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Registration: The Case of
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Abstract

Labor informality has long been a subject of public concern in Brazil, and across different occupations, domestic workers are the epitome of informal workers. In 2006, the Brazilian President approved a law to encourage employers to formally register their domestic employees this specific occupation. The present study uses various statistical approaches to investigate the effectiveness of this new law. Using different techniques, our results show that the law had no relevant impact on the formalization rates of domestic workers. Explanations for this result suggest that uncoordinated public policy initiatives may emphasize mixed goals, which prevents the achievement of any of the goals. On one hand, there continues to be a need for policy-level incentives that allow workers to deduct labor social security contributions from their personal income taxes, while on the other hand, other public policy initiatives, such as increases in the real minimum wage, provide disincentives to formalization.

1. Introduction

Women's participation in the labor market in Brazil mainly took hold in the 1970s and 1980s. Based on 2008 data¹, the rate of labor force participation was 54.68 percent for women between fifteen and sixty years old. A very peculiar characteristic of this participation is the concentration of women in jobs that require low levels of human capital with a low rate of formalization². Indeed, 62.78 percent of working women are not formally registered. Another important piece of information is that, among the 6.7 million domestic workers in Brazil, 6.3 million are women (IBGE, Brazilian Institute of Geography and Statistics). On Labor Day of 2006, new legislation on personal income taxes was approved³ with the goal of promoting fairer treatment of domestic workers (mostly maids and nannies). In the following year, all persons who hired a domestic worker and registered them would be entitled to an income tax exemption. This exemption would be based on the social security paid by employees, which corresponds to 12 percent of the gross monthly salary of the domestic worker.

This new piece of legislation aimed to encourage the registration of domestic workers. While this labor sector had a formality index⁴ of 38.93 percent in 2005 (PNAD 2005, IBGE), this index increased to 41.88 percent in 2008 (PNAD 2008, IBGE). This increase in the formality index is not conclusive evidence that the legislation reform achieved the desired goal. In order to evaluate whether domestic workers exhibited a real increase in their formality index, it is necessary to evaluate whether the increase in the formality index was based on individual characteristics of the registered workers and

¹ As discussed below, the data were collected by the Brazilian Institute of Geography and Statistics (IBGE, Instituto Brasileiro de Geografia e Estatística) as part of the National Sample Survey of Households (PNAD, Pesquisa Nacional de Amostra por Domicílios) survey.

² A formal worker is the one who has a register on his/her labor booklet. When an employer registers the domestic worker, he/she has to pay several labor contributions, as well 30 days of vacation per month and complain with national labor regulation.

³ Provisory Law Number 284, March 2006.

⁴ The formality index is the proportion of workers that are formally registered by occupation.

whether the treatment effect occurred mainly due to these characteristics or if there were other sources of change that affected the result. The literature on natural experiments usually suggests the use of a differences-in-differences test to evaluate these claims. Because the characteristics of the control group have a strong effect on the estimated results, new approaches were proposed in order to evaluate the impact of the law.

The purpose of the present paper was to use different methodologies, including a differences-in-differences approach and a propensity score evaluation, to test the effectiveness of this legislation. Our results show that the reform had no significant impact on the formality index of domestic workers independent of the methodology used to calculate the change on the formality index. In addition to the restrictiveness of the tax deduction, one additional explanation for this result is the increase in the real minimum wage, which also occurred during the year in which the new law was implemented.

This paper proceeds as follows. Section 2 describes previous literature on natural experiments in relation to the case of domestic workers in Brazil. Section 3 presents the data considered in this study and reports the final results. Conclusions are offered in the final section.

2. Natural Experiments and the Case of Brazilian Domestic Workers

A natural experiment involves the analysis of changes in some variable Y for a specific group of individuals after an external interference occurs. This variable can be an event; for example, Card (1990) examines the effect of a large inflow of Cuban immigrants in Miami after the Mariel Boatlift. It may also be variations in law, as presented in Besley and Burgess (2004), which studies the impact of labor regulation on economic growth in India. The important characteristic of this method is that it includes

a treatment group that has been influenced by an external interference and a control group that has a behavior trend very similar to the treatment group but that did not experience the same change. The objective of the method is to compare the difference in outcome between these two groups that differ only in terms of the external event⁵.

