Portugal, domestic workers are entitled to the national minimum wage, which is set as a monthly-based wage of 485 Euros (in 2012) for live-in or full-time workers. Domestic workers have a special contributory scheme in Portugal, which attempts to address the specificities of workers and employers (UGT, 2006) and to avoid very high contributions that probably lower the wage received by domestic workers considerably (GAMI, 2012). They can choose between paying social

security rates on the basis of either a pre-set wage or the total earned wage (GAMI, 2012).

The pre-set wage is defined by the authorities and represents around 70% of the national minimum wage. It was €356.34 euro in 2012 for monthly wage earners, €11.88 for daily, and €2.42 for hourly contracts (GAMI, 2012). This means that irrespective of the total wages earned, domestic workers have to pay contributions only on the basis of that pre-set wage. However, the social security authorities impose a minimum of 30 hours of work per month for the pre-set wage system.

Furthermore, the social security rates levied on a pre-set wage are lower than those based on total earnings. The rates for the former are 18.9% for employers and 9.40% for workers. This compares with 22.3% and 11% respectively when based on total earned wages but domestic workers in this system are eligible for unemployment insurance schemes. Eligibility for unemployment benefit also requires domestic workers to have been in a full-time job with a monthly-based wage.

Literature fails to explain why workers opt in favour of one system or the other. It does indicate, however, that employers often fail to comply with regulations, notably non-payment or non-compliance with the requirement to declare the employment relationship to social security authorities (Abrantes, 2012). It therefore seems that the decision is dictated by the non-wage cost and/or worker's income.

Social protection was extended to domestic workers in the late 1960s before the end of the fascist regime. This sought to ensure that everyone could obtain a pension (old-age, disability or widow's) even if they had not made social security contributions.

Recently, the Portuguese government has ratified the ILO Convention 189 (Parliament Resolution 42/2015; Decree-law 31/2015). These recommendations are

expected to be implemented as national bodies have strived to prepare and disseminate information on legal rights and legislation in domestic work (e.g. GAMI, 2012).

Nevertheless, poor working conditions still prevail in domestic work in Portugal, due in part to illegal migration and undeclared work (Pereira, 2013; Reyneri, 2003). However, considerable efforts have been made by Portuguese governments to regularise undocumented migrants and give them labour rights (see Oliveira, 2013 for details).

The dataset

The empirical analysis draws on an original cross-sectional dataset of domestic workers in Portugal collected in 2010 for an international project (see Guibentif, 2011 for details). Given the characteristics of domestic workers and their workplace, snowball sampling was used to gain access to participants. The contact details of domestic workers were obtained from domestic work unions, immigration-related institutions, and personal acquaintances.

Data on domestic work are scarce and more importantly they lack robust statistical check of the estimates (ILO, 2013). We applied an original inquiry to collect specific information for the purpose of studying the drivers of wages differentials. However, we are aware that our sample is not fully representative of the population of domestic workers in Portugalⁱⁱ. In this context, the conclusions drawn for this sample cannot necessarily be extrapolated to the entire population.

The data were gathered in face to face interviews and include information on socio-demographic characteristics, demand for skills, wages, contracts, tasks to be performed, working hours, formality, and employers' characteristics (n = 684).

Though some variables are self-explanatory, others deserve further explanation. For example, the tasks performed were collected from a list of 19 items detailing the

specific cleaning, cooking, child and elderly care tasks. Domestic workers were recoded into three types of job: cleaners, child caregivers, and elderly care workers. However, as caregivers also perform non-caring tasks, we labelled workers who perform at least one of the caring tasks detailed in the survey as caregivers.

The skills were assessed through self-perception of relevant skills. The questionnaire included the following question: “*If you were an employer, which skills would you look for in a domestic worker?*” It was assumed that the workers would mention the skills they considered appropriate to perform household tasks. This might proxy the skills required in the domestic work. The survey included further questions regarding the skills and abilities of domestic workers. Domestic workers were also asked whether their employers demanded specific skills. Moreover, the sampled workers were asked whether employers asked for references, how they got the job and how work was monitored. Monitoring activities were assessed through the presence (absence) of the employer in the workplace during working hours.

There are no uniform data regarding wages. While some domestic workers refer to an hourly wage, others earn on a daily, weekly or monthly basis. In order to achieve a standard that facilitates further analysis, hourly wage was computed using data on total working days per month and week, and the total working hours per day, reported by the domestic workers themselves. Of course, this was not necessary for readily available data on hourly wages.