In the present study, we aim to estimate the effect of a new law on personal income taxes that allows individuals who hire domestic workers to deduct the social security contribution made on behalf of these workers from their income tax. Discussion of this law began in 2004 at the National Congress; however, it was not approved until May 2006. In applying the differences-in-differences approach to this case, there is an important issue regarding the possible endogeneity of this legal change. There is no question that domestic workers represent, by far, one of the most informal occupations in Brazil. However, this group was not organized to either demand or implement this kind of reform⁶. Furthermore, there was no movement among workers to promote a greater formalization of domestic work as compared to other occupations. Both of these observations undermine the possible endogeneity of this legal change.

The new law has some restrictions. The most important restrictions are as follows. First, each individual can deduct only the contribution for one domestic worker. In addition, only individuals that present a full declaration of income⁷ can make this deduction. Finally, the deducted contribution is limited to 12 percent of the minimum wage. In the category of “domestic worker”, the government includes

⁵ Details on the methodology of differences-in-differences can be found on Angrist and Pischke (2009) and Puhani (2008). Critiques and additional motivations to experiment alternative approaches, as the propensity score matching that we also implement, can be found on Ai and Norton (2003) and Bertrand, Duflo and Mullainathan (2004).

⁶ Using a gender perspective, Pinho and Silva (2010) analyze relations between domestic workers and their employees, which is generally a relation between two women. In this study, we abstain from issues related to domestic work relationships in Brazil. However, we acknowledge the importance of these aspects in terms of worker formalization rates. Indeed, our conclusions are in accordance with previous findings on the precarious situation of these workers.

⁷ In Brazil, there are two forms used to declare income, namely, simplified and full declaration forms. On the simplified form, everyone has a fixed amount of deductions, without verification. Full declaration requires receipts and proof of expenses for all deductible items.

workers who engage in continuous work inside a household; the category is generally limited to maids, nannies, gardeners, drivers and housekeepers.

Because the goal of the new law was to increase the formalization of domestic work, our response variable is a dichotomous variable indicating the formality of work, using the fact that each individual in the sample reported whether his/her employment⁸ was registered. Therefore, we can use a probit model, as in Madrian (1994). Our regression model is as follows:

$$\Pr(Y_i) = \beta_0 + \beta_1(DW_i) + \beta_2Time_i + \beta_3(DW_i * Time_i) + \sum_{j=1}^k \alpha_j X_{ij} + \varepsilon_i, i = 1, \dots, n$$

Y is an indicator variable for labor formality that assumes a value of 1 if the job is formal; it is 0 otherwise.

DW is an indicator variable for occupation that assumes a value of one to indicate domestic work; it is zero otherwise.

$Time$ is an indicator variable for pre- and post-event observations. It assumes a value of one to indicate 2007 (i.e., the post-event period); it is zero, otherwise.

X_1, \dots, X_k are control variables that represent individual characteristics; ε_i is the random error, and n is the sample size.

Using this probit regression model, we examined the significance of the β_3 coefficient. The magnitude of the effect can be measured by the marginal effect of this coefficient⁸. As discussed before, the advantage of using a regression model is that we can include additional characteristics to control for unwanted effects as well as check the robustness of the estimation with respect to demographic and individual-level characteristics. Our results are consistent and persistent along different specifications,

⁸ Some authors, such as Madrian (1994), prefer to estimate the effect by predicting Y for the treated group. However, the marginal effect can be used for the same purpose, since it is a dummy variable.

which reinforce the robustness of the results. In the next section, we present the data and discuss the proposed control group used in this experiment.

In order to further test the robustness of our findings, we used another econometric approach called propensity score analysis. Heckman, Ichimura and Todd (1998) propose a propensity score method to match data in order to evaluate natural events. The difference between this method and the above mentioned technique is that, in propensity score analysis, we pair individuals that report similar characteristics; i.e., for each domestic worker, we selected one non-domestic worker who exhibited the same control variables. Note that there is no need to include the control variables in the model, as this matching ensures that the two compared groups are homogeneous in terms of their individual characteristics. The advantage of the propensity score model is that it is possible to guarantee that we are comparing very similar individuals, at least with respect to the observed variables. Thus, it is almost as if we are able to analyze the same individual in two contrasting situations (namely, as a domestic worker and a non-domestic worker) in order to compare across different circumstances the changes in the variable of interest, that is, the formality index.