Live-in workers on call 24 hours a day were the most difficult cases; but it was decided to consider at least 7 hours of rest and 17 hours of work per day. On the other hand, as some live-in workers reported one day off per week, one day was excluded from the total days per week. However, the dataset does not include information on public holidays.

Where applicable, hourly wage accommodates the value related to Christmas and holiday bonuses. The hourly wage was weighted by 1.083 if the worker received one bonus and 1.166 if there were two bonuses. More specifically, if the worker was paid 13 or 14 monthly wages a year. It should be stressed that some domestic workers receiving an hourly-based wage are entitled to bonuses and the weighting was applied in the same way in these cases. However, the dataset does not enable us to confirm whether the workers who reported receiving holiday allowances actually get paid holiday.

Finally, the net hourly wage was used in regression models. The dataset includes declared or formal and undeclared or informal workers. Social security contributions are deducted from the wages of declared and formal workers, while the informal workers receive the wages reported. For the sake of comparison, we deducted the social contributions costs (either based on the pre-set or total earned wage) from the wages of declared domestic workers, and this reduced their wages by 10%.

Primarily, we used a principal components analysis (PCA) to reduce the 14 skills and abilities variables, measured by self-perception of required skills, to a smaller and more manageable number of components that explains a large proportion of the variance. The following categories of skills are grouped through PCA: personal traits, specific skills, flexibility and general skills (see Table A2 for details in Appendix 2).

Table 1 provides summary statistics of variables, detailed in Table A1, used to estimate the determinants of wages in the labour market of domestic workers. It should be stressed that domestic work is almost exclusively a female occupation (99.6% of the sample) in Portugal.

Table 1

At the outset, descriptive statistics suggested variations in the wages of workers with different contractual arrangements. The figures displayed in Table 1 indicate that workers with multiple employers tend to earn higher wages than those on single-employer contracts. The estimates point to wage differentials among stable and flexible workers; and between declared and undeclared. We notice that undeclared workers have lower wages. Furthermore, the evidence reported in Table 2 confirmed additional benefits of being engaged in declared work.

Table 2

It can be observed that undeclared workers experience less favourable treatment in both situations. The pay package of declared and stable workers seems to be closer to the package of other employees in the economy, while occasional workers benefit from being declared.

The methodology and econometric model

The variables

To test the impact of the proposed measures of contractual arrangements, this section describes the econometric model to estimate the wage differentials between four types of contractual arrangement that combine coverage by social security and stability: declared and stable; undeclared and stable; declared and flexible; and undeclared and flexible domestic workers. While declared work presupposes registration with social security authorities and the payment of the respective contributions, the stability (flexibility) of the relationship is measured through the payment system, i.e. by a monthly (hourly or daily) based system. From our day-to-day experience, households

try to develop lasting or continuing relationships by paying wages on a monthly rather than hourly or daily basis in the case of both full-time and part-time workers. This generally fosters a long term relationship between households and domestic workers with single or multiple employers. Benefits associated with declared work reinforces the impact of labour market regulations by reducing inequalities and points to the segmentation hypothesis. Therefore, informal workers are a disadvantaged group in the labour market. In contrast, if the labour market enables undeclared workers to have positive wage differentials, it suggests that informality is compensated by higher wages. The predictions of compensating wage differentials are fully confirmed by the higher wages of undeclared and flexible arrangements.

In addition, the model included a set of control variables for socioeconomic characteristics like age; origin (particularly relevant in a market with so many migrants); job status (to control for single or multiple employers); network to obtain a job and recommendation of the candidate associated with trust-related issues; job requirements (the skills required to perform household tasks); and occupational structure to explore the role of caring tasks and household characteristics related to the type of workplace (see Table A1 in Appendix 1 for the description of variables).

Econometric model

Firstly, we use an OLS regression model to explore the drivers of wages in domestic work, in which the dependent variable was the hourly wage in logarithm form. However, the possibility of inconsistent estimators due to endogenous selection bias associated with the choice of contractual arrangement is a major problem in this estimation. Any worker in the economy may voluntarily choose (or at least accept) informal jobs when entering the labour market either out of personal preference or because he/she has no alternative due to the scarcity of formal work (Maloney and

Arias, 2007). Endogenous selection in domestic work might arise because not all of them know as much about their legal rights and the benefits of doing a regulated work. Domestic workers are dubious about the benefits or protection of formality within an invisible activity performed in private households where compliance with labour laws is not monitored (Chen, 2011). Therefore, those aware of rights and benefits prefer formal arrangements, while others may choose informality. This has an impact on the choice (or acceptance) and makes domestic workers select contractual arrangements accordingly. Furthermore, national bodies seek to increase and broaden the access of domestic workers, and especially migrants, to their legal rights by publicising information about the relevant laws and labour rights in Portugal (GAMI, 2012).

Following Deb and Trivedi (2006a, 2006b), we examine the impact of the four types of contractual arrangement on wages by using a treatment-outcome model for the multinomial choice of contractual arrangements. The treatment effects approach is suitable for dealing with endogenous selection as in the case of contractual arrangements in our wage determinants model (Imbens and Angrist, 1994; Maddala, 1983). Neglecting selection leads to correlation of the error terms and consequently to an omitted variable bias.

However, multiple arrangements (as opposed to binary) call for the multinomial choice model (Deb and Trivedi, 2006b), which is in fact an extension of the treatment model applied to multinomial choice. The model assumes the joint distribution of endogenous treatment and wages using a latent factor structure and applies a maximum simulated likelihood approach for estimation. These econometric solutions are captured in *mtreatreg* Stata command and presuppose a model with two sets of equations: the selection and the outcome equations.

The determinants of contractual arrangements include the above-mentioned socioeconomic variables that influence wages and an additional instrument to illustrate domestic workers' knowledge of legal rights and benefits. We are interested in examining the role of workers in the enforcement process. Marinakis (2016) suggests that employers often fail to comply with regulations and reports institutional factors that ensure compliance with regulations, notably in the case of minimum wage. Rani *et al* (2013) add the role of workers and consider that domestic workers should help ensure regulations are enforced by reporting violations and claims.

In our survey, the domestic workers were asked “*if needed, would you be willing to use courts to appeal against any failures to comply with contractual obligations?*” Rani *et al* (2013) underline that the lack of suitable data makes it difficult to assess compliance based on the number of complaints reported by workers to enforcement bodies or to courts. Furthermore, the “quasi-familial” relationship with employers (Romero, 1992) deters domestic workers from seeking compliance through the courts or other bodies.

Nevertheless, we presuppose that affirmative answers to that question indicate that domestic workers at least know their rights and this can help them push for compliance. The knowledge of the rights is therefore the first necessary pre-requisite for enforcement, though obviously insufficient in itself. As national bodies take considerable efforts to inform domestic workers about their legal rights (GAMI, 2012), informed workers are more likely to choose legal and stable employment relationships, while ill-informed workers may select occasional and informal work.

As regards the econometric model, it should be stressed that the matrix of covariates z_i does not necessarily require additional variables relative to x_i to be identified. However, we decided to have an exclusion restriction or instrument, the

“*knowledge of legal rights*” in the treatment equation, as suggested by Deb and Trivedi (2006a). Therefore, latent factors enter the outcome and treatments equations in the same way as observed covariates and incorporate unobserved characteristics related to the knowledge of legal rights. On the other hand, since latent factors enter the likelihood function but are unknown, the maximisation of the likelihood function is performed through simulation by drawing several random numbers from a standard normal distribution.

A formal representation of the model is given for the choice of contractual arrangement, where each individual i chooses a type of contractual arrangement j from a set of four choices ($j = 0,1,2,3$) where $j = 0$ is the control group (undeclared and flexible). Let EV_{ij}^* denote the utility associated with the hourly wage of individual i with contractual arrangement j

$$EV_{ij}^* = z_i' \alpha_j + \delta_j l_{ij} + \eta_{ij}$$

where z_i denotes a set of exogenous covariates with parameters α_j , η_{ij} are *i.i.d.* error terms, and l_{ij} are latent factors which incorporate unobserved characteristics common to the individual i 's status choice and outcome (logarithm of hourly wage). The l_{ij} are assumed to be independent of η_{ij} . As a normalisation $EV_{i0}^* = 0$, so the expected utility of j -th status is the differential utility relative to that undeclared and flexible arrangement.