The next section explains the dataset as well as the main results from our analysis. Both models reached the same conclusion that the new law had no impact on the formalization of domestic workers.

3. Data and Results

The new law was aimed at giving employers of domestic workers a greater incentive to formalize their employees. We evaluated the achievement of this goal by means of a natural experiment. In order to evaluate changes in the formality index for this occupation, we used microdata collected by the National Sample Survey of Households

(PNAD, Pesquisa Nacional de Amostra por Domicílios) before and after the change in the law. The PNAD solicits information on mainly demographic and economic characteristics from individuals and their families. This dataset is the result of an annual survey implemented by the Brazilian Institute of Geography and Statistics (IBGE, Instituto Brasileiro de Geografia e Estatística), which is a government institute that is responsible for investigating population and economic data in Brazil. As the announcement about the new personal income tax deduction was made in May 2006, we set 2005 as the “pre-event” period and 2007 as the “post-event” period⁹.

In the PNAD survey, a sample of households is interviewed in September of each year and asked questions to obtain demographic data, education profiles and working characteristics of all persons living at that household. The dataset questions were constant across the years used for analysis in this paper, as most of the significant changes were made at the beginning of 2000. This allows us to investigate formalization among domestic workers by ensuring that we are using the same variables, even though the years differ. We used a question about employment formalization as our response variable. This variable is binary; therefore, our regression model is a probit model¹⁰.

In a differences-in-differences model, we must carefully examine the available control group. These individuals should be similar to the treated individuals, and every incentive or external effect that affects one of the groups must also affect the other group (of course, with the exception of the event under analysis). To this end, we selected eight groups of occupations that are similar to domestic workers with respect to work activity, human capital and hiring processes. It was not possible to select a single

⁹ We avoided using 2006 data because the announcement was made in May and data collection began in September. As such, we were not certain that 2006 data would truly be “post-event” data. Furthermore, we used data from the following year in order to exclusively capture the effect of this law. In order to analyze any long-term impacts, a different approach would be necessary, as both of the statistical methods used in the present research are aimed at analyzing short-term impacts.

¹⁰ We also implemented a logit specification; the results give the same sign and are very similar in terms of impact.

occupation for comparison because the number of domestic workers in Brazil is large as compared to other activities.

The control group included restaurant and bar workers (e.g., table waiters, bartenders and kitchen assistants), building workers (e.g., administrative, maintenance and conservation workers who are usually hired by a group of persons, not a sole employer), beauty and hygiene service workers (e.g., manicurists and hairdressers), au pairs and caretakers, laundry workers, security workers who are hired by firms, and residential security personnel¹¹. Table 1 shows the demographic characteristics of these groups for the pre- and post-event periods. Only persons between fifteen and sixty years of age¹² declaring to be full time workers (i.e., forty hours per week or more) were included in the sample. The selection of full-time workers is crucial in this study because part-time domestic workers are common; such workers may work in different households during weekdays and thus would not receive a full wage from either employer¹³.

<TABLE 1 ABOUT HERE>

For the traditional differences-in-differences approach, profiles for the treatment and control groups must be very similar before the event and after the event, of course, with the exception of the event itself. Data from 2005 show that female domestic workers comprise a greater proportion than in the comparison group; this greater proportion of female workers is very peculiar to this occupation group. In order to achieve similar characteristics for the other variables across the treatment and control

¹¹ This type of worker is very common in large Brazilian cities, where residents hire guards to stay posted on the street both night and day to keep watch and prevent incidents of crime. These guards are usually unarmed.

¹² In Brazil, it is still very common for young persons to work as domestic workers. The legal working age for all occupations is fourteen years.

¹³ Also, a part-time worker could be registered by one employer and not registered by another. This type of data would confuse our analysis. Having a very large sample as we have, we prefer to keep only the full time workers to avoid these problems.

groups, we retained all of the occupations cited above despite this difference in the proportion of female workers.