Let d_i be binary selection variables representing the observed contractual arrangement choice and $\mathbf{d}_i = (d_{i1}, d_{i2}, d_{i3})$. Also let $\mathbf{l}_i = (l_{i1}, l_{i2}, l_{i3})$. The mixed multinomial logit structure for the probability of contractual arrangement choice can then be represented as

$$P(\mathbf{d}_i | \mathbf{z}_i, \mathbf{l}_i) = \frac{\exp(z_i' \alpha_j + \delta_j l_{ij})}{1 + \sum_{k=1}^J \exp(z_i' \alpha_k + \delta_k l_{ik})}$$

The expected outcome equation for individual i is formulated as

$$E(y_i) = \mathbf{x}'_i \beta + \sum_{j=1}^3 \gamma_j d_{ij} + \sum_{j=1}^3 \lambda_j l_{ij}$$

where \mathbf{x}_i is a set of exogenous variables and γ_j denote the treatment effects relative to the undeclared and flexible arrangement. The expected value of the log hourly wage, $E(y_i)$, is a function of the latent factors l_{ij} so that it is affected by unobserved characteristics which also affect the selection a contractual arrangement. The interpretation of the λ_j factor-loading parameters is as follows: when λ_j is positive (negative), unobserved factors which increase the probability of selecting j -th contractual arrangement also increase (reduce) the hourly wage.

In order to estimate parameters of the model, latent factors are assumed to be *i.i.d.* Draws from the standard normal distribution and simulation-based method are used to maximise the log likelihood. Provided the number of draws is sufficiently large (we select 350 draws), maximisation of the simulated log likelihood is equivalent to maximising the log likelihood. Parameters of this model are identified when $\mathbf{z}_i = \mathbf{x}_i$, but Deb and Trivedi (2006b) recommend including some variables in \mathbf{z}_i which are not included in \mathbf{x}_i .

The impact of economic and non-economic factors on wages

The estimates from the OLS regression model displayed in Table 3ⁱⁱⁱ indicate that stable contracts imply that domestic workers experience a non-negligible wage penalisation. The difference is even greater for undeclared workers in stable contracts.

Table 3

Table 4 displays the estimates of the treatment-outcome model for multinomial choice to control for endogenous selection bias. The results show that the estimates from OLS and the treatment model vary considerably. The corrected estimates from the treatment model reported in columns 5 show some marked differences, especially in relation to the impact of contractual arrangements. Furthermore, the lambda (λ), which measures the impact of selection, is statistically significant for the three arrangements, indicating that our prediction of endogenous selection was correct. The OLS estimates are therefore biased and the analysis should proceed on the basis of the treatment approach estimates. Moreover, the test of degree of substitutability between contractual arrangements demonstrated the non-violation of the IIA assumption.

Table 4

The evidence from the selection equation in Table 4 presents positive and significant signs of unobserved workers' characteristics proxied by the knowledge of legal rights and benefits in the declared arrangements. Domestic workers with that knowledge are $4.2(e^{1.430})$ times more likely to have declared and stable contracts, and $3.6(e^{1.268})$ times more likely to have declared but flexible arrangements. Self-selection does in fact occur and domestic workers choose an efficient arrangement.

Socioeconomic features are also relevant predictors of contractual arrangements. For example, the tasks to be performed and the skills required by households have a positive and significant impact on declared and stable contracts. Working for multiple employers increases the probability of being engaged in flexible arrangements and at the same time decreases the likelihood of stable contracts in declared work. In addition, the estimates suggest that workplace characteristics have an impact on contractual

arrangements. Employers living in houses are more likely to offer declared and stable jobs than those living in flats.

The findings from the equation of interest, the outcome equation, are consistent with wage differentials among the range of contractual arrangements. Workers in declared and stable arrangements have a wage penalisation of almost 4.2% compared to the counterfactual group in undeclared and flexible domestic work, while workers in stable and undeclared workers suffer a penalisation of about 24.5%. Additionally, contingent workers, those paid on an hourly or daily basis, tend to have a high hourly wage and it is higher for declared work. Finally, working for multiple employers increases the hourly wage by 18.3%. Workers in caring jobs experience either a wage benefit (elderly caregivers) or penalty (child care workers), when compared to cleaning jobs.

There is an interesting finding regarding the skills required to perform household tasks. General and specific skills are drivers of earnings in domestic work, but negative and significant signs of the estimates are puzzling. The same holds for the negative sign associated with the requirement of particular skills. The trust-related estimate suggests that employers pay higher wages to domestic workers recommended by friends than to those hired from agencies or recommended by other networks. There is also a wage differential between migrants and native workers. A migrant worker suffers a wage penalisation of almost 10%. Finally, employers living in houses tend to pay lower wages than those living in flats, but are willing to pay higher wages to those caring for the elderly.

Discussion and conclusion

The marketisation of domestic work, and care work in particular, has received wide attention because it crosses several social, economic and political issues, notably patterns of women's employment, female migration, informality and shadow economy, regulations and working conditions of domestic workers. However, the employment relationship that supports that commodification deserves further inquiry.

Our study focused on the employment of domestic workers in private households and examined how the compliance with regulations affects labour market outcomes. More especially, we attempted to explore how the wages of domestic workers vary across contractual arrangements, which are regulated by a specific labour law in Portugal. It should be noted that declaration to social security authority is compulsory; so, domestic workers should always be engaged in a formal or declared employment relationship whether they have a flexible or stable work situation.

The contractual arrangements in domestic work in Portugal are heterogeneous and parallel the typology proposed by Chen (2011). Domestic workers may work for one or a set of employers; in a full-time or part-time job; be engaged in declared or undeclared relationships; earn on a monthly, hourly or daily basis; and live in the employer's house or are external workers. These different arrangements have a considerable impact on the wages earned by domestic workers.

The wage penalisation of workers in stable jobs corroborates the findings of Shierholz (2013) because full-time workers receive lower wages in the labour market of domestic workers. However, declared work is less penalised than undeclared work, and declared flexible contracts have greater benefits than flexible and undeclared work.

Declaration brings additional monetary benefits. The data provided confirms that a larger proportion of workers in declared work receive Christmas and holiday bonuses, health insurance or food allowances than those in informal employment relationships

(Table 2). The exploitation of informal workers is thus clear; undeclared work is a secondary segment in this labour market.

Domestic workers who work for multiple employers are given higher wages to compensate for the time spent going from household to household, i.e. the non-productive hours. Nevertheless, these figures hide a much more worrying situation. Contingent work involves substantial insecurity with no guarantee of regular contracted hours and, consequently, a stable income.

Caregivers working with the elderly are probably also compensated for both the range of services provided to foster wellbeing, dignity and autonomy and also for being available at all times. This finding contradicts somehow the wage penalty of caring occupations reported in the literature (Razavi and Staab, 2010; Budig and Misra, 2010). However, the residential care is extremely demanding and it is often based on the expectation that domestic workers should be available to assist the elderly at any time. Excessive working hours and often poor accommodation could cancel out the wage benefits of elderly caregivers.

On the other hand, caring for children implies a wage penalty in Portugal. This finding is consistent with previous literature, which points to segmentation that divides high-pay and low-pay in caring occupations (Barron and West, 2013). This kind of segmentation within caring jobs in domestic work deserves further scrutiny but suggests that the employer, probably the recipient of care, is able (and willing) to pay higher wages than the parents of children.

However, this is an incomplete picture of the wage setting in domestic work. While migration has contributed to the supply of labour for caring and cleaning tasks that enables women to go out to work (Anderson, 2007; Bettio, Simmonazi and Villa, 2006), wage differentials between native and non-native workers corroborate claims of

the greater vulnerability of migrant domestic workers. This supports empirical evidence of an ethnic wage gap, i.e. female migrants are at a greater disadvantage than native female domestic workers (Shamsuddin, 1998; Piazzalunga, 2015).

Society tends to undervalue domestic work and to see it as women's work. Households are unwilling to reward the skills of those who care for their home, children and elderly family members because, ultimately, they do not consider domestic work a “real job”.

However, estimates from the selection equation suggest that the probability of a stable and formal contract increased when skills were required. Employers seem to protect their investment by searching for suitable skills but might also be aware of the affective relationships and trust issues that domestic work involves. In sum, employers are not keen to pay for skills but seem to be aware of the risk of substituting the domestic worker (Anderson, 2007).

Our study reveals that domestic workers are particularly vulnerable to exploitation and to bad working conditions; this is in large part because it is done by women and migrants whose skills are undervalued. Thus, economic, social and labour market processes contribute decisively to maintaining and increasing disadvantages. However, the available research on the undervaluation of women's work has been limited to examining the inequality caused by skills in the labour market.

Despite our interesting empirical evidence, all results must be regarded with caution. As the sample is small and based on snowball sampling, it is neither random nor fully representative. In fact, it is extremely complicated to create a random and representative dataset due to the size and dispersed nature of the universe.

Our findings suggest that compliance with regulatory standards lead to better labour market outcomes for domestic workers. However, domestic workers should

assume their responsibility in the enforcement process; the first step to improve full access to rights is thus to inform workers of these legal rights.

However, the non-wage costs associated with formal employment relationships may be considerable for some employers and workers, thus lowering the incentive to comply with labour laws. Additionally, the workplace hampers the work of labour inspectors, which is an advantage to illegal workers in particular who prefer to remain invisible.