The racial profile of the two groups is practically the same; the majority of domestic workers (54.3 percent of them) are *mulatos*; almost the same proportion of *mulatos* comprises the comparison group (49.5 percent). Other racial groups are represented in similar proportions for the two groups. In terms of education, the domestic workers are slightly less educated than the control group; however, there is a high concentration in both groups of individuals with one to eight years of education, which is called fundamental education in Brazil. Regarding geographical distribution, both groups again have similar characteristics; 42 percent of the domestic workers are in the south and southeast regions, while 44 percent of the control group are in those regions. In addition, 30 percent of the treatment group lives in the northeast region, while 28.5 percent of the control group lives in that region. The average age in both groups is about thirty five years, and even though the point estimation is larger for the control group, there is no significant difference in terms of monthly income between the two groups. Finally, the most important variable for our work is the formality index. As expected, domestic workers had the lowest formality index in 2005 (36.6 percent) and 2007 (38.9 percent). The similar demographic profiles of the control and treatment groups address potential problems in the internal validity of this experiment, as discussed by Meyer (1995)¹⁴.

¹⁴ The first potential threat cited by Meyer (1995) is the omission of variables and measurement error. Since the control group has characteristics similar to those of the treated group and because the differences-in-differences method is based on the average difference in the trends of the two groups, it is less likely that variables not included as controls would bias the results with respect to the real effect of the event. Moreover, the use of two cross-sectional datasets for two different years does not lead to measurement errors because the questions are exactly the same for the variables used in this study. The second risk cited by Meyer (1995) involves trends beyond the event itself, including both macroeconomic trends as well as political influences. We can observe that almost all occupations exhibited an increase in their formality index; however, the dynamics that generated these changes may not be the same, and therefore, there is no evidence that a particular trend explains the results. The third danger in using this method is the misspecification of variances; to this end, we used a robust estimation of the standard error

Because our main focus was to understand changes in the labor conditions of domestic workers, including formality status, Table 2 presents data on changes in the formality index across different geographical regions within Brazil as well as changes in the hourly wage of the respective workers. For both years, the region that paid the highest hourly wage was the south region. In addition, this region exhibited the highest formality index for domestic workers as compared to the rest of the country, with 55.4 percent of domestic workers formally registered in both years. In terms of comparisons from 2005 to 2007, domestic workers from the central west region showed the largest nominal wage increase, at 29.2 percent, as well as the largest increase, at 5.5 percent, in the formality index from 2005 to 2007. Domestic workers in the northeast region saw a similar increase of 28.9 percent in nominal wages but a much smaller increase of 2.1 percent in the formality index.

<TABLE 2 ABOUT HERE>

Since there are some regional differences with respect to both wage level and the formalization of domestic work, we derived specifications of our regression model according to geographical region. However, these results were not significantly different from the results for the entire country. Therefore, we report only results that include observations for all of Brazil¹⁵. Table 3 presents these results¹⁶.

<TABLE 3 ABOUT HERE>

calculations. The fourth threat to this method involves both simultaneity and selection issues. There is no evidence of either of these problems because the explanatory variables are mostly determined before the event and do not depend on the occurrence of the event, as explained in the introduction. In addition, selection into the treatment group was due to an individual's choice of occupation, which is not linked to that occupation's formality index. Finally, the attrition and omission of interactions are cited as threats; these are not issues in the present study because we did not use a panel data structure. Moreover, the cross-sectional data used do not concern the same individuals but rather individuals with similar characteristics based on occupation.

¹⁵ Regional regressions results are available upon request to the authors.

¹⁶ We report both the Probit estimated coefficient as well the marginal effects. Since all variables are indicator variables, we evaluate them in terms of percentage changes.

Column (A) reports the results from the differences-in-differences model without any control variables, which is the so-called baseline regression. Column (B) presents Model 1 results based on a differences-in-differences approach with control variables. Finally, column (C) shows the results from the propensity score method, which, by definition, has no control variables¹⁷. After each of these columns, we report the marginal effects for the statistically significant variables. The marginal effects are measured for the means of the other variables; that is, fixing all other variables at their respective means, we change only the variable indicating the probability of being registered as a formal worker.