The formalisation discussion is summed up by two questions: i) Are employers, and especially middle class women who can only participate in the labour market if they employ domestic workers, able to bear the costs of formalisation? ii) How can domestic workers stand up for their rights if they stay in informal jobs? Government enforcement policies and the willingness of employers and workers to comply with regulations may be affected by the particularities of this market. Indeed, domestic work raises a compliance puzzle that must be solved.

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TABLE 1
Descriptive statistics [mean, (SD)]

	Sample	Declared and stable	Undeclared and stable	Declared and flexible	Undeclared and flexible
Hourly wage (ln [euro])	1.474 [4.37] (0.454)	1.309 [3.70] (0.465)	1.301 [3.67] (0.490)	1.681 [5.37] (0.344)	1.678 [5.35] (0.320)
Multiple employer (Yes = 1)	0.573 (0.495)	0.460 (0.499)	0.455 (0.502)	0.760 (0.429)	0.636 (0.483)
Network to obtain job: relatives (Yes = 1)	0.185 (0.388)	0.184 (0.389)	0.209 (0.410)	0.211 (0.409)	0.135 (0.343)
Network to obtain job: friends (Yes = 1)	0.602 (0.490)	0.561 (0.498)	0.455 (0.502)	0.618 (0.487)	0.685 (0.467)
Network to obtain job: others (Yes = 1)	0.213 (0.410)	0.255 (0.437)	0.209 (0.41)	0.171 (0.378)	0.180 (0.386)
Employer required particular skills (Yes = 1)	0.282 (0.451)	0.376 (0.485)	0.246 (0.434)	0.235 (0.425)	0.153 (0.362)
Personal traits (PCA scores)	-0.004 (1.005)	0.034 (0.931)	-0.018 (1.030)	-0.074 (1.070)	0.015 (1.066)
Specific skills (PCA scores)	0.000 (0.994)	0.156 (0.957)	0.089 (1.008)	-0.175 (0.988)	-0.175 (1.022)
General skills (PCA scores)	-0.012 (0.995)	0.200 (1.061)	-0.340 (0.769)	-0.141 (0.946)	-0.122 (0.934)
Elderly care tasks (Yes = 1)	0.172 (0.378)	0.250 (0.434)	0.130 (0.339)	0.118 (0.324)	0.09 (0.288)
Child care tasks (Yes = 1)	0.218 (0.413)	0.242 (0.429)	0.333 (0.475)	0.164 (0.372)	0.162 (0.370)
Cleaning tasks (Yes = 1)	0.611 (0.488)	0.508 (0.501)	0.536 (0.502)	0.717 (0.452)	0.748 (0.436)
Age (years)	43.104 (11.722)	43.518 (10.772)	45.309 (14.367)	41.47 (11.562)	43.036 (12.087)
Origin (Migrant = 1)	0.332 (0.471)	0.357 (0.480)	0.275 (0.45)	0.329 (0.471)	0.315 (0.467)
Living in a house (Yes = 1)	0.371 (0.484)	0.427 (0.496)	0.382 (0.490)	0.333 (0.473)	0.288 (0.455)
N	588	256	69	152	111

TABLE 2
Pay package by contractual arrangements (%)

Pay components	Declared and Stable	Undeclared and Stable	Declared and Flexible	Undeclared and Flexible
Christmas bonus	80.5	53.6	51.0	28.8
Holiday allowances	77.3	44.9	52.3	18.9
Health insurance	30.2	7.4	13.4	3.6
Food allowance	21.2	10.4	12.2	3.6

TABLE 3
Economic returns to contractual arrangements
in domestic work: OLS estimates

Model	Estimates
Contractual arrangements ^(a)	
Declared and stable (Yes = 1)	-0.267*** (0.046)
Undeclared and stable (Yes = 1)	-0.350*** (0.061)
Declared and flexible (Yes = 1)	-0.002 (0.043)
Multiple employer (Yes = 1)	0.135*** (0.036)
Network ^(b)	
Relatives (Yes = 1)	-0.009 (0.045)
Other network (Yes = 1)	-0.087* (0.046)
Demand for particular skills (Yes = 1)	-0.114*** (0.039)
Self-perception of relevant skills	
Personal traits (PCA scores)	-0.0003 (0.984)
Specific skills (PCA scores)	0.036** (0.018)
General skills (PCA scores)	-0.052*** (0.017)
Occupational structure ^(c)	
Elderly care tasks (Yes = 1)	0.021 (0.051)
Child care tasks (Yes = 1)	-0.011 (0.043)
Age (years)	0.0004 (0.787)
Origin (Migrant = 1)	-0.050 (0.191)
Living in a house (Yes = 1)	-0.010*** (0.038)
Constant	1.638*** (0.082)
N	557
R ²	0.253

Standard errors in brackets; Reference categories: ^(a)Undeclared and flexible; ^(b)Friends; ^(c)Cleaning tasks. (*) p < 0.10; (**) p < 0.05; and (***) p < 0.01.