A negative effect of this variable is observed on the domestic work occupation. Independently of the model used, there is a decrease in the probability of being registered as a formal worker if the sampled individual works as a domestic worker. Considering the baseline regression, the fact that a person is a domestic worker decreases her/his chances of being registered as a formal worker by 74.7 percent. However, when considering other individual characteristics, such as demographic and economic variables, being employed as a domestic worker decreases the chances of being registered as a formal worker by more than 50 percent; this value is 56.1 percent in Model 1 and 59.8 percent in Model 2. These results are not unexpected, as we can see in Tables 1 and 2 that domestic workers exhibit lower registration rates even when compared to similar workers. Table 1 shows that, in 2005, only 36.6 percent of the domestic workers were formally registered, while 69.5 percent of the workers in the control group were registered. The results are slightly different for 2007; the formality

¹⁷ Because the goal of this paper was to investigate the effect on the formality index, the most important variable is the interaction between the occupational dummy and year, which is denoted as the interaction coefficient. Therefore, we do not present the results for the control variables; they are available upon request to the authors.

index increased to 38.9 percent for domestic workers and to 70.7 percent for other workers.

Additionally, previous analyses of Tables 1 and 2 have shown that more workers are becoming formally registered as time goes on. However, the coefficient for the year 2007 indicator shows mixed results. While it is positive for both the baseline model and Model 2, which uses the propensity score method, it is statistically significant only for the baseline model. In addition, the results are also significantly negative for Model 1, which uses a differences-in-differences approach and controls for all individual demographic and economic characteristics. These results indicate that, even with the government's efforts to encourage more employers to formally register their workers, it is not clear that the proportion of workers who are formally registered is increasing during this period in Brazil.

The most important result in Table 3 concerns the estimated coefficient for the interaction of being a domestic worker and the 2007 year dummy variable. This result indicates the net effect of being a domestic worker after the implementation of the new law. A positive result would indicate that the policy is successful in achieving its goals, while a negative or non-significant result would indicate the reverse. Based on the third row of Table 3, we can deduce that there was no significant impact of this variable on the formality index. Even if these coefficients were significant, they are all negative, which would indicate that the effort of encouraging domestic workers to become formally registered had the opposite effect. Our results, therefore, show that the effect of the new law intended to encourage domestic workers to become formally registered cannot in fact be confirmed.

One other factor in evaluating the effect of the new law is the significant increase in the real minimum wage that took place in 2006. The inflation rate was one

of the most significant problems facing the country throughout the past century, particularly in the 1980s and 1990s. After stabilization of the inflation rate, however, the cultural habit of periodical and systematical increases in wages persisted. The government establishes the minimum wage every year. Since 2000, there has been an increase in the real value of minimum wage, except in 2004, when purchasing power was only maintained. Table 4 shows changes in the nominal and real minimum wages using the Consumer Price Index (*Índice de Preços ao Consumidor*, IPC) of the previous year¹⁸. We note that the largest increase in real minimum wage occurred in 2006; this increase was 12 percent, as compared to the average of 7 percent for the entire decade.

<TABLE 4 ABOUT HERE>

One possible hypothesis that reconciles the previous result regarding no increase in the formality index despite the new law is that the increase in minimum wage had a larger negative effect on the motivation of these employers to formalize their workers. According to Table 1, the mean average monthly wage for domestic workers was R\$ 301.00 in 2005 and R\$ 375.50 in 2007. The minimum wage was R\$ 300.00 and 380.00, respectively. Because a large portion of domestic workers receive the minimum wage or a remuneration that is lower than that established by law, the increase in the real minimum wage may have decreased the predisposition of domestic employers to formally register their workers.

Based on this evidence, we conclude that the new law implemented in 2006 had a null effect because competing public policy initiatives distorted any incentive that this law may have elicited. On the one hand, employers that used a complete annual income declaration form would benefit from an additional deduction if they chose to declare their domestic worker. On the other hand, this incentive did not appeal to everyone, as

¹⁸ The minimum wage is readjusted at the beginning of the year; therefore, we used the previous year's inflation rate to infer its real value.

there were many restrictions (e.g., only one domestic worker could be deducted per declaration). Moreover, this incentive was counteracted by the real increase in the minimum wage. Meneguín and Bugarín (2008) propose a model in which the judiciary system influences the probability of labor formality. One of their cases shows that a high level of informality can be maintained through relatively ineffective actions of the judiciary system together with a high turnover rate among employees. Applying their model to our case, we see that the new law lost its effectiveness due to competing incentives at the level of public policy.

4. Conclusion

Domestic workers, a group mainly comprised of women, have a history of being highly informal. Government assessments of this problem led to a new law that aimed at creating an incentive for domestic employers to formalize their employees by allowing for a personal income tax deduction. Because the new incentive was applicable to domestic workers, we examined a natural experiment to evaluate its consequences.

By using individual-level data before and after the new law and generating an appropriate control group, we found that the new law did not have the expected impact. Instead of increasing the formality index for domestic workers, the probability of a domestic worker becoming formally registered did not change. We tested this result using different methodologies, including the differences-in-differences approach and propensity score matching; both showed no policy impact in the short run.

Two explanations for this result are possible. Either the incentive was too low insofar as only a few employers were eligible due to the restrictions, and/or the significant increase in the real minimum wage counteracted the incentive. This latter explanation would suggest that a lack of coordination among public policy initiatives

not only fails to adequately communicate the government's intentions but also creates expectations that such competing initiatives cannot fulfill.

References

Ai, Chunrong, and Edward Norton

2003 "Interaction Terms in Logit and Probit Models", *Economics Letters*, 80(1):123-129.

Angrist, Joshua D., and Jörn-Steffen Pischke

2009 "Mostly Harmless Econometrics: An empiricist's Companion", Princeton, New Jersey: Princeton University Press.

Bertrand, Marianne, Esther Duflo, and Sendhil Mullainathan

2004 "How Much Should We Trust Differences-in-Differences Estimatives?", *Quarterly Journal of Economics*, 119(1): 249-275.

Besley, Timothy, and Robin Burgess

2004 "Can Labor Regulation Hinder Economic Performance? Evidence from India", *Quarterly Journal of Economics*, 113(1): 91-134.

Card, David

1990 "The Impact of the Mariel Boatlift on the Miami Labor Market", *Industrial and labor relations Review*, 43(2): 245-257.

Heckman, James, Hidehiko Ichimura, and Petra Todd

1998 "Matching As An Econometric Evaluation Estimator", *Review of Economic Studies*, 65: 261-294.

Madrian, Brigitte C.

1994 "Employment-Based Health Insurance and Job Mobility: Is There Evidence of Job-Lock?", *Quarterly Journal of Economics*, 109(1): 27-54.

Meneguín, Fernando, and Mauricio Bugarín

- 2008 “A informalidade no mercado de trabalho e o impacto das instituições: uma análise sob a ótica da teoria dos jogos.”, *Economia Aplicada*, 12(3): 341-363.

Meyer, Bruce

- 1995 “Natural and Quasi-Experiments in Economics”, *Journal of Business & Economic Statistics*, 13(2): 151-161.

Pinho, Patricia de S., and Elizabeth Silva

- 2010) “Domestic relations in Brazil: legacies and horizons”, *Latin American Research Review*, 45(2): 90-113.

Puhani, Patrick A.

- 2008 “The Treatment Effect, the cross Difference, and the Interaction Term in Nonlinear “Difference-in-Differences” Models”, *IZA Discussion Paper # 3478*, April.