TABLE 4
Economic returns to contractual arrangements in domestic work:
Endogenous multinomial treatment effect estimates

	Declared and stable	Undeclared and stable	Declared and flexible	ln (hourly wage)
Multiple employer (Yes=1)	-0.617** (0.284)	-0.736** (0.373)	0.756** (0.317)	0.183*** (0.009)
Network ^a				
Relatives (Yes=1)	0.560 (0.391)	0.363 (0.495)	0.580 (0.400)	-0.035** (0.015)
Other network (Yes=1)	0.657* (0.372)	0.398 (0.496)	0.184 (0.392)	-0.095*** (0.014)
Particular skills required (Yes = 1)	0.860** (0.339)	0.501 (0.433)	0.496 (0.377)	-0.082*** (0.016)
Self-perception of relevant skills				
Personal traits (PCA scores)	0.014 (0.142)	-0.063 (0.188)	-0.126 (0.150)	0.001 (0.004)
Specific skills (PCA scores)	0.323** (0.139)	0.135 (0.205)	0.021 (0.144)	-0.062*** (0.004)
General skills (PCA scores)	0.318** (0.146)	-0.382* (0.200)	-0.048 (0.317)	-0.043*** (0.002)
Occupational structure ^(b)				
Elderly care tasks (Yes=1)	1.512*** (0.408)	0.819 (0.588)	0.198 (0.461)	0.095*** (0.008)
Child care tasks (Yes=1)	0.972*** (0.373)	1.133** (0.446)	0.227 (0.391)	-0.071*** (0.016)
Age (years)	0.004 (0.766)	0.007 (0.017)	-0.009 (0.013)	-0.002*** (0.0003)
Origin (Migrant =1)	0.345 (0.303)	-0.052 (0.420)	0.237 (0.308)	-0.090*** (0.010)
Living in a house (Yes=1)	0.625** (0.295)	0.589 (0.389)	0.191 (0.317)	-0.084*** (0.008)
Knowledge of legal rights (Yes=1)	1.430*** (0.282)	0.183 (0.374)	1.268*** (0.291)	
Constant	-1.183* (0.688)	-1.842** (0.934)	-1.250* (0.687)	1.557*** (0.018)
Contractual Arrangements ^(c)				
Declared and stable (Yes=1)				-0.042*** (0.013)
Undeclared and stable (Yes=1)				-0.245*** (0.017)
Declared and flexible (Yes=1)				0.215*** (0.011)
λ (Declared and stable)				-0.273*** (0.004)
λ (Undeclared and stable)				0.071*** (0.004)
λ (Declared and flexible)				-0.300*** (0.003)
Observations			545	

Standard errors in brackets; Reference categories: ^(a)friends; ^(b)cleaning tasks; ^(c)undeclared and flexible. (*) p < 0.10; (**) p < 0.05; and (***) p < 0.01.

Appendix 1: Table A1 Description of the variables in the model

Variable	Definition of the variable
Dependent variable	
Hourly wage	Natural logarithm of hourly net wage: reported wage minus 10% for declared workers (Euro)
Explanatory variables	
Contractual arrangements	
Declared and stable	1 if yes; 0 otherwise
Undeclared and stable	
Declared and flexible	
Undeclared and flexible	
Job status	
Multiple employer	1 if yes; 0 otherwise
Trust issues	
Network to obtain job: relatives	1 if yes; 0 otherwise
Network to obtain job: friends	
Network to obtain job: others	
Specific skill requirements	
Employer required particular skills	1 if yes; 0 otherwise
Self-perception of relevant skills	
Personal traits	PCA analysis scores
Specific skills	
General skills	
Occupational structure	
Elderly care tasks	1 if yes; 0 otherwise
Child care tasks	
Cleaning tasks	
Workers' characteristics	
Age	Age reported (years)
Origin	1 if Migrants; 0 Native
Employers' characteristics	1 if living in a house; 0 apartment

Appendix 2: Table A2 The self-perception of relevant skills through principal component analysis

Table A2 displays the estimated factors, and indicates that four factors with *eigenvalue* greater than one explain 53.49% of the variance of skills. The value of the KMO test (0.811) reveals a good adequacy of the sample.