**Table 1: Demographic Characteristics of the Treatment and Control Samples:
Pre-Event (2005) and Post-Event (2007)**

Year	2005		2007	
	Domestic workers	Control Group	Domestic workers	Control Group
Sample percentage	45.1%	54.9%	42.0%	58.0%
Gender				
Male	8.1%	59.8%	8.0%	58.3%
Female	91.9%	40.2%	92.0%	41.7%
Race				
White	33.6%	39.0%	33.5%	38.6%
Black	11.6%	11.0%	13.6%	13.5%
Mulato	54.3%	49.5%	52.0%	47.2%
Asiatic	0.3%	0.2%	0.5%	0.4%
Indigene	0.1%	0.3%	0.4%	0.4%
Education profile				
No education	10.1%	6.7%	9.6%	5.7%
1 to 4 years	32.7%	20.6%	29.8%	19.2%
5 to 8 years	37.6%	35.9%	39.1%	35.1%
9 to 11 years	18.1%	34.1%	20.2%	37.0%
12 to 14 years	0.3%	1.2%	0.3%	1.4%
15+ years	1.2%	1.5%	0.8%	1.6%
Region				
North	15.1%	11.7%	13.5%	11.4%
Northeast	30.4%	28.5%	30.3%	28.0%
Center	12.2%	11.6%	13.5%	11.1%
Southeast	31.1%	34.2%	31.2%	33.9%
South	11.1%	14.0%	11.5%	15.6%
Age	35.01 (10.76)	34.42 (10.93)	36.22 (10.65)	34.93 (11.07)
Monthly labor income	301.0 (140.6)	435.9 (254.6)	375.5 (173.5)	514.4 (285.1)
Formality index	36.6%	69.5%	38.9%	70.7%

Source: PNAD (IBGE) and authors' tabulation.

Parentheses indicate the standard deviations.

Table 2: Changes in the Formality Index and Nominal Hourly Wage for Domestic Workers from 2005 to 2007

Domestic workers				
Year		2005	2007	Δ (2007-2005)
Region				
North	Formality Index	17.0%	20.9%	+ 3.9%
	Hourly Wage	5.6 (2.4)	6.7 (2.9)	+ 19.6%
Northeast	Formality Index	24.2%	26.3%	+ 2.1%
	Hourly Wage	4.5 (2.2)	5.8 (2.8)	+ 28.9%
Center	Formality Index	37.6%	43.1%	+ 5.5%
	Hourly Wage	7.2 (2.7)	9.3 (3.7)	+ 29.2%
Southeast	Formality Index	51.0%	50.9%	- 0.1%
	Hourly Wage	7.8 (3.5)	9.6 (4.1)	+ 23.1%
South	Formality Index	55.4%	55.4%	0.0%
	Hourly Wage	8.2 (3.3)	10.4 (4.3)	+ 26.8%

Source: PNAD (IBGE) and authors' tabulation.

Parentheses indicate the standard deviations.

Table 3: Regression Results for Full-Time Workers

	(A) Baseline Regression	Marginal Effect Baseline Model	(B) Model 1	Marginal Effect Model 1	(C) Model 2	Marginal Effect Model 2
Domestic Worker	-0.804* (0.023)	-0.747	-0.503* (0.027)	-0.561	-0.488* (0.031)	-0.598
Year 2007	0.053** (0.022)	0.060	- 0.053** (0.025)	-0.188	0.055 (0.036)	-
Interaction Coefficient	-0.020 (0.033)	-	-0.032 (0.035)	-	-0.021 (0.044)	-
Female Indicator	No		Yes		No	
Age	No		Yes		No	
Race	No		Yes		No	
Indicators						
Head of Household	No		Yes		No	
Urban Area	No		Yes		No	
Education Indicators	No		Yes		No	
Regional Indicators	No		Yes		No	
Labor Income	No		Yes		No	
Working Hours per Week	No		Yes		No	
Job Tenure	No		Yes		No	
Intercept	0.523* (0.016)		-0.122 (0.253)		0.207* (0.026)	
Number of Observations	31,174		31,174		19,890	
Pseudo R ²	0.0778		0.1818		0.0308	

Notes:

- i) Robust standard errors appear in parentheses.
- ii) In all regressions, probability weights were assumed.
- iii) Asterisks indicate significance; * is significant at 1%, ** is significant at 5%, and *** is significant at 10%.

Table 4: Changes in the Real Minimum Wage from 2000 to 2010

	Nominal Minimum Wage (R\$)	Inflation Index by IPC	Real Minimum Wage Increase (base=2000)
2000	151.00	4.4%	
2001	180.00	7.1%	14%
2002	200.00	9.9%	4%
2003	240.00	8.2%	9%
2004	260.00	6.6%	0%
2005	300.00	4.5%	8%
2006	350.00	2.5%	12%
2007	380.00	4.4%	6%
2008	415.00	6.2%	5%
2009	465.00	3.6%	6%
2010	510.00	n.a.	6%

Source: FIPE/USP and the Brazilian Labor Ministry.