PCA factors: Explained variance (Cronbach Alpha)	Skills and abilities
Factor 1: Personal traits 26.6% (0.695)	Personal service (dealing with people) Problem solving Discretion Humility Work satisfaction
Factor 2: Specific skills 9.6% (0.686)	Care experience Active listening Counseling
Factor 3: Flexibility 9.3% (0.381)	Ability to adapt Work autonomy Rapidity
Factor 4: General skills 7.95% (0.526)	General experience Availability Training

On further analysis of the main components, we find that the abilities labeled as “personal traits” explain 26.6% of the variability of data including traits like humility, discretion, and work satisfaction. Two other components (2 and 4) show the relevance of general and specific experience. Finally, the third component brings together the skills related to autonomy in work and ability to adapt. Table 6 also presents the Cronbach alpha in parentheses after the proportion of explained variance. The estimates reported for skill and ability subsets range between 0.381 and 0.695. Given the very low internal consistency of the factor labeled “flexibility”, we decided to exclude it from further analyses.

Appendix 3: Table A3 Correlation matrix

Variable	Hourly Wage	Multiple employers	Network: relatives	Network: others	Requirements	Personal traits	Specific skills	General skills	Elderly care tasks	Child care tasks	Age	Origin	Living in a house	Knowledge of legal rights	Declared and stable	Undeclared and stable	Declared and flexible
Hourly Wage	1.00																
Multiple employe	0.28***	1.00															
Network: Relatives	-0.00	-0.02	1.00														
Network: Others	-0.13***	-0.04	-0.25***	1.00													
Requirements	-0.22***	-0.17***	0.08**	0.07	1.00												
Personal traits	-0.00	0.01	0.01	0.04	-0.00	1.00											
Specific skills	-0.16***	-0.09**	-0.02	0.10**	0.08*	0.00	1.00										
General skills	-0.16***	-0.02	0.02	-0.01	0.07	-0.00	-0.00	1.00									
Elderly care tasks	-0.09**	-0.05	-0.01	0.08**	0.09**	0.02	0.12***	0.10**	1.00								
Child care tasks	-0.04	-0.06	0.02	-0.03	0.05	0.04	-0.05	-0.04	-0.24***	1.00							
Age	-0.02	-0.04	0.04	-0.04	-0.02	0.15***	0.12***	0.09**	0.10**	0.02	1.00						
Origin	-0.07	-0.01	-0.13***	0.12**	-0.00	-0.10**	0.03	-0.04	0.06	-0.08*	-0.30***	1.00					

Living in a house	-0.17***	-0.10**	-0.02	-0.01	0.08*	0.09**	0.01	0.08*	-0.07*	0.06	0.16***	-0.09**	1.00				
Knowledge of legal rights	0.01	-0.05	-0.00	-0.03	0.04	0.01	0.02	0.02	-0.03	0.02	-0.09**	-0.01	0.04	1.00			
Declared and stable	-0.32***	-0.20***	-0.00	0.09**	0.19***	0.03	0.14	0.19***	0.18***	0.05	0.03	0.05	0.10**	0.16***	1.00		
Undeclared and stable	-0.14**	-0.09**	0.02	-0.00	-0.03	-0.01	0.03	-0.12**	-0.04	0.10**	0.07*	-0.04	0.01	-0.08**	-0.32***	1.00	
Declared and flexible	0.27***	0.23***	0.04	-0.06	-0.06	-0.04	-0.10**	-0.08*	-0.08**	-0.08	-0.08**	-0.00	-0.05	0.07*	-0.52***	-0.22***	1.00

(*) $p < 0.10$; (**) $p < 0.05$; and (***) $p < 0.01$.

ⁱ We learned that the variables relevant for our study are often missing in the secondary data available for research (e.g. Labour Force Survey, LFS, EUROSTAT). This leads to the neglect of several important issues related to domestic work, notably the informality. Furthermore, we are interested in testing the argument of the value of skills in the labour market (Green, 1998). However, the available economic literature has overlooked the workers and occupations viewed as “non-skilled”.

ii Relative to LFS, workers from the largest city (Lisbon) and migrants are overrepresented in our dataset.

iii We checked for correlation among variables and excluded some from the model. For example, multiple employer condition is negatively correlated with live-in status. A live-in domestic worker is unable to work for more than one employer. See the correlation matrix in Table A3 in Appendix 3 for all other variables.